Biological Resources Baseline Environment Technical Memorandum

Uinta Basin Railway

Seven County Infrastructure Coalition

December 3, 2019

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Acronyms and Abbreviations

BLM	U.S. Bureau of Land Management
Coalition	Seven County Infrastructure Coalition
EIS	Environmental Impact Statement
I	interval
SGMA	Sage-Grouse Management Area
SITLA	Utah School and Institutional Trust Lands Administration
STB	U.S. Surface Transportation Board
UDWR	Utah Division of Wildlife Resources
UNHP	Utah Natural Heritage Program
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
var.	variety

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1.0 Introduction

The Seven County Infrastructure Coalition (Coalition), a governmental entity comprising Carbon, Daggett, Duchesne, Emery, San Juan, Sevier, and Uintah Counties, is proposing a new railway that would connect the Uinta Basin's various industries to the national rail network. Currently, the Uinta Basin does not have rail service, and freight needs are met primarily through trucking over a limited highway network. The Coalition is conducting engineering and environmental activities in support of an Environmental Impact Statement (EIS). The railway would be constructed and operated under the authority of the U.S. Surface Transportation Board (STB). STB, in conjunction with other regulatory bodies, is preparing an EIS for this railway, which has the potential to cause environmental impacts.

The Coalition has proposed three routes to STB for detailed study in the EIS. This memorandum has been prepared by HDR, Inc., on behalf of the Coalition, and submitted to the STB to support the preparation of the EIS.

This baseline report summarizes the existing biological resources that would be affected by the three alternative railway routes:

- Indian Canyon, as defined by a conceptually engineered route dated May 30, 2019
- Wells Draw, as defined by a conceptually engineered route dated May 30, 2019
- Whitmore Park, as defined by a conceptually engineered route dated August 21, 2019

A brief description of each alternative route is provided in Sections 1.1 through 1.3 below.

1.1 Indian Canyon Alternative

The Indian Canyon route is about 80 miles long; crosses Uintah, Duchesne, Carbon, and Utah Counties; and ranges in elevation from 5,015 to 8,207 feet. Figure 1-1 shows an overview map of this route.[1] The Indian Canyon route runs from a connection to the national railway network near Kyune, Utah, to a terminus near Myton, Utah, in the Uinta Basin. The route travels through privately owned land as well as land owned by the U.S. Department of Agriculture (USDA) Forest Service, the U.S. Bureau of Land Management (BLM), the Utah School and Institutional Trust Lands Administration (SITLA), and the Ute Tribe.

1.2 Wells Draw Alternative

The Wells Draw route is about 102 miles long; crosses Uintah, Duchesne, Carbon, and Utah Counties; and ranges in elevation from 4,956 to 8,207 feet. Figure 1-2 shows an overview map of this route.[2] The Wells Draw route runs from a connection to the national railway network near Kyune, Utah, to a terminus near Myton, Utah, in the Uinta Basin. The route travels through privately owned land as well as land owned by BLM and SITLA.

1.3 Whitmore Park Alternative

The Whitmore Park route is about 85 miles long; crosses Uintah, Duchesne, Carbon, and Utah Counties; and ranges in elevation from 5,015 to 8,207 feet. Figure 1-3 shows an overview map of this route.[3] The Whitmore Park route runs from a connection to the national railway network near Kyune, Utah, to a terminus near Myton, Utah, in the Uinta Basin. It coincides with the Indian Canyon route for much of its length. The route travels through privately owned land as well as land owned by the USDA Forest Service, BLM, SITLA, and the Ute Tribe.

[1] The route shown in Figure 1-1 is based on conceptual engineering completed May 30, 2019.
[2] The route shown in Figure 1-2 is based on conceptual engineering completed May 30, 2019.
[3] The route shown in Figure 1-3 is based on conceptual engineering completed August 21, 2019.

Figure 1-1. Overview of Indian Canyon Alternative

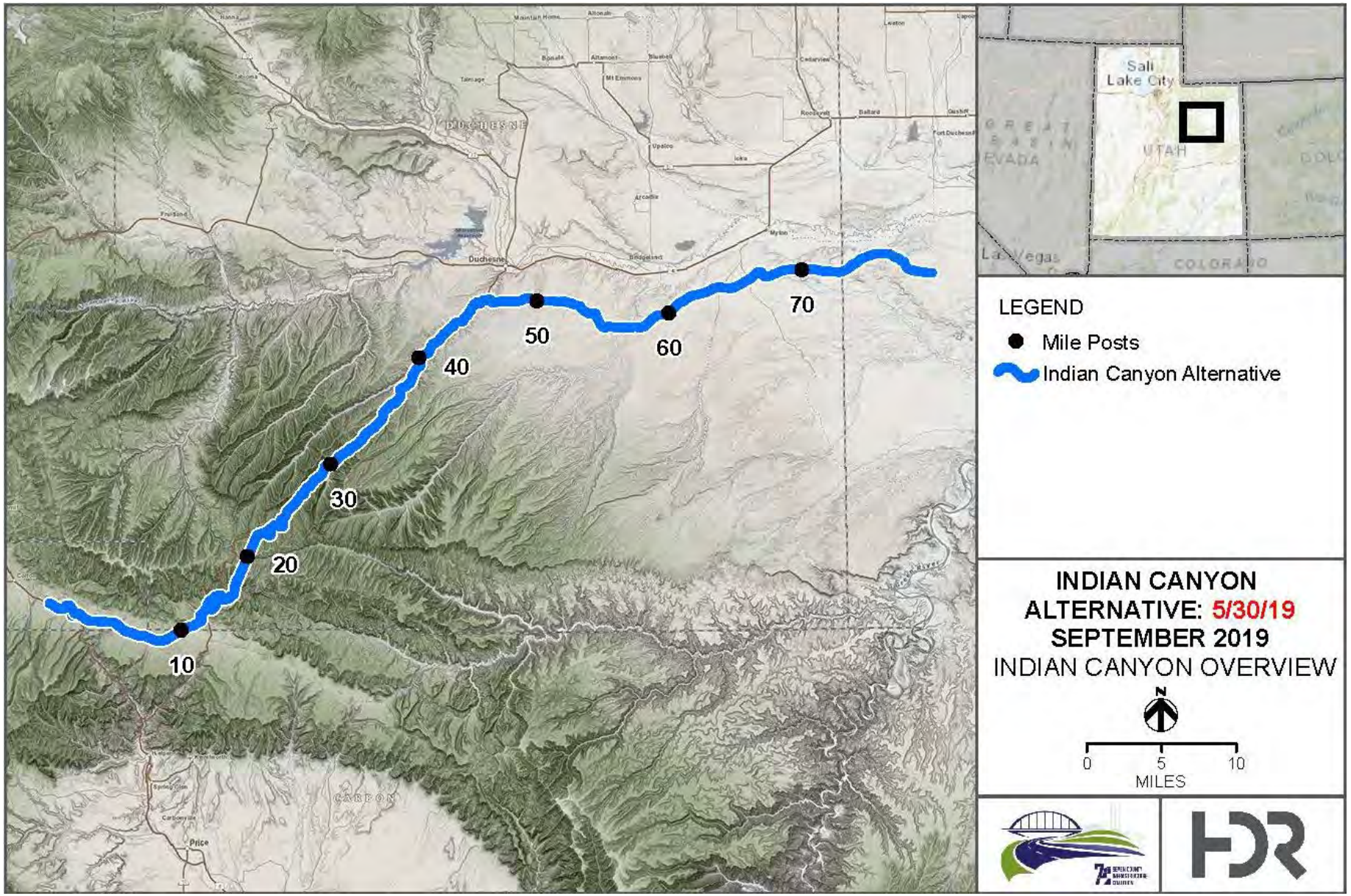


Figure 1-2. Overview of Wells Draw Alternative

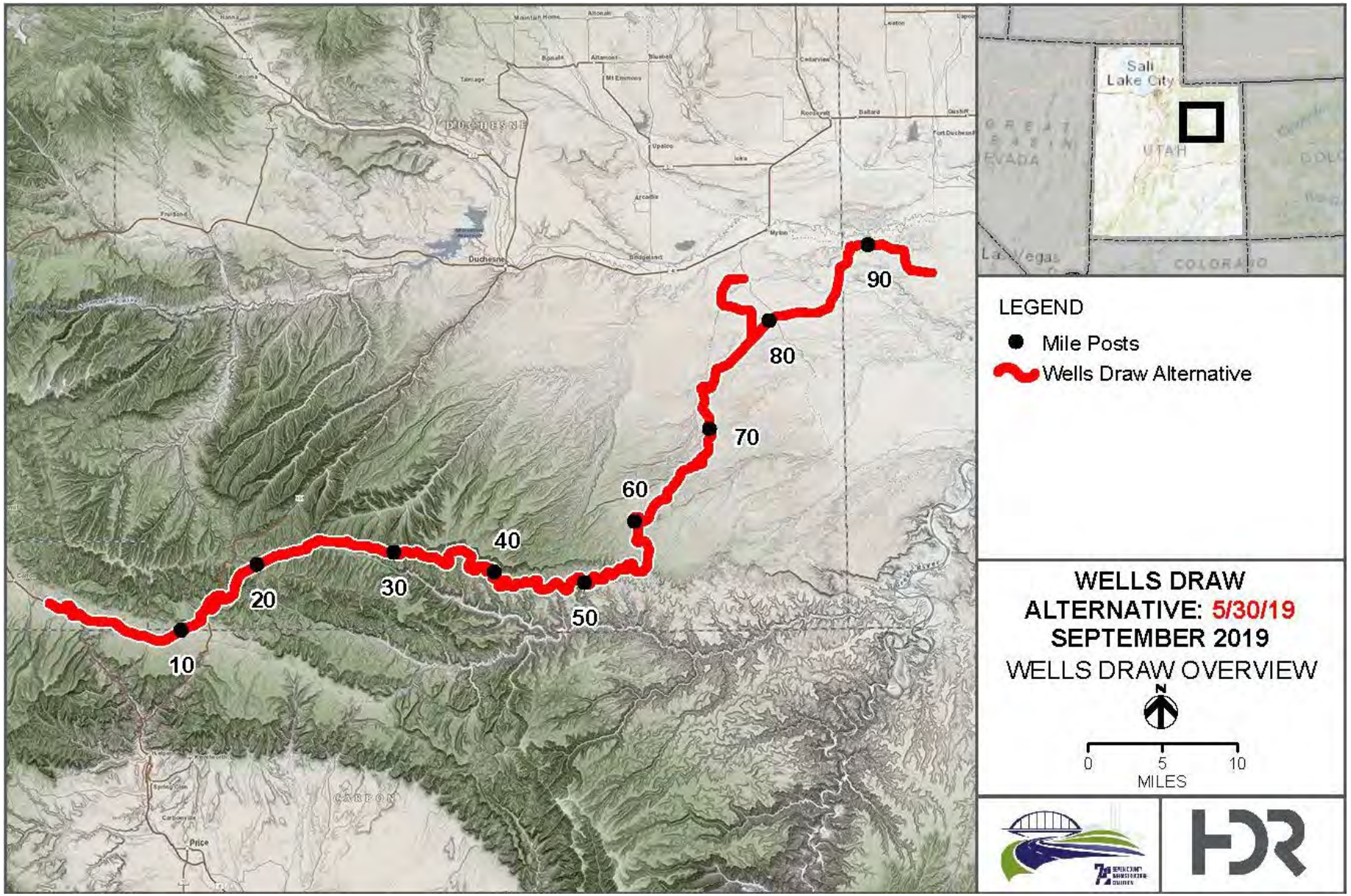
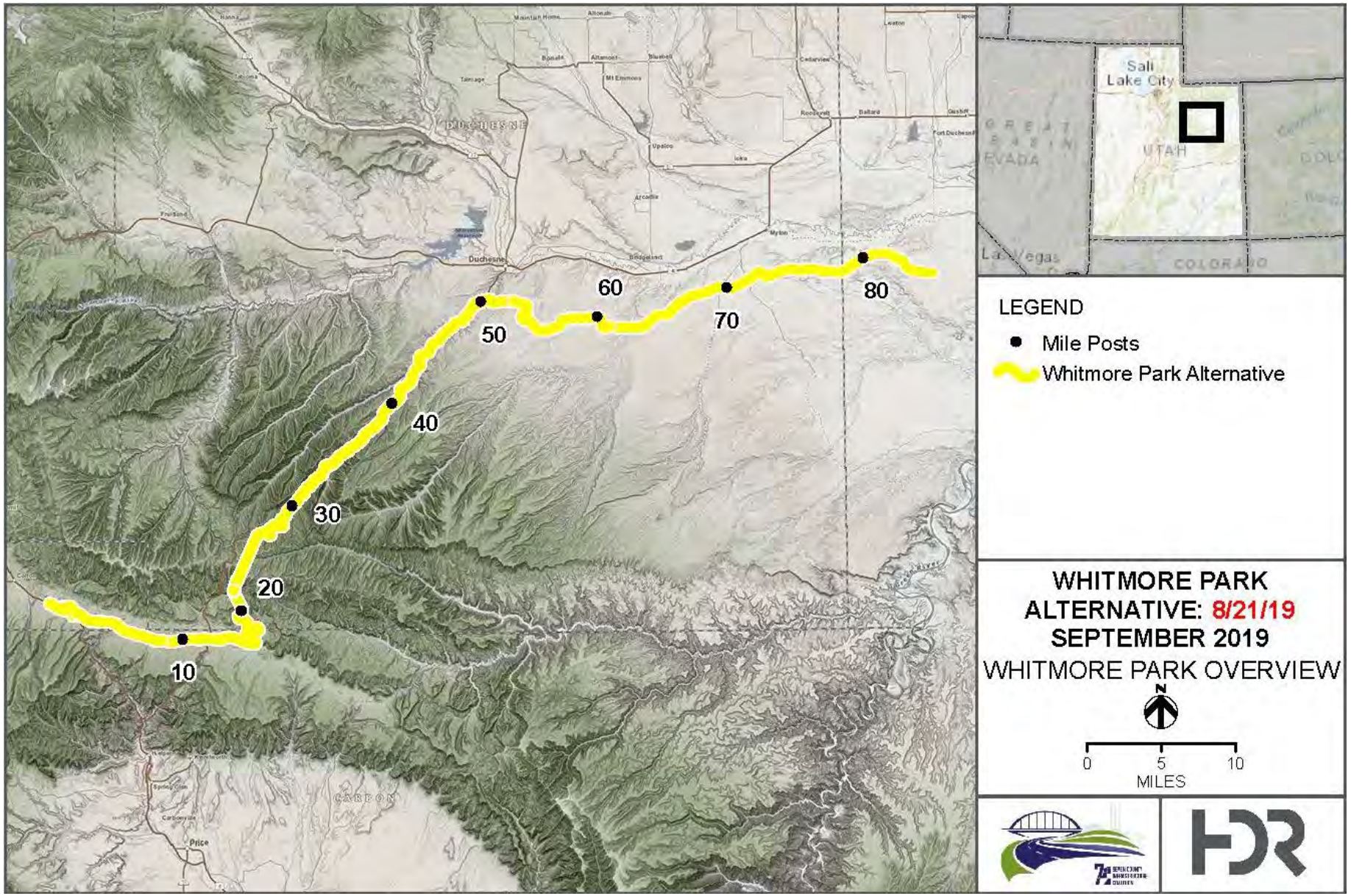


Figure 1-3. Overview of Whitmore Park Alternative



2.0 Regulatory Setting

2.1 Threatened and Endangered Species

The Endangered Species Act (16 United States Code [USC] Sections 1531–1544) provides for the conservation of threatened and endangered species and the ecosystems on which they depend. Section 3 of the Endangered Species Act prohibits the "taking" of any endangered species, and defines "taking" broadly to include actions that are not necessarily intended to cause harm to the species (an "incidental taking").

What is critical habitat?

Critical habitat is defined as geographic locations that are critical to the existence of a threatened or endangered species.

Section 7 of the Endangered Species Act requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) before taking any action that could affect a federally listed threatened or endangered species or designated critical habitat for an endangered species. In addition, federal agencies must ensure that their actions are not likely to jeopardize the continued existence of any listed species or to destroy or adversely modify any designated critical habitat.

2.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC Sections 703–712) makes it unlawful to take, import, export, possess, sell, purchase, or barter any migratory bird, with the exception of the taking of game birds during established hunting seasons. The law also applies to feathers, eggs, nests, and products made from migratory birds. Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (January 10, 2001), directs federal agencies taking actions likely to affect migratory birds to support the implementation of the Migratory Bird Treaty Act by requiring agencies to analyze impacts to migratory birds and species of concern in accordance with the National Environmental Policy Act (NEPA) as appropriate.

2.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Sections 668–668d) makes it unlawful to take, import, export, sell, purchase, transport, or barter any bald or golden eagle or their parts, products, nests, or eggs. Take includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing eagles.

2.4 Other Special-status Species and Habitat Designations

Resource and land management agencies, including the Utah Division of Wildlife Resources (UDWR), USDA Forest Service, and BLM designate sensitive species, identify wildlife habitat areas such as those for big-game species, and establish conservation agreements. These agencies and USFWS also manage designated lands as wildlife refuges or lands otherwise protected for wildlife. Sensitive species and conservation agreement species typically include species listed under the Endangered Species Act and additional species identified as those that warrant management considerations and actions in order to avoid becoming threatened or endangered.

3.0 Methodology

The survey team conducted reconnaissance-level field surveys for biological resources, consistent with methodology agreed to by STB, throughout the spring, summer, and fall of 2019. The study area for each alternative generally included a 500-foot buffer on either side of the proposed centerline of the route, generally totaling a 1,000-foot-wide survey corridor for each alternative. These surveys were conducted concurrently with field efforts to delineate wetlands and other aquatic resources in the study areas.

The survey team used the GAP/LANDFIRE National Terrestrial Ecosystems data set for baseline information about vegetation communities and collected site-specific data every 300 meters (that is, in 300-meter intervals) throughout each study area. The data collected included site photos in the four cardinal directions, and the survey team noted the percentages of the dominant plant species at each interval. If a given interval location was inaccessible, a nearby representative location was selected. The reconnaissance-level field surveys did not include species-specific surveys or other agency protocol surveys.

The survey team was able to conduct on-the-ground, reconnaissance-level surveys for about 74 miles of the approximately 80-mile Indian Canyon route (about 4.25 miles of which are tunnel), about 94 miles of the approximately 102-mile Wells Draw route (about 4.5 miles of which are tunnel), and about 77 miles of the approximately 85-mile Whitmore Park route (about 5.25 miles of which are tunnel). Tunnel areas were not surveyed. The areas that were not surveyed in the Indian Canyon and Whitmore Park study areas were omitted because of restrictions in accessing private property. The areas that were not surveyed in the Wells Draw study area were omitted due to restrictions in accessing private and public property as well as steep terrain that posed safety concerns and winter weather conditions.

In addition to on-site surveys, the survey team consulted the Environmental Conservation Online System (USFWS 2019a, 2019b, 2019c), the NatureServe Explorer (NatureServe, no date), and the Utah Conservation Data Center database (UDWR, no date) for lists of federally threatened, endangered, or candidate species as well as state- or agency-listed sensitive species known to be present in Uintah, Duchesne, Carbon, and Utah Counties, and to determine whether there were existing records of occurrence for these species in the study area.

What is NatureServe?

NatureServe is a nonprofit organization that provides proprietary wildlife conservation-related data, tools, and services to private and government clients, partner organizations, and the public.

The survey team also consulted with agency personnel, including personnel with the USDA Forest Service, the U.S. Fish and Wildlife Service (USFWS), BLM, UDWR, and the Utah Natural Heritage Program (UNHP) to request information from these agencies regarding the resources under their jurisdiction in the survey areas. The official letters from USFWS and UNHP are provided in Appendix A, Pertinent Correspondence. There is a letter for each alternative.

4.0 General Overview of the Ecoregion

The three alternative routes cross Uintah, Duchesne, Carbon, and Utah Counties in Utah. Duchesne and Uintah Counties occupy most of what is known as the Uinta Basin. The Uinta Basin is bounded on the north by the Uinta Mountains, on the south by the Tavaputs Plateau, on the west by the Wasatch Mountains, and on the east by elevated terrain that separates it from the Piceance Basin in Colorado. The Uintah and Ouray Reservation covers a substantial portion of the Uinta Basin. The basin is the geological remains of prehistoric Uinta Lake, which was formed during the late Tertiary period. Sediment was deposited in the lake bottom during this time, forming what is now gilsonite, oil shale, tar sands, and oil (USDA NRCS, no date; Utah Division of Air Quality 2019).

Most of the alternative study areas are part of the Colorado Plateau Ecoregion and are composed of Semiarid Benchlands and Canyonlands, Escarpments, and the Uinta Basin Floor subregions (USGS 2001). These are generally described as follows:

- The Semiarid Benchlands and Canyonlands subregion is characterized by benches and mesas covered with broad grass, shrub, and woodlands. Bedrock exposures are common and common plant species include warm season grasses, winterfat, Mormon tea, four-wing saltbush, sagebrush, and pinyon and juniper woodlands.
- The Escarpments subregion is characterized by deeply dissected cliff-bench complexes that ascend from lower regions to the mountain rims. Common vegetation includes Douglas-fir forest on steep, north-facing slopes at higher elevations to desert and semidesert grassland or shrubland on lower, drier sites.
- The Uinta Basin Floor subregion lies in a large basin that is enclosed by the Uinta Mountains and Tavaputs Plateau. Precipitation is typically low and soils are arid, but the area receives stream runoff from the nearby mountains. Stream runoff is often diverted for crop and pasture irrigation on gentle slopes and the valley floor.

A small portion of the study areas is in the Wasatch and Uinta Mountains ecoregion and includes the Wasatch Montane Zone and Mountain Valleys subregions (USGS 2001). The Wasatch Mountain zone consists of forested mountains and plateaus where Douglas-fir and aspen forests are common and Engelmann spruce and subalpine fir grow on steep, north-facing slopes.

The Mountain Valleys subregion, which is mostly unforested, contains terraces, flood plains, alluvial fans, and hills and is naturally dominated by sagebrush. Irrigated cropland, irrigated pastureland, and rangeland are common.

5.0 Vegetation Resources

5.1 Vegetation Communities

The GAP/LANDFIRE National Terrestrial Ecosystems data set is produced by the U.S. Geological Survey and includes detailed vegetation and land cover patterns for the continental United States. This data set describes various vegetation communities such as Inter-Mountain Basins Big Sagebrush Shrubland, Colorado Plateau Pinyon-Juniper Woodland, and Rocky Mountain Aspen Forest and Woodland. Over 30 of these vegetation communities are present in the Indian Canyon, Wells Draw, and Whitmore Park study

areas. The survey team categorized the GAP/LANDFIRE vegetation communities in the study areas into six broad land cover types: agriculture/altered, badland/bedrock, forest/woodland, meadow/grassland, open water, and shrubland.

Table 5-1 lists the acreages, and Appendices B, C, and D, Vegetation Community Maps, show the distribution, of these vegetation communities in the Indian Canyon, Wells Draw, and Whitmore Park study areas. A list of plant species observed in the study areas is included as Appendix E, List of Plant Species Observed. The six land cover types and the corresponding GAP/LANDFIRE vegetation communities are described in more detail in Sections 5.1.1 through 5.1.6 following Table 5-1. The GAP/LANDFIRE descriptions are based on those provided by the NatureServe Explorer.

Table 5-1. Vegetation Communities in the Study Areas by Land Cover Type

In acres

Vegetation Communities by Land Cover Type	Study Area		
	Indian Canyon	Wells Draw	Whitmore Park
Agriculture/Altered Land Cover Type			
Agriculture	568.8	197.0	568.8
Developed, Medium – High Intensity	10.1	0.0	10.1
Developed, Open Space – Low Intensity	0.0	2.8	9.3
Disturbed, Oil Well	0.0	53.7	0.0
Recently Chained Pinyon-Juniper Areas	0.0	10.5	0.0
Total	578.9	264.0	588.1
Badland/Bedrock Land Cover Type			
Colorado Plateau Mixed Bedrock Canyon and Tableland	232.7	432.4	236.4
Inter-Mountain Basins Shale Badland	387.1	134.4	387.0
Rocky Mountain Cliff and Canyon	158.5	518.9	161.5
Total	778.3	1,085.7	784.9
Forest/Woodland Land Cover Type			
Colorado Plateau Pinyon-Juniper Woodland	902.1	3,055.5	959.6
Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex	17.9	55.5	22.1
Rocky Mountain Aspen Forest and Woodland	216.3	201.8	157.2
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	302.6	208.0	292.2
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	98.7	65.4	86.1
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	39.1	64.4	39.1
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	86.7	84.9	86.7
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	140.3	37.9	138.4
Total	1,803.7	3,773.4	1,781.4

(*continued on next page*)

Table 5-1. Vegetation Communities in the Study Areas by Land Cover Type

In acres

Vegetation Communities by Land Cover Type	Study Area		
	Indian Canyon	Wells Draw	Whitmore Park
Meadow/Grassland Land Cover Type			
Inter-Mountain Basins Semi-Desert Grassland	80.3	191.8	81.6
Invasive Annual Grassland	18.4	26.7	17.9
Rocky Mountain Alpine-Montane Wet Meadow	201.3	73.9	253.8
Southern Rocky Mountain Montane-Subalpine Grassland	107.7	184.7	103.4
Total	407.7	477.1	456.8
Open Water Land Cover Type			
Open Water	10.6	9.2	11.6
Total	10.6	9.2	11.6
Shrubland Land Cover Type			
Colorado Plateau Mixed Low Sagebrush Shrubland	1,031.8	1,079.0	1,093.5
Colorado Plateau Pinyon-Juniper Shrubland	546.7	231.4	655.3
Inter-Mountain Basins Big Sagebrush Shrubland	967.9	1,151.1	1,213.2
Inter-Mountain Basins Greasewood Flat	364.2	315.1	344.2
Inter-Mountain Basins Mat Saltbush Shrubland	65.9	55.1	65.9
Inter-Mountain Basins Mixed Salt Desert Scrub	1,263.1	1,718.2	1,265.9
Inter-Mountain Basins Montane Sagebrush Steppe	1,404.5	1,972.2	1,619.7
Inter-Mountain Basins Semi-Desert Shrub Steppe	276.6	254.4	269.9
Invasive Southwest Riparian Woodland and Shrubland	0.0	3.3	0.0
Rocky Mountain Gambel Oak–Mixed Montane Shrubland	227.6	83.6	238.1
Total	6,148.2	6,863.5	6,765.7

5.1.1 Agriculture/Altered

The agriculture/altered land cover type totals about 578.9 acres in the Indian Canyon study area, 264.0 acres in the Wells Draw study area, and 588.1 acres in the Whitmore Park study area. The agriculture/altered land cover type includes the following GAP/LANDFIRE vegetation communities.

Agriculture. The Agriculture vegetation community (Photo 5-1) includes grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops. It also includes annual crops such as vegetables and perennial woody crops such as orchards. The Agriculture vegetation community also includes all land being actively tilled.

Photo 5-1. Agriculture Site

Photo taken at Wells Draw interval 384 (WD 384).

Developed, Medium – High Intensity. The Developed, Medium Intensity vegetation community includes areas with a mix of constructed materials and vegetation, such as at single-family homes, where an impervious surface accounts for 50%–79% of the total cover. The Developed, High Intensity land cover type includes highly developed areas where people reside or work in high numbers, areas including apartment complexes and commercial and industrial areas where impervious surfaces account for 80%–100% of the total cover.

Developed, Open Space – Low Intensity. The Developed, Open Space vegetation community includes areas with a mix of some construction materials but that are mostly vegetated by lawn grasses where impervious surfaces account make up less than 20% of the total cover. These areas include parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. The Developed, Low Intensity land cover type includes areas with a mix of constructed materials and vegetation, such as at single-family homes, where impervious surfaces account for 20%–49% of the total cover.

Disturbed, Oil Well. The Disturbed, Oil Well vegetation community (Photo 5-2) includes barren areas or those with disturbed vegetation associated with oil well sites.

Photo 5-2. Disturbed, Oil Well Site

Photo taken at Wells Draw interval 320 (WD 320).

Recently Chained Pinyon-Juniper Areas. The Recently Chained Pinyon-Juniper Areas vegetation community includes those areas that have recently been cleared by dragging a steel chain to remove pinyon-juniper.

5.1.2 Badland/Bedrock

The badland/bedrock land cover type totals about 778.3 acres in the Indian Canyon study area, 1,085.7 acres in the Wells Draw study area, and 784.9 acres in the Whitmore Park study area. The badland/bedrock land cover type includes the following GAP/LANDFIRE vegetation communities.

Colorado Plateau Mixed Bedrock Canyon and Tableland. The distribution of this vegetation community (Photo 5-3) is centered on the Colorado Plateau, where it is composed of barren and sparsely vegetated landscapes (generally less than 10% plant cover) of steep cliff faces, narrow canyons, and open tablelands of predominantly sedimentary rocks such as sandstone, shale, and limestone. Some eroding shale layers might be interbedded between the harder rocks. The vegetation is characterized by a very open tree canopy or scattered trees and shrubs with a sparse herbaceous layer. Common species include *Pinus edulis*, *Pinus ponderosa*, *Juniperus* species, *Cercocarpus intricatus*, and other shrub and herbaceous species.

Photo 5-3. Colorado Plateau Mixed Bedrock Canyon and Tableland Site

Photo taken at Wells Draw interval 160 (WD 160).

Inter-Mountain Basins Shale Badland. This widespread vegetation community of the Intermountain western United States (Photo 5-4) is composed of barren and sparsely vegetated substrates (less than 10% plant cover) typically derived from marine shales but also includes substrates derived from siltstones and mudstones (clay). Landforms are typically rounded hills and plains that form a rolling topography. The harsh soil properties and high rate of erosion and deposition are driving environmental variables supporting sparse, small shrubs such as *Atriplex corrugata*, *Atriplex gardneri*, *Artemisia pedatifida*, and herbaceous vegetation.

Photo 5-4. Inter-Mountain Basins Shale Badland Site

Photo taken at Indian Canyon interval 182 (I 182).

Rocky Mountain Cliff and Canyon. This vegetation community of barren and sparsely vegetated landscapes (generally less than 10% plant cover) is found from foothill to subalpine elevations on steep cliff faces, narrow canyons, and smaller rock outcrops of various bedrock types (Photo 5-5). It is located throughout the Rocky Mountains and the northeastern Cascade Range in North America. Also included are unstable scree and talus slopes that typically occur below cliff faces. In general, these are the dry, sparsely vegetated places on a landscape.

The biota on the cliff faces reflect what is surrounding them, unless it is an extreme parent material. There might be small patches of dense vegetation, but the vegetation typically includes scattered trees and/or shrubs. Characteristic trees include species from the surrounding landscape, species such as *Pseudotsuga menziesii*, *Pinus ponderosa*, *Pinus flexilis*, *Populus tremuloides*, *Abies concolor*, *Abies lasiocarpa*, or *Pinus edulis* and *Juniperus* species at lower elevations. Scattered shrubs might be present, such as species of *Holodiscus*, *Ribes*, *Physocarpus*, *Rosa*, and *Juniperus*, and *Jamesia americana*, *Mahonia repens*, *Rhus trilobata*, or *Amelanchier alnifolia*. Soil development is limited, as is herbaceous cover.

Photo 5-5. Rocky Mountain Cliff and Canyon Site

Photo taken at Wells Draw interval 3 (WD 3).

5.1.3 Forest/Woodland

The forest/woodland land cover type totals about 1,803.7 acres in the Indian Canyon study area, 3,773.4 acres in the Wells Draw study area, and 1,781.4 acres in the Whitmore Park study area. The forest/woodland land cover type includes the following GAP/LANDFIRE vegetation communities.

Colorado Plateau Pinyon-Juniper Woodland. This vegetation community (Photo 5-6) occurs in dry mountains and foothills of the Colorado Plateau region. It is typically found at lower elevations ranging from 4,900 to 8,000 feet. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Soils supporting this vegetation community vary in texture, ranging from stony, cobbly, gravelly sandy loams to clay loam or clay.

Pinus edulis and/or *Juniperus osteosperma* dominate the tree canopy. In the southern portion of the Colorado Plateau in northern Arizona and northwestern New Mexico, *Juniperus monosperma* and hybrids of *Juniperus* species might dominate or codominate the tree canopy. *Juniperus scopulorum* might codominate or replace *Juniperus osteosperma* at higher elevations. Understory layers are variable and might be dominated by shrubs or graminoids or be absent. Associated species can include *Arctostaphylos patula*, *Artemisia tridentata*, *Cercocarpus intricatus*, *Cercocarpus montanus*, *Coleogyne ramosissima*, *Purshia stansburiana*, *Purshia tridentata*, *Quercus gambelii*, *Bouteloua gracilis*, *Pleuraphis jamesii*, *Pseudoroegneria spicata*, *Poa secunda*, and *Poa fendleriana*.

Photo 5-6. Colorado Plateau Pinyon-Juniper Woodland Site

Photo taken at Whitmore Park interval 470 (WP 470).

Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex. This vegetation community occurs on montane slopes and plateaus in Utah, western Colorado, northern Arizona, eastern Nevada, southern Idaho, western Wyoming, and north-central Montana. It also occurs in local settings in the Klamath Mountains of California as well as in the Sierra Nevada and adjacent Great Basin mountains. Elevations range from 5,500 to 9,200 feet. Occurrences are typically on gentle to steep slopes on any aspect but are often found on clay-rich soils in intermontane valleys. Soils are derived from alluvium, colluvium, and residuum from a variety of parent materials but most typically occur on sedimentary rocks.

The tree canopy is composed of a mix of deciduous and coniferous species, codominated by *Populus tremuloides* and conifers, including *Pseudotsuga menziesii*, *Abies* species, *Picea* species, and *Pinus* species. As the stands age, the percentage of cover of *Populus tremuloides* might be slowly reduced until the conifer species become dominant. Common shrubs include *Amelanchier alnifolia*, *Prunus virginiana*, *Acer grandidentatum*, *Symphoricarpos oreophilus*, *Juniperus communis*, *Paxistima myrsinites*, *Rosa woodsii*, *Spiraea betulifolia*, *Symphoricarpos albus*, and *Mahonia repens*. Herbaceous species include numerous grass and forb species. Most occurrences at present represent a late-seral stage of aspen changing to a pure conifer occurrence. Nearly a hundred years of fire suppression and livestock grazing have converted much of the pure aspen occurrences to the present-day aspen-conifer forest and woodland vegetation community.

Rocky Mountain Aspen Forest and Woodland. This widespread vegetation community is more common in the southern and central Rocky Mountains but occurs in the montane and subalpine zones throughout much of the western United States and north into Canada. An eastern extension occurs along the Rocky Mountains foothill front and in mountain “islands” in Montana and the Black Hills of South Dakota. In California, this vegetation community is found only on the east side of the Sierra Nevadas adjacent to the

Great Basin. Elevations generally range from 5,000 to 10,000 feet, but occurrences can be found at lower elevations in some regions, especially in the Canadian Rockies. The distribution of this vegetation community is limited primarily by adequate soil moisture required to meet its high evapotranspiration demand. It is limited secondarily by the length of the growing season or low temperatures.

These are upland forests and woodlands dominated by *Populus tremuloides* without a significant conifer component (less than 25% relative tree cover). The understory structure might be complex with multiple shrub and herbaceous layers or simple with just an herbaceous layer. The herbaceous layer might be dense or sparse, dominated by graminoids or forbs. Associated shrub species include *Symphoricarpos* species, *Rubus parviflorus*, *Amelanchier alnifolia*, and *Arctostaphylos uva-ursi*.

Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland. This is a highly variable vegetation community of the montane zone of the Rocky Mountains. It occurs throughout the southern Rockies north and west into Utah, Nevada, Wyoming, and Idaho. These are mixed-conifer forests occurring on all aspects at elevations ranging from 3,900 to 10,800 feet. Rainfall averages15 to 24 inches per year, with summer “monsoons” during the growing season contributing substantial moisture.

The composition and structure of the overstory depend on the temperature and moisture relationships of the site and the successional status of the occurrence. *Pseudotsuga menziesii* and *Abies concolor* are most frequent, but *Pinus ponderosa* might be present to codominant. As many as seven conifers can be found growing in the same occurrence, and a number of cold-deciduous shrub and graminoid species are common, including *Arctostaphylos uva-ursi*, *Mahonia repens*, *Paxistima myrsinites*, *Symphoricarpos oreophilus*, *Jamesia americana*, *Quercus gambelii*, and *Festuca arizonica*.

Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland. These are mixed-conifer forests of the Rocky Mountains west into the ranges of the Great Basin, occurring predominantly in cool ravines and on north-facing slopes (Photo 5-7). Elevations range from 3,900 to 10,800 feet. Occurrences of this vegetation community are found on cooler and more mesic sites than Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland. Such sites include lower and middle slopes of ravines; along stream terraces; moist, concave topographic positions; and north- and east-facing slopes that burn somewhat infrequently.

Pseudotsuga menziesii and *Abies concolor* are the most common canopy dominants, but *Picea engelmannii*, *Picea pungens*, or *Pinus ponderosa* might be present. This vegetation community includes mixed conifer/*Populus tremuloides* stands. A number of cold-deciduous shrub species can occur, including *Acer glabrum*, *Acer grandidentatum*, *Alnus incana*, *Betula occidentalis*, *Cornus sericea*, *Jamesia americana*, *Physocarpus malvaceus*, *Robinia neomexicana*, *Vaccinium membranaceum*, and *Vaccinium myrtillus*.

Photo 5-7. Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland Site

Photo taken at Wells Draw interval 2 (WD 2).

Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland. Engelmann spruce and subalpine fir forests make up a substantial part of the subalpine forests of the Cascades and Rocky Mountains from southern British Columbia east into Alberta and south into New Mexico and the Intermountain region. They also occur on mountain "islands" of north-central Montana. They are the matrix forests of the subalpine zone, with elevations ranging from 4,100 feet in its northern distribution to 11,000 feet in the south. They often represent the highest-elevation forests in an area. Sites in this vegetation community are cold year-round, and precipitation is predominantly in the form of snow, which might persist until late summer.

Despite this vegetation community's wide distribution, the tree canopy characteristics are remarkably similar, with *Picea engelmannii* and *Abies lasiocarpa* dominating either mixed or alone. *Pseudotsuga menziesii* might persist in occurrences of this vegetation community for long periods without regeneration. *Pinus contorta* is common in many occurrences, as well as mixed conifer/*Populus tremuloides stands*. Upper-elevation examples might have more woodland physiognomy. These are more typically islands or ribbons of trees, sometimes with a krummholz form, with open-meadow areas in a mosaic. These patterns are controlled by snow deposition and wind-blown ice. Xeric species might include *Juniperus communis*, *Linnaea borealis*, *Mahonia repens*, and *Vaccinium scoparium*.

What is a krummholz form?

Krummholz form refers to the stunted, matted, deformed coniferous trees often encountered in the subarctic and subalpine landscapes. The form develops from continual exposure to fierce, freezing winds.

Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland. This is a high-elevation vegetation community of the Rocky Mountains, dominated by *Picea engelmannii* and *Abies lasiocarpa*. It extends eastward into the northeastern Olympic Mountains and the northeastern side of Mount Rainier in Washington. Occurrences are typically found in locations with cold-air drainage or ponding, or where snowpacks linger late into the summer, such as north-facing slopes and high-elevation ravines. They can extend down in elevation below the subalpine zone in places where cold-air ponding occurs; northerly and easterly aspects predominate. These forests are found on gentle to very steep mountain slopes, high-elevation ridgetops and upper slopes, plateau-like surfaces, basins, alluvial terraces, well-drained benches, and inactive stream terraces. Mesic understory shrubs include *Menziesia ferruginea*, *Vaccinium membranaceum*, *Rhododendron albiflorum*, *Amelanchier alnifolia*, *Rubus parviflorus*, *Ledum glandulosum*, *Phyllodoce empetriformis*, and *Salix* species.

Rocky Mountain Lower Montane Riparian Woodland and Shrubland. This vegetation community is found throughout the Rocky Mountain and Colorado Plateau regions within a broad elevation range from about 2,900 to 9,200 feet. This vegetation community often occurs as a mosaic of multiple communities that are tree-dominated with a diverse shrub component. This vegetation community depends on a natural hydrologic regime, especially annual to episodic flooding. Occurrences are found in the flood zone of rivers, on islands, on sand or cobble bars, and on immediate streambanks. They can form large, wide occurrences on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well-drained benches. They are also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains swales and irrigation ditches.

Dominant trees might include *Acer negundo*, *Populus* species, *Pseudotsuga menziesii*, *Picea pungens*, *Salix amygdaloides*, or *Juniperus scopulorum*. Dominant shrubs include *Acer glabrum*, *Alnus incana*, *Betula occidentalis*, *Cornus sericea*, *Crataegus rivularis*, *Forestiera pubescens*, *Prunus virginiana*, *Rhus trilobata*, *Salix* species, *Shepherdia argentea*, or *Symphoricarpos* species. Exotic trees of *Elaeagnus angustifolia* and *Tamarix* species are common in some stands. Generally, the upland vegetation surrounding this riparian vegetation community is different and ranges from grasslands to forests.

5.1.4 Meadow/Grassland

The meadow/grassland land cover type totals about 407.7 acres in the Indian Canyon study area, 477.1 acres in the Wells Draw study area, and 456.8 acres in the Whitmore Park study area. The meadow/grassland land cover type includes the following GAP/LANDFIRE vegetation communities.

Inter-Mountain Basins Semi-Desert Grassland. This widespread vegetation community (Photo 5-8) includes the driest grasslands throughout the intermountain western United States. It occurs on xeric sites over an elevation range of about 4,750 to 7,610 feet on a variety of landforms including swales, playas, mesas, alluvial flats, and plains. Substrates are often well-drained sandy or loam soils derived from sedimentary parent materials but are quite variable and might include fine-textured soils derived from igneous and metamorphic rocks.

This vegetation community might constitute the matrix over large areas of intermountain basins, and also might occur as large patches in mosaics with shrubland communities dominated by *Artemisia tridentata* subspecies *tridentata*, *Artemisia tridentata* subspecies *wyomingensis*, *Atriplex* species, *Coleogyne* species, *Ephedra* species, *Gutierrezia sarothrae*, or *Krascheninnikovia lanata*. Grasslands in areas of higher precipitation, at higher elevation, typically belong to other communities. The dominant perennial bunchgrasses and shrubs in this vegetation community are all drought-resistant plants. Dominant or codominant species are *Achnatherum hymenoides*, *Aristida* species, *Bouteloua gracilis*, *Hesperostipa*

comata, *Muhlenbergia* species, *Pleuraphis jamesii*, or *Sporobolus* species. This vegetation community is typically composed of cool-season grasses in the western portion of its range where winter precipitation dominates, and a mix of cool- and warm-season grasses where precipitation occurs during both winter and summer.

Photo 5-8. Inter-Mountain Basins Semi-Desert Grassland Site

Photo taken at Wells Draw interval 326 (WD 326).

Invasive Annual Grassland. This vegetation community includes areas that are dominated by introduced annual grass species such as *Avena* species, *Bromus* species, and *Schismus* species.

Rocky Mountain Alpine-Montane Wet Meadow. These are high-elevation vegetation communities found throughout the Rocky Mountains and Intermountain regions, dominated by herbaceous species found on wetter sites with very low-velocity surface and subsurface flows. They range in elevation from montane to alpine (3,250 to 12,000 feet). These types occur as large meadows in montane or subalpine valleys; as narrow strips bordering ponds, lakes, and streams; and along toeslope seeps. They are typically found on flat areas or gentle slopes but might also occur on sub-irrigated sites with slopes up to 10%. In alpine regions, sites typically are small depressions located below late-melting snow patches or on snowbeds. The soils of this vegetation community might be mineral or organic. In either case, soils show typical hydric soil characteristics, including high organic content and/or low chroma and redoximorphic features.

This vegetation community often occurs as a mosaic of several plant associations, often dominated by graminoids, including *Calamagrostis stricta*, *Caltha leptosepala*, *Cardamine cordifolia*, *Carex* species, *Deschampsia cespitosa*, *Eleocharis quinqueflora*, *Juncus drummondii*, *Phippsia algida*, *Rorippa alpina*, *Senecio triangularis*, *Trifolium parryi*, and *Trollius laxus*. Often, alpine dwarf-shrublands, especially those dominated by *Salix* species, are immediately adjacent to the wet meadows. Wet meadows are tightly associated with snowmelt and are typically not subjected to high-disturbance events such as flooding.

Southern Rocky Mountain Montane-Subalpine Grassland. This Rocky Mountain vegetation community typically occurs between 7,200 and 9,850 feet in elevation on flat to rolling plains and parks or on lower sideslopes that are dry, but it might extend up to 11,000 feet on warm aspects. Soils resemble well-drained prairie soils, being relatively high in organic matter. An occurrence usually consists of a mosaic of two or three plant associations with one of the following dominant bunchgrasses: *Danthonia intermedia*, *Danthonia parryi*, *Festuca idahoensis*, *Festuca arizonica*, *Festuca thurberi*, *Muhlenbergia filiculmis*, or *Pseudoroegneria spicata*. The subdominants include *Muhlenbergia montana*, *Bouteloua gracilis*, and *Poa secunda*. These large-patch grasslands are intermixed with matrix stands of spruce-fir, lodgepole pine, ponderosa pine, and aspen forests.

5.1.5 Open Water

The open water land cover type totals about 10.6 acres in the Indian Canyon study area, 9.2 acres in the Wells Draw study area, and 11.6 acres in the Whitmore Park study area. This vegetation community (Photo 5-9) consists of areas of inland open water (streams, rivers, lakes, and ponds) generally with less than 25% cover of vegetation or soil.

Photo 5-9. Open Water Site

Photo taken near Indian Canyon interval 252 (I 252).

5.1.6 Shrubland

The shrubland land cover type totals about 6,148.2 acres in the Indian Canyon study area, 6,863.5 acres in the Wells Draw study area, and 6,765.7 acres in the Whitmore Park study area. The shrubland land cover type includes the following GAP/LANDFIRE vegetation communities.

Colorado Plateau Mixed Low Sagebrush Shrubland. This vegetation community (Photo 5-10) occurs in the Colorado Plateau, Tavaputs Plateau, and Uinta Basin in canyons, gravelly draws, hilltops, and dry flats at elevations generally below 5,900 feet. Soils are often rocky, shallow, and alkaline. This vegetation community extends across northern New Mexico into the southern Great Plains on limestone hills. It includes open shrublands and steppe dominated by *Artemisia nova* or *Artemisia bigelovii*, sometimes with *Artemisia tridentata* subspecies *wyomingensis* codominant. Semi-arid grasses such as *Achnatherum hymenoides*, *Aristida purpurea*, *Bouteloua gracilis*, *Hesperostipa comata*, *Pleuraphis jamesii*, or *Poa fendleriana* are often present and might form a graminoid layer with over 25% cover.

Photo 5-10. Colorado Plateau Mixed Low Sagebrush Shrubland Site

Photo taken at Indian Canyon interval 40 (I 40).

Colorado Plateau Pinyon-Juniper Shrubland. This vegetation community (Photo 5-11) is characteristic of the rocky mesatops and slopes on the Colorado Plateau and western slope of Colorado, but these stunted tree shrublands might extend farther upslope along the low-elevation margins of taller pinyon-juniper woodlands. Sites are drier than Colorado Plateau Pinyon-Juniper Woodland. Substrates are shallow/rocky and shaly soils at lower elevations (3,900 to 6,550 feet). The vegetation is dominated by dwarfed (usually less than 10 feet tall) *Pinus edulis* and/or *Juniperus osteosperma* trees forming extensive tall shrublands in the region along low-elevation margins of pinyon-juniper woodlands. Other shrubs, if present, might include *Artemisia nova*, *Artemisia tridentata* subspecies *wyomingensis*, *Chrysothamnus viscidiflorus*, or *Coleogyne*

ramosissima. Herbaceous layers are sparse to moderately dense and are typically composed of xeric graminoids.

Photo 5-11. Colorado Plateau Pinyon-Juniper Shrubland Site

Photo taken at Whitmore Park interval 476 (WP 476).

Inter-Mountain Basins Big Sagebrush Shrubland. This vegetation community (Photo 5-12) occurs throughout much of the interior western United States, typically in broad basins between mountain ranges, plains, and foothills between 2,600 and 8,200 feet in elevation. Soils are typically deep, well-drained, and non-saline. These shrublands are dominated by *Artemisia tridentata* subspecies *tridentata* and/or *Artemisia tridentata* subspecies *wyomingensis*. Scattered *Juniperus* species, *Sarcobatus vermiculatus*, and *Atriplex* species might be present in some stands. *Ericameria nauseosa*, *Chrysothamnus viscidiflorus*, *Purshia tridentata*, or *Symphoricarpos oreophilus* might codominate disturbed stands. Perennial herbaceous components typically contribute less than 25% vegetative cover. Common graminoid species can include *Achnatherum hymenoides*, *Bouteloua gracilis*, *Elymus lanceolatus*, *Festuca idahoensis*, *Hesperostipa comata*, *Leymus cinereus*, *Pleuraphis jamesii*, *Pascopyrum smithii*, *Poa secunda*, or *Pseudoroegneria spicata*.

Photo 5-12. Inter-Mountain Basins Big Sagebrush Shrubland Site

Photo taken at Indian Canyon interval 36 (I 36).

Inter-Mountain Basins Greasewood Flat. This vegetation community (Photo 5-13) occurs throughout much of the western United States in intermountain basins and extends onto the western Great Plains and into central Montana. It typically occurs near drainages on stream terraces and flats or might form rings around more sparsely vegetated playas. Sites typically have saline soils, have a shallow water table, and flood intermittently, but remain dry for most growing seasons. The water table remains high enough to maintain vegetation, despite salt accumulations.

This vegetation community usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or codominated by *Sarcobatus vermiculatus*. In high-salinity areas, greasewood often grows in nearly pure stands, and on less-saline sites, it commonly grows with other shrub species and typically has a grass understory. Other shrubs that might be present to codominant in some occurrences include *Atriplex* species, *Artemisia tridentata* subspecies *wyomingensis*, *Artemisia tridentata* subspecies *tridentata*, *Artemisia cana* subspecies *cana*, or *Krascheninnikovia lanata*. Occurrences are often surrounded by mixed salt desert scrub or big sagebrush shrublands. The herbaceous layer, if present, is usually dominated by graminoids. There might be inclusions of *Sporobolus airoides*, *Pascopyrum smithii*, *Distichlis spicata* (where water remains ponded the longest), *Calamovilfa longifolia*, *Eleocharis palustris*, *Elymus elymoides*, *Hordeum jubatum*, *Leymus cinereus*, *Poa pratensis*, *Puccinellia nuttalliana*, or herbaceous types. In more saline environments, *Allenrolfea occidentalis*, *Nitrophila occidentalis*, and *Suaeda* species might be present.

Photo 5-13. Inter-Mountain Basins Greasewood Flat Site

Photo taken at Indian Canyon interval 401 (I 401).

Inter-Mountain Basins Mat Saltbush Shrubland. This vegetation community occurs on gentle slopes and rolling plains in the northern Colorado Plateau and Uinta Basin on Mancos shale and on arid, windswept basins and plains across parts of Wyoming. It is also found in eastern Wyoming in Great Plains areas and can extend north into Montana and Canada. These landscapes typically support small-statured shrublands composed of relatively pure stands of *Atriplex* species. The herbaceous layer is typically sparse with scattered perennial grasses, forbs, and seasonal annuals. Substrates are shallow—typically saline, alkaline, fine-textured soils developed from shale or alluvium—and might be associated with shale badlands. The infiltration rate is typically low.

Inter-Mountain Basins Mixed Salt Desert Scrub. This extensive vegetation community (Photo 5-14) includes open-canopied shrublands of typically saline basins, alluvial slopes, and plains across the Intermountain western United States. This type also extends in limited distribution into the southern Great Plains. Substrates are often saline and calcareous, medium- to fine-textured, alkaline soils, but include some coarser-textured soils.

The vegetation is characterized by a typically open to moderately dense shrubland composed of one or more *Atriplex* species. Other shrubs present to codominant might include *Artemisia tridentata* subspecies *wyomingensis*, *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, *Ephedra nevadensis*, *Grayia spinosa*, *Krascheninnikovia lanata*, *Lycium* species, *Picrothamnus desertorum*, or *Tetradymia* species. Northern occurrences might lack *Atriplex* species and are typically dominated by *Grayia spinosa*, *Krascheninnikovia lanata*, and/or *Picrothamnus desertorum*. The herbaceous layer varies from sparse to moderately dense and is dominated by perennial graminoids such as *Achnatherum hymenoides*, *Bouteloua gracilis*, *Elymus lanceolatus* subspecies *lanceolatus*, *Pascopyrum smithii*, *Pleuraphis jamesii*, *Pleuraphis rigida*, *Poa secunda*, or *Sporobolus airoides*. Various forbs are also present.

Photo 5-14. Inter-Mountain Basins Mixed Salt Desert Scrub Site

Photo taken at Indian Canyon interval 189 (I 189).

Inter-Mountain Basins Montane Sagebrush Steppe. This vegetation community (Photo 5-15) includes sagebrush communities occurring at foothills to montane and subalpine elevations across the western United States from 3,280 feet in eastern Oregon and Washington to over 9,850 feet in the southern Rockies. Climate is cool; semi-arid to subhumid. This vegetation community occurs primarily on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. In general, this vegetation community is found on fine-textured soils, some source of subsurface moisture or more mesic sites, zones of higher precipitation, and areas of snow accumulation.

Across its range, this is a compositionally diverse community. It is composed primarily of *Artemisia tridentata* subspecies *vaseyana*, *Artemisia cana* subspecies *viscidula*, and related taxa such as *Artemisia tridentata* subspecies *spiciformis*. *Purshia tridentata* might codominate or even dominate some stands. *Artemisia arbuscula* subspecies *arbuscula*–dominated shrublands commonly occur within this community on rocky or windblown sites. Other common shrubs include *Symphoricarpos* species, *Amelanchier* species, *Ericameria nauseosa*, *Peraphyllum ramosissimum*, *Ribes cereum*, *and Chrysothamnus viscidiflorus*. Most stands have an abundant perennial herbaceous layer (over 25% cover, and in many cases over 50% cover). Common graminoids include *Danthonia intermedia*, *Festuca arizonica*, *Festuca idahoensis*, *Hesperostipa comata*, *Poa fendleriana*, *Elymus trachycaulus*, *Bromus carinatus*, *Poa secunda*, *Deschampsia cespitosa*, *Calamagrostis rubescens*, *Pseudoroegneria spicata*, and *Achnatherum* species.

Photo 5-15. Inter-Mountain Basins Montane Sagebrush Steppe Site

Photo taken at Indian Canyon interval 287 (I 287).

Inter-Mountain Basins Semi-Desert Shrub Steppe. This vegetation community (Photo 5-16) occurs throughout the intermountain western United States, typically at lower elevations on alluvial fans and flats with moderate to deep soils, and extends into south-central Montana between the Pryor and Beartooth ranges where a distinct rainshadow effect occurs.

This semi-arid shrub-steppe is typically dominated by graminoids (more than 25% cover) with an open shrub to moderately dense woody layer. The most widespread (but not dominant) species is *Pseudoroegneria spicata*, which occurs from the Columbia Basin to the northern Rockies. Characteristic grasses include *Achnatherum hymenoides*, *Bouteloua gracilis*, *Distichlis spicata*, *Poa secunda*, *Poa fendleriana*, *Sporobolus airoides*, *Hesperostipa comata*, *Pleuraphis jamesii*, and *Leymus salinus*. The woody layer is often a mix of shrubs and dwarf-shrubs, although it might be dominated by a single species. Characteristic species include *Atriplex canescens*, *Artemisia tridentata*, *Chrysothamnus greenei*, *Chrysothamnus viscidiflorus*, *Ephedra* species, *Ericameria nauseosa*, *Gutierrezia sarothrae*, and *Krascheninnikovia lanata*. Annual grasses, especially the exotics *Bromus arvensis* and *Bromus tectorum*, might be present to abundant. Forbs are generally of low importance and are highly variable across the range but might be diverse in some occurrences.

Photo 5-16. Inter-Mountain Basins Semi-Desert Shrub Steppe Site

Photo taken at Indian Canyon interval 198 (I 198).

Invasive Southwest Riparian Woodland and Shrubland. This vegetation community consists of areas that are dominated by introduced riparian woody species such as *Tamarix* species and *Elaeagnus angustifolius*.

Rocky Mountain Gambel Oak–Mixed Montane Shrubland. This vegetation community occurs in the mountains, plateaus, and foothills of the southern Rocky Mountains and Colorado Plateau, including the Uinta and Wasatch ranges and the Mogollon Rim. These shrublands are most commonly found along dry foothills, on lower mountain slopes, and at the edge of the western Great Plains from about 6,550 to 9,500 feet in elevation. They are often situated above pinyon-juniper woodlands. Substrates are variable and include soil types ranging from calcareous, heavy, fine-grained loams to sandy loams, gravelly loams, clay loams, deep alluvial sand, or coarse gravel.

The vegetation is typically dominated by *Quercus gambelii* alone or codominant with *Amelanchier alnifolia*, *Amelanchier utahensis*, *Artemisia tridentata*, *Cercocarpus montanus*, *Prunus virginiana*, *Purshia stansburiana*, *Purshia tridentata*, *Robinia neomexicana*, *Symphoricarpos oreophilus*, or *Symphoricarpos rotundifolius*.

5.2 Riparian Habitat

Riparian vegetation occurs along water courses in areas transitioning from aquatic to upland environments. These transitional and often limited areas provide important habitat for many plant and animal species. Riparian areas are included in the forest/woodland and meadow/grassland communities described in Sections 5.1.3 and 5.1.4. However, to more accurately identify the extent of riparian areas, the survey team mapped the extent of riparian vegetation in the study area for each alternative. Based on field surveys and interpretation of aerial images, the survey team mapped both woody and herbaceous riparian vegetation along water courses as riparian. Riparian areas total about 210.5 acres in the Indian Canyon study area, about 148.4 acres in the Wells Draw study area, and about 239.6 acres in the Whitmore Park study area.

5.3 Special-status Plant Species

Threatened, Endangered, and Candidate Species. The survey team's database research and consultation with agencies area found that five federally listed plant species could occur or are known to occur in or near the study areas (Table 5-2). (For the consultation letters from USFWS, see Appendix A, Pertinent Correspondence.) None of the three study areas includes designated or proposed critical habitat for any federally listed plant species. There is suitable habitat for Barneby ridge-cress in the Indian Canyon and Whitmore Park study areas, and there is suitable habitat for pariette cactus in all three study areas. There is potentially suitable habitat in all three study areas for the other three federally listed plant species. Figure 5-1 shows areas of known occurrence for Barneby ridge-cress (*Lepidium barnebyanum*), pariette cactus (*Sclerocactus brevispinus*), and Uinta Basin hookless cactus (*Sclerocactus wetlandicus*). Known-occurrence polygons were provided by USFWS.

Table 5-2. Federally Listed Plant Species That Could Occur or Are Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Federal Status	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Barneby ridge-cress	*Lepidium barnebyanum*	Endangered	✓		✓	Barneby ridge-cress is a white-flowered perennial herb that grows in cushion-shaped tufts and is endemic to the Indian Canyon drainage in Duchesne County, Utah. Barneby ridge-cress is found on soils that are shallow, fine-textured shale soils, and intermixed with rock fragments. It grows with similar cushion-shaped plant species along semi-barren ridges in mixed desert shrub and pinyon-juniper communities at elevations ranging from 6,100 to 6,450 feet.	Suitable habitat exists in the Indian Canyon and Whitmore Park study areas (see Figure 5-1). Occurrences have also been identified within a ½-mile radius and a 2-mile radius of the Indian Canyon and Whitmore Park alternatives.
Clay phacelia	*Phacelia argillacea*	Endangered	✓			Clay phacelia is a winter annual with blue to violet flowers and is endemic to Spanish Fork Canyon, Utah County, Utah. Clay phacelias are found in clay and shale soils of the Green River Formation. They grow on barren, steep hillsides in sparse pinyon-juniper and mountain brush communities on east- and southeast-facing slopes at elevations ranging from 6,030 to 6,170 feet.	Potentially suitable habitat exists in the study areas. However, the current known distribution is outside the study areas. Historical occurrences (dated 1883) have been identified within a 2-mile radius of the three alternatives.
Pariette cactus	*Sclerocactus brevispinus*	Threatened	✓	✓	✓	The pariette cactus is a small barrel-shaped cactus with pink flowers that is endemic to Duchesne and Uintah Counties, Utah. They are restricted to one area, located in the Pariette Draw, along the Duchesne County–Uintah County border. They grow on highly saline and alkaline fine soils, limited to clay badlands and in saltbush and sagebrush flats in areas that are sparsely vegetated between 4,590 and 4,920 feet in elevation. Some individuals have been found in marginal habitats outside the main population areas.	Suitable habitat exists in the Indian Canyon, Wells Draw, and Whitmore Park study areas (see Figure 5-1). Occurrences have also been identified within a 2-mile radius of the Wells Draw alternative.

(*continued on next page*)

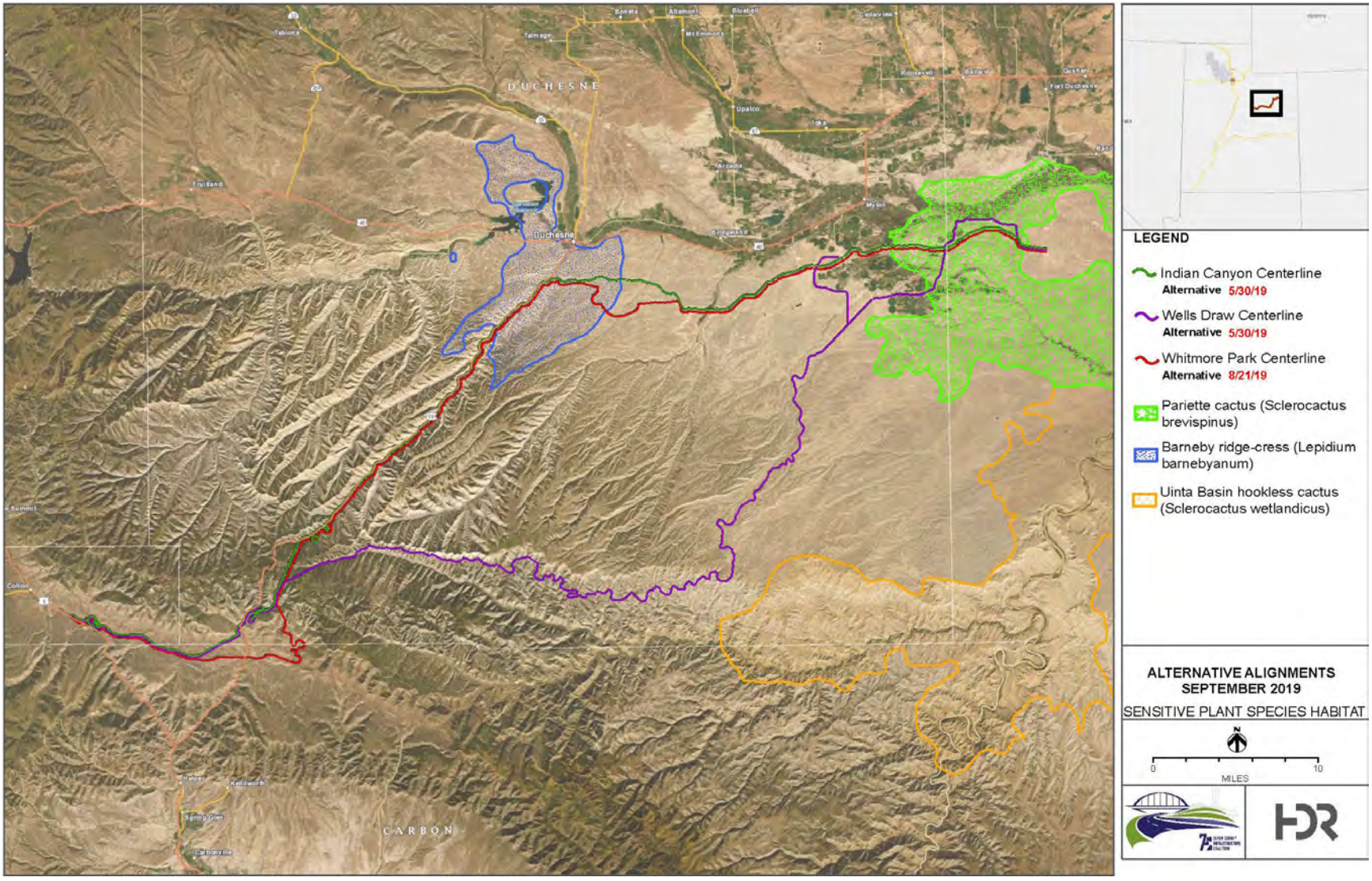
Table 5-2. Federally Listed Plant Species That Could Occur or Are Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Federal Status	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	Threatened	✓	✓	✓	Uinta Basin hookless cactus is a barrel-shaped cactus with pink flowers that occurs in Carbon, Duchesne, and Uintah Counties, Utah. These cacti are found in xeric, fine-textured soils overlain with cobbles and pebbles, growing in salt desert shrub and pinyon-juniper communities, at elevations ranging from 4,460 to 6,560 feet.	Potentially suitable habitat exists in the study areas. However, the current known distribution is outside the study areas (see Figure 5-1).
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	✓	✓	✓	This white-flowered orchid is found in moist to very wet meadows, along streams, in abandoned stream meanders, and near springs, seeps, and lake shores where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance.	Potentially suitable habitat exists in the study areas in areas along water courses and in wet meadows where vegetation is relatively open and below 7,000 feet.

[a] Sources: Species list from USFWS (2019a, 2019b, 2019c) and Appendix A, Pertinent Correspondence

[b] Sources: NatureServe, no date; UDWR, no date; Utah Native Plant Society, no date

Figure 5-1. Habitat Polygons for Pariette Cactus, Barneby Ridge-cress, and Uinta Basin Hookless Cactus



BLM and USDA Forest Service Sensitive Plant Species. Representatives from BLM and USDA Forest Service provided a list of 23 sensitive plant species that are known or suspected to occur in Carbon, Duchesne, Uintah, or Utah Counties. These sensitive species are listed in Table 5-3. Potentially suitable habitat might exist for 14 of the 23 species. Potentially suitably habitat was largely determined based on the preferred geologic substrate for each plant species. Geologic substrate was in the study areas is based on maps provided by USGS (no date).

Table 5-3. USDA Forest Service and BLM Sensitive Plant Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, or Utah Counties

Common Name[a]	Scientific Name	Agency	County[a]				Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Carbon	Duchesne	Uintah	Utah		
Ackerman's green gentian	*Frasera ackermaniae*	BLM			✓		Ackerman's green gentian is a restricted endemic known to occur on 40 acres in northern Uintah County, Utah. It grows in semi-barrens on the Chinle Formation with scattered juniper and sometimes in alluvium washed from the Chinle Formation at elevations between 5,830 and 6,000 feet.	The Chinle Formation is not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.
Argyle canyon phacelia	*Phacelia argylensis*	BLM		✓			Argyle canyon phacelia is a restricted endemic known to occur only in Argyle Canyon in Duchesne County, Utah. It is found in wash bottoms in Green River Formation shales in pinyon-juniper–Douglas-fir–serviceberry communities between 7,500 and 7,600 feet in elevation.	Argyle Canyon is located in the Wells Draw study area, and the Green River Formation is found in all three study areas. Potentially suitable habitat might exist in the study areas.
Atwood's columbine	*Aquilegia atwoodii*	BLM			✓		Atwood's columbine is known to occur only in the Firewater Canyon tributary to Desolation Canyon at 4,800 feet in elevation.	Suitable habitat does not exist in the study areas. Firewater Canyon is outside the study areas.
Barneby's cryptantha	*Cryptantha barnebyi*	BLM			✓		Barneby's cryptantha is a narrow endemic restricted to domed or gently sloping white shale barrens of the Green River Formation between Hill Creek and the Colorado border. It grows in shadscale and pinyon-juniper communities between 5,600 and 7,200 feet in elevation.	The Green River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.

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Table 5-3. USDA Forest Service and BLM Sensitive Plant Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, or Utah Counties

Common Name[a]	Scientific Name	Agency	County[a]				Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Carbon	Duchesne	Uintah	Utah		
Creutzfeldt-flower	*Cryptantha creutzfeldtii*	BLM	✓				Creutzfeldt-flower is endemic to central Utah in Carbon, Emery, and Sevier Counties. It is found on barren clay knolls and shaley slopes of the Mancos Shale Formation in shadscale and mat-saltbush communities between 5,250 and 6,500 feet in elevation.	The Mancos Shale Formation is not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.
Goodrich's blazingstar	*Mentzelia goodrichii*	BLM, USDA Forest Service		✓			Goodrich's blazingstar is endemic to southern Duchesne County, Utah, along the escarpments of Willow and Argyle Canyons. It grows on steep, white, calciferous shale outcrops of the Green River and Uinta Formations with scattered limber pine, pinyon pine, Douglas-fir, mountain mahogany, and rabbitbrush communities between 6,440 and 8,800 feet in elevation.	The Green River and Uinta Formations are found in the study areas. Potentially suitable habitat might exist in the study areas.
Goodrich's columbine	*Aquilegia scopulorum* var. *goodrichii*	BLM		✓			Goodrich's columbine is found on the semi-barrens of the Green River Formation at elevations between 7,400 and 9,420 feet.	The Green River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.
Goodrich's penstemon	*Penstemon goodrichii*	BLM		✓	✓		Goodrich's penstemon is a Uinta Basin endemic known to occur only from between Roosevelt and Maeser and north to Tridell in Duchesne and Uintah Counties, Utah. It grows on gray and red clays and sandy clays of the Duchesne River Formation in salt desert shrub and juniper-mountain mahogany communities between 5,600 and 6,200 feet in elevation.	The Duchesne River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.

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Table 5-3. USDA Forest Service and BLM Sensitive Plant Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, or Utah Counties

Common Name[a]	Scientific Name	Agency	County[a]				Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Carbon	Duchesne	Uintah	Utah		
Goodrich's stickweed	*Cleomella hillmanii* var. *goodrichii*	BLM			✓		Goodrich's stickweed is known to occur on the Morrison Formation near Island Park, Uintah County, Utah, at 5,400 feet elevation.	The Morrison Formation is not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.
Graham's beardtongue	*Penstemon grahamii*	BLM	✓	✓	✓		Graham's beardtongue is restricted to the Uinta Basin in Carbon, Duchesne, and Uintah Counties, Utah, and adjacent Rio Blanco County, Colorado. It grows on semi-barren knolls, ridges, and steep slopes in a mix of fragmented shale and silty clay soils closely associated with the Mahogany zone (oil-shale bearing) of the Green River Formation. It grows in sparsely vegetated communities of pinyon-juniper and desert shrub between 4,600 and 6,700 feet in elevation.	The Green River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.
Hamilton's milkvetch	*Astragalus hamiltonii*	BLM			✓		A Uinta Basin endemic, Hamilton's milkvetch is limited to western Uintah County, Utah. It grows on eroding slopes of the Duchesne River, Wasatch Formation, and less commonly Mowry Shale, Dakota Formation, and other formations in desert scrub communities between 5,250 and 6,200 feet in elevation.	The Duchesne River and Wasatch Formations are found in the study areas. Potentially suitable habitat might exist in the study areas.
Horse canyon stickleaf	*Mentzelia multicaulis* var. *librina*	BLM	✓				Horse canyon stickleaf grows on Mancos Shale and Price River Formations in sagebrush, rabbitbrush, and pinyon-juniper communities at 6,200 feet elevation.	The Mancos Shale and Price River Formations are not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.

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Table 5-3. USDA Forest Service and BLM Sensitive Plant Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, or Utah Counties

Common Name[a]	Scientific Name	Agency	County[a]				Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Carbon	Duchesne	Uintah	Utah		
Horseshoe milkvetch	*Astragalus equisolensis*	BLM			✓		Horseshoe milkvetch is restricted to Uintah County, Utah, and Mesa County, Colorado. It grows in sagebrush, shadscale, horsebrush, and other mixed desert shrub communities on the Duchesne River Formation between 4,800 and 5,200 feet in elevation.	The Duchesne River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.
Huber's pepperplant	*Lepidium huberi*	BLM			✓		Huber's pepperplant grows in sand or silty sands derived from the Navajo Formation, the Shinarump member of the Chinle and Moenkopi Formations, and Park City and Weber sandstone formations in ponderosa pine, lodgepole pine, Douglas-fir, spruce-fir, sagebrush, snowberry, and mountain mahogany communities between 7,300 and 9,700 feet in elevation.	The Navajo, Chinle, Moenkopi, Park City, and Weber Formations are not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.
Large yellow evening primrose	*Oenothera acutissima*	BLM		✓	✓		Large yellow evening primrose is found in Daggett, Duchesne, and Uintah Counties in Utah and Colorado. It grows in sandy to gravelly soils, often growing among rocks, in sagebrush, grass-forb, and ponderosa pine communities between 6,000 and 8,500 feet in elevation that are temporarily moist in the spring and early summer.	Potentially suitable habitat exists in the study areas.
Low greenthread	*Thelesperma caespitosum*	BLM, USDA Forest Service		✓			Low greenthread is endemic to Duchesne County, Utah, and Sweetwater County, Wyoming. It grows in sparsely vegetated cushion plant communities with little or no cover of graminoids or shrubs on white shale slopes and ridges of the Green River Formation from 6,300 to 6,520 feet in elevation.	The Green River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.

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Table 5-3. USDA Forest Service and BLM Sensitive Plant Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, or Utah Counties

Common Name[a]	Scientific Name	Agency	County[a]				Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Carbon	Duchesne	Uintah	Utah		
Park rockcress	*Arabis vivariensis*	BLM			✓		Endemic to Uintah County, Utah, and Moffat County, Colorado, park rockcress grows in shade or on north-facing slopes in mixed desert shrub and pinyon-juniper communities in limestone and sandstone outcrops between 5,000 and 7,000 feet in elevation.	Potentially suitable habitat exists in the study areas.
Rock hymenoxys	*Hymenoxys lapidicola*	BLM			✓		Rock hymenoxys is endemic to Uintah County, Utah. It grows in sandstone rock crevices of the Weber Formation in ponderosa pine–manzanita and pinyon-juniper communities from 6,000 to 8,100 feet in elevation.	The Weber Formation is not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.
Sterile yucca	*Yucca sterilis*	BLM			✓		Endemic to the Uinta Basin in Duchesne and Uintah Counties, Utah, sterile yuccas grow in sandy soils in salt desert scrub, juniper, sagebrush, and shadscale communities from 4,790 to 5,800 feet in elevation.	Potentially suitable habitat exists in the study areas.
Strigose townsendia	*Townsendia strigosa* var. *prolixa*	BLM		✓			*Townsendia strigosa* is widespread and grows in desert shrub and sagebrush communities between 4,700 and 7,000 feet in elevation. The survey team was unable to find specific habitat information for var. *prolixa*.	Preferred habitat characteristics are uncertain; therefore, it is unclear whether potentially suitable habitat is present in the study areas.
Untermann's daisy	*Erigeron untermannii*	BLM		✓	✓		Untermann's daisy is endemic to Duchesne County, Utah. It grows in pinyon-juniper, mountain mahogany, limber and bristlecone pine, and sagebrush communities on calcareous shales and sandstones of the Uinta and Green River Formations between 7,000 and 9,400 feet in elevation.	The Green River and Uinta Formations are found in the study areas. Potentially suitable habitat might exist in the study areas.

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Table 5-3. USDA Forest Service and BLM Sensitive Plant Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, or Utah Counties

Common Name[a]	Scientific Name	Agency	County[a]				Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Carbon	Duchesne	Uintah	Utah		
Utah phacelia	*Phacelia utahensis*	BLM	✓				Utah phacelia is known to occur in Sanpete and Sevier Counties, Utah, and the Mancos Shale in Carbon County, Utah. It grows in salt desert shrub communities on clay hills and banks in the Arapien Shale Formation from 5,500 to 6,200 feet in elevation.	The Mancos Shale and Arapien Shale Formations are not found in the study areas; therefore, suitable habitat is not likely to exist in the study areas.
White River beardtongue	*Penstemon scariosus* var. *albifluvis*	BLM			✓		White river beardtongue is endemic to oil shale barrens of the Green River Formation in the Uinta Basin in Utah and Colorado. It prefers calcareous soils, often white or red, fine-textured and mixed with shale. It grows in sparsely vegetated mixed desert shrub and pinyon-juniper communities at elevations between 5,000 and 6,800 feet in elevation.	The Green River Formation is found in the study areas. Potentially suitable habitat might exist in the study areas.

[a] Source: Species lists provided by BLM (Fletcher 2019) and USDA Forest Service (2019)

[b] Sources: NatureServe, no date; UDWR, no date

[c] Sources: NatureServe, no date; UDWR, no date; Utah Native Plant Society, no date

6.0 Wildlife Resources

6.1 Terrestrial and Aquatic Wildlife

6.1.1 General Wildlife Species

Large mammals found in the study areas include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), moose (*Alces alces*), pronghorn antelopes (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), coyotes (*Canis latrans*), cougars (*Felis concolor*), and black bears (*Ursus americanus*). Smaller animals include raccoons, skunks, foxes, badgers, porcupines, beavers, snakes, lizards, rabbits, squirrels, bats, and mice.

Birds are abundant throughout the study areas. Table 6-1 lists the bird species that were identified in the study areas during field surveys.

Table 6-1. Bird Species Identified in the Study Areas during Field Surveys

Common Name	Scientific Name	Common Name	Scientific Name
American avocet	*Recurvirostra americana*	Lark sparrow	*Chondestes grammacus*
American kestrel	*Falco sparverius*	Loggerhead shrike	*Lanius ludovicianus*
American robin	*Turdus migratorius*	Mallard	*Anas platyrhynchos*
Bald eagle	*Haliaeetus leucocephalus*	Mourning dove	*Zenaida macroura*
Black-billed magpie	*Pica hudsonia*	Northern harrier	*Circus hudsonius*
Black-headed grosbeak	*Pheucticus melanocephalus*	Northern mockingbird	*Mimus polyglottos*
Blue-gray gnatcatcher	*Polioptila caerulea*	Orange-crowned warbler	*Oreothlypis celata*
Brewer's blackbird	*Euphagus cyanocephalus*	Pinyon jay	*Gymnorhinus cyanocephalus*
Brewer's sparrow	*Spizella breweri*	Red-breasted nuthatch	*Sitta canadensis*
Broad-tailed hummingbird	*Selasphorus platycercus*	Red-tailed hawk	*Buteo jamaicensis*
Brown-headed cowbird	*Molothrus ater*	Red-winged blackbird	*Agelaius phoeniceus*
Canada goose	*Branta canadensis*	Ring-necked pheasant	*Phasianus colchicus*
Canyon wren	*Catherpes mexicanus*	Ruby-crowned kinglet	*Regulus calendula*
Chipping sparrow	*Spizella passerina*	Sage thrasher	*Oreoscoptes montanus*
Cliff swallow	*Petrochelidon pyrrhonota*	Song sparrow	*Melospiza melodia*
Common raven	*Corvus corax*	Swainson's hawk	*Buteo swainsoni*
Common yellowthroat	*Geothlypis trichas*	Townsend's solitaire	*Myadestes townsendi*
Dark-eyed junco	*Junco hyemalis*	Tree swallow	*Tachycineta bicolor*
European starling	*Sturnus vulgaris*	Turkey vulture	*Cathartes aura*
Gambel's quail	*Callipepla gambelii*	Violet-green swallow	*Tachycineta thalassina*

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Table 6-1. Bird Species Identified in the Study Areas during Field Surveys

Common Name	Scientific Name	Common Name	Scientific Name
Golden eagle	*Aquila chrysaetos*	Western meadowlark	*Sturnella neglecta*
Green-tailed towhee	*Pipilo chlorurus*	Western tanager	*Piranga ludoviciana*
Green-winged teal	*Anas crecca*	White-crowned sparrow	*Zonotrichia leucophrys*
Hermit thrush	*Catharus guttatus*	White-throated swift	*Aeronautes saxatalis*
Horned lark	*Eremophila alpestris*	Wild turkey	*Meleagris gallopavo*
House finch	*Haemorhous mexicanus*	Yellow warbler	*Setophaga petechia*
House wren	*Troglodytes aedon*	Yellow-breasted chat	*Icteria virens*
Killdeer	*Charadrius vociferus*	Yellow-rumped warbler	*Setophaga coronata*
Lapland longspur	*Calcarius lapponicus*		

6.1.2 Big-game Species

The study areas cross a number of areas identified as big-game range. The survey team obtained information regarding big-game ranges in Utah from UDWR range maps and metadata (UDWR 2019a). Big-game habitat is described in terms of seasonal use (year-long, winter, spring, or summer) and habitat value. Habitat value is described as either crucial or substantial.

- *Crucial-value habitat* is defined by UDWR as "habitat on which the local population of a wildlife species depends for survival because there are no alternate ranges or habitats available. Crucial habitat is essential to the life history requirements of a wildlife species."
- *Substantial-value habitat* is defined by UDWR as "habitat that is used by a wildlife species but is not considered crucial for population survival."

Bighorn sheep, elk, mule deer, and pronghorn antelope all have crucial year-long habitat in the study areas, and moose have crucial winter habitat in the study areas. Table 6-2 identifies the seasonal use and habitat value of habitats for each big-game species by study area. Appendix F, Habitat Maps for Big-game Species, provides maps showing the relevant habitat for each species.

Table 6-2. Existing Big-game Habitat in the Study Areas

Common Name	Scientific Name	Study Area		
		Indian Canyon	Wells Draw	Whitmore Park
Bighorn sheep	*Ovis canadensis*	• Year-long, crucial	• Year-long, crucial • Year-long, substantial	• Year-long, crucial
Elk	*Cervus canadensis*	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, crucial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, substantial
Moose	*Alces alces*	• Winter, crucial • Winter, substantial • Year-long, crucial	• Winter, crucial • Winter, substantial • Year-long, crucial	• Winter, crucial • Winter, substantial • Year-long, crucial
Mule deer	*Odocoileus hemionus*	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, crucial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, crucial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, crucial • Year-long, substantial
Pronghorn antelope	*Antilocapra americana*	• Year-long, crucial • Year-long, substantial	• Year-long, crucial • Year-long, substantial	• Year-long, crucial • Year-long, substantial

6.1.3 Special-status Wildlife Species

Threatened, Endangered, and Candidate Species. The survey team's database research and consultation with agencies found that eight federally listed wildlife species could occur or are known to occur in or near the study areas (Table 6-3): two bird species, five fish species, and one mammal species. (For the consultation letters from USFWS, see Appendix A, Pertinent Correspondence.) Suitable habitat was identified for two of these eight species. None of the three study areas include designated or proposed critical habitat for any federally listed wildlife species.

Table 6-3. Federally Listed Wildlife Species Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Federal Status	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Birds							
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	✓	✓	✓	Spotted owls are nonmigratory and occupy a variety of habitats in different parts of their range, habitats including various forest types and steep rocky canyons, this last habitat being the primary habitat used in Utah. These owls are basically intolerant of even-age forest management practices, and forests used for roosting and nesting often contain mature or old-growth stands with a complex structure. They require cool summer roosts, such as near canyon bottoms, in dense forests, on shady cliffs, or in caves. Spotted owls do not build their own nests but use suitable naturally occurring sites and nests built by other animals. Nests are either in trees (typically large Douglas-fir), in trunk cavities, or on cliffs.	Although no observations have been documented in the study areas or within a 2-mile buffer of the three alternatives, potentially suitable habitat might exist in the study areas.
Western yellow-billed cuckoo	*Coccyzus americanus*	Threatened	✓	✓	✓	Western yellow-billed cuckoos prefer to nest in tall cottonwood and willow riparian woodland with dense understory foliage. They prefer patches of at least 25 acres of dense riparian forest with a canopy cover of at least 50% in both the understory and overstory. USFWS's suitable habitat guidelines for this species for Utah require patches of multilayered vegetation that are at least 12 acres in extent and at least 100 meters (328 feet) wide by 100 meters long.	There is no suitable habitat large enough in or within 0.5 mile of the study areas. Additionally, no observations have been recorded in the study areas or within a 2-mile buffer of the three alternatives.

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Table 6-3. Federally Listed Wildlife Species Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Federal Status	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Fish							
Bonytail	*Gila elegans*	Endangered	✓	✓	✓	Bonytails are native to the Colorado River system and its larger tributaries, including the Green and Yampa Rivers; however, few bonytails exist in the wild. Bonytails prefer eddies, pools, and backwaters near swift currents in large rivers.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered	✓	✓	✓	The present distribution of Colorado pikeminnows is restricted to the Upper Colorado River basin of Colorado, Utah, New Mexico, and Wyoming, primarily in the Green River in Utah and in the Yampa and Colorado Rivers in Colorado and parts of Utah. Adult Colorado pikeminnows prefer medium to large rivers in habitats ranging from deep, turbid rapids to flooded lowlands. Young pikeminnows prefer slow-moving backwaters.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.

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Table 6-3. Federally Listed Wildlife Species Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Federal Status	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Humpback chub	*Gila cypha*	Endangered	✓	✓	✓	Humpback chubs inhabit large rivers and are native to the Colorado River system, but their current distribution in Utah is confined to a few whitewater areas in the Colorado, Green, and White Rivers. Young fish are spawned in backwater areas and remain in slower water until they are large enough to move into white-water areas.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.
June sucker	*Chasmistes liorus*	Endangered	✓	✓	✓	June suckers are endemic to Utah Lake and its tributaries (the Provo and Spanish Fork Rivers).	There is no suitable habitat in the study areas, nor is there downstream habitat.
Razorback sucker	*Xyrauchen texanus*	Endangered	✓	✓	✓	The razorback sucker is found in the Green, Yampa, White, Duchesne, Gunnison, San Juan, and upper Colorado Rivers. The species prefers slow backwater habitats and impoundments and is often associated with sand, mud, and rock substrate in areas with sparse aquatic vegetation where temperatures are moderate to warm.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas and eventually drains in the Duchesne River which is a tributary of the Green River. Argyle Creek is located in the Wells Draw study area and Willow Creek and the Price River are located in all three study areas, all of which ultimately drain to the Green River system.

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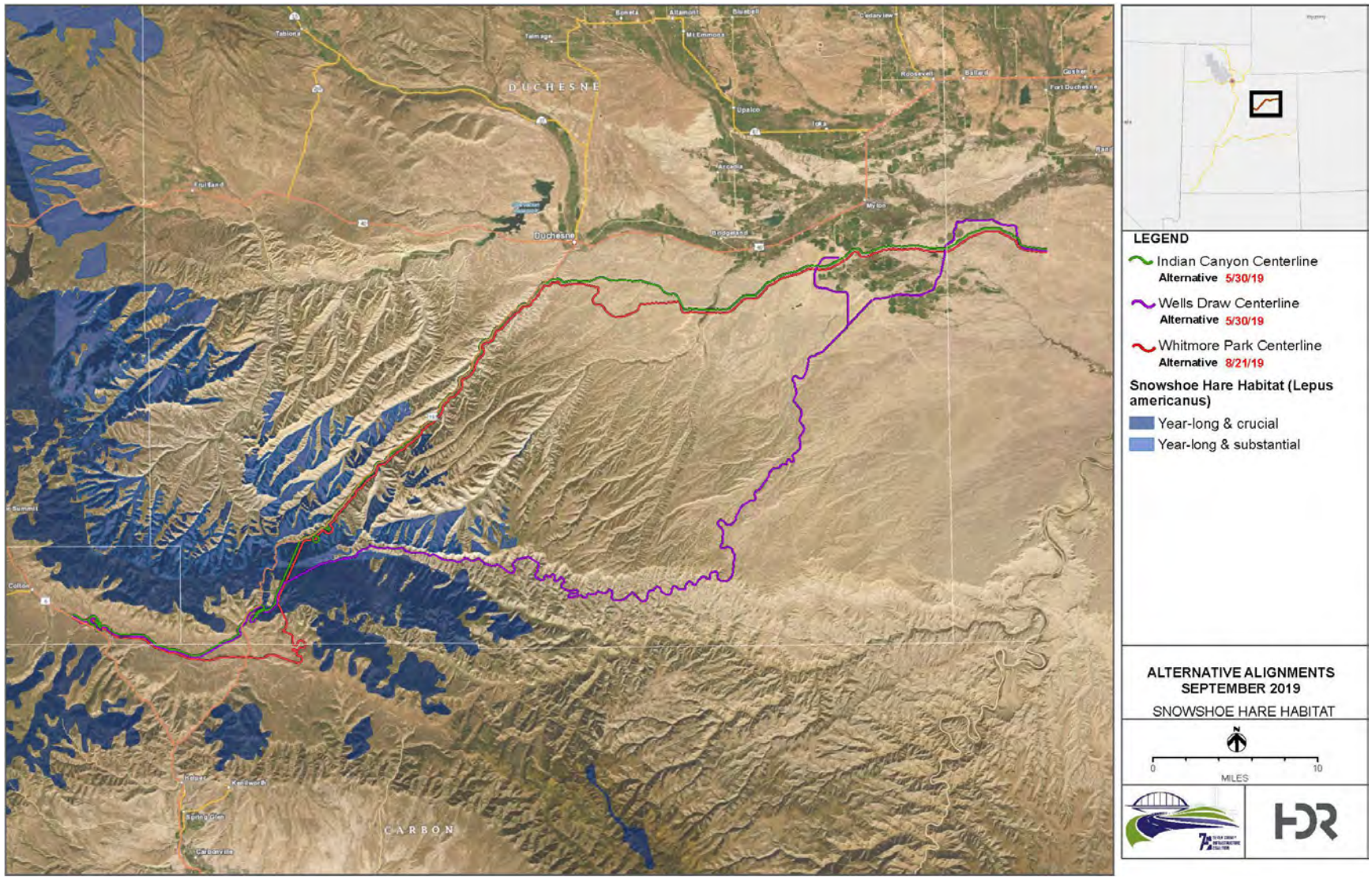
Table 6-3. Federally Listed Wildlife Species Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Federal Status	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
			Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Mammals							
Canada lynx	*Lynx canadensis*	Threatened	✓	✓	✓	The preferred habitat of Canada lynxes is boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth, but lynxes also sometimes enter open forest, rocky areas, and tundra to forage for abundant prey. The major limiting factor is the abundance of snowshoe hares.	Potentially suitable habitat exists in the study areas. Year-long crucial habitat for snowshoe hare is present at higher elevations (see Figure 6-1).

[a] Sources: Species list from USFWS (2019a, 2019b, 2019c) and Appendix A, Pertinent Correspondence

[b] Sources: NatureServe, no date; UDWR, no date

Figure 6-1. Snowshoe Hare Habitat



State-, USDA Forest Service–, and BLM-Listed Sensitive Species. The survey team consulted the Utah Conservation Data Center (UDWR, no date) as well as representatives from the Ashley National Forest and BLM to determine the state-, USDA Forest Service–, and BLM-listed sensitive species that might occur in the study areas, which include Carbon, Duchesne, Uintah, and Utah Counties. Forty-five sensitive wildlife species were identified (Table 6-4): 2 amphibians, 15 birds, 11 fish, 11 mammals, 4 mollusks, and 2 reptiles. The table shows which species are known to occur in each county. Potentially suitable habitat was identified for 26 of the 45 species.

Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Amphibians								
Columbia spotted frog	*Rana luteiventris*	UDWR, BLM				✓	Columbia spotted frogs are highly aquatic and are rarely found far from permanent quiet water. They usually live at the grassy/sedgy margins of streams, lakes, ponds, springs, and marshes and use stream-side small-mammal burrows as shelter.	Potentially suitable habitat exists in the study areas. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways provide a permanent source of water.
Great plains toad	*Anaxyrus cognatus*	UDWR, BLM		✓	✓		Great Plains toads inhabit deserts, grasslands, semidesert shrublands, open floodplains, and agricultural areas, typically in stream valleys. When not active on the surface, they usually occupy underground burrows. Breeding sites include rain pools, flooded areas, and ponds and reservoirs that fluctuate in size.	Potentially suitable habitat exists in the study areas.
Western toad	*Bufo anaxyrus*	UDWR, BLM		✓	✓	✓	Western toads are found throughout most of Utah and can be found in a variety of habitats including slow-moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands.	Potentially suitable habitat exists in the study areas. Observations have been recorded within a ½-mile radius and a 2-mile radius of the three alternatives.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Birds								
American three-toed woodpecker	*Picoides dorsalis*	UDWR, USDA Forest Service, BLM		✓	✓*	✓*	Three-toed woodpeckers prefer natural coniferous forests with an abundance of insect-infested snags (dead, upright trees) or dying trees for both nesting and foraging. In Utah, this woodpecker nests and winters in coniferous forests, generally above 8,000 feet in elevation.	Potentially suitable habitat exists in the study areas.
American white pelican	*Pelecanus erythrorhynchos*	UDWR			✓*	✓	Pelican habitat includes rivers, lakes, reservoirs, estuaries, bays, and open marshes. Pelicans roost and nest on islands and peninsulas. In Utah, pelicans nest on Gunnison Island, but, during spring migration, the breeding season, and fall staging and migration, they can be observed at many reservoirs throughout the state.	There is no suitable habitat in the study areas.
Bald eagle	*Haliaeetus leucocephalus*	UDWR, USDA Forest Service, BLM	✓	✓	✓	✓	Breeding habitat for bald eagles most commonly includes areas close to coastal areas, bays, rivers, lakes, reservoirs, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, or seabirds. Nests usually are in tall trees or on pinnacles or cliffs near water. Winter habitat is commonly associated with open water, though some bald eagles use montane areas if upland food resources such as rabbit or deer carrion are readily available.	Potentially suitable habitat exists in the study areas. Individual eagles have been documented within a 2-mile radius of the three alternatives.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Black swift	*Cypseloides niger*	UDWR, BLM	✓*	✓*	✓	✓	Black swifts require waterfalls for nesting; typically, the falls are permanent but can be intermittent if they flow throughout the breeding season (June to early September). Nesting sites are typically surrounded by coniferous forests (often mixed conifer or spruce-fir forests), but this varies depending on elevation and aspect, and nest sites can include mountain shrub, aspen, or even alpine components. Streams that create the waterfalls are typically mountain riparian habitats.	Potentially suitable habitat exists in the study areas. Multiple small-to-medium-sized waterfalls exist along Indian Creek and flow year-round.
Bobolink	*Dolichonyx oryzivorus*	UDWR, BLM		✓	✓*	✓	Bobolinks prefer habitat with tall, dense vegetation; with moderately deep litter; and lacking woody vegetation. Bobolinks do not breed in most of Utah. They occur in low abundance and in isolated patches primarily in the northern half of the state.	There is no suitable habitat in the study areas.
Boreal owl	*Aegolius funereus*	USDA Forest Service		✓	✓		Boreal owls are rare in Utah. They occur in the Wasatch Mountains, the Bear River Range, and the Uinta Mountains. They prefer dense coniferous forests; mixed forests; and thickets of alder, aspen, or stunted spruce, most commonly in proximity to open, grassy areas. Nests are located in tree cavities.	Potentially suitable habitat exists in the study areas. Two observations have been recorded within a 2-mile radius of both the Indian Canyon and Whitmore Park alternatives.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Burrowing owl	*Athene cunicularia*	UDWR, BLM	✓	✓	✓	✓	Burrowing owls are widespread in Utah where habitat includes open grasslands and other open areas such as vacant lots near human habitation. Burrowing owls typically nest in abandoned burrows.	Potentially suitable habitat exists in the study areas. Although no observations of have been recorded in the study areas, occurrences have been recorded within a ½-mile radius of the Indian Canyon and Wells Draw alternatives and within a 2-mile radius of all three alternatives.
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	BLM			✓		Columbian sharp-tailed grouse prefer native bunch-grass and shrub-steppe communities interspersed with deciduous shrubs. Nests are shallow hollows lined with grass and leaves, usually placed near a bush or clump of grass.	Potentially suitable habitat exists in the study areas.
Common loon	*Gavia immer*	USDA Forest Service	✓	✓	✓	✓	Common loons are usually found on large, open clear lakes containing both shallow and deep-water areas. Nests are shallow scrapes on raised areas along shorelines or on islands. Common loons are an uncommon migrant through Utah.	There is no suitable habitat in the study areas.
Ferruginous hawk	*Buteo regalis*	UDWR, BLM	✓	✓	✓	✓	Ferruginous hawks are found throughout Utah and prefer open habitat such as prairies, badlands, shrublands, deserts, or the periphery of pinyon-juniper woodlands.	Potentially suitable habitat exists in the study areas. Observations have been recorded in each of the study areas as well as within a ½-mile radius of the Indian Canyon and Wells Draw alternatives and within a 2-mile radius of all three alternatives.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Flammulated owl	*Psiloscops flammeolus*	USDA Forest Service			✓*	✓*	Flammulated owls breed in dry, relatively open mature mountain forests of ponderosa pine or other large coniferous trees. They most often nest in abandoned tree cavities.	Potentially suitable habitat exists in the study areas.
Golden eagle	*Aquila chrysaetos*	BLM	✓	✓	✓	✓	Golden eagles generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions, in areas with sufficient mammalian prey base and near suitable nesting sites. Nests are most often on rock ledges of cliffs.	Potentially suitable habitat exists in the study areas. Observations have been recorded in all three study areas as well as within a 2-mile radius of the three alternatives.
Grasshopper sparrow	*Ammodramus savannarum*	BLM	✓	✓	✓	✓	Grasshopper sparrows prefer grasslands of intermediate height with some bare ground and little to no woody vegetation cover. Breeding populations in Utah have been found only in northern parts of the state.	Potentially suitable habitat exists in the study areas.
Great gray owl	*Strix nebulosa*	USDA Forest Service					In Canada, great gray owls spend the year in dense, wet evergreen forests (also known as taiga). In the United States, they use pine and fir forests adjacent to montane meadows between 2,500 and 7,500 feet in elevation. They nest on top of large broken-off tree trunks, in old nests of other large birds, or in debris platforms from dwarf mistletoe.	There is no suitable habitat in the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Greater sage-grouse	*Centrocercus urophasianus*	UDWR, USDA Forest Service, BLM	✓	✓	✓	✓	Greater sage-grouse are found throughout Utah and require sagebrush habitat.	Potentially suitable habitat exists in the study areas. Observations have been recorded in each of the study areas as well as within a ½-mile radius and a 2-mile radius of the three alternatives. Furthermore, portions of the study areas run through the Carbon Sage-Grouse Management Area. At least four known lek locations are near the southern end of the Indian Canyon and Wells Draw study areas, and five are located near the Whitmore Park study area. For more information, see Section 6.4.
Lewis's woodpecker	*Melanerpes lewis*	UDWR, BLM		✓	✓	✓	The preferred breeding habitat of Lewis's woodpeckers consists of open, park-like Ponderosa pine forests as well as burned-over Douglas-fir, mixed conifer, pinyon-juniper, and riparian and oak woodlands. They also live in the fringes of pine and juniper stands and deciduous forests, especially riparian cottonwoods. Areas with a good understory of grasses and shrubs to support insect prey populations are preferred. Dead trees or stumps are required for nesting.	Potentially suitable habitat exists in the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Long-billed curlew	*Numenius americanus*	UDWR, BLM	✓	✓	✓	✓	Long-billed curlews prefer shortgrass prairies and meadows, usually near water. Long-billed curlews are common summer residents and migrants in Utah, especially through the central and northern valleys. They are less common in the Colorado River drainage.	Potentially suitable habitat might exist in the study areas. Observations have been recorded within a ½-mile radius of the Wells Draw alternative and within a 2-mile radius of all three alternatives.
Mountain plover	*Charadrius montanus*	UDWR, BLM		✓	✓		Nesting habitat for mountain plovers includes shortgrass prairie and desert tablelands with sagebrush and blue grama grass. Nesting sites are typically composed of at least 30% bare ground.	Potentially suitable habitat exists in the study areas. Although no observations have been recorded in the study areas, observations have been recorded within a ½-mile radius and a 2-mile radius of the Wells Draw alternative.
Northern goshawk	*Accipiter gentiles*	UDWR, USDA Forest Service, BLM	✓	✓	✓	✓	Northern goshawks nest in mature, old-growth forests with more than 60% closed canopy. They nest in a wide variety of forest types including deciduous, coniferous, and mixed forests. Nests are often built near breaks in the canopy at sites with a creek, pond, or lake nearby.	Potentially suitable habitat exists in the study areas. Although no observations of have been documented in the study areas, observations have been recorded within a 2-mile radius of all three alternatives.
Peregrine falcon	*Falco peregrinus*	USDA Forest Service	✓	✓	✓	✓	The preferred habitat of peregrine falcons includes open areas ranging from tundra, moorlands, steppes, and seacoasts, especially where there are suitable nesting cliffs, to mountains, open forested regions, and human population centers. These falcons often nest on ledges or holes on the faces of rocky cliffs or crags.	Potentially suitable habitat exists in the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Short-eared owl	*Asio flammeus*	UDWR, BLM		✓*	✓*	✓	Broad expanses of open land with low vegetation are required for the nesting and foraging habits of short-eared owls. Suitable habitat types include grasslands, marshlands, shrublands, prairies, tundra, and other open habitats. Nest are found in small depressions on the ground, often beside a bush or clump of grass.	Potentially suitable habitat exists in the study areas. Observations have been recorded within a 2-mile radius of the Indian Canyon and Whitmore Park alternatives.
Snowy plover	*Charadrius nivosus*	BLM			✓	✓*	Snowy plovers are common in Utah, with the largest known concentration in interior North America being found on the Great Salt Lake. Preferred habitat includes beaches, dry mud or salt flats, and sandy shores of rivers, lakes, and ponds. Nests are built on the ground, usually in open or sparsely vegetated areas near water.	There is no suitable habitat in the study areas.
Trumpeter swan	*Cygnus buccinator*	USDA Forest Service		✓	✓		Ponds, lakes, and marshes are the preferred habitat for trumpeter swans. They breed in emergent marsh vegetation, primarily on fresh water, and winter on open ponds, lakes, and sheltered bays and estuaries. Trumpeter swans are an occasional migrant to Utah during the winter.	There is no suitable breeding habitat in the study areas.
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	UDWR			✓	✓	Western yellow-billed cuckoos prefer to nest in tall cottonwood and willow riparian woodland with dense understory foliage. They prefer patches of at least 25 acres of dense riparian forest with a canopy cover of at least 50% in both the understory and overstory.	There is no suitable habitat large enough in or within ½-mile of the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Fish								
Bluehead sucker	*Catostomus discobolus*	UDWR, BLM	✓	✓	✓	✓	Bluehead suckers are found in the upper Colorado River system, the Snake River system, and the Lake Bonneville basin. They prefer moderate- to fast-flowing water above rubble-rock substrate in high-gradient reaches of mountain rivers.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system, a major tributary of the Colorado River. Occurrences have been recorded within a ½-mile radius and a 2-mile radius of the Wells Draw alternative (dated from 2011) and within a 2-mile radius of the Indian Canyon and Whitmore Park alternatives (dated from 1932).
Bonneville cutthroat trout	*Oncorhynchus clarkii utah*	UDWR, BLM	✓	✓		✓	Habitat for Bonneville cutthroat trout ranges from high-elevation streams with coniferous and deciduous riparian trees, to low-elevation streams in sage-steppe grasslands containing herbaceous riparian zones, to lakes.	There is no suitable habitat in the study areas, nor is there downstream habitat.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Bonytail	*Gila elegans*	UDWR	✓		✓		Bonytails are native to the Colorado River system and its larger tributaries, including the Green and Yampa Rivers; however, few bonytail exist in the wild. Bonytails prefer eddies, pools, and backwaters near swift currents in large rivers.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.
Colorado pikeminnow	*Ptychocheilus lucius*	UDWR	✓		✓		The present distribution of Colorado pikeminnows is restricted to the Upper Colorado River basin of Colorado, Utah, New Mexico, and Wyoming, primarily in the Green River in Utah and in the Yampa and Colorado Rivers in Colorado and portions of Utah. Adult Colorado pikeminnows prefer medium to large rivers in habitats ranging from deep turbid rapids to flooded lowlands. Young pikeminnows prefer slow-moving backwaters.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	UDWR, BLM	✓	✓	✓	✓	Colorado River cutthroat trout require cool, well-oxygenated water and vegetated streambanks for cover and bank stability. Deep pools, boulders, and logs are also important for cover. Colorado River cutthroat trout are native to the Colorado River basin and are currently limited to a few small headwater streams of the Green and upper Colorado Rivers in Colorado, Utah, and Wyoming.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system, a major tributary of the Colorado River. Occurrences have been recorded within a 2-mile radius of the Indian Canyon and Whitmore Park alternatives.
Flannelmouth sucker	*Catostomus latipinnis*	UDWR, BLM	✓	✓	✓		Flannelmouth suckers are native to the Colorado River system. In Utah, the species occurs in the main-stem Colorado River as well as in many of the Colorado River's large tributaries. Flannelmouth suckers prefer rocky pools, runs, riffles, and backwater habitats of medium to large rivers.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system, a major tributary of the Colorado River. Occurrences have been recorded within a 2-mile radius of the Wells Draw alternative.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Humpback chub	*Gila cypha*	UDWR	✓		✓		Humpback chubs inhabit large rivers and are native to the Colorado River system, but their current distribution in Utah is confined to a few whitewater areas in the Colorado, Green, and White Rivers. Young fish are spawned in backwater areas and remain in slower water until they are large enough to move into whitewater areas.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.
June sucker	*Chasmistes liorus*	UDWR				✓	June suckers are endemic to Utah Lake and its tributaries (the Provo and Spanish Fork Rivers).	There is no suitable habitat in the study areas, nor is there downstream habitat.
Razorback sucker	*Xyrauchen texanus*	UDWR	✓		✓		Razorback suckers are found in the Green, Yampa, White, Duchesne, Gunnison, San Juan, and upper Colorado Rivers. The species prefers slow backwater habitats and impoundments and is often associated with sand, mud, and rock substrate in areas with sparse aquatic vegetation where temperatures are moderate to warm.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas and eventually drains in the Duchesne River, which is a tributary of the Green River. Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas, all of which ultimately drain to the Green River system.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Roundtail chub	*Gila robusta*	UDWR, BLM	✓	✓	✓	✓*	Roundtail chubs are native to the Colorado River system where habitat includes rocky runs, rapids, and pools of creeks and small to large rivers. They are also found in large reservoirs in the upper Colorado River system.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system, a major tributary of the Colorado River.
Southern leatherside chub	*Lepidomeda aliciae*	UDWR, BLM				✓	Southern leatherside chubs are found in the southeastern portion of the Bonneville Basin. Introduced populations of leatherside chubs (species uncertain) occur in the Strawberry, Green, and Fremont Rivers in the Upper Colorado River basin. Preferred habitat includes sluggish pools and backwaters, usually over sand or mud, of creeks and small to medium rivers.	There is no suitable habitat in the study areas. However, suitable habitat is available downstream. Indian Creek is located in the Indian Canyon and Whitmore Park study areas, Argyle Creek is located in the Wells Draw study area, and Willow Creek and the Price River are located in all three study areas. All of these waterways ultimately drain to the Green River system.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Insects								
Monarch butterfly	*Danaus plexippus*	BLM					Virtually all patches of milkweed in North America provide breeding habitat for monarch butterflies. They overwinter in high-altitude Mexican conifer forests or coastal California conifer or Eucalyptus groves.	Potentially suitable habitat exists in the study areas.
Western bumble bee	*Bombus occidentalis*	BLM					Habitat for western bumble bees includes open coniferous, deciduous, and mixed-wood forests; wet and dry meadows; montane meadows and prairie grasslands; along roadsides in taiga adjacent to wooded areas, urban parks, gardens, and agricultural areas; subalpine habitats; and more-isolated natural areas.	Potentially suitable habitat exists in the study areas.
Mammals								
Big free-tailed bat	*Nyctinomops macrotis*	UDWR, BLM		✓	✓*	✓	Big free-tailed bats are rare in Utah. They prefer rocky and woodland habitats, where they roost in caves, mines, old buildings, and rock crevices. The species is typically active year-round, spending summers in temperate North America and migrating to warmer areas in North America and South America for the winter.	Potentially suitable habitat exists in the study areas.
Bighorn sheep	*Ovis canadensis*	USDA Forest Service	✓	✓	✓		Bighorn sheep occur in mesic to xeric, alpine to desert grasslands or shrub-steppe in mountains, foothills, or river canyons. Steep rocky slopes and cliffs offer important escape terrain.	Potentially suitable habitat exists in the study areas. See Appendix F, Habitat Maps for Big-game Species, for maps of big-game species.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Black-footed ferret	*Mustela nigripes*	UDWR	✓*	✓*	✓		This species is limited to open habitat such as grasslands, steppe, and shrub-steppe communities. Black-footed ferrets live in underground prairie dog burrows and eat prairie dogs as their primary food source. Although the black-footed ferret is a Federally listed endangered species, populations in the Uinta Basin were reintroduced and have been classified as "nonessential–experimental" by USFWS.	Potentially suitable habitat exists in the study areas.
Brown/grizzly bear	*Ursus arctos*	UDWR		✓*	✓*	✓*	Brown bears are currently found in arctic tundra, alpine tundra, and subalpine mountain forests. They were once found in a wider variety of habitats including open prairie, brushlands, riparian woodlands, and semidesert scrub. Most populations require huge areas of suitable habitat. Brown bears were extirpated from Utah in the 1920s. They persist in Alaska, parts of Canada, and the northwestern United States.	Potentially suitable habitat exists in the study areas. Historic observations were recorded within a ½-mile radius and a 2-mile radius of all three alternatives (dated from 1914).
Canada lynx	*Lynx canadensis*	UDWR			✓*		The preferred habitat of Canada lynxes is boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth, but lynxes also sometimes enter open forest, rocky areas, and tundra to forage for abundant prey. The major limiting factor is the abundance of snowshoe hares.	Potentially suitable habitat exists in the study areas. Year-long crucial habitat for snowshoe hare is present at higher elevations (see Figure 6-1 above).

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Fringed myotis	*Myotis thysanodes*	UDWR, BLM	✓	✓*	✓	✓*	Fringed myotis occur in most of the western United States, as well as in much of Mexico and part of southwestern Canada, and are widely distributed throughout Utah. These bats occur primarily at middle elevations in desert, riparian, grassland, and woodland habitats. Roosts are in caves, mines, cliff faces, rock crevices, old buildings, bridges, snags (dead, upright trees), and other sheltered sites.	Potentially suitable habitat exists in the study areas.
Gray wolf	*Canis lupus*	UDWR		✓*			Gray wolves can live in a variety of habitats where ungulate prey is abundant but prefer areas with little human activity. Gray wolves were once common in Utah, but they was extirpated from the state by early settlers.	Potentially suitable habitat exists in the study areas. Historic observations were recorded within a 2-mile radius of the Indian Canyon and Whitmore Park alternatives (dated from 1916).
Kit fox	*Vulpes macrotis*	UDWR, BLM	✓*	✓*	✓*	✓*	Kit foxes are found primarily in open desert, shrubby or shrub-grass habitat. They occur in the western, east-central, and southeastern areas of Utah.	Potentially suitable habitat exists in the study areas.
Pygmy rabbit	*Brachylagus idahoensis*	USDA Forest Service					Pygmy rabbits prefer dense stands of big sagebrush growing in loose soils. This species is highly dependent on sagebrush for food and shelter throughout the year.	Potentially suitable habitat exists in the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Spotted bat	*Euderma maculatum*	UDWR, USDA Forest Service, BLM		✓*	✓	✓*	Spotted bats live in various habitats from desert to montane coniferous stands, habitats including open ponderosa pine, pinyon-juniper woodland, canyon bottoms, riparian and river corridors, meadows, open pasture, and hayfields. Roosts, including maternity roosts, generally are in cracks and crevices in cliffs.	Potentially suitable habitat exists in the study areas.
Townsend's big-eared bat	*Corynorhinus townsendii*	UDWR, USDA Forest Service, BLM	✓	✓*	✓*	✓	Throughout much of their known range, Townsend's big-eared bats commonly live in mesic habitats characterized by coniferous and deciduous forests. Caves, mines, and buildings are used for maternity and hibernation.	Potentially suitable habitat exists in the study areas.
Western red bat	*Lasiurus blossevillii*	UDWR, BLM	✓*			✓*	Western red bats are normally found near water in wooded areas. Roosting usually occurs in trees and foraging near riparian areas. They are rare in Utah.	Potentially suitable habitat exists in the study areas.
White-tailed prairie dog	*Cynomys leucurus*	UDWR, BLM	✓	✓	✓	✓*	White-tailed prairie dogs are colonial species that inhabit open shrublands, semidesert grasslands, and open valleys. They live at higher elevations and in meadows with more diverse grass and herb cover than do black-tailed prairie dogs. White-tailed prairie dogs are the main food source of the Utah population of black-footed ferrets.	Potentially suitable habitat exists in the study areas. Observations have been recorded within a ½-mile radius and a 2-mile radius of all three alternatives.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Wolverine	*Gulo gulo*	USDA Forest Service		✓	✓	✓	Wolverines prefer alpine tundra and mountain forest habitats that are not frequented by humans. Wolverines are not common in Utah.	Potentially suitable habitat exists in the study areas.
Mollusks								
California floater	*Anodonta californiensis*	UDWR				✓*	The California floater is a freshwater mussel. The larvae require gravel and rocky substrates in fast-flowing water, whereas adults require mud, silt, or fine sand substrates in quiet areas.	Potentially suitable habitat exists in the study areas
Eureka mountainsnail	*Oreohelix eurekensis*	UDWR, BLM		✓		✓*	Eureka mountainsnails are endemic to Utah and have been reported from about six locations representing four widely separated populations scattered across northern Utah in roughly an east-west band. These four populations are in the northern part of the East Tintic Mountains on the Juab County–Tooele County border; on Hominy Creek on the south slope of the Uinta Mountains near the Duchesne County–Uintah County border; in the Deep Creek Mountains near the Juab County–Tooele County border and the Utah–Nevada boundary; and on the East Tavaputs Plateau in Grand County. They prefer sites with limestone talus, outcrops, or high-calcium soils in cliff, forest, woodland, or shrubland habitat.	Potentially suitable habitat exists in the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Southern Bonneville pyrg	*Pyrgulopsis transversa*	UDWR, BLM				✓*	This species prefers freshwater springs and is known to occur in six locations in north-central Utah. Four of these locations are in Tooele County, one in Utah County, and one in Sanpete County.	Potentially suitable habitat exists in the study areas.
Utah physa	*Physella utahensis*	UDWR, BLM				✓*	The Utah physa is a freshwater snail. They are currently known to occur at two locations in Box Elder County. The species was historically known to inhabit Utah Lake and its associated springs: Redden Spring in Tooele County; Fish Springs National Wildlife Refuge in Juab County; and Montrose County, Colorado, near the border of San Juan County, Utah.	Potentially suitable habitat exists in the study areas.

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Table 6-4. State-, USDA Forest Service–, and BLM-Listed Wildlife Species Known or Suspected to Occur in Carbon, Duchesne, Uintah, and Utah Counties

Common Name	Scientific Name	Agency[a]	County[b]				Preferred Habitat[c]	Potentially Suitable Habitat Present?[c]
			Carbon	Duchesne	Uintah	Utah		
Reptiles								
Cornsnake	*Pantherophis emoryi*	UDWR, BLM			✓		Cornsnakes are found in northeastern Mexico and throughout much of the southern United States east of New Mexico. An isolated population is located in western Colorado and eastern Utah. Cornsnakes use a wide variety of habitats including rocky hillsides, meadows, stream courses and river bottoms, canyons, barnyards, abandoned buildings, and wooded areas.	Potentially suitable habitat exists in the study areas.
Smooth greensnake	*Opheodrys vernalis*	UDWR, BLM		✓*	✓*	✓	The smooth greensnake is found throughout the northeastern and western United States, southeastern Canada, and parts of Texas and Mexico. The snake is uncommon in Utah and occurs in the Wasatch, Uinta, Abajo, and La Sal Mountains. Smooth greensnakes prefer meadows, grassy marshes, mountain shrublands, stream borders, bogs, open moist woodland, abandoned farmland, and vacant lots.	Potentially suitable habitat exists in the study areas.

[a] Species lists obtained from UDWR (no date); BLM (Fletcher 2019); USDA Forest Service (Christensen 2019)

[b] County information was collected from provided lists and NatureServe. In some cases, county information was not available.

[c] Sources: Cornell Lab of Ornithology, no date; NatureServe, no date; UDWR, no date

* Presumed extirpated (NatureServe, no date)

Migratory Birds. Table 6-5 lists the bird species included on the USFWS Information for Planning and Conservation (IPAC) website that could occur near the study areas. (For the consultation letter from USFWS with the official list of these species, see Appendix A, Pertinent Correspondence.) The table also describes the preferred habitat for each species and states whether there is potentially suitable habitat in the study areas. Potentially suitable habitat was identified for 13 of the 15 species.

Table 6-5. Migratory Birds Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
		Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Bald eagle	*Haliaeetus leucocephalus*	✓			Breeding habitat for bald eagles most commonly includes areas close to coastal areas, bays, rivers, lakes, reservoirs, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, or seabirds. Nests usually are in tall trees or on pinnacles or cliffs near water. Winter habitat is commonly associated with open water, though some bald eagles use montane areas if upland food resources such as rabbit or deer carrion are readily available.	Potentially suitable habitat exists in the study areas. Individual eagles have been documented within a 2-mile radius of the three alternatives.
Black rosy-finch	*Leucosticte atrata*	✓			Black rosy-finches breed above the timberline in alpine tundra using barren, rocky, or grassy areas and cliffs among glaciers or at the bases of snow fields.	Potentially suitable habitat exists in the study areas. Observations have been recorded in the Indian Canyon and Whitmore Park study areas and within a 2-mile radius of all three alternatives.
Brewer's sparrow	*Spizella breweri*	✓	✓	✓	Brewer's sparrows breed primarily in shrub-steppe habitats in Utah and are considered to be shrub-steppe obligates. They also breed in large sagebrush openings in pinyon-juniper habitat or coniferous forests. Breeding habitats are usually dominated by big sagebrush.	Potentially suitable habitat exists in the study areas. Observations have been recorded within all three study areas and within a 2-mile radius of the three alternatives.
Burrowing owl	*Athene cunicularia*	✓		✓	Burrowing owls are widespread in Utah where habitat includes open grasslands and other open areas such as vacant lots near human habitation. Burrowing owls typically nest in abandoned burrows.	Potentially suitable habitat exists in the study areas. Observations have been recorded within a 2-mile radius of the Indian Canyon and Whitmore Park alternatives.
Clark's grebe	*Aechmophorus clarkii*	✓	✓	✓	Clarke's grebes prefer to nest on large freshwater lakes and marshes among tall, emergent vegetation on the water's edge. Winter habitat includes saltwater habitats including shores, bays, and rivers.	There is no suitable habitat in the study areas. However, one observation has been recorded within a 2-mile radius of the Wells Draw alternative.
Golden eagle	*Aquila chrysaetos*	✓	✓	✓	Golden eagles generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions, in areas with sufficient mammalian prey base and near suitable nesting sites. Nests are most often on rock ledges of cliffs.	Potentially suitable habitat exists in the study areas. Observations have been recorded within all three study areas as well as within a 2-mile radius of the three alternatives.

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Table 6-5. Migratory Birds Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
		Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Grace's warbler	*Dendroica graciae*	✓	✓	✓	Open pine forests, pine-oak associations, and pine savannas are the preferred habitat for Grace's warblers. Nests are usually on the outer limb of a pine tree 20 to 60 feet above ground.	Potentially suitable habitat exists in the study areas.
Lesser yellowlegs	*Tringa flavipes*	✓	✓	✓	Lesser yellowlegs breed in open forest in Alaska and Canada and winter in a variety of wetland habitats from the southern United States to Argentina. They are a common migrant through Utah.	Potentially suitable habitat exists in the study areas. Observations have been recorded in all three study areas.
Long-billed curlew	*Numenius americanus*	✓	✓	✓	Long-billed curlews prefer short-grass prairies and meadows, usually near water. Long-billed curlews are a common summer resident and migrant in Utah, especially through the central and northern valleys. They are less common in the Colorado River drainage.	Potentially suitable habitat exists in the study areas.
Marbled godwit	*Limosa fedoa*	✓	✓	✓	Marbled godwits breed in short-grass prairies near wetlands and winter along mudflats, estuaries, and beaches. They are common migrants in northern Utah, especially in areas around the Great Salt Lake and Utah Lake.	There is no suitable habitat in the study areas.
Olive-sided flycatcher	*Contopus cooperi*	✓	✓	✓	Olive-sided flycatchers breed in various forest and woodland habitats—taiga, subalpine coniferous forest, mixed coniferous-deciduous forest, burned-over forest, spruce or tamarack bogs and other forested wetlands—and along the forested edges of lakes, ponds, and streams. Most nesting sites contain snags (dead standing trees), which are used as singing and feeding perches. Nests are placed most often in conifers.	Potentially suitable habitat exists in the study areas. Observations have been recorded in all three study areas.
Pinyon jay	*Gymnorhinus cyanocephalus*	✓		✓	Pinyon-juniper forests are the preferred habitat for pinyon jays. The diet of pinyon jays consists primarily of pinyon and other pine seeds, and the timing and location of breeding is tied to pine seed availability. Nests are located in trees, usually conifers, 5 to 30 feet off the ground.	Potentially suitable habitat exists in the study areas. Observations have been recorded in the Wells Draw study area as well as within a 2-mile radius of the Indian Canyon and Whitmore Park alternatives.

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Table 6-5. Migratory Birds Known to Occur in or near the Study Areas

Common Name[a]	Scientific Name	Study Area			Preferred Habitat[b]	Potentially Suitable Habitat Present?[b]
		Indian Canyon[a]	Wells Draw[a]	Whitmore Park[a]		
Virginia's warbler	*Vermivora virginiae*	✓	✓	✓	The preferred breeding habitat for Virginia's warblers is in low, brushy areas on dry mountainsides where an herbaceous or woody understory is well-developed. Lower mountain habitats with dense stands of Gambel oak and a relatively high slope are preferred for breeding, although mountain mahogany woodlands, riparian areas, Ponderosa pine forests, and pinyon-juniper woodlands, all with shrubby understories, are also used for breeding. Breeding occasionally occurs in Douglas-fir and aspen habitats with the required shrubby understory.	Potentially suitable habitat exists in the study areas. Observations have been recorded in all three study areas and within a 2-mile radius of the three alternatives.
Willet	*Tringa semipalmata*	✓	✓	✓	Willets prefer marshes, wet meadows, mudflats, beach habitats. Birds nest in salt marshes in eastern North America and along marshy lake margins in western North America. Large expanses grasslands are required for nesting and foraging.	Potentially suitable habitat exists in the study areas.
Willow flycatcher	*Empidonax traillii*	✓	✓	✓	Willow flycatchers are associated with dense, riparian, deciduous shrub cover separated by open areas. The presence of water (running water, pools, or saturated soils) and willow, alder, or other deciduous riparian shrubs are essential habitat elements. Nests are primarily near slow streams, standing water, or seeps, or swampy thickets (especially of willow and buttonbush, but also dogwood, elderberry, hawthorn, rose, tamarisk, and others).	Potentially suitable habitat exists in the study areas. One observation has been recorded within a 2-mile radius of all three alternatives.

[a] Sources: Species list from USFWS (2019a, 2019b, 2019c) and Appendix A, Pertinent Correspondence

[b] Sources: Cornell Lab of Ornithology, no date; NatureServe, no date; UDWR, no date

6.2 Fragmentation

The existing habitat in the study areas has been fragmented by previous construction of highway corridors and smaller roads and conversion of land for agricultural, residential, commercial, and industrial uses. The major highways in or near the study areas are U.S. Highway 191 and U.S. Highway 6. Numerous smaller paved and dirt roads provide access to homes, businesses, and oil well pads. These land use changes have disrupted the continuity and function of the original wildlife habitat by affecting the foraging habits, reproductive habits, and migratory movements of many species.

6.3 Wildlife Mortality

The survey team reviewed crash data from the Utah Wildlife-Vehicle Collision Reporter (UDOT and UDWR, no date) for the past 2 years to determine whether there were clusters of wildlife strikes. During the 2-year period, 42 wildlife strikes occurred near the study areas. Thirty-seven of the 42 strikes occurred on U.S. Highway 191 between Duchesne and the junction with Emma Park Road/Kyune Pass Road, and 5 occurred on U.S. Highway 6 near the junction with Emma Park Road/Kyune Pass Road. Of the 37 strikes that occurred on U.S. Highway 191, 30 involved mule deer, 3 involved domestic cows, 2 involved elk, 1 involved a coyote, and 1 involved a kit fox. The 5 strikes that occurred on U.S. Highway 6 all involved mule deer.

6.4 Conservation and Natural Areas

6.4.1 UDWR Carbon Greater Sage-grouse Management Area

In March 2010, USFWS found that greater sage-grouse warranted listing under the Endangered Species Act. That finding was attributed to habitat fragmentation and “inadequate regulatory mechanisms” designed to protect habitats at the local, state, and federal levels. In response, Utah Governor Gary Herbert established a task force to review relevant information and develop a statewide plan to conserve sage-grouse and their habitats. As a result, the first *Conservation Plan for Greater Sage-Grouse* was finalized in February 2013, in which Utah’s Sage-Grouse Management Areas (SGMAs), which represent the highest-priority areas for sage-grouse conservation, were identified.

In October 2015, USFWS found that sage-grouse did not warrant listing under the Endangered Species Act. That decision was based on new scientific information and voluntary conservation put in place since 2010, including state-led conservation actions. Utah has continued its sage-grouse management practices and revised its conservation plan to incorporate practices identified by USFWS in 2015 (UDWR 2019b).

The Carbon SGMA is located in the southern end of the three study areas. The survey team obtained information regarding sage-grouse habitat and lek locations from UDWR range maps and metadata (UDWR 2019a). Figure 6-2, Figure 6-3, and Figure 6-4 show the Carbon SGMA in relation to the Indian Canyon, Wells Draw, and Whitmore Park study areas, respectively. The figures show habitat, non-habitat, and opportunity areas.

- **Habitat areas** include the "combined total of seasonal habitats used by sage-grouse at some point during their lifecycle. Habitat includes the geographical extent of leks, nesting, brood-rearing, transitional, and winter areas."
- **Non-habitat areas** are land that does not contribute to the lifecycle of sage-grouse.
- **Opportunity areas** are those portions of the SGMA that "currently do not contribute to the lifecycle of sage-grouse, but they are areas where restoration or rehabilitation efforts can provide additional habitat when linked to existing sage-grouse populations."

Table 6-6 shows the acreage of habitat, non-habitat, and opportunity areas in each of the study areas. At least four known lek locations are near the southern end of the Indian Canyon and Wells Draw study areas, and five are located near the Whitmore Park study area (see Figure 6-2, Figure 6-3, and Figure 6-4 for the lek locations).

Table 6-6. UDWR Greater Sage-grouse Habitat in the Study Areas

In acres

Type of Area	Study Area		
	Indian Canyon	Wells Draw	Whitmore Park
Habitat	1,630.8	1,623.0	2,083.1
Non-habitat	28.1	28.1	326.4
Opportunity	49.6	49.6	97.7
Total	1,708.5	1,700.6	2,507.2

Figure 6-2. Greater Sage-grouse Habitat and Lek Locations in the Indian Canyon Study Area

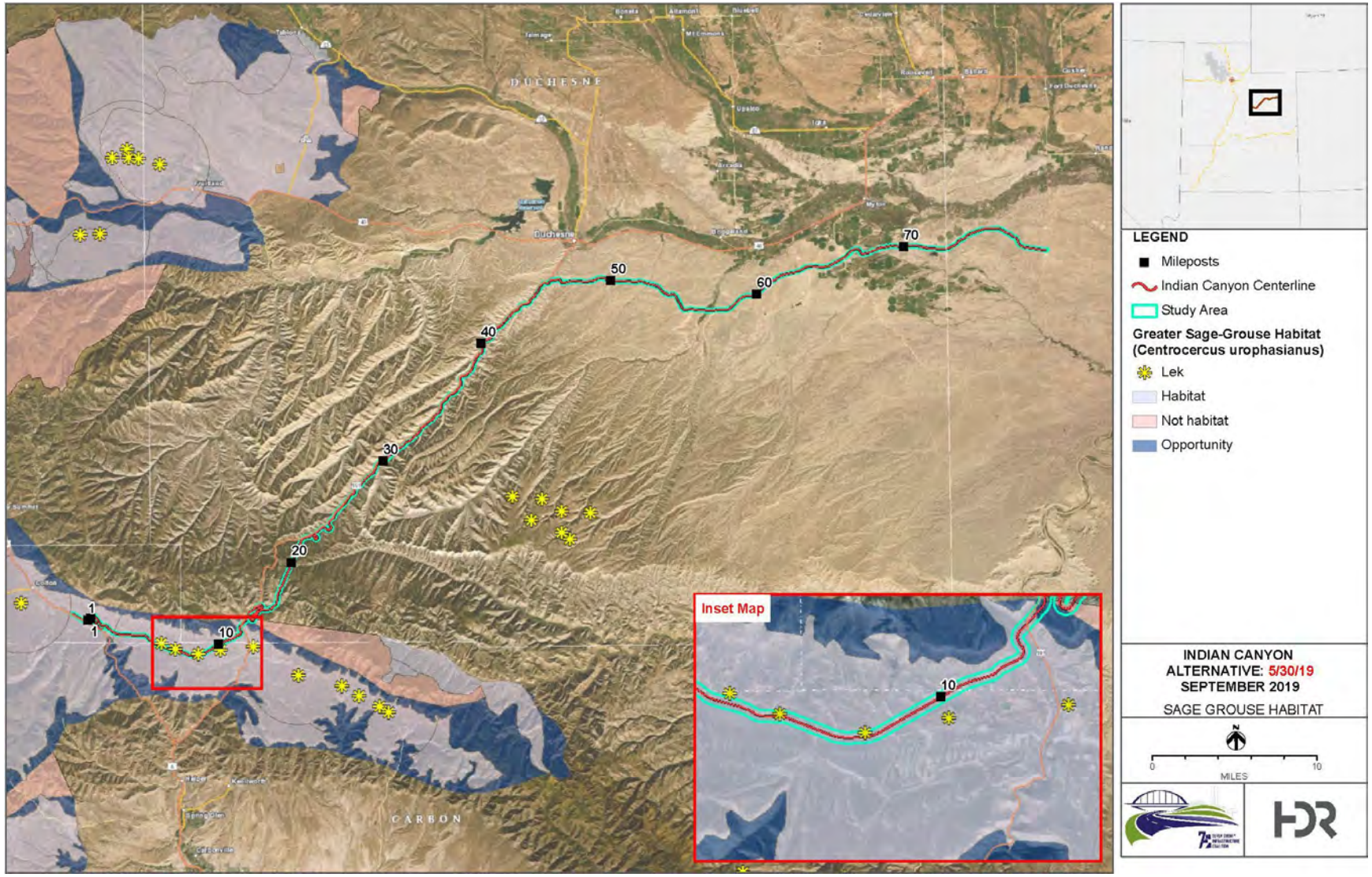


Figure 6-3. Greater Sage-grouse Habitat and Lek Locations in the Wells Draw Study Area

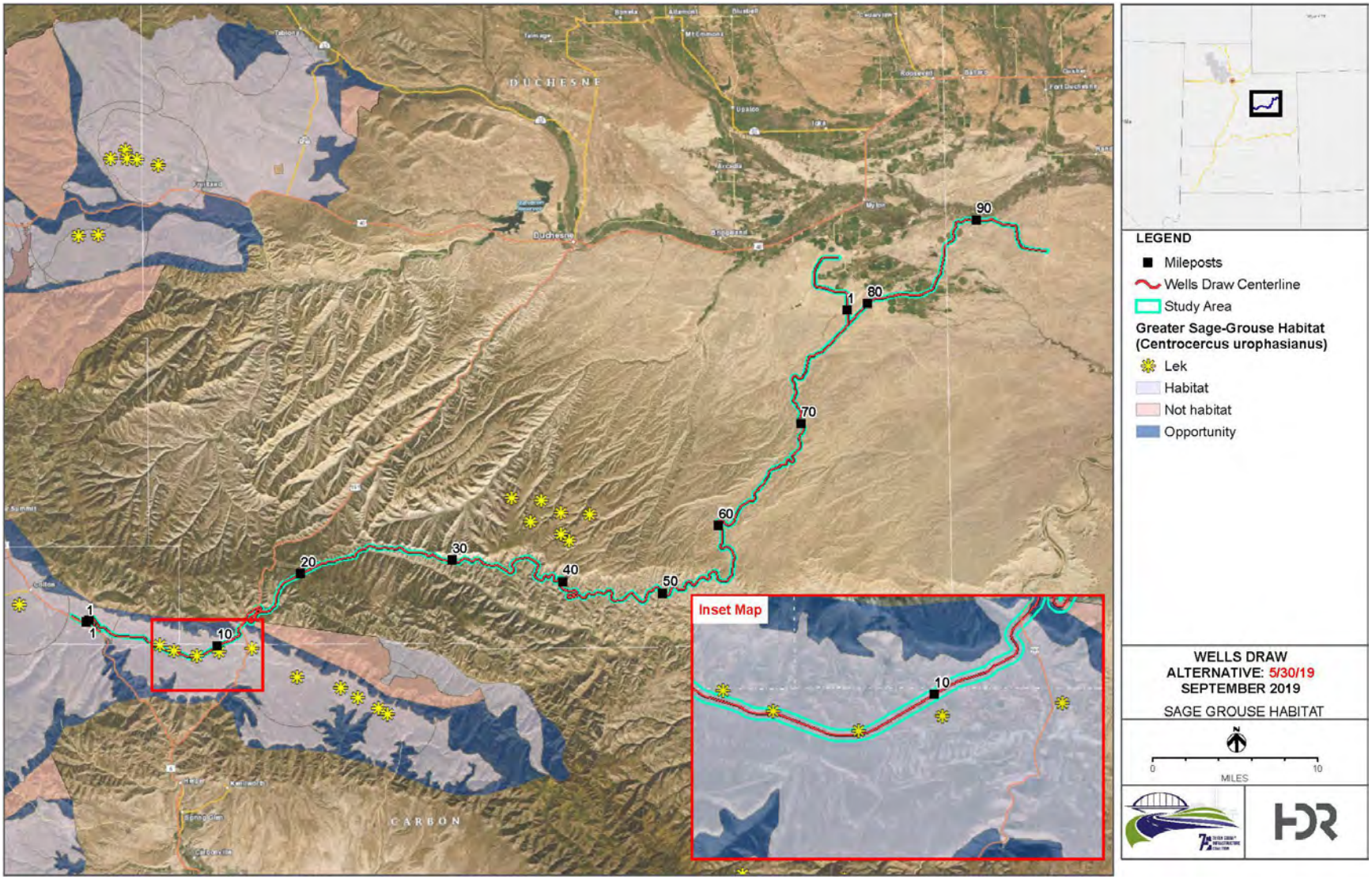
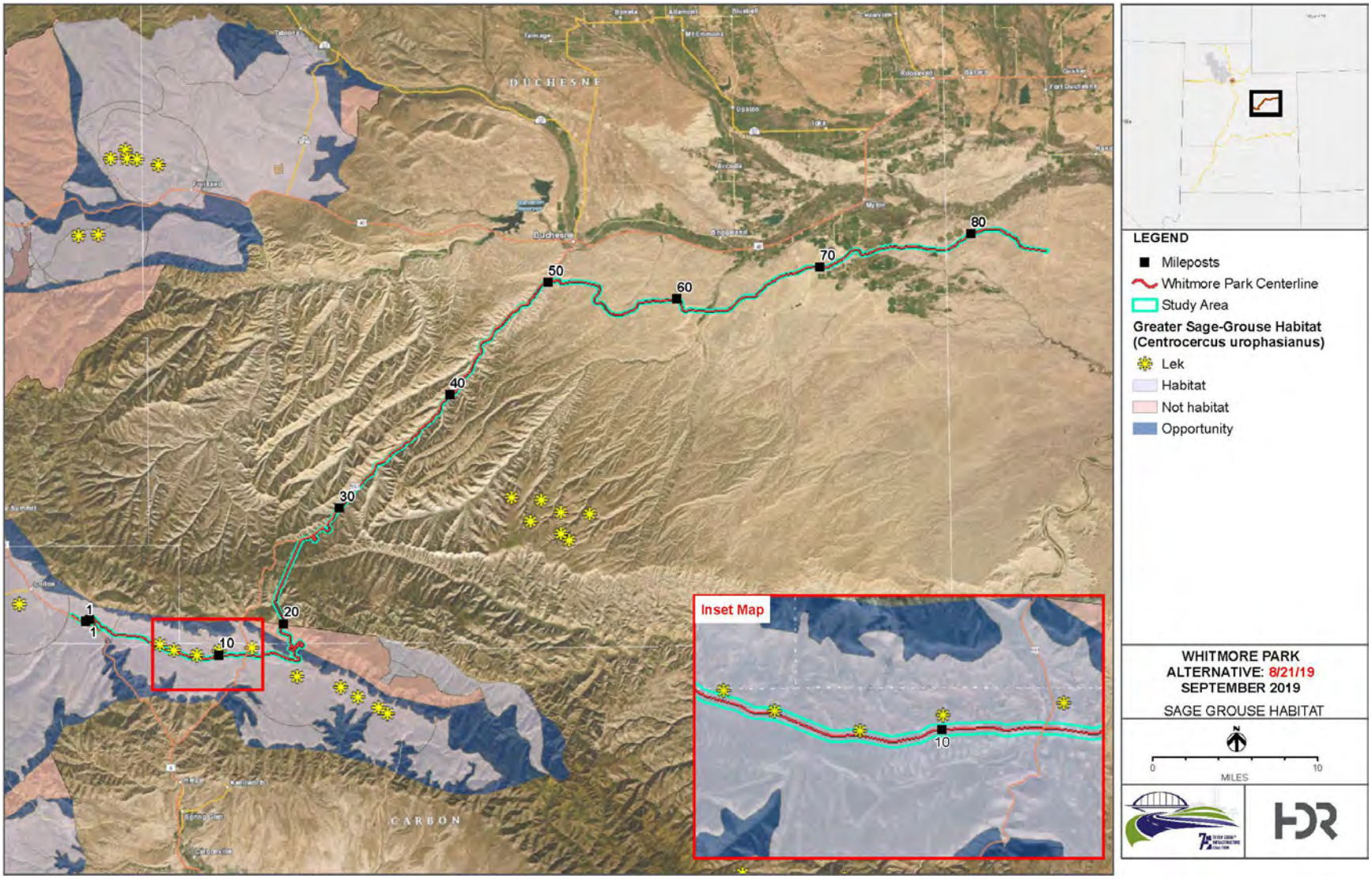


Figure 6-4. Greater Sage-grouse Habitat and Lek Locations in the Whitmore Park Study Area



6.4.2 BLM Greater Sage-grouse Management Area

BLM prepared the *Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015)[4] to amend the resource management plans for BLM offices that manage land containing greater sage-grouse priority and general habitats. This plan was in response to USFWS's March 2010 Endangered Species Act listing decision for greater sage-grouse in which USFWS identified as significant threats the present or threatened destruction, modification, or curtailment of habitat or range for this species and the inadequacy of existing regulatory mechanisms. BLM recognized that changes in management were necessary to avoid the continued decline of greater sage-grouse populations across the species' range.

Greater sage-grouse priority habitat managed by BLM is located in the southern ends of the three study areas. The survey team obtained information regarding greater sage-grouse habitat and lek locations from BLM range maps and metadata (BLM 2019). Figure 6-5 shows the BLM priority and general habitat areas in relation to the Indian Canyon, Wells Draw, and Whitmore Park study areas. The figure shows priority and general habitat management areas as well as a separate occupied habitat category.

- **Priority habitat management areas** are "BLM-administered lands identified as having the highest value to maintaining sustainable greater sage-grouse populations. These areas include breeding, late brood-rearing, winter concentration areas, and migration or connectivity corridors."
- **General habitat management areas** are "BLM-administered lands where some special management will apply to sustain greater sage-grouse populations. Areas of occupied seasonal or year-round habitat outside of priority."
- **Occupied habitat** refers to lands where the surface and mineral estates are owned or administered by separate entities. These areas show where the surface estate is not BLM-administered but has a federal mineral estate administered by BLM.

Table 6-7 shows the acreage of BLM priority and general habitat management areas in each of the study areas. At least four known lek locations are near the southern ends of the Indian Canyon and Wells Draw study areas, and five are near the Whitmore Park study area.

Table 6-7. BLM Greater Sage-grouse Habitat in the Study Areas

In acres

Type of Area	Study Area		
	Indian Canyon	Wells Draw	Whitmore Park
Priority	1,629.9	1,622.0	2,081.9
General	636.7	328.0	810.6
Total	2,266.6	1,950.0	2,892.5

[4] The most recent 2019 BLM greater sage-grouse plans for Idaho, Wyoming, Colorado, Utah, Nevada/northeastern California, and Oregon were suspended by preliminary injunction (issued by the U.S. District Court for Idaho). As a result, the 2015 greater sage-grouse plans remain in effect until the Court lifts the injunction. For more information, see https://www.blm.gov/programs/fish-and-wildlife/sagegrouse/blm-sagegrouse-plans.

Figure 6-5. BLM Greater Sage-grouse Habitat

7.0 References

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[USFWS] United States Fish and Wildlife Service

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2019b List of threatened and endangered species for the Wells Draw Alignment. Species list provided by the Utah Ecological Services Field Office. October 2019.

2019c List of threatened and endangered species for the Whitmore Park Alignment. Species list provided by the Utah Ecological Services Field Office. October 2019.

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APPENDIX A

Pertinent Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
Phone: (801) 975-3330 Fax: (801) 975-3331
http://www.fws.gov
http://www.fws.gov/utahfieldoffice/

In Reply Refer To: October 29, 2019
Consultation Code: 06E23000-2020-SLI-0099
Event Code: 06E23000-2020-E-00210
Project Name: Uinta Basin Railway Project- Indian Canyon Alternative

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
(801) 975-3330

Project Summary

Consultation Code: 06E23000-2020-SLI-0099

Event Code: 06E23000-2020-E-00210

Project Name: Uinta Basin Railway Project- Indian Canyon Alternative

Project Type: TRANSPORTATION

Project Description: Uinta Basin Railway Project- Indian Canyon Alternative. The Indian Canyon Alternative crosses Uintah, Duchesne, Carbon, and Utah Counties.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.98547907190422N110.60164954550284W

Counties: Carbon, UT | Duchesne, UT | Uintah, UT | Utah, UT

Endangered Species Act Species

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bonytail *Gila elegans* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1377	Endangered
Colorado Pikeminnow (=squawfish) *Ptychocheilus lucius* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3531	Endangered
Humpback Chub *Gila cypha* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3930	Endangered
June Sucker *Chasmistes liorus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4133	Endangered
Razorback Sucker *Xyrauchen texanus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/530	Endangered

Flowering Plants

NAME	STATUS
Barneby Ridge-cress *Lepidium barnebyanum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3736	Endangered
Clay Phacelia *Phacelia argillacea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8452	Endangered
Pariette Cactus *Sclerocactus brevispinus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2966	Threatened
Uinta Basin Hookless Cactus *Sclerocactus wetlandicus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9037	Threatened
Ute Ladies'-tresses *Spiranthes diluvialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Rosy-finch *Leucosticte atrata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9460	Breeds Jun 15 to Aug 31

NAME	BREEDING SEASON
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
Burrowing Owl *Athene cunicularia* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Grace's Warbler *Dendroica graciae* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 20 to Jul 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay *Gymnorhinus cyanocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15

NAME	BREEDING SEASON
Virginia's Warbler *Vermivora virginiae* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Willow Flycatcher *Empidonax traillii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

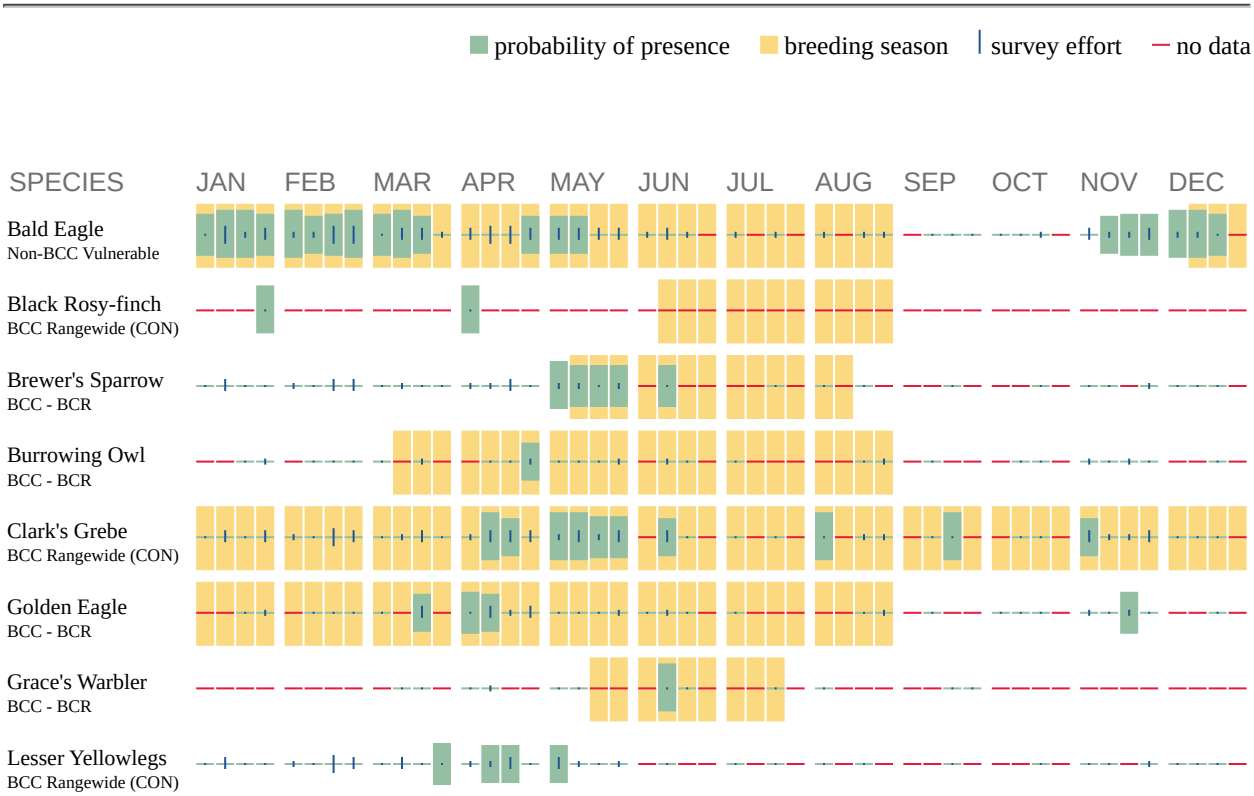
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

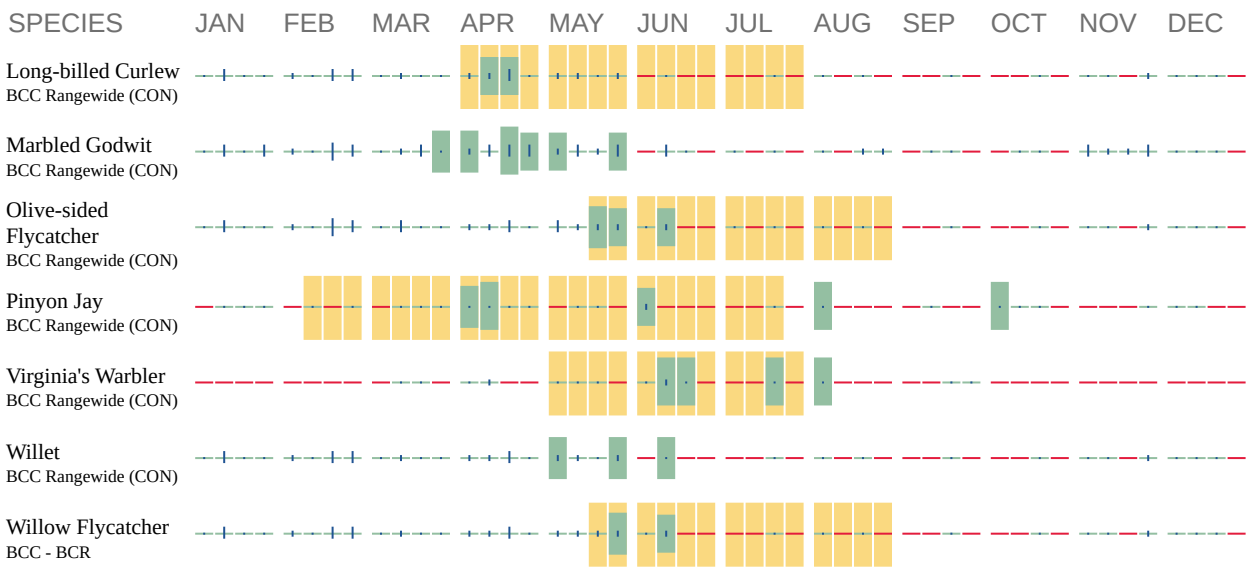
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
Phone: (801) 975-3330 Fax: (801) 975-3331
http://www.fws.gov
http://www.fws.gov/utahfieldoffice/

In Reply Refer To: October 29, 2019
Consultation Code: 06E23000-2020-SLI-0100
Event Code: 06E23000-2020-E-00212
Project Name: Uinta Basin Railway Project- Wells Draw Alternative

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
(801) 975-3330

Project Summary

Consultation Code: 06E23000-2020-SLI-0100

Event Code: 06E23000-2020-E-00212

Project Name: Uinta Basin Railway Project- Wells Draw Alternative

Project Type: TRANSPORTATION

Project Description: Uinta Basin Railway Project- Wells Draw Alternative. The Indian Canyon Alternative crosses Uintah, Duchesne, Carbon, and Utah Counties.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.990120687790494N110.14842347946009W

Counties: Carbon, UT | Duchesne, UT | Uintah, UT | Utah, UT

Endangered Species Act Species

There is a total of 11 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bonytail *Gila elegans* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1377	Endangered
Colorado Pikeminnow (=squawfish) *Ptychocheilus lucius* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3531	Endangered
Humpback Chub *Gila cypha* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3930	Endangered
June Sucker *Chasmistes liorus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4133	Endangered
Razorback Sucker *Xyrauchen texanus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/530	Endangered

Flowering Plants

NAME	STATUS
Pariette Cactus *Sclerocactus brevispinus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2966	Threatened
Uinta Basin Hookless Cactus *Sclerocactus wetlandicus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9037	Threatened
Ute Ladies'-tresses *Spiranthes diluvialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Rosy-finch *Leucosticte atrata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9460	Breeds Jun 15 to Aug 31

NAME	BREEDING SEASON
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Grace's Warbler *Dendroica graciae* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 20 to Jul 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Virginia's Warbler *Vermivora virginiae* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

NAME	BREEDING SEASON
Willow Flycatcher *Empidonax traillii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical

Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
Phone: (801) 975-3330 Fax: (801) 975-3331
http://www.fws.gov
http://www.fws.gov/utahfieldoffice/

In Reply Refer To: October 29, 2019
Consultation Code: 06E23000-2020-SLI-0098
Event Code: 06E23000-2020-E-00208
Project Name: Uinta Basin Railway Project- Whitmore Park Alternative

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
(801) 975-3330

Project Summary

Consultation Code: 06E23000-2020-SLI-0098

Event Code: 06E23000-2020-E-00208

Project Name: Uinta Basin Railway Project- Whitmore Park Alternative

Project Type: TRANSPORTATION

Project Description: Uinta Basin Railway Project- Whitmore Park Alternative. The Whitmore Park Alternative crosses Uintah, Duchesne, Carbon, and Utah Counties.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.98342153519857N110.60557881977608W

Counties: Carbon, UT | Duchesne, UT | Uintah, UT | Utah, UT

Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bonytail *Gila elegans* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1377	Endangered
Colorado Pikeminnow (=squawfish) *Ptychocheilus lucius* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3531	Endangered
Humpback Chub *Gila cypha* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3930	Endangered
June Sucker *Chasmistes liorus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4133	Endangered
Razorback Sucker *Xyrauchen texanus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/530	Endangered

Flowering Plants

NAME	STATUS
Barneby Ridge-cress *Lepidium barnebyanum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3736	Endangered
Pariette Cactus *Sclerocactus brevispinus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2966	Threatened
Uinta Basin Hookless Cactus *Sclerocactus wetlandicus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9037	Threatened
Ute Ladies'-tresses *Spiranthes diluvialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

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Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Rosy-finch *Leucosticte atrata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9460	Breeds Jun 15 to Aug 31

NAME	BREEDING SEASON
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
Burrowing Owl *Athene cunicularia* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Grace's Warbler *Dendroica graciae* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 20 to Jul 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay *Gymnorhinus cyanocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15

NAME	BREEDING SEASON
Virginia's Warbler *Vermivora virginiae* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Willow Flycatcher *Empidonax traillii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

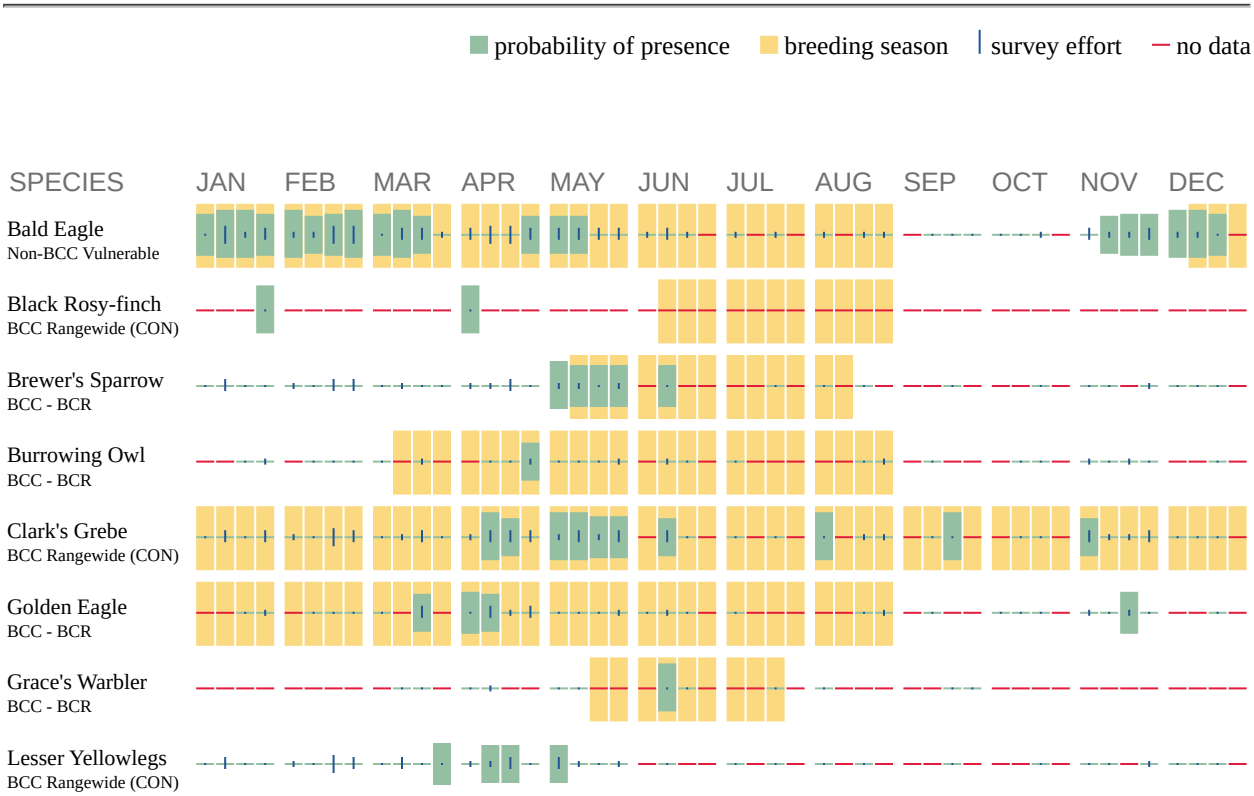
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

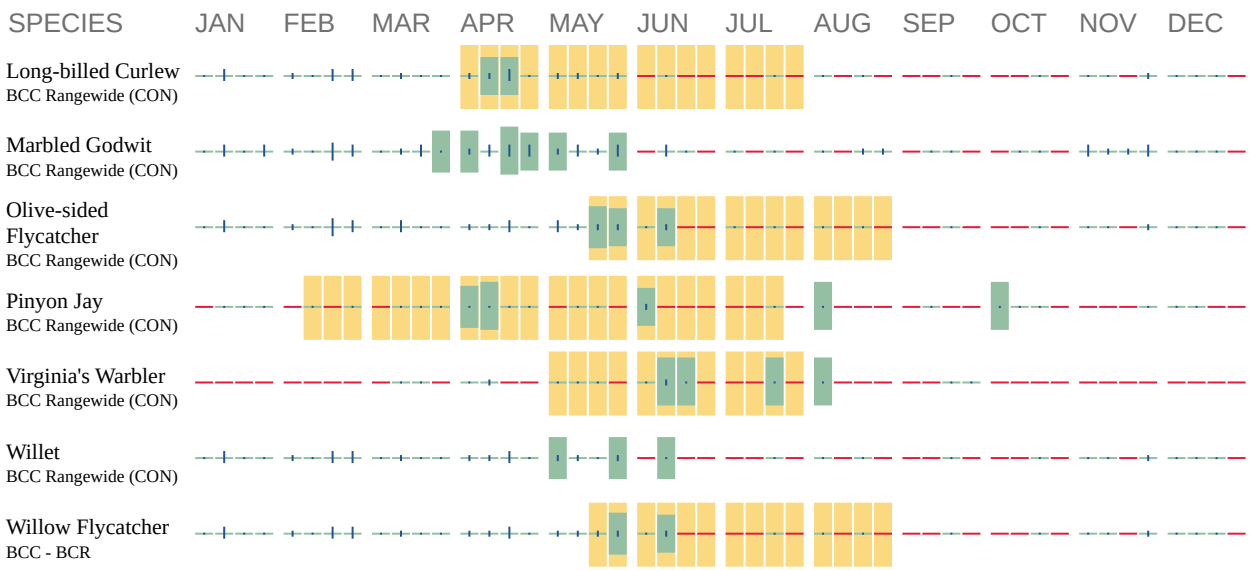
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Utah Division of Wildlife Resources
Utah Natural Heritage Program
1594 W. North Temple
PO Box 146301
Salt Lake City, UT 84116

Report Number: 10743
October 16, 2019

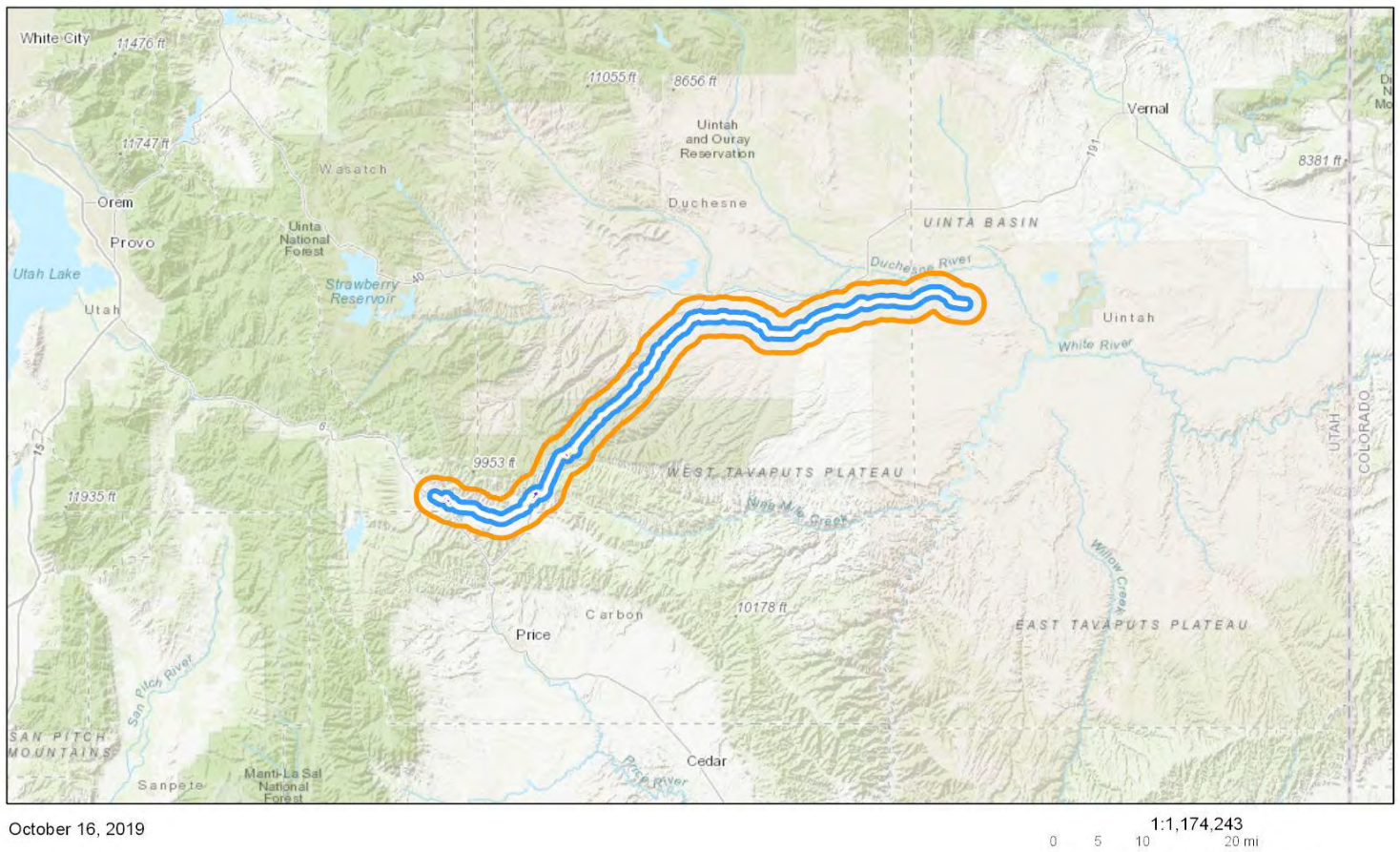
Utah Natural Heritage Program Online Species Search Report

Project Information

Project Name
Uinta Basin Railway Project- Indian Canyon Alternative

Project Description
Uinta Basin Railway Project- Indian Canyon Alternative

Location Description
The Indian Canyon Alternative crosses Uintah, Duchesne, Carbon, and Utah Counties.



October 16, 2019

1:1,174,243
0 5 10 20 mi
0 12.5 25 50 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Species within a ½ mile radius

Common Name	Scientific Name	State Protection Status	U.S. ESA Status	Last Observation Year
Greater Sage-grouse	Centrocercus urophasianus	SPC		2008
White-tailed Prairie Dog	Cynomys leucurus	SPC		2008
Ferruginous Hawk	Buteo regalis	SPC		1998
Barneby Ridgecress	Lepidium barnebyanum		LE	1989
Brown (Grizzly) Bear	Ursus arctos	S-ESA	LT	1914
Western Toad	Anaxyrus boreas	SPC		

Species within a 2 mile radius

Common Name	Scientific Name	State Protection Status	U.S. ESA Status	Last Observation Year
White-tailed Prairie Dog	Cynomys leucurus	SPC		2016
Greater Sage-grouse	Centrocercus urophasianus	SPC		2008
Burrowing Owl	Athene cunicularia	SPC		2004
Colorado River Cutthroat Trout	Oncorhynchus clarkii pleuriticus	CS		2001
Barneby Ridgecress	Lepidium barnebyanum		LE	1998
Ferruginous Hawk	Buteo regalis	SPC		1998
Long-billed Curlew	Numenius americanus	SPC		1995
Short-eared Owl	Asio flammeus	SPC		1994
Bluehead Sucker	Catostomus discobolus	CS		1932
Gray Wolf	Canis lupus	S-ESA	LE	1916
Brown (Grizzly) Bear	Ursus arctos	S-ESA	LT	1914
Clay Phacelia	Phacelia argillacea		LE	1883
Western Toad	Anaxyrus boreas	SPC		

Definitions

State Protection Status

S-ESA	Federally-listed or candidate species under the Endangered Species Act
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U.S. Endangered Species Act

LE	A taxon that is listed by the U.S. Fish and Wildlife Service as "endangered" with the probability of worldwide extinction
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LE;XN	An "endangered" taxon that is considered by the U.S. Fish and Wildlife Service to be "experimental and nonessential" in its designated use areas in Utah
C	A taxon for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to justify it being a "candidate" for listing as endangered or threatened
PT/PE	A taxon "proposed" to be listed as "endangered" or "threatened" by the U.S. Fish and Wildlife Service

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Contact the U.S. Fish and Wildlife Service at (801) 975-3330 for the purpose of consultation under the Endangered Species Act.

Please contact our office at (801) 538-4759 or habitat@utah.gov if you require further assistance.

Your project is located in the following UDWR region(s): Southeastern region , Northeastern region

Report generated for:

Amy Croft
HDR
2825 East Cottonwood Parkway Suite 200
Cottonwood Heights, UT 84121
(801) 743-7832
amy.croft@hdrinc.com

Utah Division of Wildlife Resources
Utah Natural Heritage Program
1594 W. North Temple
PO Box 146301
Salt Lake City, UT 84116

Report Number: 10744
October 16, 2019

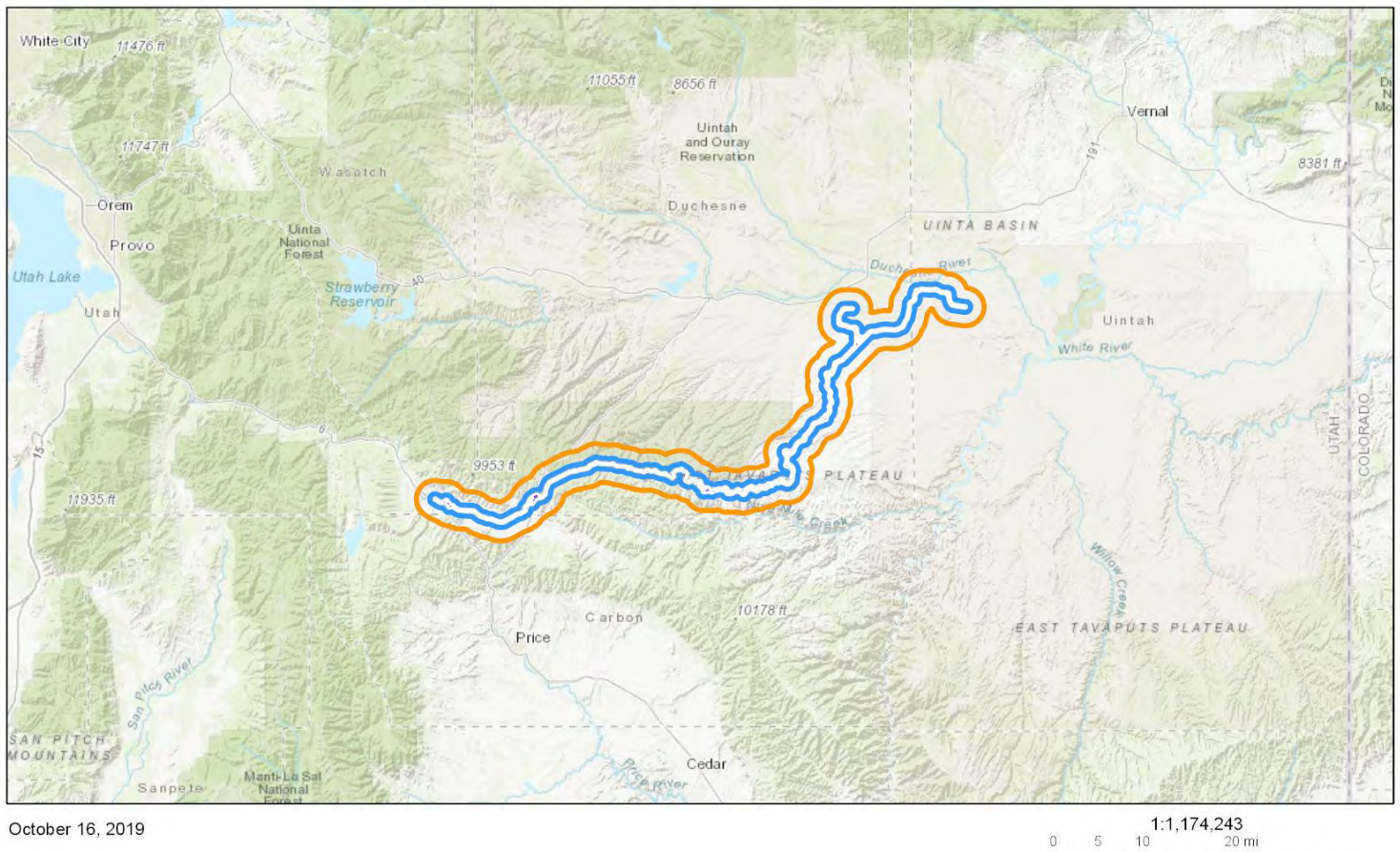
Utah Natural Heritage Program Online Species Search Report

Project Information

Project Name
Uinta Basin Railway Project- Wells Draw Alternative

Project Description
Uinta Basin Railway Project- Wells Draw Alternative

Location Description
The Wells Draw Alternative crosses Uintah, Duchesne, Carbon, and Utah Counties.



October 16, 2019

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Species within a ½ mile radius

Common Name	Scientific Name	State Protection Status	U.S. ESA Status	Last Observation Year
Bluehead Sucker	Catostomus discobolus	CS		2011
Greater Sage-grouse	Centrocercus urophasianus	SPC		2010
White-tailed Prairie Dog	Cynomys leucurus	SPC		2008
Ferruginous Hawk	Buteo regalis	SPC		2007
Burrowing Owl	Athene cunicularia	SPC		2004
Long-billed Curlew	Numenius americanus	SPC		2004
Mountain Plover	Charadrius montanus	SPC		2002
Brown (Grizzly) Bear	Ursus arctos	S-ESA	LT	1914
Western Toad	Anaxyrus boreas	SPC		

Species within a 2 mile radius

Common Name	Scientific Name	State Protection Status	U.S. ESA Status	Last Observation Year
Bluehead Sucker	Catostomus discobolus	CS		2011
Greater Sage-grouse	Centrocercus urophasianus	SPC		2010
White-tailed Prairie Dog	Cynomys leucurus	SPC		2009
Ferruginous Hawk	Buteo regalis	SPC		2007
Burrowing Owl	Athene cunicularia	SPC		2004
Flannelmouth Sucker	Catostomus latipinnis	CS		2004
Long-billed Curlew	Numenius americanus	SPC		2004
Northern Goshawk	Accipiter gentilis	CS		2004
Mountain Plover	Charadrius montanus	SPC		2002
Pariette Cactus	Sclerocactus brevispinus		LT	1992
Brown (Grizzly) Bear	Ursus arctos	S-ESA	LT	1914
Clay Phacelia	Phacelia argillacea		LE	1883
Western Toad	Anaxyrus boreas	SPC		

Definitions

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Report generated for:

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HDR
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amy.croft@hdrinc.com

Utah Division of Wildlife Resources
Utah Natural Heritage Program
1594 W. North Temple
PO Box 146301
Salt Lake City, UT 84116

Report Number: 10745
October 16, 2019

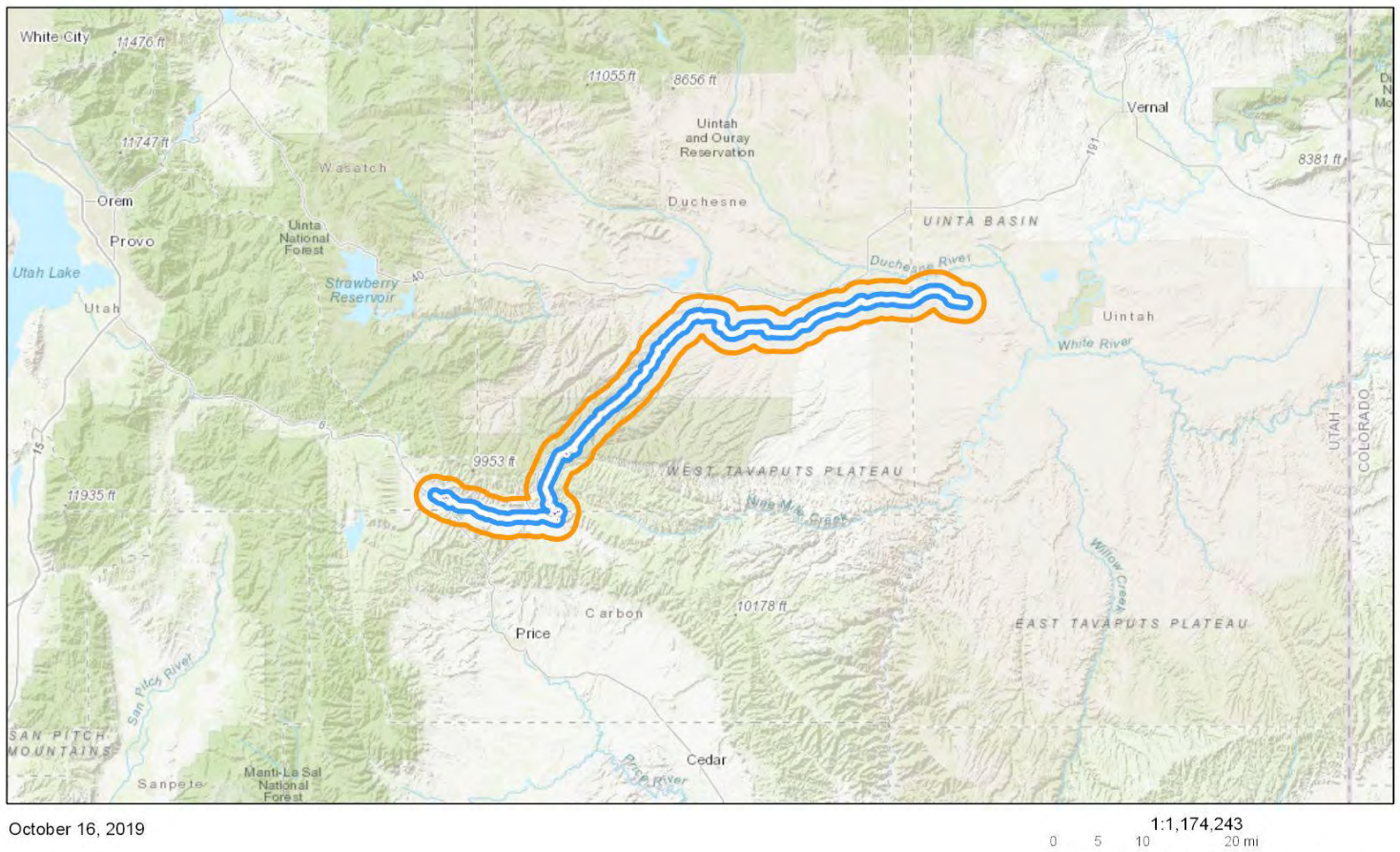
Utah Natural Heritage Program Online Species Search Report

Project Information

Project Name
Uinta Basin Railway Project- Whitmore Park Alternative

Project Description
Uinta Basin Railway Project- Whitmore Park Alternative

Location Description
The Whitmore Park Alternative crosses Uintah, Duchesne, Carbon, and Utah Counties.



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White-tailed Prairie Dog	Cynomys leucurus	SPC		2008
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Brown (Grizzly) Bear	Ursus arctos	S-ESA	LT	1914
Western Toad	Anaxyrus boreas	SPC		

Species within a 2 mile radius

Common Name	Scientific Name	State Protection Status	U.S. ESA Status	Last Observation Year
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Long-billed Curlew	Numenius americanus	SPC		1995
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Report generated for:

Amy Croft
HDR
2825 East Cottonwood Parkway Suite 200
Cottonwood Heights, UT 84121
(801) 743-7832
amy.croft@hdrinc.com

Ulrich, Carrie L.

From: Croft, Amy
Sent: Monday, December 2, 2019 2:56 PM
To: Ulrich, Carrie L.
Subject: FW: [EXTERNAL] Uinta Basin Railway - Carbon Sage Grouse Management Area and Sensitive Species coordination
Attachments: Utah Sensitive Plant List 2018 Final.xlsx; Utah Sensitive Wildlife List 2018 Final.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Uinta Basin Railway

From: Fletcher, Christine
Sent: Thursday, October 31, 2019 10:12 AM
To: Nichols, Karen <
Cc: Jared Reese < Scott Whitesides (< ; Kegen Benson ; Perkins, Michael < >; Croft, Amy < >; Keller, Kevin < ;
Subject: Re: [EXTERNAL] Uinta Basin Railway - Carbon Sage Grouse Management Area and Sensitive Species coordination

All,
As promised from our meeting yesterday, here are the Utah BLM Sensitive Species Lists for both plants and animals. Thanks,

Christine Fletcher
Utah Sage-Grouse Plan Implementation Coordinator (temporary detail)
National Project Support Team (Wildlife Biologist)
Bureau of Land Management
176 East DL Sargent Drive
Cedar City, UT 84721

On Mon, Oct 28, 2019 at 4:21 PM Nichols, Karen <Karen.Nichols@hdrinc.com> wrote:

> Agenda attached

Utah Bureau of Land Management Sensitive Plant Species List				
December 2018				
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**	**COUNTY**	**FIELD OFFICE**
Aliciella caespitosa	Rabbit Valley gilia	S	Wayne	Richfield
Aliciella tenuis	Mussentuchit gilia	S	Emery, Sevier, Wayne	Price, Richfield
Aquilegia atwoodii	Atwood's columbine	S	Uintah	Vernal
Aquilegia desolaticola	Desolation Canyon columbine	S	Grand	Moab
Aquilegia scopulorum var goodrichii	Goodrich's columbine	S	Duchesne	Vernal
Arabis goodrichii	Goodrich eared rockcress	S	Beaver, Iron	Cedar City, Fillmore
Arabis vivariensis	Park rockcress	S	Uintah	Vernal
Astragalus ampullarius	Gumbo milkvetch	S	Kane, Washington	GSENM, Kanab, St. George
Astragalus anserinus	Goose Creek milkvetch	S	Box Elder	Salt Lake
Astragalus cronquistii	Cronquist's milkvetch	S	San Juan	BENM, Monticello
Astragalus equisolensis	Horseshoe milkvetch	S	Uintah	Vernal
Astragalus hamiltonii	Hamilton's milkvetch	S	Uintah	Vernal
Astragalus iselyi	Isely's milkvetch	S	Grand, San Juan	Moab
Astragalus lentiginosus var pohlii	Pohl's milkvetch	S	Tooele	Salt Lake
Astragalus loanus	Loa milkvetch, Glenwood milkvetch	S	Sevier	Richfield
Astragalus oophorus var lonchocalyx	Pink egg milkvetch	S	Iron, Beaver	Cedar City
Astragalus pubentissimus var peabodianus	Peabody's milkvetch, Green River milkvetch	S	Emery, Grand	Moab, Price
Astragalus sabulosus var sabulosus	Cisco milkvetch	S	Grand	Moab
Astragalus sabulosus var vehiculus	Stage milkvetch	S	Grand	Moab
Astragalus striatiflorus	Escarpment milkvetch	S	Kane, Washington	GSENM, St. George
Astragalus welshii	Welsh's milkvetch, Loa milkvetch	S	Garfield, Iron, Kane, Millard, Piute, Wayne	Cedar City, Fillmore, GSENM, Kanab, Richfield
Atriplex canescens var gigantea	Dunes four-wing saltbush	S	Juab, Tooele	Fillmore, Salt Lake
Camissonia bairdii	Baird's camissonia	S	Washington	St. George
Camissonia bolanderi	Bolander's camissonia	S	Emery, Wayne?	Price, Richfield?
Camissonia gouldii	Gould's camissonia	S	Washington	St. George
Cirsium virginense	Virgin thistle	S	Washington	St. George
Cleomella hillmanii var goodrichii	Goodrich's stickweed	S	Uintah	Vernal
Cryptantha barnebyi	Barneby's cryptanth, Oilshale cryptantha	S	Uintah	Vernal

Utah Bureau of Land Management Sensitive Plant Species List				
December 2018				
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**	**COUNTY**	**FIELD OFFICE**
Cryptantha compacta	Mound cryptanth	S	Beaver, Iron, Millard	Cedar City, Fillmore
Cryptantha creutzfeldtii	Creutzfeldt-flower	S	Carbon, Emery	Price
Cymopterus beckii	Pinnate spring-parsley	S	San Juan, Wayne, Garfield	BENM, GSENM?, Kanab?, Monticello, Richfield
Dalea flavescens var epica	Hole-in-the-rock prairie-clover	S	Garfield, San Juan	BENM, GSENM, Kanab, Monticello
Epilobium nevadense	Nevada willowherb	S	Iron, Millard, Washington	Cedar City, Fillmore, St. George
Ericameria crispa	Pine Valley goldenbush	S	Washington, Millard	Fillmore, St. George
Ericameria lignumviridis	Greenwood's goldenbush	S	Sevier	Richfield
Erigeron kachinensis	Kachina daisy	S	San Juan	BENM, Monticello
Erigeron maguirei	Maguire's daisy	S	Emery, Wayne	Price, Richfield
Erigeron untermannii	Untermann's daisy	S	Duchesne, Uintah	Vernal
Eriogonum ammophilum	Ibex buckwheat	S	Millard	Fillmore
Eriogonum artificis	Kaye H. Thorne's buckwheat	S	Beaver	Cedar City
Eriogonum brevicaule var mitophyllum	Lost Creek wild buckwheat	S	Sevier	Richfield
Eriogonum corymbosum var smithii	Flat Top buckwheat, Smith's wild buckwheat	S	Emery, Wayne	Price, Richfield
Eriogonum cronquistii	Cronquist's buckwheat	S	Garfield	GSENM, Kanab
Eriogonum pharnaceoides var cervinum	Wirestem buckwheat	S	Beaver, Iron, Washington	Cedar City, St. George
Eriogonum phoeniceum	Scarlet buckwheat	S	Millard	Fillmore
Eriogonum racemosum var nobilis	Bluff buckwheat	S	San Juan	BENM, Monticello
Eriogonum soredium	Frisco buckwheat	S, C	Beaver	Cedar City
Euphorbia nephradenia	Utah spurge	S	Emery, Garfield, Kane, Wayne	GSENM, Kanab, Price, Richfield
Frasera ackermaniae	Ackerman's green gentian	S	Uintah	Vernal
Frasera gypsicola	White River swertia	S	Millard	Fillmore
Hymenoxys lapidicola	Rock hymenoxys	S	Uintah	Vernal
Ivesia shockleyi var ostleri	Ostler's ivesia or Wah Wah ivesia	S	Beaver	Cedar City
Jamesia tetrapetala	Four-petal jamesia, Basin jamesia	S	Millard	Fillmore
Lepidium huberi	Huber's pepperplant	S	Uintah	Vernal

Utah Bureau of Land Management Sensitive Plant Species List				
December 2018				
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**	**COUNTY**	**FIELD OFFICE**
Lepidium ostleri	Ostler pepperplant	S, C	Beaver	Cedar City
Lomatium latilobum	Canyonlands lomatium	S	Grand, San Juan	BENM, Moab, Monticello
Lupinus caudatus var cutleri	Cutler's spurred lupine	S	Kane, Garfield	GSENM, Kanab
Lygodesmia grandiflora var entrada	Entrada rushpink	S	Emery, Grand	Moab, Price
Mentzelia argillosa	Arapien stickleaf, Arapien blazingstar	S	Sanpete, Sevier	Richfield
Mentzelia goodrichii	Goodrich's blazingstar	S	Duchesne	Vernal
Mentzelia multicaulis var librina	Horse Canyon stickleaf	S	Carbon, Emery	Price
Mentzelia shultziorum	Shultz' stickleaf	S	Grand	Moab
Oenothera acutissima	Large yellow evening primrose,Flaming Gorge evening primrose	S	Uintah, Daggett, Duchesne, Iron	Cedar City, Vernal
Oenothera murdockii	Murdock's evening primrose	S	Kane	GSENM, Kanab
Oreoxis trotteri	Trotter's oreoxis	S	Emery, Grand	Moab, Price
Pediomelum aromaticum var barnebyi	Barneby's breadroot	S	Washington	St. George
Pediomelum aromaticum var tuhyi	Tuhy's breadroot	S	San Juan	BENM, Monticello
Pediomelum epipsilum	Kane breadroot	S	Kane	GSENM, Kanab
Penstemon acaulis var acaulis	Stemless penstemon	S	Daggett	Vernal
Penstemon angustifolius var dulcis	Neese narrowleaf penstemon	S	Juab, Millard	Fillmore
Penstemon franklinii	Franklin's penstemon	S	Iron	Cedar City
Penstemon gibbensii	Gibben's penstemon	S	Daggett	Vernal
Penstemon goodrichii	Goodrich's penstemon	S	Duchesne, Uintah	Vernal
Penstemon grahamii	Graham's beardtongue	S, P	Duchesne, Uintah, Carbon	Price, Vernal
Penstemon idahoensis	Idaho penstemon	S	Box Elder	Salt Lake
Penstemon pinorum	Pinyon penstemon	S	Iron, Washington	Cedar City, St. George
Penstemon scariosus var albifluvis	White River beardtongue	S, P	Uintah	Vernal
Penstemon wardii	Ward's penstemon	S	Piute, Sanpete, Sevier	Richfield
Perityle specuicola	Alcove rock-daisy	S	Grand, San Juan	BENM, Moab, Monticello
Petalonyx parryii	Parry's petalonyx	S	Washington	St. George
Phacelia argylensis	Argyle Canyon phacelia	S	Duchesne	Vernal

Utah Bureau of Land Management Sensitive Plant Species List				
December 2018				
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**	**COUNTY**	**FIELD OFFICE**
Phacelia cronquistiana	Cronquist's phacelia	S	Kane	GSENM, Kanab
Phacelia indecora	Bluff phacelia	S	San Juan	BENM, Monticello
Phacelia pulchella var atwoodii	Atwood's pretty phacelia	S	Kane	GSEMN, Kanab
Phacelia utahensis	Utah phacelia	S	Carbon, Sevier, Sanpete	Price, Richfield
Phemeranthus thompsonii	Thompson's talinum, Cedar Mountain fameflower	S	Emery	Price
Potentilla cottamii	Cottam's cinquefoil	S	Box Elder, Juab, Tooele	Fillmore, Salt Lake
Primula cusickiana var domensis	House Range primrose	S	Millard	Fillmore
Psorothamnus polydenius var jonesii	Jones indigo bush, Jones' dalea	S	Emery	Price
Sphaeralcea caespitosa var caespitosa	Jones globemallow, Tufted globemallow	S	Beaver, Millard	Cedar City, Fillmore
Salvia columbariae var argillacea	Chinle chia	S	Kane	GSENM, Kanab
Sphaeralcea grossulariifolia var fumariensis	Smoky Mt. globemallow	S	Kane	GSENM, Kanab
Sphaeralcea janeae	Jane's globemallow	S	Grand, San Juan, Wayne (Millard benches)	BENM, Moab, Monticello, Richfield
Sphaeralcea psoraloides	Psorlea globemallow	S	Emery, Grand, Wayne	Moab, Price, Richfield
Stephanomeria occultata	Hidden wirelettuce, Disguised wirelettuce	S	Morgan	Salt Lake
Terraria haydenii	Hayden's mustard	S	Beaver	Cedar City
Thelesperma caespitosum	Low greenthread	S	Duchesne	Vernal
Thelesperma subnudum var alpinum	Alpine greenthread	S	Wayne	Richfield
Thelypodiopsis ambigua var erecta	Kanab thelyplody	S	Kane	GSENM, Kanab
Townsendia beamanii	Beaman's townsendia	S	San Juan	BENM, Monticello
Townsendia jonesii var lutea	Sevier townsendia	S	Juab, Piute, Sevier	Fillmore, Richfield
Townsendia strigosa var prolixa	Strigose townsendia	S	Duchesne, Grand	Moab, Vernal
Trifolium friscanum	Frisco clover	S, C	Beaver, Millard	Cedar City, Fillmore
Trifolium variegatum var parunuweapensis	Sand seep clover or Kane white-tip clover	S	Kane	GSENM, Kanab

Utah Bureau of Land Management Sensitive Plant Species List				
December 2018				
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**	**COUNTY**	**FIELD OFFICE**
Yucca sterilis	Sterile yucca	S	Uintah	Vernal
Status: S = Sensitive, C = Candidate, P = Proposed				

Utah Bureau of Land Management Sensitive Wildlife Species List					
December 2018					
COMMON NAME	SCIENTIFIC NAME	BLM STATUS	COUNTY	FIELD OFFICE	
FISH					
Bluehead sucker	*Catostomus discobolus*	CA	BOX, CAR, DAV, DUC, EME, GAR, GRA, KAN, MOR, SNJ, SNP, SUM, UIN, WAY, WEB, WSH	BENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Bonneville cutthroat trout	*Oncorhynchus clarkii utah*	CA	BEA, BOX, CAR, DAV, DUC, IRO, JUA, KAN, MIL, MOR, PIU, RIC, SEV, SNP, SUM, TOO, UTA, WEB, WSH, WST	Cedar City, Fillmore, GSENM, Kanab, Price, Richfield, St. George, Salt Lake, Vernal	
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	CA	CAR, DAG, EME, GAR, SEV, SNJ, SNP, SUM, UIN, UTA, WAY, WST	BENM, GSENM, Kanab, Monticello, Price, Richfield, Salt Lake, Vernal	
Desert sucker	*Catostomus clarkii*	SS	KAN, WSH	GSENM, Kanab, St. George	
Flannelmouth sucker	*Catostomus latipinnis*	CA	CAR, DUC, EME, GAR, GRA, KAN, SNJ, UIN, WAY, WSH	BENM, GSENM, Kanab, Moab, Monticello, Price, Richfield, Vernal, St. George	
Least chub	*Iotichthys phlegethontis*	CA	BOX, DAV, JUA, MIL, RIC, SAL, TOO	Fillmore, Salt Lake	
Northern leatherside chub	*Lepidomeda copei*	CA	RIC, SUM	Salt Lake	
Roundtail chub	*Gila robusta*	CA	CAR, DAG, DUC, EME, GAR, GRA, SNJ, UIN, WAY	BENM, GSENM, Kanab, Moab, Monticello, Price, Richfield, Vernal	
Southern leatherside chub	*Lepidomeda aliciae*	CA	GAR, IRO, JUA, KAN, MIL, PIU, SEV, SNP, UTA, WAY, WST	Cedar City, Fillmore, Kanab, Richfield, Salt Lake	
Virgin spinedace	*Lepidomeda mollispinis mollispinis*	CA	KAN, WSH	Kanab, St. George	
Yellowstone cutthroat trout	*Oncorhynchus clarkii bouvieri*	CA	BOX	Salt Lake	
AMPHIBIANS					
Arizona toad	*Anaxyrus microscaphus*	SS	GAR, IRO, KAN, WSH	Cedar City, GSENM, Kanab, St. George	
Columbia spotted frog	*Rana luteiventris*	CA	JUA, MIL, SAL, SUM, TOO, UTA, WEB, WST	Fillmore, Salt Lake	
Great Plains toad	*Anaxyrus cognatus*	SS	DUC, EME, GRA, SNJ, UIN	BENM, Moab, Monticello, Price, Vernal	
Western (boreal) toad	*Anaxyrus boreas*	SS	BOX, CAC, DUC, EME, GAR, KAN, MOR, PIU, RIC, SAL, SEV, SUM, UIN, UTA, WAY, WSH, WST	GSENM, Kanab, Price, Richfield, St. George, Salt Lake, Vernal	
REPTILES					
Common chuckwalla	*Sauromalus ater*	SS	KAN, WSH	GSENM, Kanab, St. George	
Cornsnake	*Elaphe guttata*	SS	EME, GRA, SNJ, UIN	BENM, Moab, Monticello, Price, Vernal	
Desert iguana	*Dipsosaurus dorsalis*	SS	WSH	St. George	
Desert night lizard	*Xantusia vigilis*	SS	KAN, SNJ, WSH	BENM, GSENM, Kanab, Monticello, St. George	
Gila monster	*Heloderma suspectum*	SS	WSH	St. George	
Mojave rattlesnake	*Crotalus scutulatus*	SS	WSH	St. George	
Sidewinder	*Crotalus cerastes*	SS	WSH	St. George	
Smooth Green snake	*Opheodrys vernalis*	SS	DUC, DAG, GRA, SAL, SNJ, SUM, UIN, UTA, WEB, WST	BENM, Moab, Monticello, Salt Lake, Vernal	
Speckled rattlesnake	*Crotalus mitchellii*	SS	WSH	St. George	
Western banded gecko	*Coleonyx variegatus*	SS	WSH	St. George	
Western threadsnake	*Leptotyphlops humilis*	SS	WSH	St. George	
Zebra-tailed lizard	*Callisaurus draconoides*	SS	WSH	St. George	
BIRDS					
American Three-toed woodpecker	*Picoides dorsalis*	SS	BEA, DAG, DUC, EME, GAR, GRA, IRO, PIU, RIC, SAL, SEV, SNJ, SNP, SUM, UTA, WSH	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Price, Richfield, St. George, Salt Lake, Vernal	
American white pelican	*Pelecanus erythrorhynchos*	SS		Salt Lake	

Utah Bureau of Land Management Sensitive Wildlife Species List					
December 2018					
COMMON NAME	SCIENTIFIC NAME	BLM STATUS	COUNTY	FIELD OFFICE	
Bald eagle	*Haliaeetus leucocephalus*	SS	BEA, BOX, CAC, CAR, DAG, DUC, EME, GAR, GRA, IRO, JUA, KAN, MOR, SAL, SNJ, SNP, UIN, WAY, WEB, WSH, WST	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal,	
Black swift	*Cypseloides niger*	SS	DUC, GAR, IRO, KAN, PIU, SAL, SEV, SNP, UIN, UTA, WSH	GSENM, Kanab, Richfield, St. George, Salt Lake, Vernal	
Bobolink	*Dolichonyx oryzivorous*	SS	BOX, CAC, DAV, DUC, GAG, JUA, MOR, RIC, SAL, SNJ, SUM, TOO, UTA, WAY, WEB, WSH, WST	BENM, Fillmore, Monticello, St. George, Salt Lake, Vernal	
Burrowing owl	*Athene cunicularia*	SS	BEA, BOX, CAC, CAR, DAV, DUC, EME, GAR, GRA, IRO, JUA, KAN, MIL, RIC, SAL, SNJ, SNP, SEV, TOO, UIN, UTA, WAY, WSH	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Columbian Sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	SS	BOX, CAC, DAG, MOR, UIN, WEB	Salt Lake, Vernal	
Ferruginous hawk	*Buteo regalis*	SS	BEA, BOX, CAC, CAR, DUC, GAR, GRA, IRO, JUA, KAN, MIL, PIU, RIC, SAL, SNJ, SNP, TOO, UIN, UTA, WAY, WEB, WSH	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Golden eagle	*Aquila chrysaetos*	SS	All	All	
Grasshopper sparrow	*Ammodramus savannarum*	SS	SUM, SEV, SNP, UIN, WAY, WSH, WST	Richfield, St. George, Salt Lake, Vernal	
Greater sage-grouse	*Centrocercus urophasianus*	SS	BEA, BOX, CAC, CAR, DAG, DUC, EME, GAR, IRO, JUA, KAN, MIL, MOR, PIU, RIC, SEV, SNJ, SNP, SUM, TOO, UIN, UTA, WAY, WEB, WST	Cedar City, Fillmore, GSENM, Kanab, Price, Richfield, Salt Lake, Vernal	
Lewis's woodpecker	*Melanerpes lewis*	SS	BOX, DAG, DAV, DUC, GRA, IRO, JUA, KAN, RIC, SEV, SNJ, SNP, TOO, UIN, UTA, WAY, WEB, WSH, WST	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Long-billed curlew	*Numenius americanus*	SS	BEA, BOX, CAR, DAV, DUC, EME, GAR, IRO, JUA, KAN, MIL, PIU, SEV, SNJ, SNP, SUM, TOO, UIN, UTA, WAY, WEB, WSH, WST	BENM, Cedar City, Fillmore, GSENM, Kanab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Mountain Plover	*Charadrius montanus*	SS	DUC, GRA, UIN, WEB, WSH	St. George, Salt Lake, Vernal	
Northern goshawk	*Accipiter gentilis*	CA	BEA, BOX, CAC, CAR, DAG, DUC, EME, GAR, GRA, IRO, KAN, PIU, SAL, SEV, SNJ, SNP, SUM, UIN, UTA, WAY, WSH, WST	BENM, Cedar City, GSENM, Kanab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Short-eared owl	*Asio flammeus*	SS	BEA, BOX, CAC, DAG, DUC, GAR, IRO, JUA, MIL, SEV, SNJ, SNP, TOO, UIN, WAY, WSH	BENM, Cedar City, Fillmore, St. George, Salt Lake, Richfield	
Snowy plover	*Charadrius nivosus*	SS*	BOX, CAC, DAV, GRA, JUA, MIL, SAL, SUM, TOO, UIN, UTA, WEB, WSH	Fillmore, St. George, Salt lake, Vernal	
MOLLUSKS					
Bifid duct pyrg	*Pyrgulopsis peculiaris*	CA	MIL	Fillmore	
California floater	*Anodonta californiensis*	CA	BOX, CAC, JUA, MIL, PIU, RIC, TOO	Fillmore Richfield, Salt Lake	
Cloaked physa	*Physa megalochlamys*	CA	MIL	Fillmore	
Eureka mountainsnail	*Oreohelix eurekensis*	CA	JUA, UTA	Fillmore, Salt Lake	
Fat-whorled pondsnail	*Stagnicola bonnevillensis*	CA	BOX	Salt Lake	
Hamlin Valley pyrg	*Pyrgulopsis hamlinensis*	CA	BEA	Cedar City	
Longitudinal gland pyrg	*Pyrgulopsis anguina*	CA	MIL	Fillmore	
Lyrate mountainsnail	*Oreohelix haydeni*	CA	MOR	Salt Lake	
Northwest Bonneville pyrg	*Pyrgulopsis variegata*	CA	BOX, TOO	Salt Lake	
Southern Bonneville pyrg	*Pyrgulopsis transversa*	CA	UTA	Salt Lake	
Sub-globose snake pyrg	*Pyrgulopsis saxatilis*	CA	MIL	Fillmore	
UTA physa	*Physella utaensis*	CA	BOX, JUA, PIU, TOO, UTA	Fillmore, Richfield, Salt Lake	
INSECTS					

Utah Bureau of Land Management Sensitive Wildlife Species List					
December 2018					
COMMON NAME	SCIENTIFIC NAME	BLM STATUS	COUNTY	FIELD OFFICE	
Coral Pink Sand Dunes Tiger Beetle	*Cicindela albissima*	CA	KAN	Kanab	
Monarch Butterfly	*Danaus plexippus*	SS*	Statewide	All	
Western Bumble Bee	*Bombus occidentalis*	SS*	Statewide	All	
MAMMALS					
Allen's big-eared bat	*Idionycteris phyllotis*	SS	BEA, GAR, GRA, IRO, KAN, SNJ, TOO, WAY, WSH	BENM, Cedar City, GSENM, Kanab, Moab, Monticello, Richfield, St. George, Salt Lake	
Big free-tailed bat	*Nyctinomops macrotis*	SS	BEA, DUC, GAR, GRA, KAN, MIL, SEV, SNJ, SNP, UIN, UTA, WAY, WSH	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Richfield, Salt Lake, St. George, Vernal	
Dark kangaroo mouse	*Microdipodops megacephalus*	SS	BEA, BOX, IRO, JUA, MIL, SNJ, TOO	Cedar City, Fillmore, Monticello, Salt Lake	
Fringed myotis	*Myotis thysanodes*	SS	BEA, CAR, DAG, DUC, EME, GAR, GRA, JUA, KAN, MIL, SNJ, TOO, UIN, WAY, WSH	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Gunnison prairie dog	*Cynomys gunnisoni*	SS	GRA, SNJ	BENM, Moab, Monticello	
Kit fox	*Vulpes macrotis*	SS	BEA, BOX, DUC, EME, GAR, GRA, IRO, JUA, KAN, MIL, SNJ, TOO, WAY, WSH	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, Richfield, St. George, Salt Lake, Vernal	
Preble's shrew	*Sorex preblei*	SS	BOX	Salt Lake	
Pygmy rabbit	*Brachylagus idahoensis*	SS	BEA, BOX, IRO, PIU, RIC, SEV, TOO, WAY, WSH	Cedar City, Richfield, St. George, Salt Lake	
Silky pocket mouse	*Perognathus flavus*	SS	SNJ	BENM, Monticello	
Spotted bat	*Euderma maculatum*	SS	BEA, DAG, DUC, GAR, GRA, IRO, SNJ, UIN, WAY, WSH	Cedar City, GSENM, Kanab, Moab, Monticello, Richfield, Salt Lake, St. George, Vernal	
Townsend's big-eared bat	*Corynorhinus townsendii*	SS	BEA, BOX, CAC, CAR, DAG, DAV, DUC, EME, GAR, GRA, IRO, JUA, KAN, MIL, PIU, SEV, SNJ, TOO, UIN, UTA, WAY, WEB, WSH, WST	BENM, Cedar City, Fillmore, GSENM, Kanab, Moab, Monticello, Price, St. George, Salt Lake, Vernal	
Western red bat	*Lasiurus blossevillii*	SS	BEA, CAC, CAR, GAR, GRA, KAN, IRO, SEV, SNJ, WAY, WSH	Cedar City, GSENM, Kanab, Moab, Monticello, Price, Richfield, Salt Lake, St. George	
White-tailed prairie dog	*Cynomys leucurus*	SS	CAR, DAG, DUC, EME, GRA, RIC, SNJ, UIN	Moab, Price, Salt Lake, Vernal	
SS=Sensitive species; SS*=Sensitive species not on UDWR list, CA=Conservation Agreement species; CN=Candidate species					
Counties: BEA=Beaver, BOX=Box Elder, CAC=Cache, CAR=Carbon, DAG=Daggett, DAV=Davis, DUC=Duchesne, EME=Emery, GAR=Garfield, GRA=Grand,					
IRO=Iron, JUA=Juab, KAN=Kane, MIL=Millard, MOR=Morgan, PIU=Piute, RIC=Rich, SAL=Salt Lake, SEV=Sevier, SNJ=San Juan, SNP=Sanpete, SUM=Summit,					
TOO=Tooele, UIN=Uintah, UTA=Utah, WST=Wasatch, WSH=Washington, WAY=Wayne, WEB=Weber					

Wayland, Joshua

From: Groves, Kristy L -FS <[redacted]>
Sent: Friday, May 10, 2019 5:57 PM
To: Wayland, Joshua
Cc: Little, Tera -FS
Subject: Response of Resource Concerns for Uinta Basin Railway
Attachments: VQO Hwy191.pdf; UnitaRailwayResourceConcernsResponse.pdf; SIO_Hwy191.pdf; Migratory_Bird_list.doc

Josh, I have attached our response of resource concerns that the STB should be looking at the Uinta Basin Railway. Let me know if you have any questions.

Kristy

Kristy Groves
District Ranger
Forest Service
Ashley National Forest
p: [redacted]
f: [redacted]
[redacted]
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USDA United States Department of Agriculture | Forest Service | Ashley National Forest
Duchesne/Roosevelt Ranger District
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Duchesne, UT 84021
435-738-2482

File Code: 1950
Date: May 10, 2019

Joshua Wayland
Surface Transportation Board
c/o ICF
9300 Lee Highway
Fairfax, VA 22031

Dear Joshua,

This letter is in response to your request for preliminary information related to the proposed rail line brought forward by the Seven County Infrastructure Coalition. At this time only the Indian Canyon Route crosses Forest Service lands.

Below I have listed the resources that may be potentially affected by the rail line proposal where it crosses Forest Service lands on the Ashley National Forest:

- **Roadless Area impacts** – the entirety of the Indian Canyon Route is proposed within roadless area 0401011 that was designated under the 2001 Roadless Rule on the Ashley National Forest. Impacts to roadless character would have to be addressed. The connected actions for construction and maintenance would also be subject to the 2001 Rule and would need to be addressed. Approval of the roadless clearance process for infrastructure was retained at the Regional Office level.

- **Threatened, Endangered and Sensitive Species** – The following sensitive plant species have not yet been identified in the Hwy 191 corridor, but could exist there since the geology and soils they are found in are similar in this location: Goodrich Blazingstar (Mentzelia goodrichii) and Low Greenthread (Thelesperma caespitosum).

  There are no threatened or Endangered wildlife species in this area. However, Forest Service sensitive species will need to be considered.
  - FS Sensitive Species
    - peregrine falcon, northern goshawk, boreal owl, great gray owl, flammulated owl, three-toed woodpecker, greater sage grouse, spotted bat, Townsend's big-eared bat, common loon, trumpeter swan, pygmy rabbit, bald eagle, bighorn sheep, and wolverine.

- **Management Indicator Species** – Below is a list of Ashley National Forest Management Indicator Species. A table is attached to this letter that lists those migratory birds that will also need to be considered.

  - Ashley MIS

- Golden eagle, red-naped sapsucker, warbling vireo, Lincoln's sparrow, song sparrow, white-tailed ptarmigan, elk, deer, northern goshawk, sage grouse.

- Migratory Birds – see the attached table.

- **Scenic Byway and Visuals** – Highway 191 south is a designated Scenic Byway.

- **Soils and Hydrology** - Soil Erosion and Slope Stability Concerns

  Indian Canyon's topography with its steep ridge side slopes is composed of the Green River Formation. Ridge slopes have bands of highly skeletal (rocky) soils, rock outcrop, and bands of loose regolith/soils. The highest erosion problems correspond to the areas where soils are low in rock content and very high in salts, particularly calcium carbonate. The calcareous nature adds to the lack of soil structure and acts like silt, which is the most erosive soil texture fraction. The plant canopy cover and low root content adds to erosion caused by summer thunderstorms and any human-caused disturbance.

  Storm events could result in mass wasting (flow events) and impair watersheds by adding to the TDS content. Evidence of these should be noted so further investigation of stability concerns can be looked for. Mass wasting can occur when materials are saturated from normal precipitation events.

- **Archeology and National Historic Preservation Act** - The project proponent will need to complete an archaeological file search with both the Ashley National Forest and the Utah Division of State History. The Forest can provide GIS data for heritage site locations and previous surveys. Approval of the survey methods would be needed.

- **Compliance with the Land Management Plan** – The Ashley National Forest is currently undergoing Forest Plan Revision.

  Current Forest Plan - The Indian Canyon Route is within management areas n, d, and f in the current Ashley National Forest Plan. A review of the activities, as currently proposed, indicates that if the decision occurs under the current forest plan I believe we may need an amendment, but that would depend on the exact location of the railway. The area around Highway 191 on the south unit is mapped as retention on a ¼ mile on either side of the highway and as partial retention beyond that, see attached map.

  - **Retention (R)** – The Retention (R) VQO provides for management activities that are not visually evident. Under Retention, activities may only repeat form, line, color and texture that are frequently found in the characteristic landscape. Changes in qualities of size, amount, intensity, direction, pattern, etc., should not be evident." (USDA FS, 1974).

  - **Partial Retention (PR)** - Under the Partial Retention (PR) VQO, management activities are to remain visually subordinate to the characteristic landscape.

> Activities may repeat form, line, color, or texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color, or texture, which are found infrequently or not at all in the characteristic landscape, but they should remain visually subordinate to the visual strength of the characteristic landscape. (USDA FS, 1974).

- The management are prescriptions for n, d, and f relating to scenic resources are:
- n: VQOs as inventoried
- d: VQOs variable to meet range resource needs expect in highly sensitive.
- f: VQOs as inventoried standards

Revised Forest Plan -
The new Scenery Management System - Scenic Integrity Objectives (SIO) for the Forest Plan Revision maps the SIOs around Highway 191 as High and Moderate depending on the view from 191, map is attached.

The proposed Forest Plan Revision includes a number of guidelines that refer to scenic resources. The guidelines that would pertain to railroad construction are below.

01 Scenic deviations that are visible in some areas of the Ashley National Forest should generally be subordinate to the surrounding natural landscape and diminish over time.

04 Components of new projects other than vegetation management, such as facility installation or road construction, should meet the assigned scenic integrity objectives within 2 years after completion of all activities associated with the project to reduce significant visual deviations from the surrounding landscape.

05 New landscape modifications such as timber harvesting on lands not suitable for timber production or construction of facilities, should meet or exceed the assigned scenic integrity objectives as seen from anywhere with areas assigned as scenic integrity objective of very high or high, and as seen from mapped concern level 1 and 2 travel ways and viewpoints. The scenic integrity objectives serve as thresholds of allowable visual dominance by landscape modifications over the valued scenic resources and allowable deviation from the desired scenic resource.

I don't believe that we would need a plan amendment for the revised forest plan pertaining to the effects of the proposed railroad on scenic resources if any rehabilitation work is completed in 2 years after the project is completed. We will begin NEPA on the new Forest Plan this year with the intent to complete it by next year.

Other permits or approvals needed:

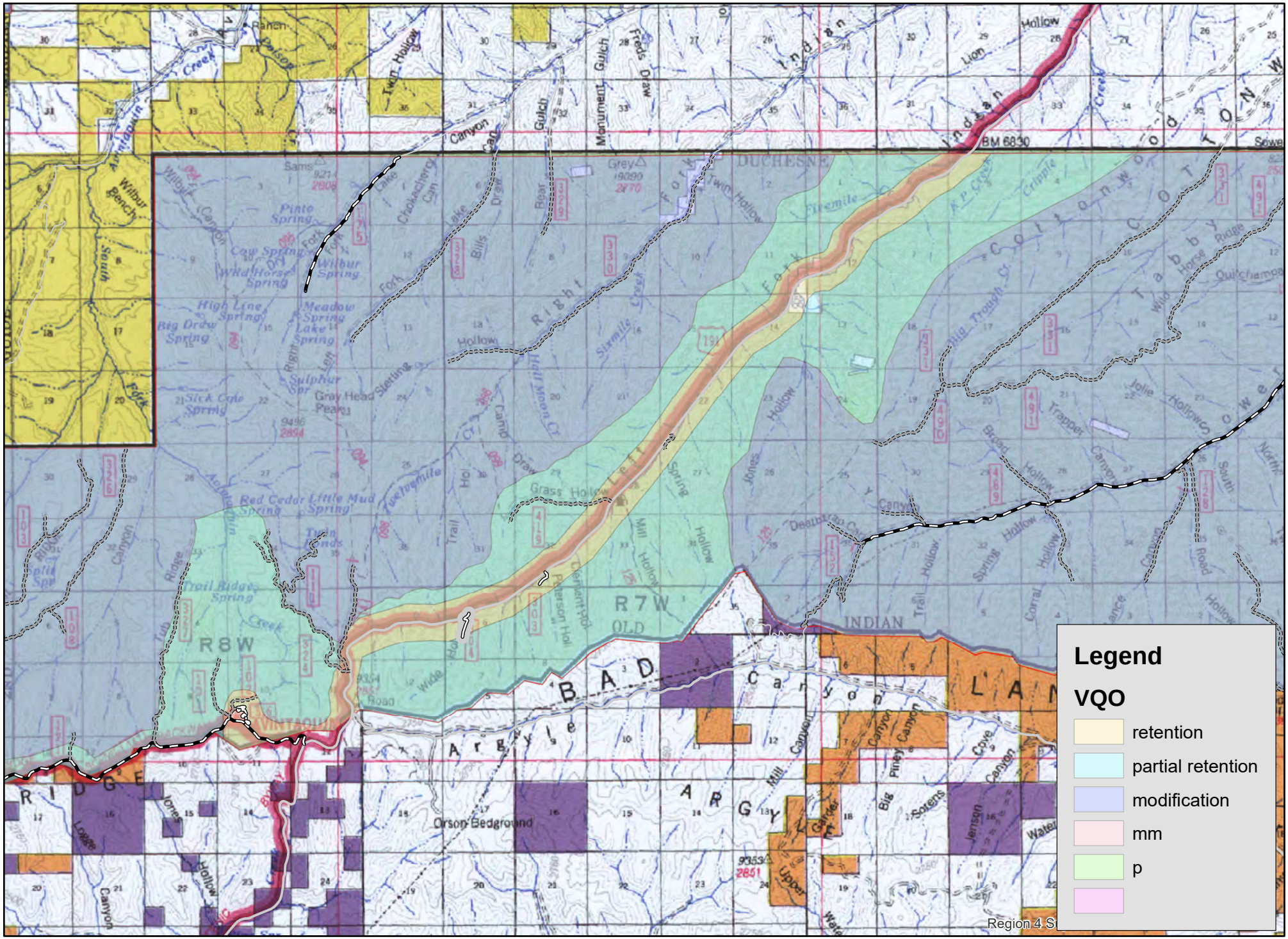
The Forest Supervisor would have to authorize any amendments to the Forest Plan. Temporary

use permits would be needed for various surveys including wetlands delineation, archeology surveys, geophysical surveys etc. The proponent would need to apply for and obtain a railroad ROW permit to cover all expected activities including access, construction, maintenance and operation.

Sincerely,

KRISTY GROVES
District Ranger

Migratory Bird table
Maps for Visuals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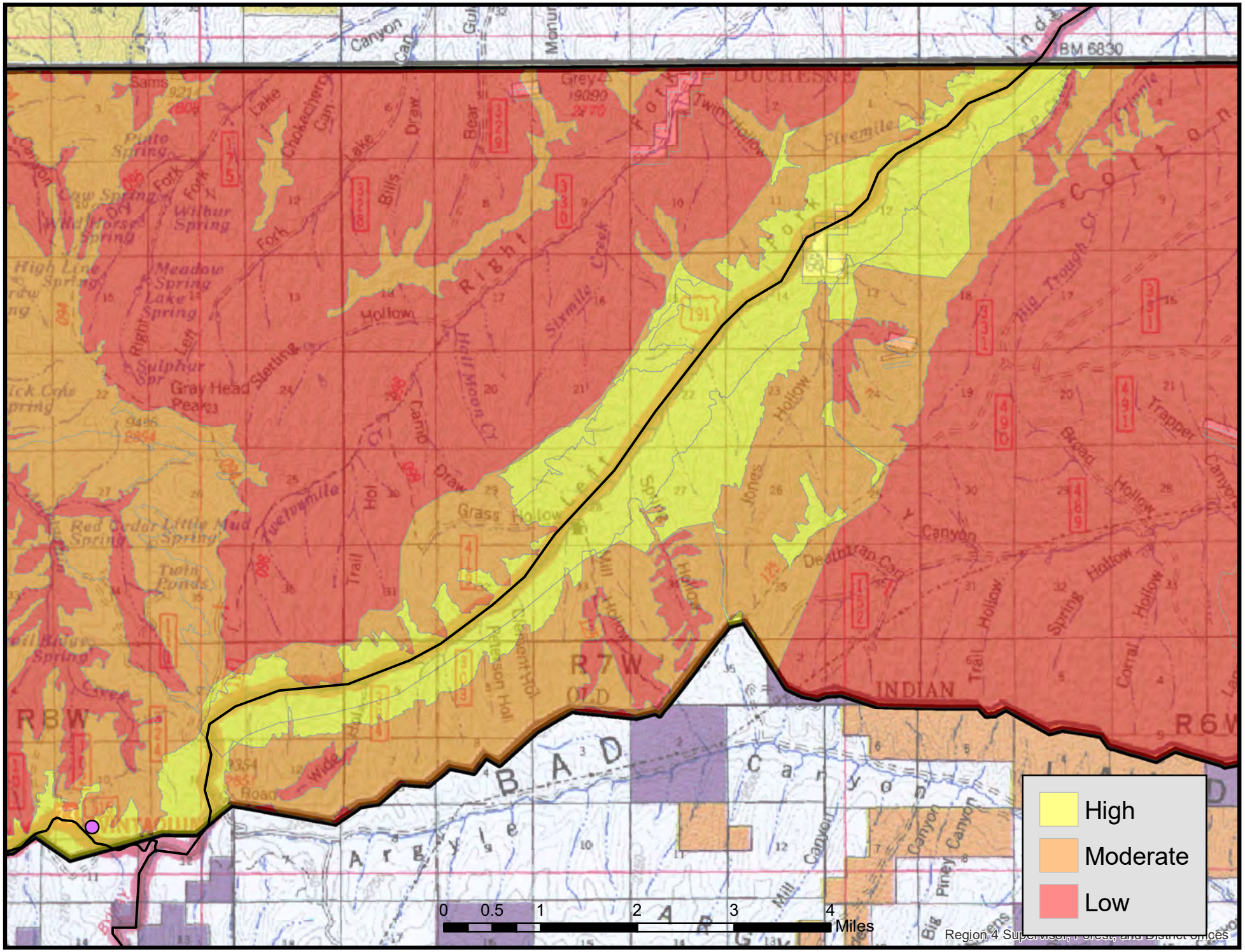
DUCHESNE
INDIAN
OLD
Orson Bedground
Region 4 S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Moderate
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Miles
Region 4 Supervisor, Forest, and District offices

US Fish & Wildlife Service list of Birds of Conservation Concern (BCC) in Bird Conservation Regions 10 & 16, and Utah Partners in Flight (PIF) Priority Species - their status in the project area.

Species	BCR 16	BCR 10	PIF	Occurrence in Project Area	Basis for Occurrence Determination
American Avocet	X		X		
Bald Eagle	X	X			
Black Rosy-Finch	X	X	X		
Black-necked Stilt			X		
Black-throated Gray Warbler			X		
Brewer's Sparrow	X	X	X		
Broad-tailed Hummingbird			X		
Brown-capped Rosy Finch	X				
Burrowing Owl	X				
Calliope Hummingbird		X			
Cassin’s Finch	X	X			
Flammulated Owl	X	X			
Golden Eagle	X				
Grasshopper Sparrow	X				
Greater Sage-Grouse			X		
Juniper Titmouse	X				
Lewis's Woodpecker	X	X	X		
Loggerhead Shrike		X			
Olive-sided Flycatcher		X			
Peregrine Falcon	X	X			
Pinyon Jay	X				
Prairie Falcon	X				
Sage Sparrow		X	X		
Sage Thrasher		X			
Three-toed Woodpecker			X		
Veery	X				
Virginia's Warbler			X		
Williamson's Sapsucker		X			
Willow Flycatcher	X	X			
American White Pelican			X		
Black Swift		X	X		
Bobolink			X		
Ferruginous Hawk	X	X	X		
Gray Vireo	X		X		
Long-billed Curlew	X	X	X		
McCown's Longspur		X			
Mountain Plover	X		X		
Snowy Plover	X				

Swainson's Hawk		X			
Yellow-billed Cuckoo	X	X	X		
Abert's Towhee			X		
Bell's Vireo			X		
Bendire's Thrasher	X				
Chestnut-collared Longspur	X				
Gambel's Quail			X		
Grace's Warbler	X				
Gunnison Sage-Grouse	X		X		
Lucy's Warbler			X		
Sharp-tailed Grouse			X		
Upland Sandpiper		X			
White-headed Woodpecker		X			

2008 Birds of Conservation Concern List & 2002 PIF Priority Species List

Ulrich, Carrie L.

From: Croft, Amy
Sent: Monday, December 2, 2019 2:59 PM
To: Ulrich, Carrie L.
Subject: FW: Ashley National Forest Sensitive Species - Uinta Basin Railway Project
Attachments: Ashley Sensitive Species List.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Uinta Basin Railway

From: Christensen, Robert -FS
Sent: Tuesday, November 26, 2019 3:31 PM
To: Croft, Amy <
Cc: Groves, Kristy L -FS >
Subject: Ashley National Forest Sensitive Species - Uinta Basin Railway Project

Attached is the Forest Service Region 4 Sensitive Species that have habitat on the Ashley NF. Let me know if you have any questions.

Bob Christensen
Wildlife Biologist
Roosevelt/Duchesne RD
Ashely NF

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USDA Forest Service Sensitive Species either occurring, potentially occurring, or that may be influenced by management actions on the Ashley NF.

Species	Habitat Use and Local Distribution	References
Spotted bat (Euderma maculatum)	Various habitats and elevations, but most often collected in dry, rough desert terrain. Distribution thought to be limited by availability of roosts (primarily under loose rock or in crevices in rock cliffs). Locally they have been located near steep-walled stream canyons. Utah elevational range is 2,700-9,200 ft.	USDA Forest Service 2006b, Oliver 2000, Perkins 2001, Perkins 2002
Townsend's big-eared bat (Plecotus townsendii)	Various habitats and elevations, but in Utah primarily found in shrub steppe and pinon/juniper habitats. Needs caves or mines for hibernation and maternity roosts; occasionally uses old buildings. Sensitive to disturbance at these roosts. Utah elevational range is 3,300-8,851 ft.	USDA Forest Service 2006b, Oliver 2000, Perkins 2001, Perkins 2002
Bald eagle (Haliaeetus leucocephalus)	Usually occurs near Flaming Gorge Reservoir and Green River corridor during winter; occasionally near other waters until freeze-up. A new nest was discovered spring of 2004 near Flaming Gorge and another along the Duchesne River (23 miles south of the Forest Boundary) in Spring of 2005. Generally a migrant on the rest of the Ashley.	USDA Forest Service 2006b.
Boreal owl (Aegolius funerus)	Spruce/fir or mixed conifer forest*; may use aspen if suitable conifer is nearby. Possible but less likely in pure lodgepole. Secondary cavity nester; needs large (13"+) diameter trees for nesting. Availability of suitable nest sites can limit population size.	USDA Forest Service 2006b
Great gray owl (Strix nebulosa)	Conifer or conifer/hardwood forests. Two (possibly 3) locations (in the 90's) and one historic record on Ashley, all in mixed conifer. Uses old stick nests constructed by other species, depressions in broken tops of trees, etc. for nesting. Uinta	USDA Forest Service 2006b

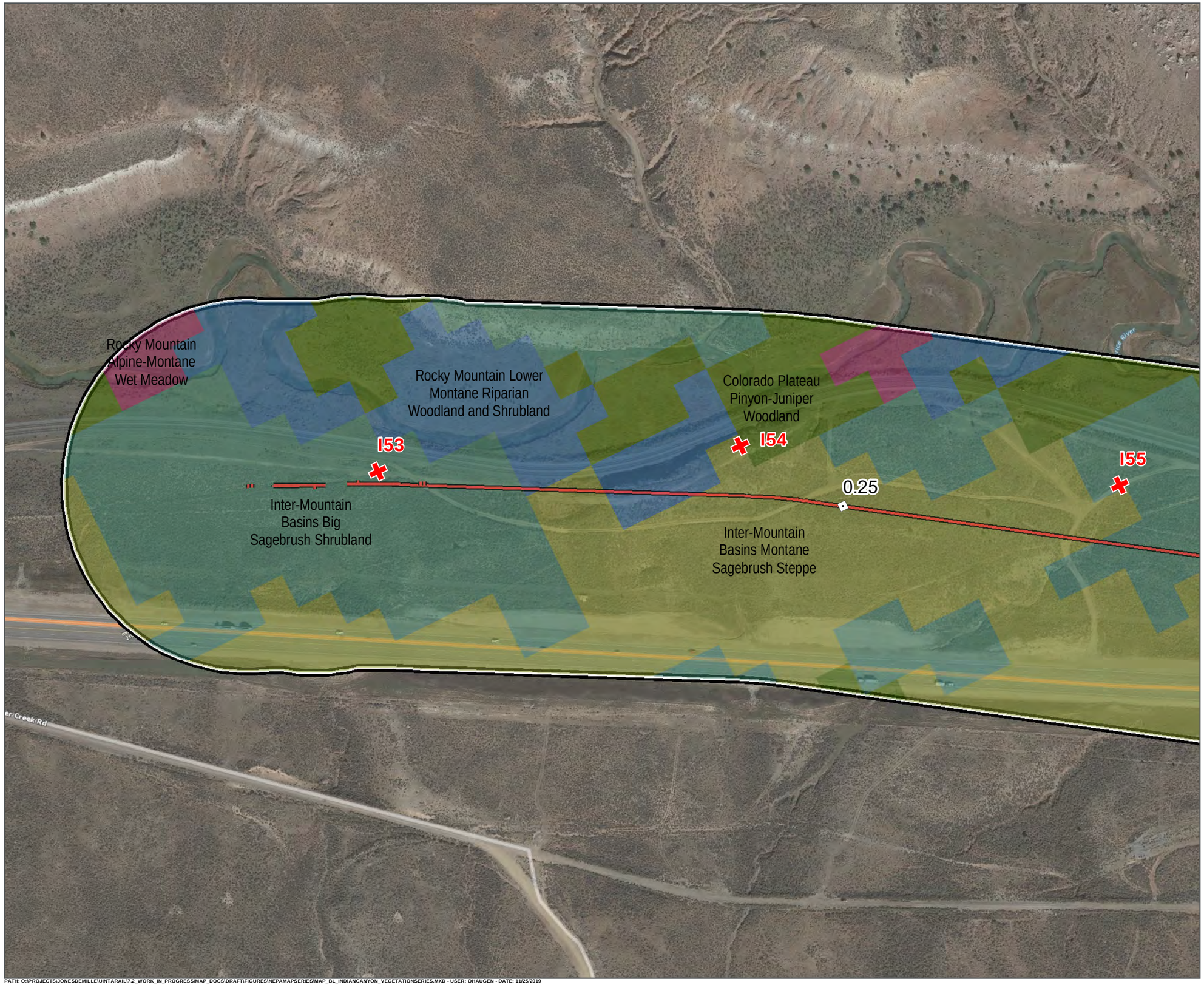
	Mountains are at or just beyond southern limit of normal range; species is considered casual or irregular in Utah.	
Flammulated owl (Otus flammeolus)	Typical habitat for this species is ponderosa pine or Douglas fir forests. Has been located on the Ashley. Secondary cavity nester.	USDA Forest Service 2006b
Three-toed woodpecker (Picoides tridactylus)	Coniferous forests, or conifer mixed with aspen. Has been found in lodgepole, Douglas fir, spruce/fir and mixed conifer on the Ashley. Excavates a new cavity for nesting each year. Forages by prying off loose, scaly tree bark to find insects. Trees used for both nesting and foraging average 11" dbh or more. Management recommendations include maintenance of some snags greater than 12" dbh, and with some bark still present.	USDA Forest Service 2006b, Parrish et. al. 2002
Northern goshawk (Accipiter gentilis)	Most forest types. Uses a wide variety of forest types, but majority of known breeding territories are in lodgepole or mixed conifer stands. Home ranges include a variety of stand ages and structures, but older-age stands with a high density of large trees, relatively high canopy closure and high basal area are preferred for nesting. Stands with large trees and relatively open understories are preferred for foraging. Can be sensitive to disturbance during the nesting season.	USDA Forest Service 2006b
Peregrine falcon (Falco peregrinus)	Known to nest on cliffs along Flaming Gorge Reservoir on the Ashley. Usually found where rivers, marshes or other wet habitats are associated with cliffs.	USDA Forest Service 2006b
Pygmy rabbit (Brachylagus idahoensis)	Typically found in dense stands of big sagebrush growing in deep loose soils. In southwestern Wyoming pygmy rabbits	USFWS 2010

	selectively used dense and structurally diverse stands of sagebrush that accumulated a relatively large amount of snow. They are present on the Flaming Gorge Ranger District (on the NRA), but nowhere else on the Ashley NF.	
Bighorn sheep (Ovis canadensis)	Bighorn sheep prefer open habitat types (high alpine to lower grasslands) with adjacent steep rocky areas for escape and safety. Habitat is characterized by rugged terrain including canyons, gulches, talus cliffs, steep slopes, mountaintops, and river benches. This species is present on the Ashley (Uintas and Avintaquin).	Shackleton 1985, UDWR 2018
Greater sage grouse (Centrocercus urophasianus)	Sage grouse populations are allied closely with sagebrush habitats. Sagebrush habitats are important for the survival of nesting and wintering sage grouse.	USDA Forest Service 2006b, USDA Forest Service 2015b, USFWS 2015.

*Mixed conifer defined as Engelmann spruce, subalpine fir and lodgepole pine on the Ashley.

APPENDIX B

Vegetation Community Maps for the Indian Canyon Study Area


Rocky Mountain
Alpine-Montane
Wet Meadow
Rocky Mountain Lower
Montane Riparian
Woodland and Shrubland
Colorado Plateau
Pinyon-Juniper
Woodland
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Inter-Mountain
Basins Big
Sagebrush Shrubland
Inter-Mountain
Basins Montane
Sagebrush Steppe
Duchesne
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1
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Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)
Vegetation Communities
Colorado Plateau Pinyon-Juniper Woodland
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Rocky Mountain Alpine-Montane Wet Meadow
Rocky Mountain Lower Montane Riparian Woodland and Shrubland
INDIAN CANYON ALTERNATIVE: 5/30/2019
VEGETATION COMMUNITIES
SEPTEMBER 2019
N
0 100 200 Feet
1 inch = 250 Feet
DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane
SEVEN COUNTY INFRASTRUCTURE COALITION
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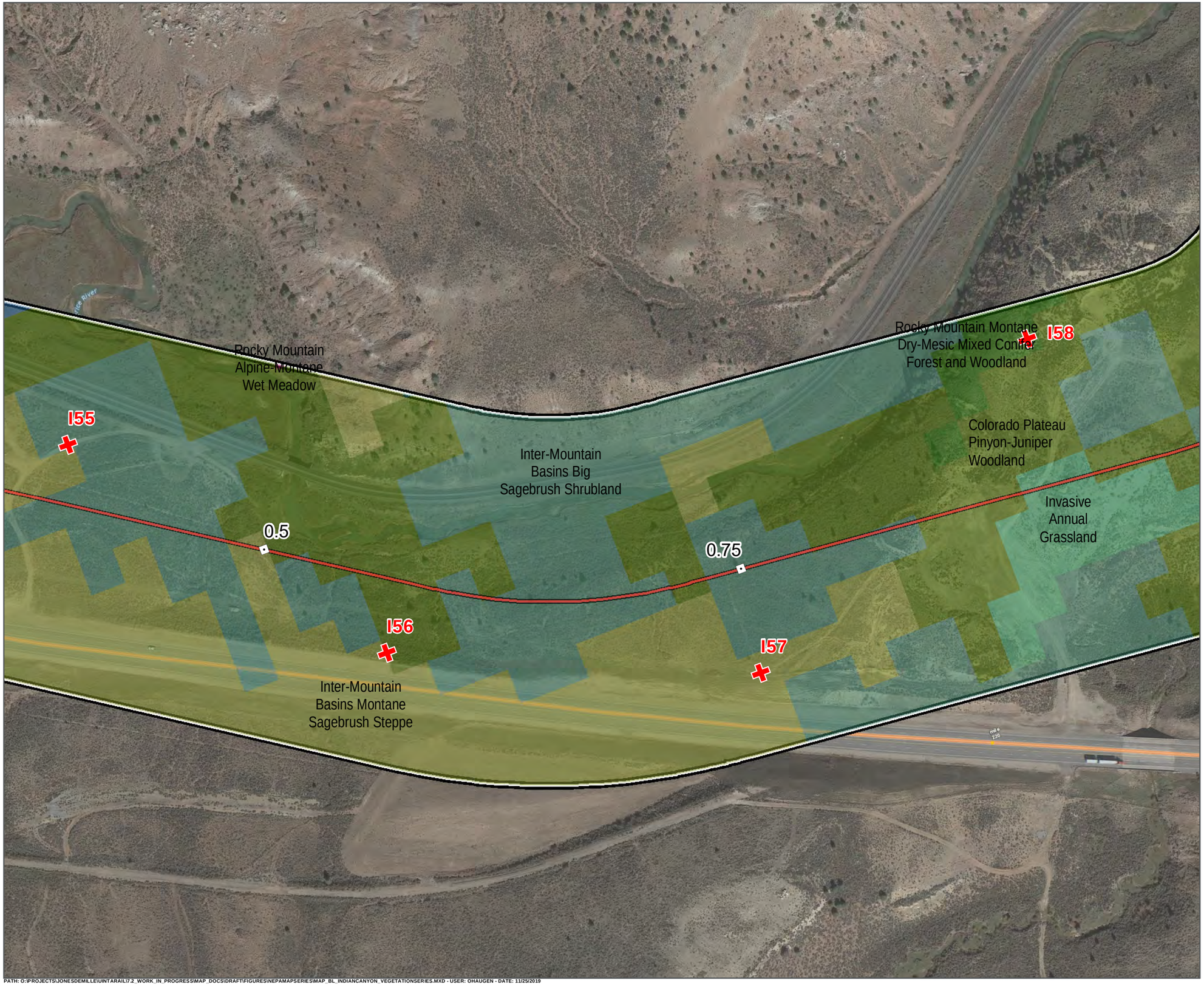

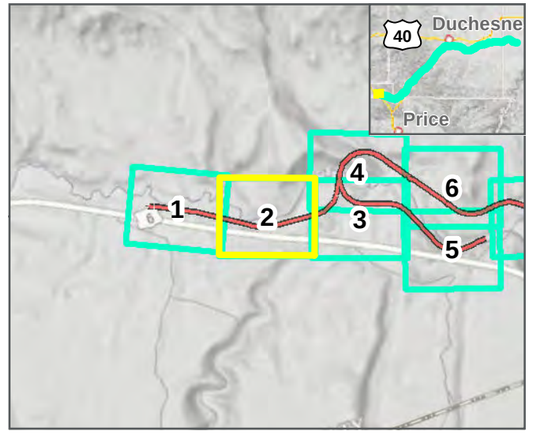

Photo Points
Mileposts
Indian Canyon Centerline
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SWReGAP Landcover
Utah Google Imagery
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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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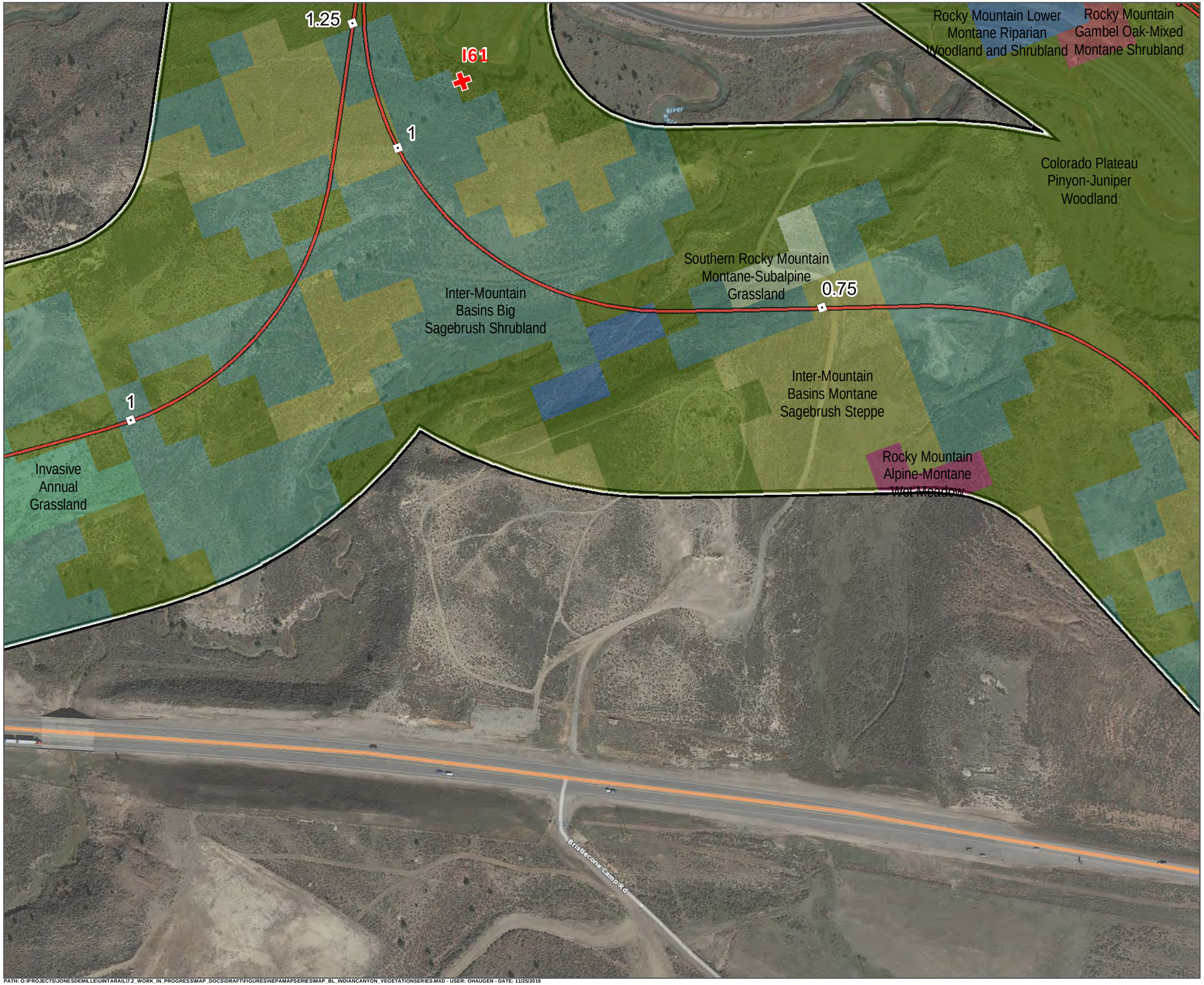

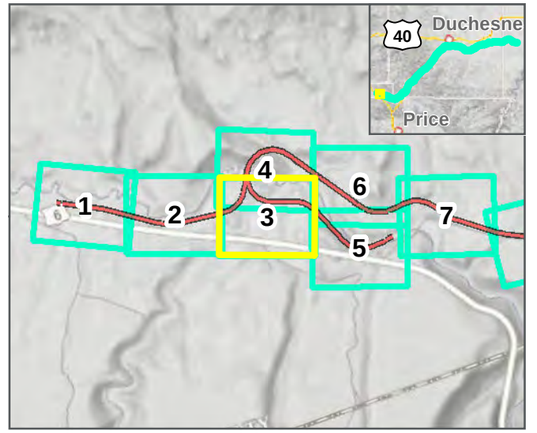

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INDIAN CANYON ALTERNATIVE: 5/30/2019

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SEPTEMBER 2019

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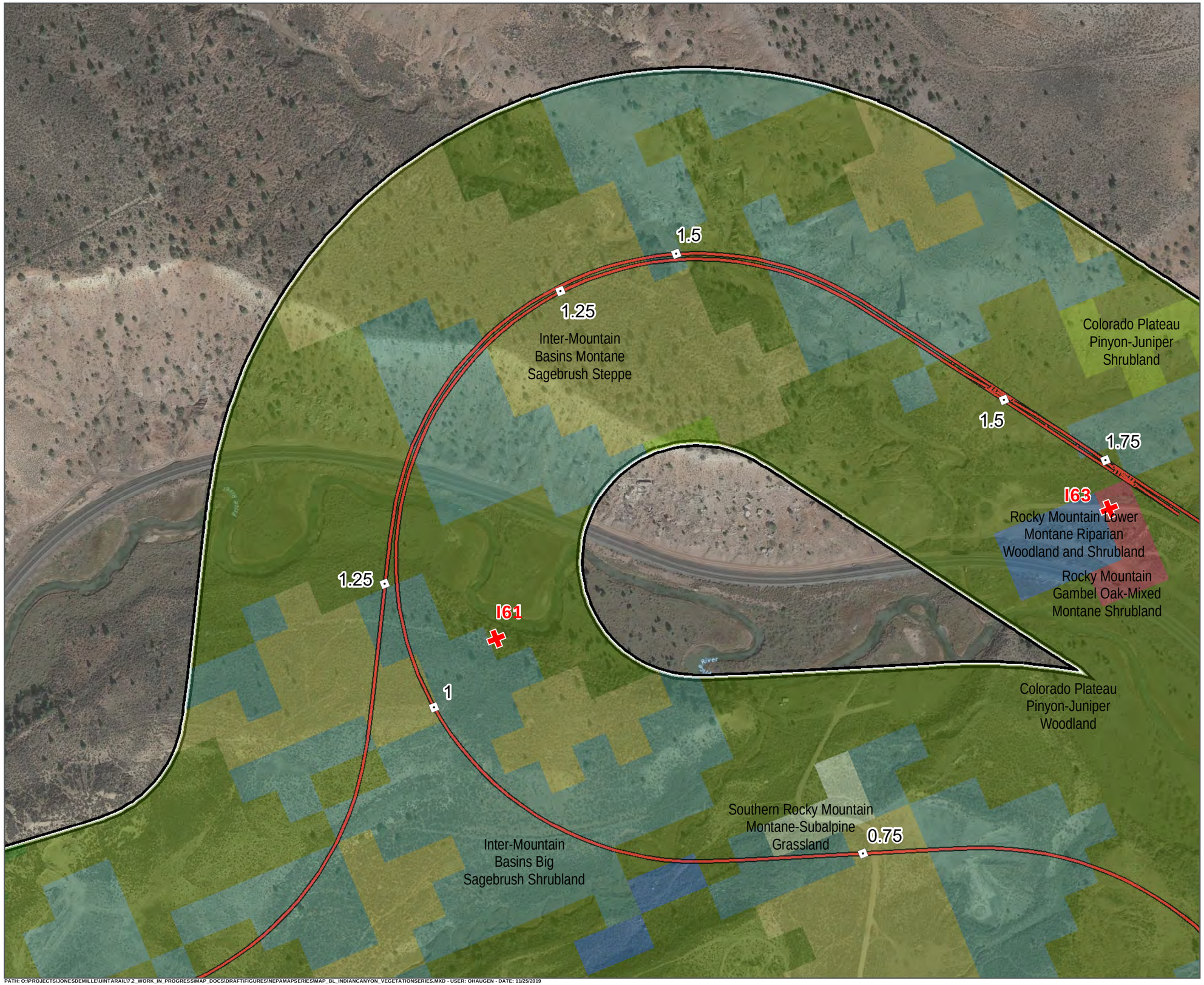

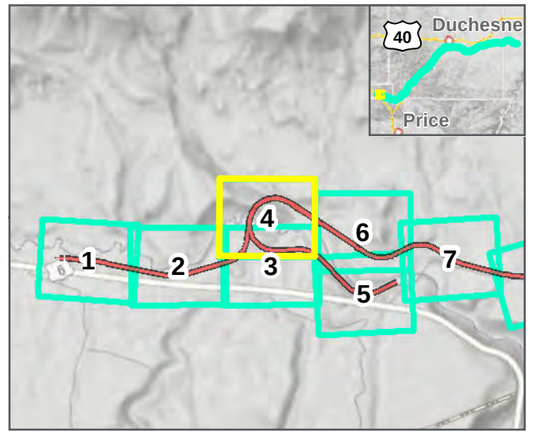

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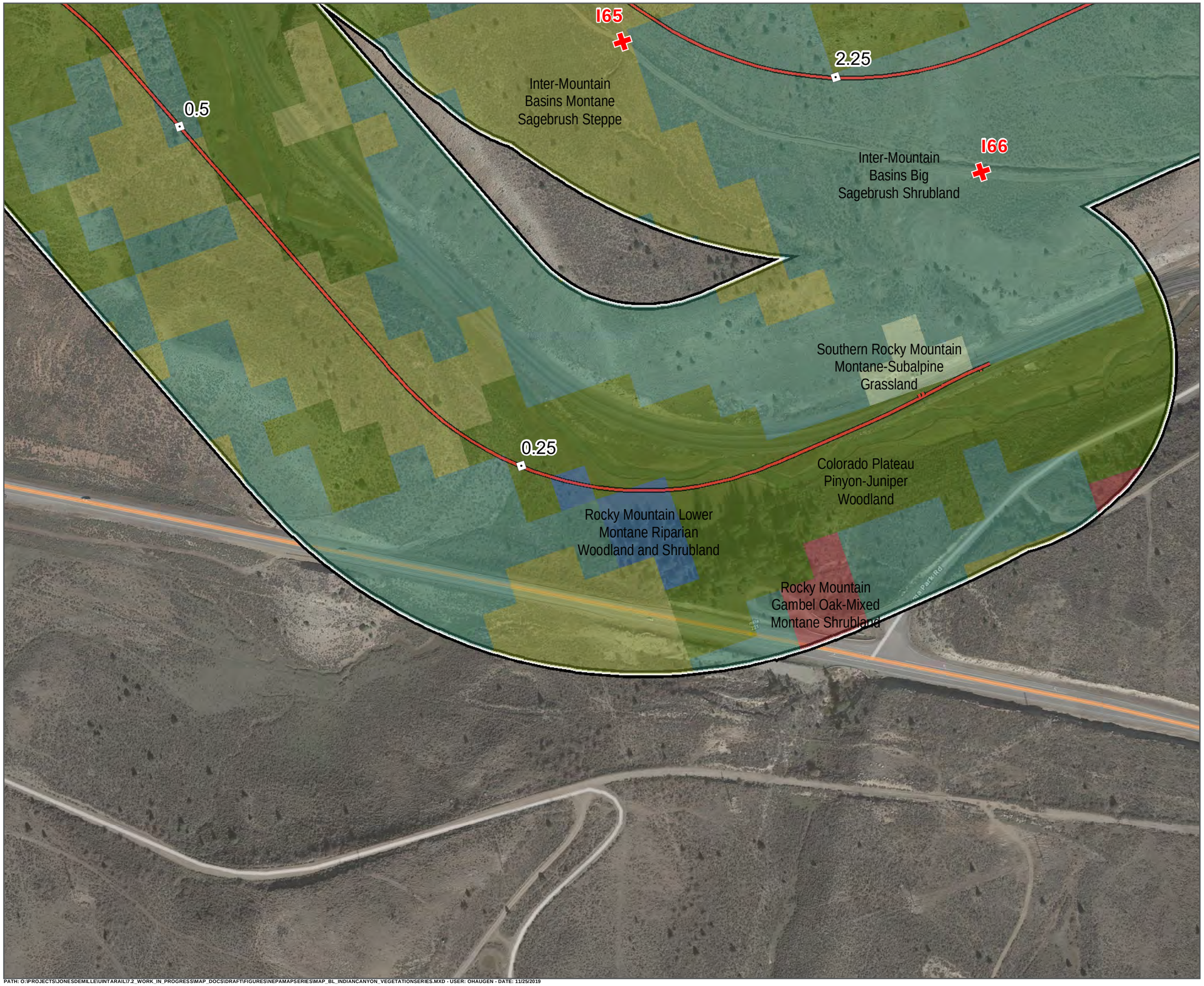

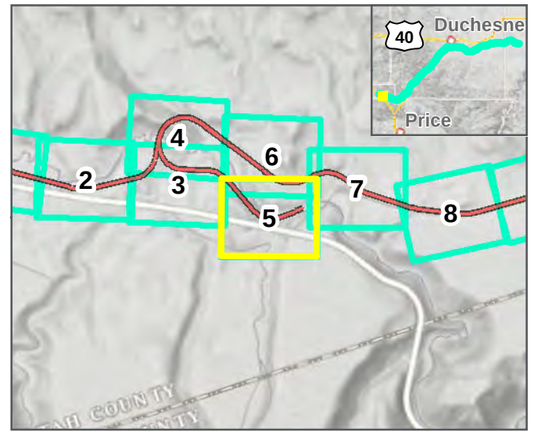

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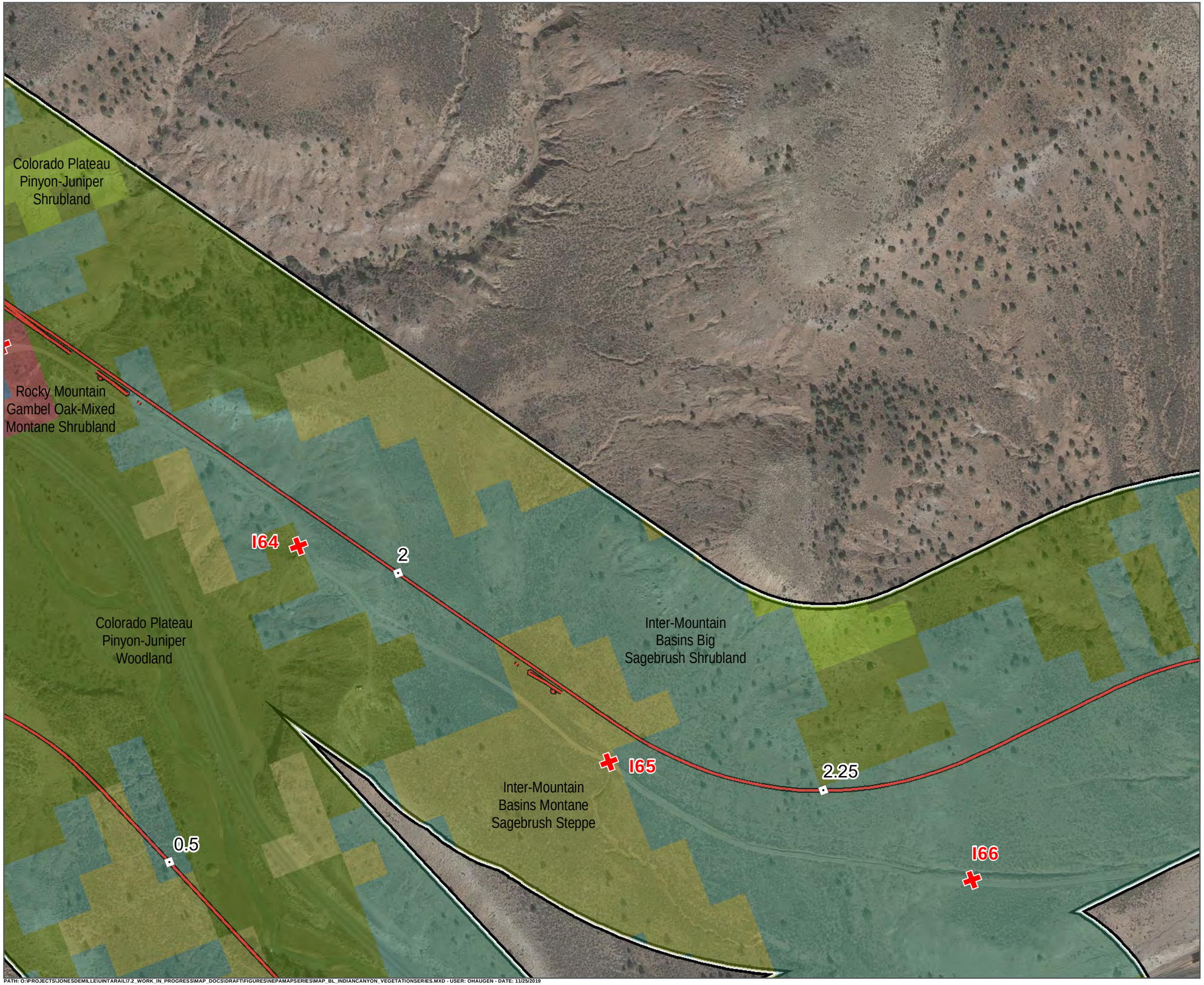

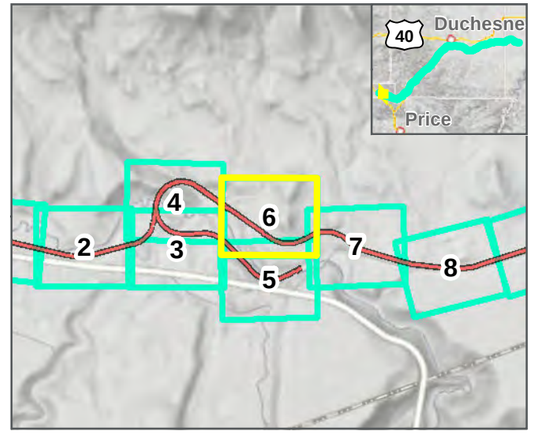

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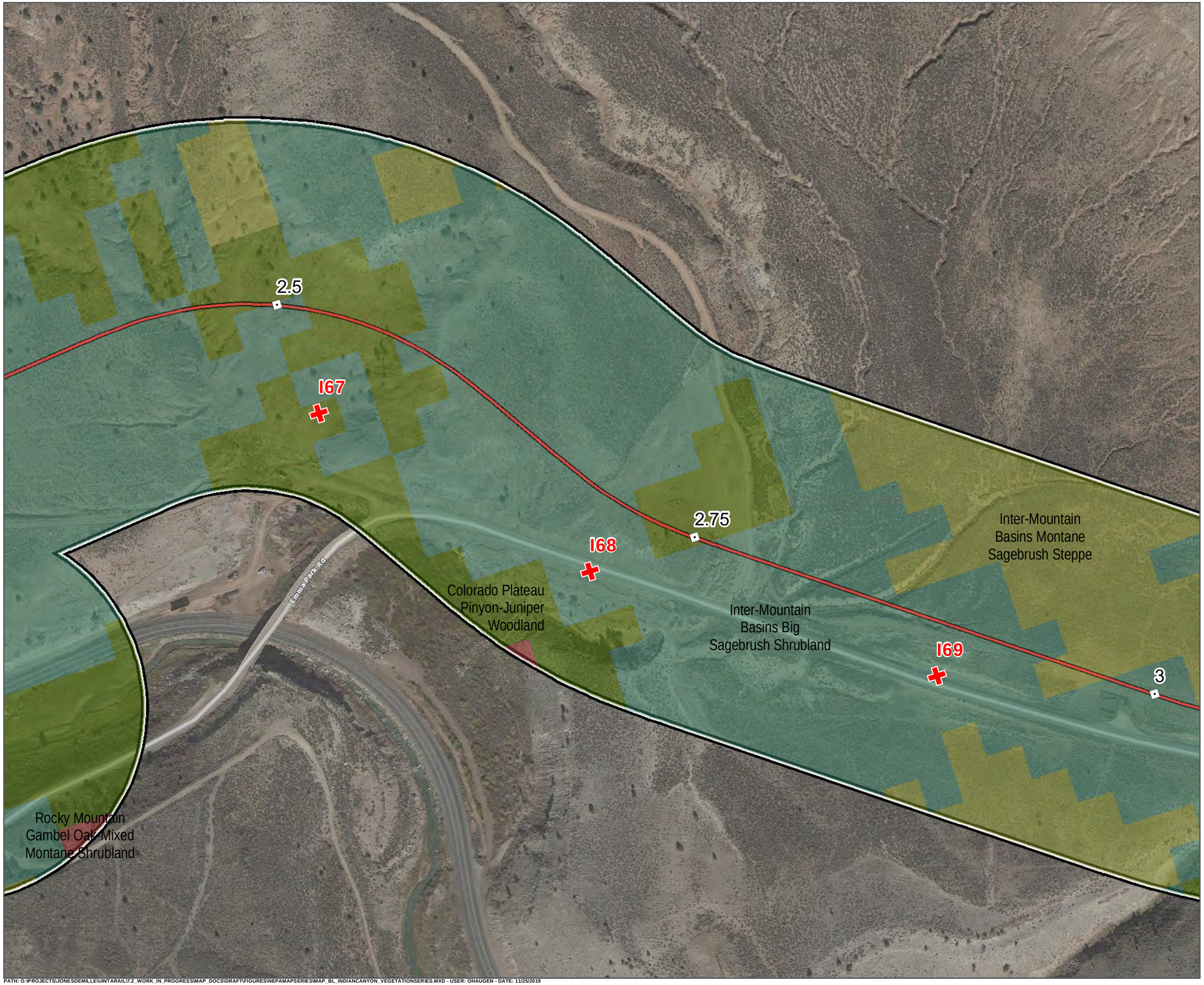

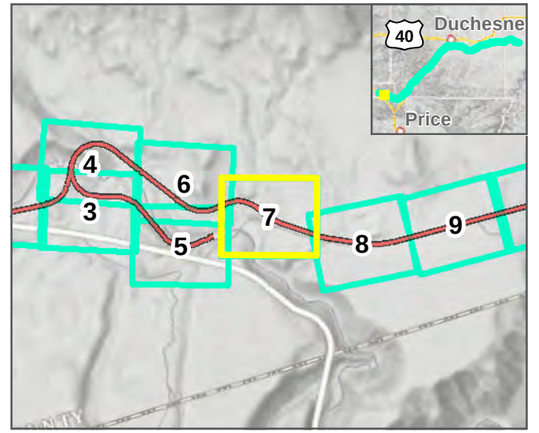

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INDIAN CANYON ALTERNATIVE: 5/30/2019

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HDR

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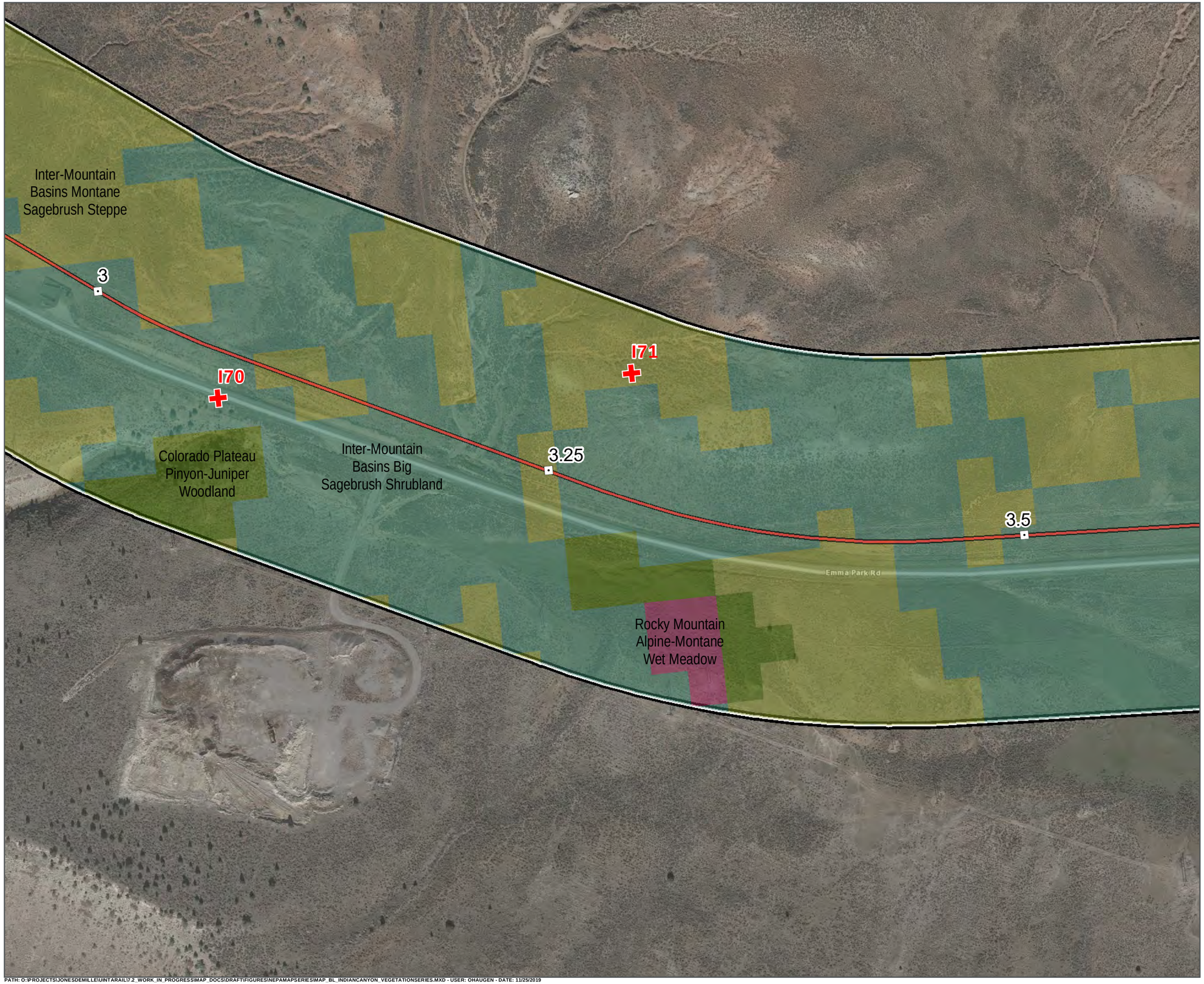

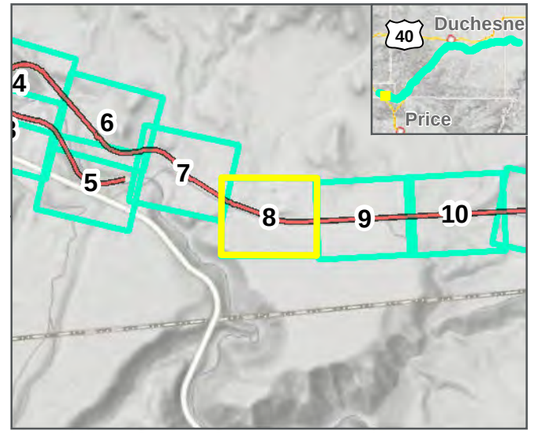

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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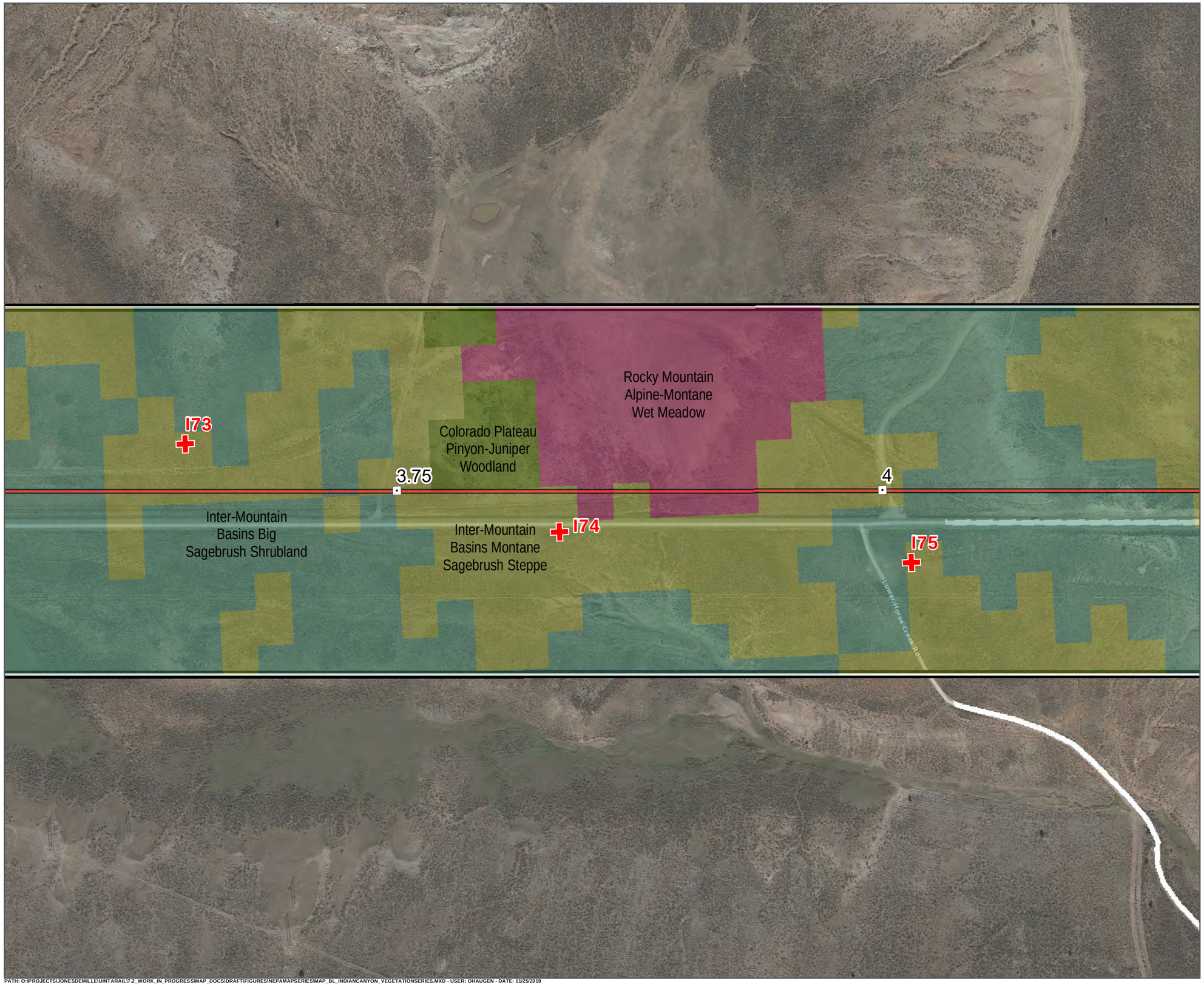

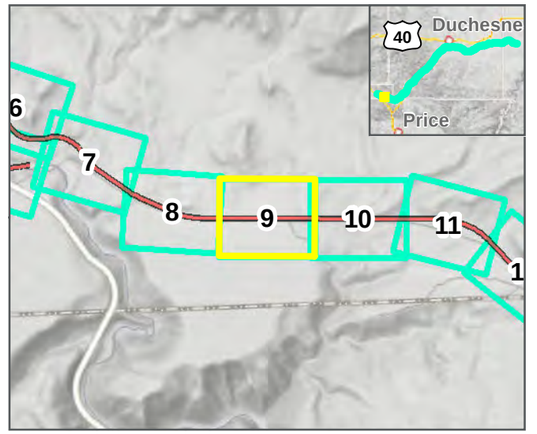

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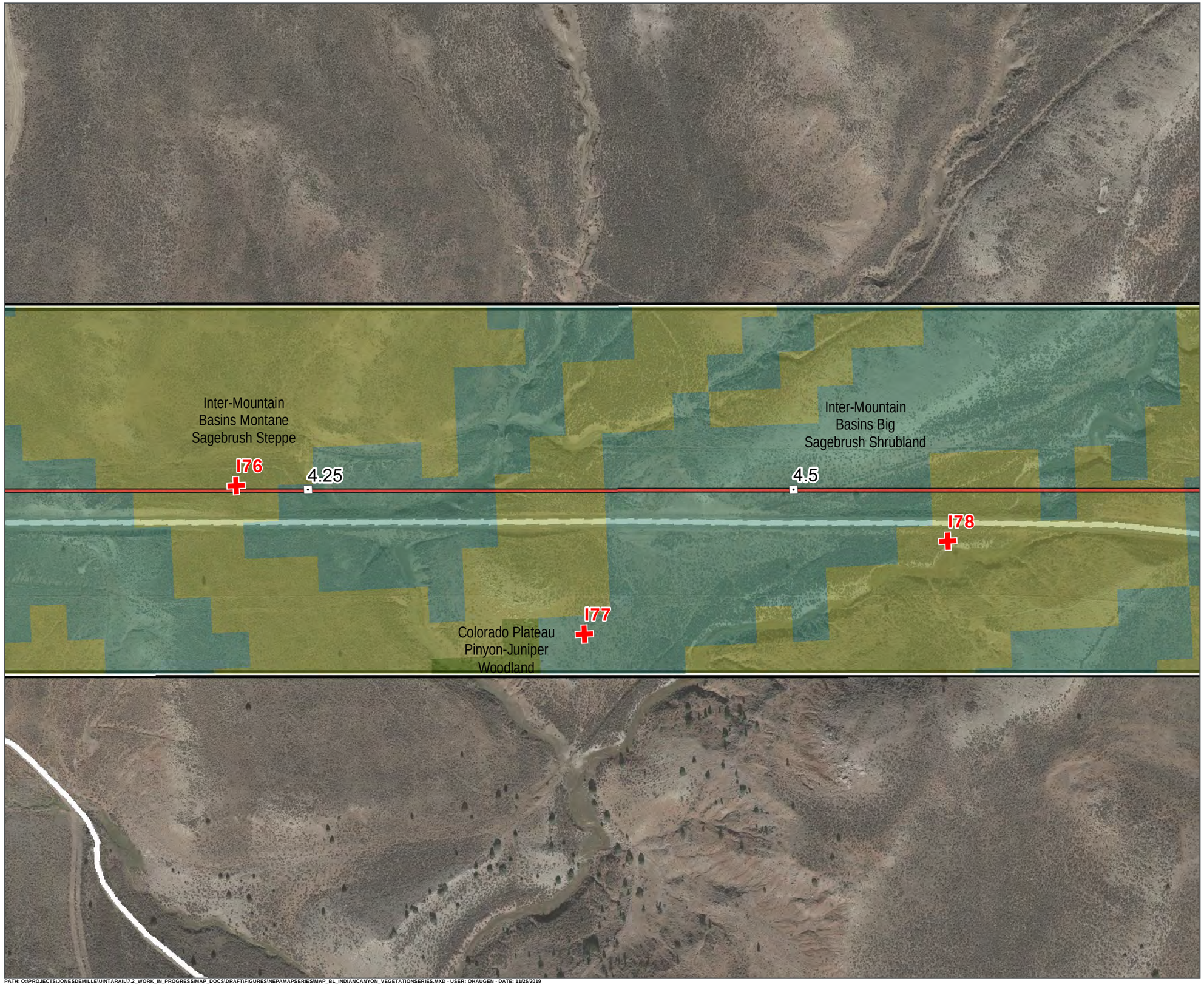

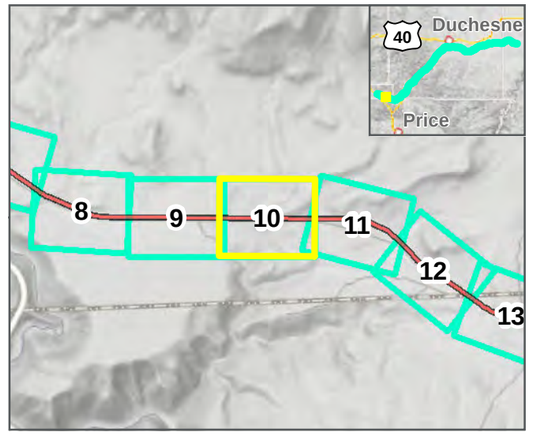

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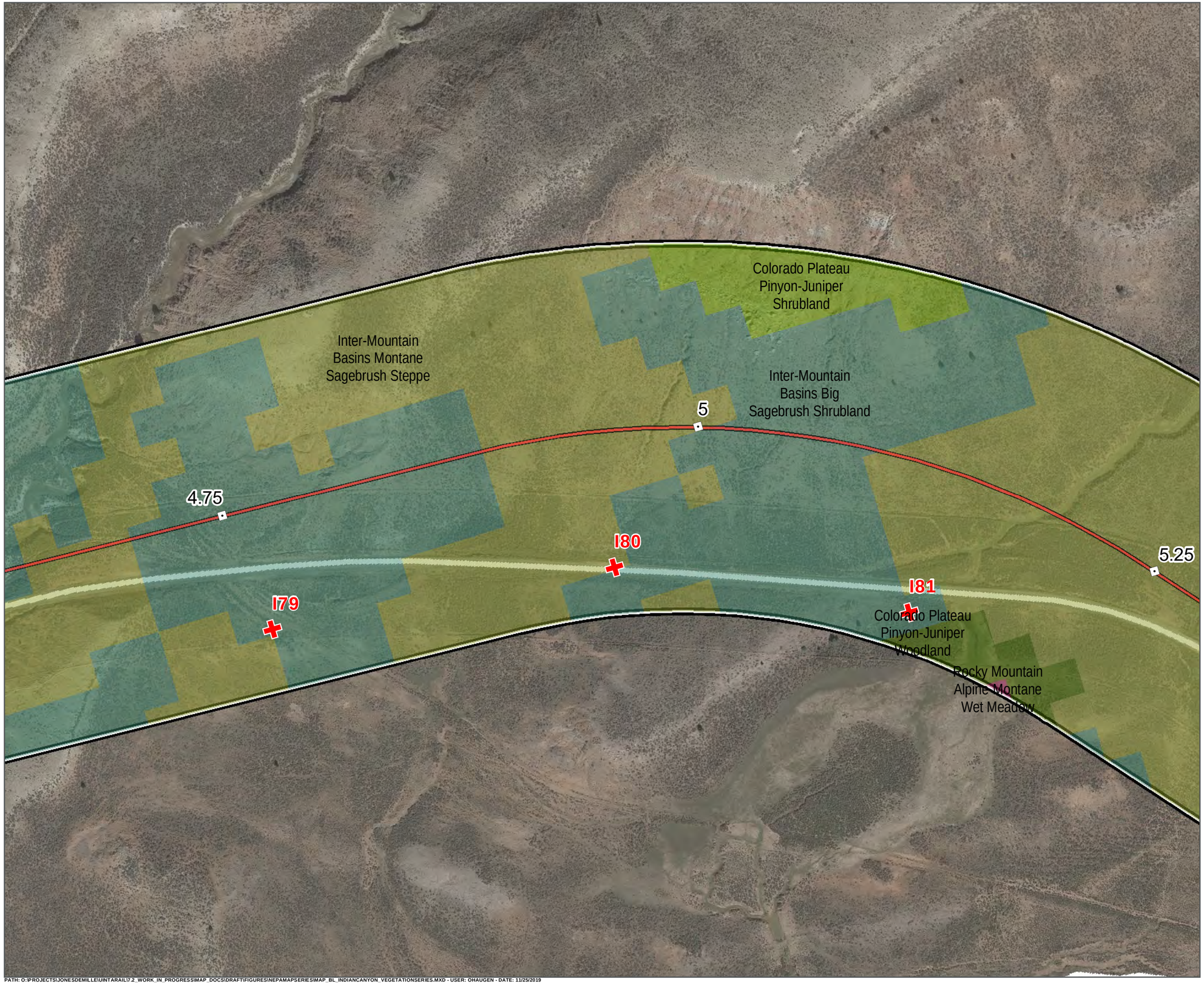

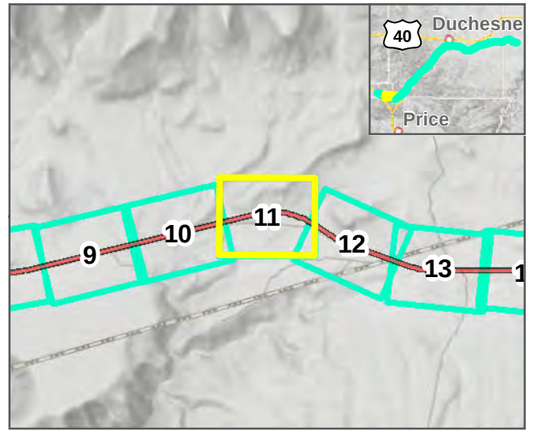

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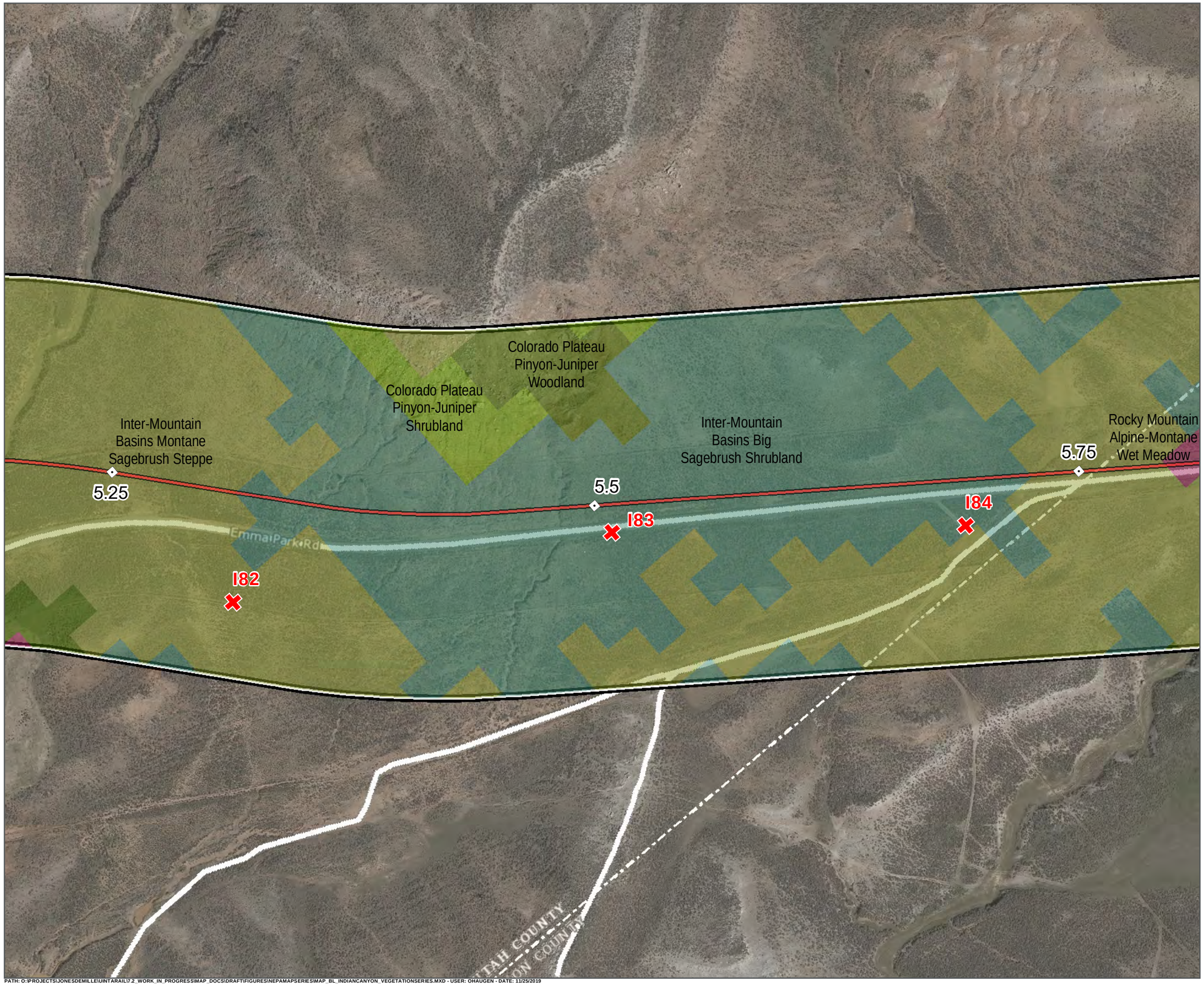

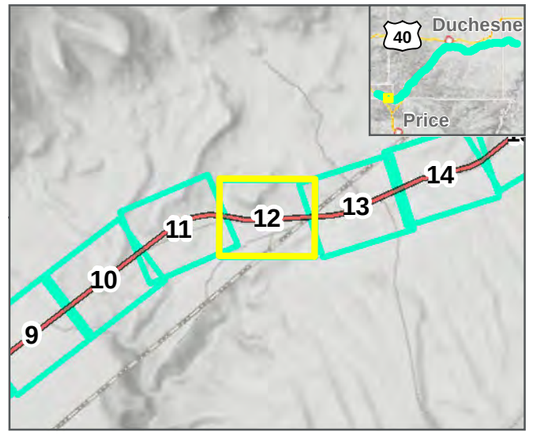

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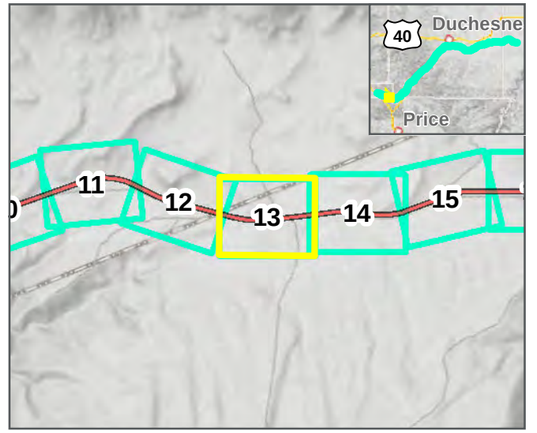

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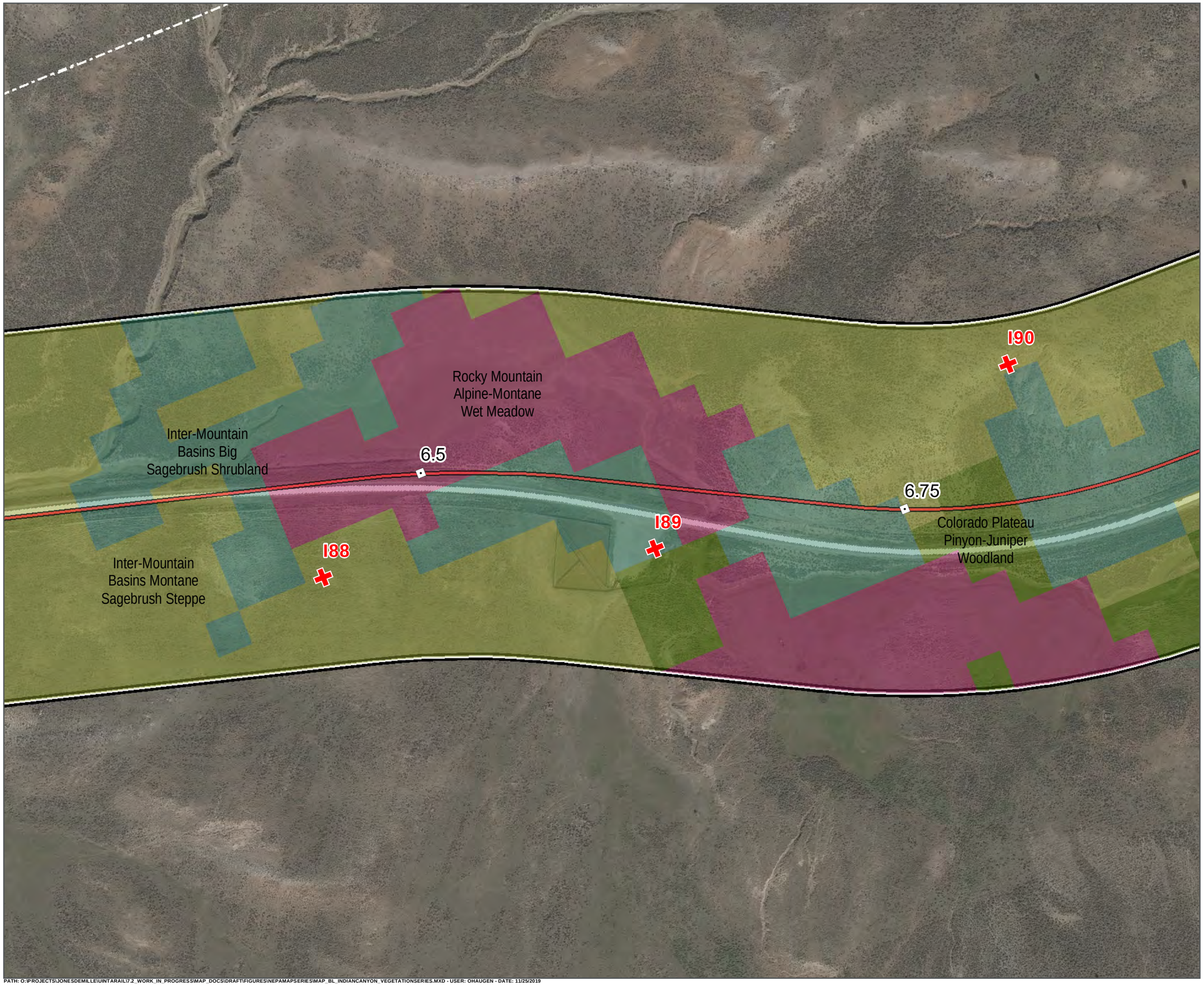

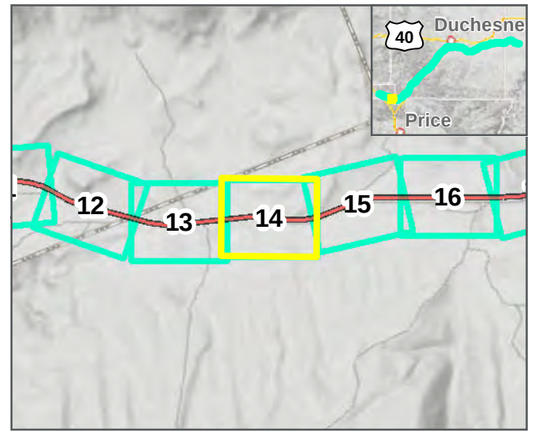

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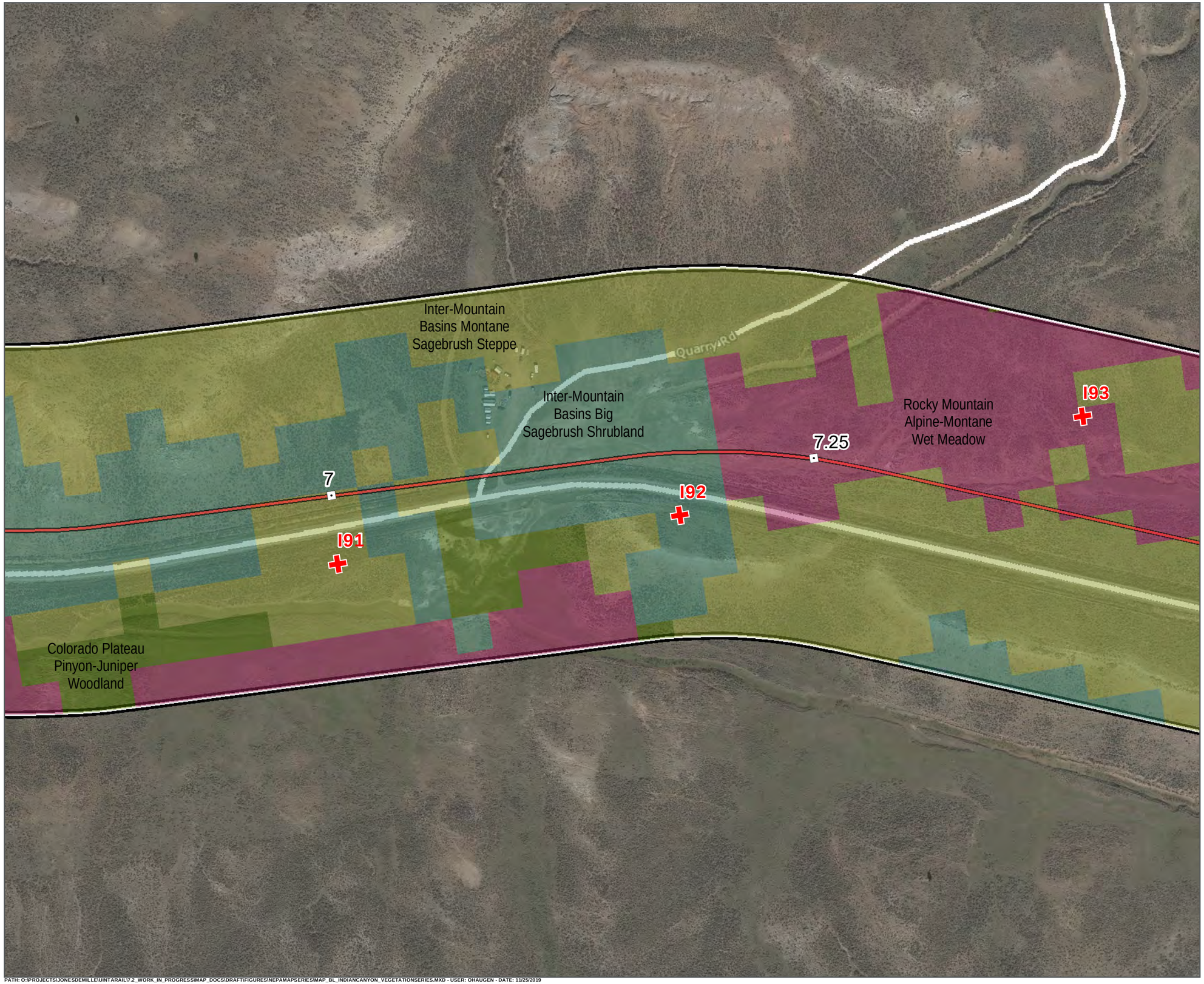

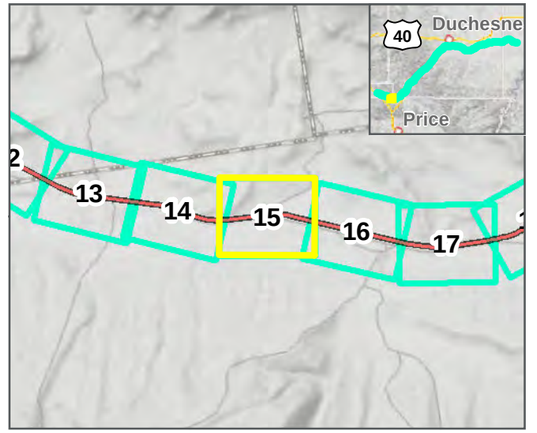

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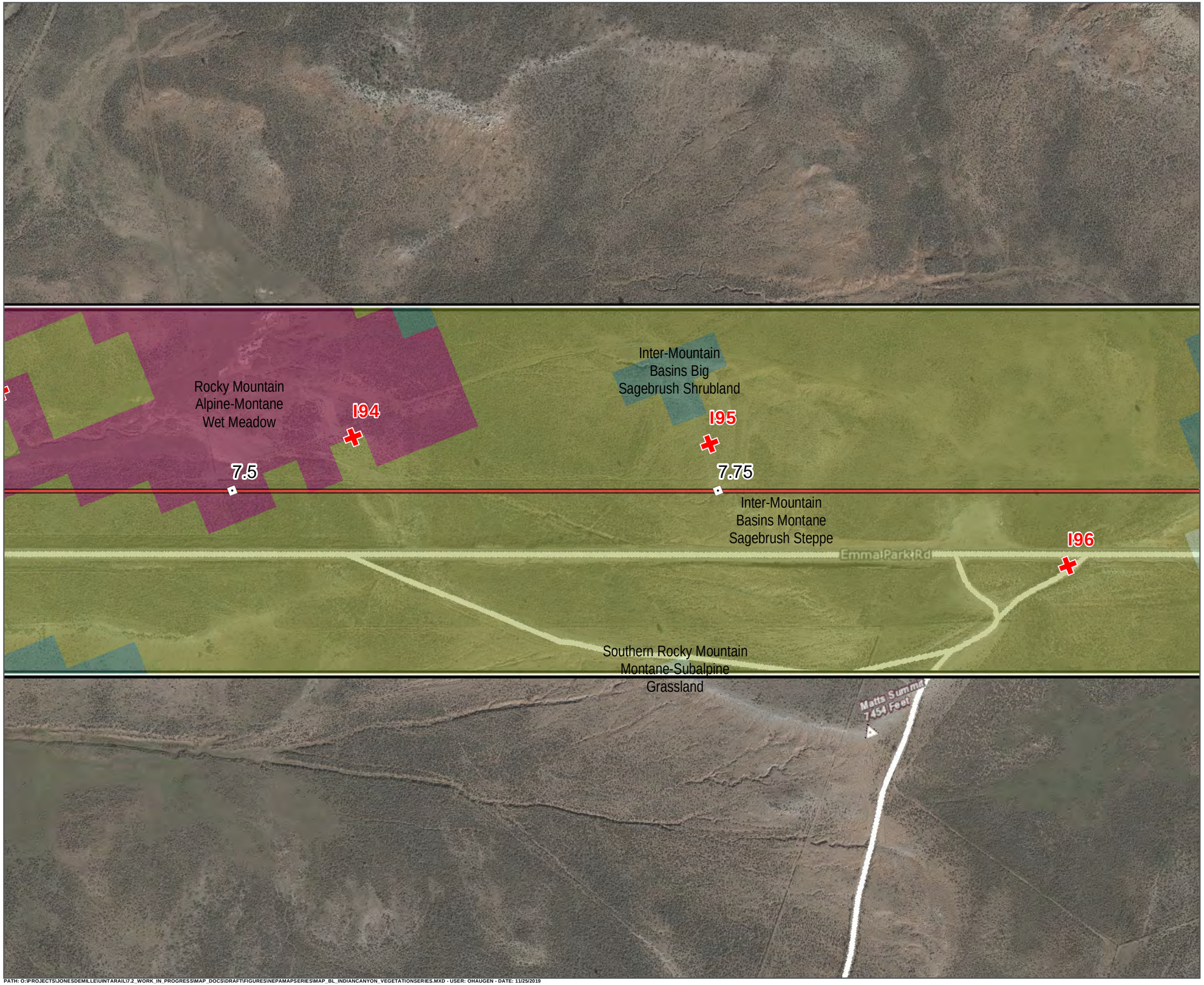

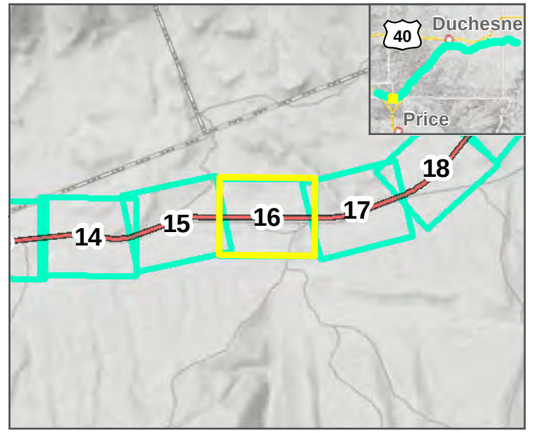

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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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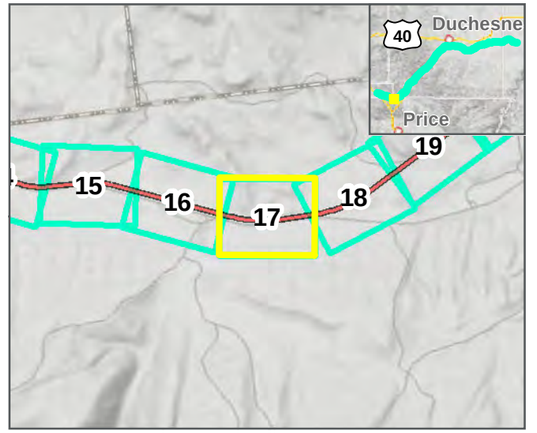

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Vegetation Communities

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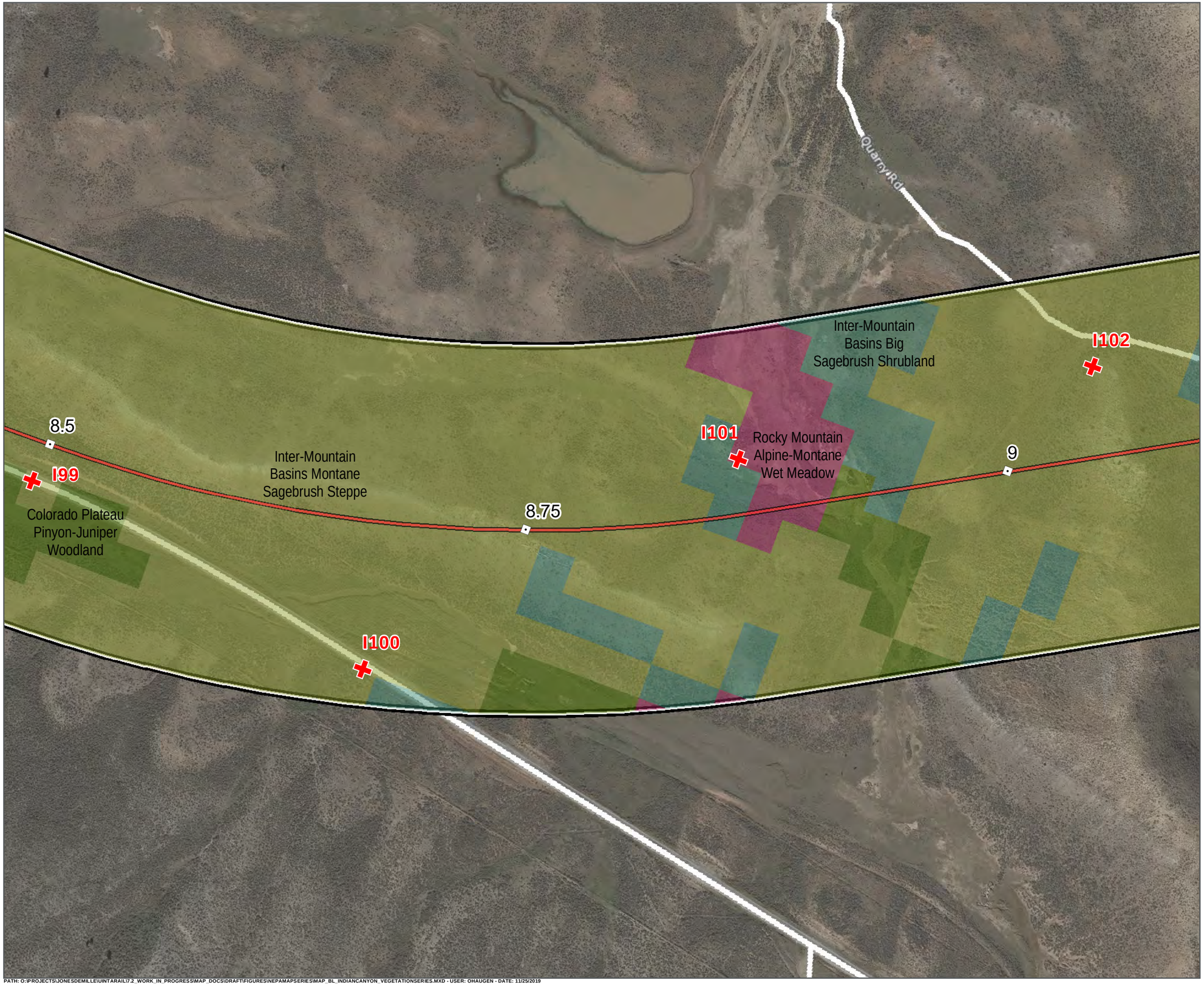

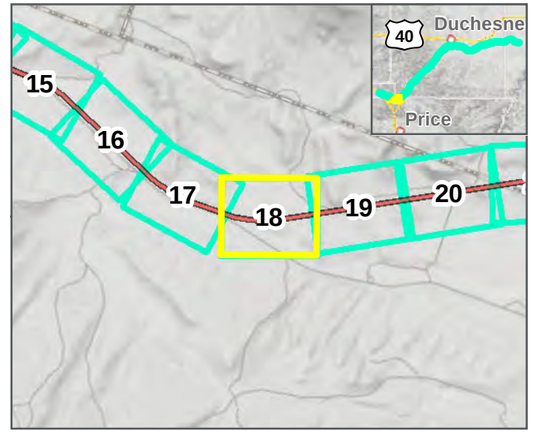

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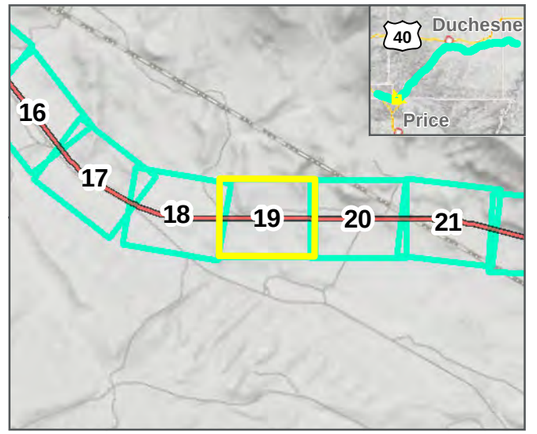

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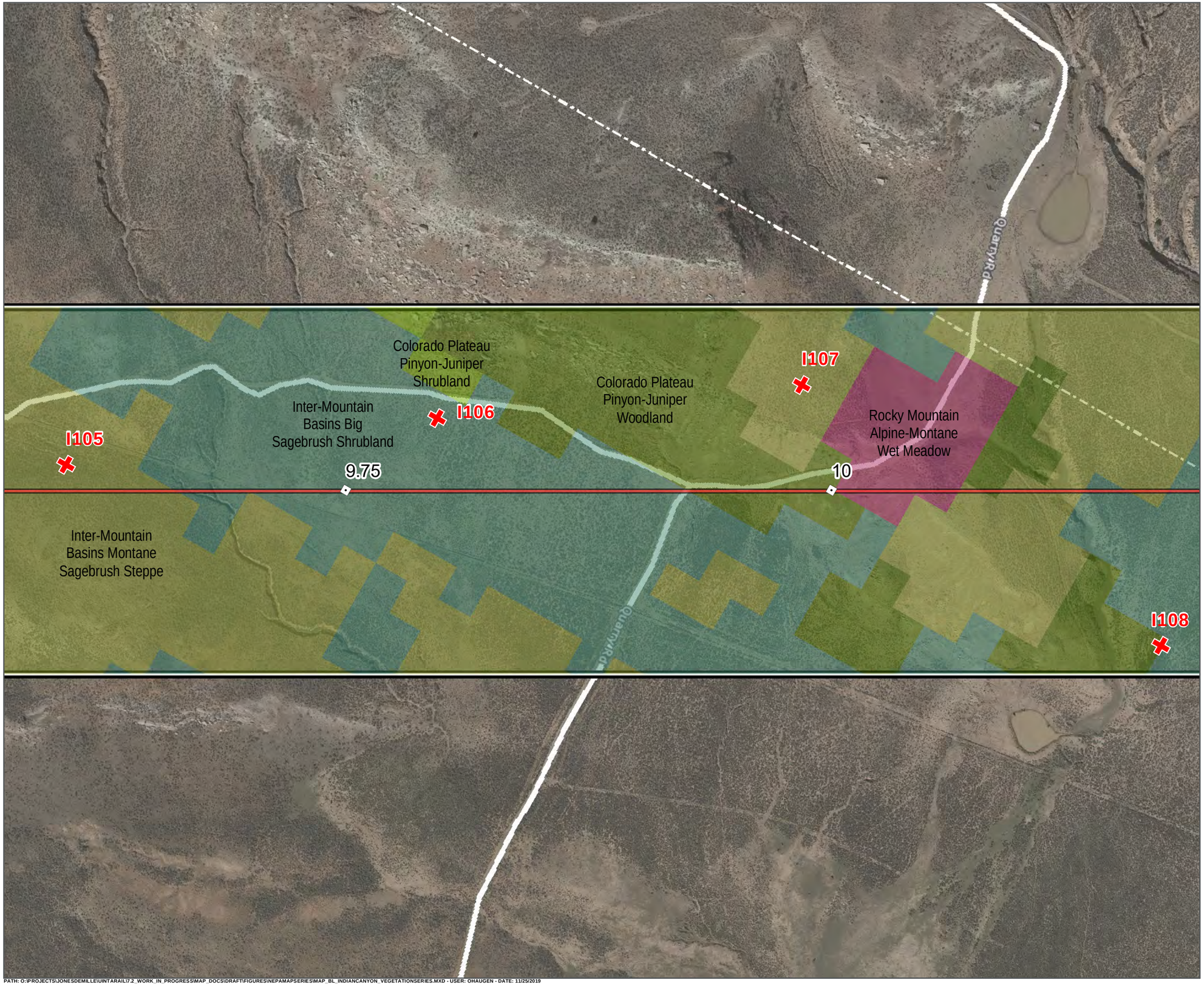

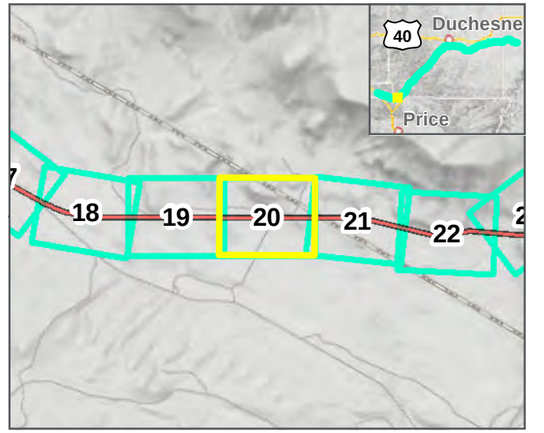

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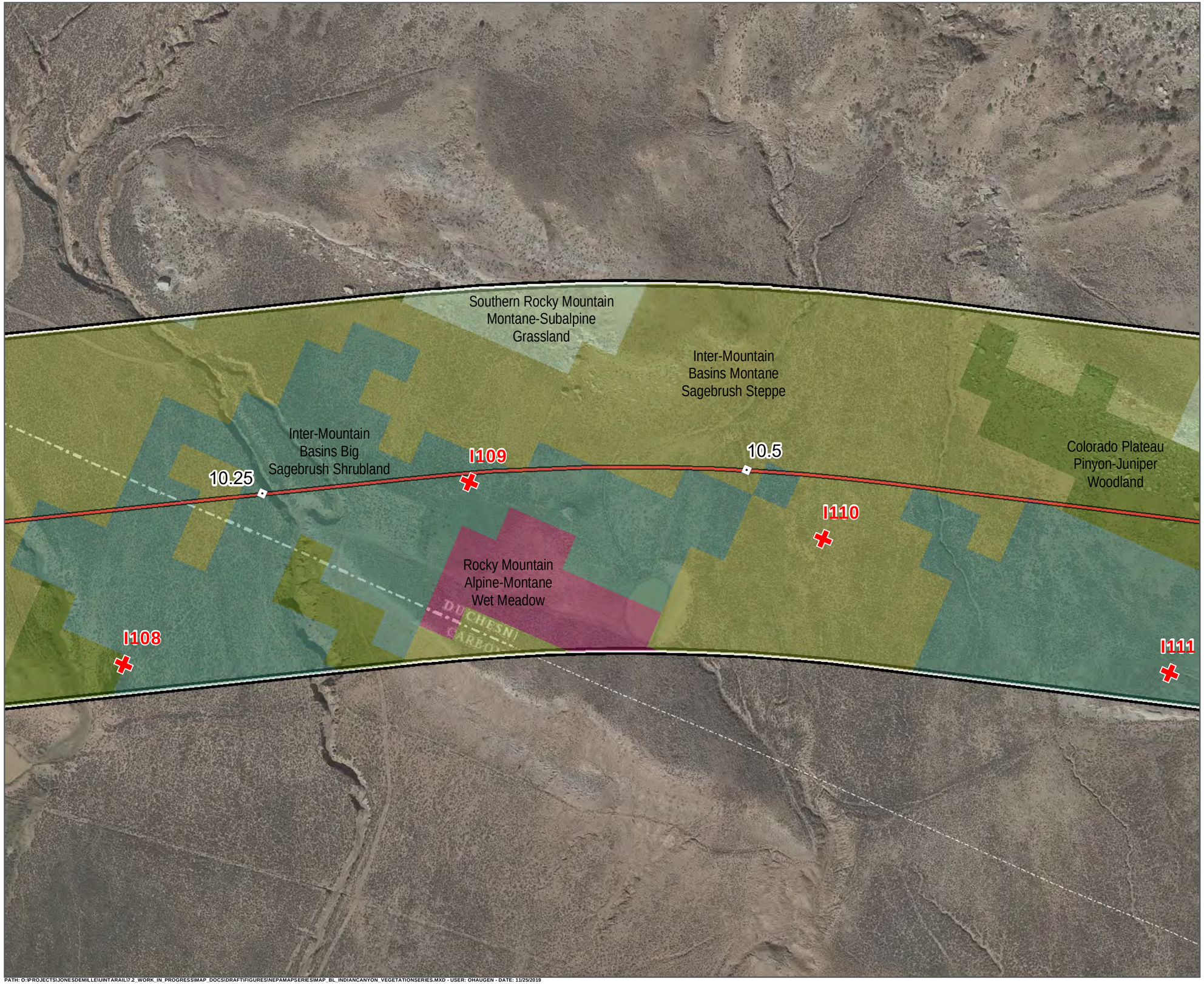

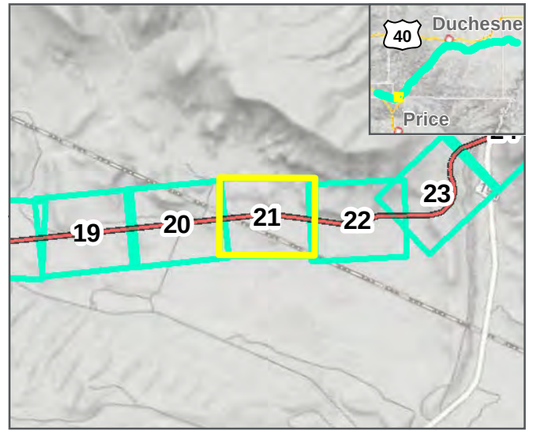

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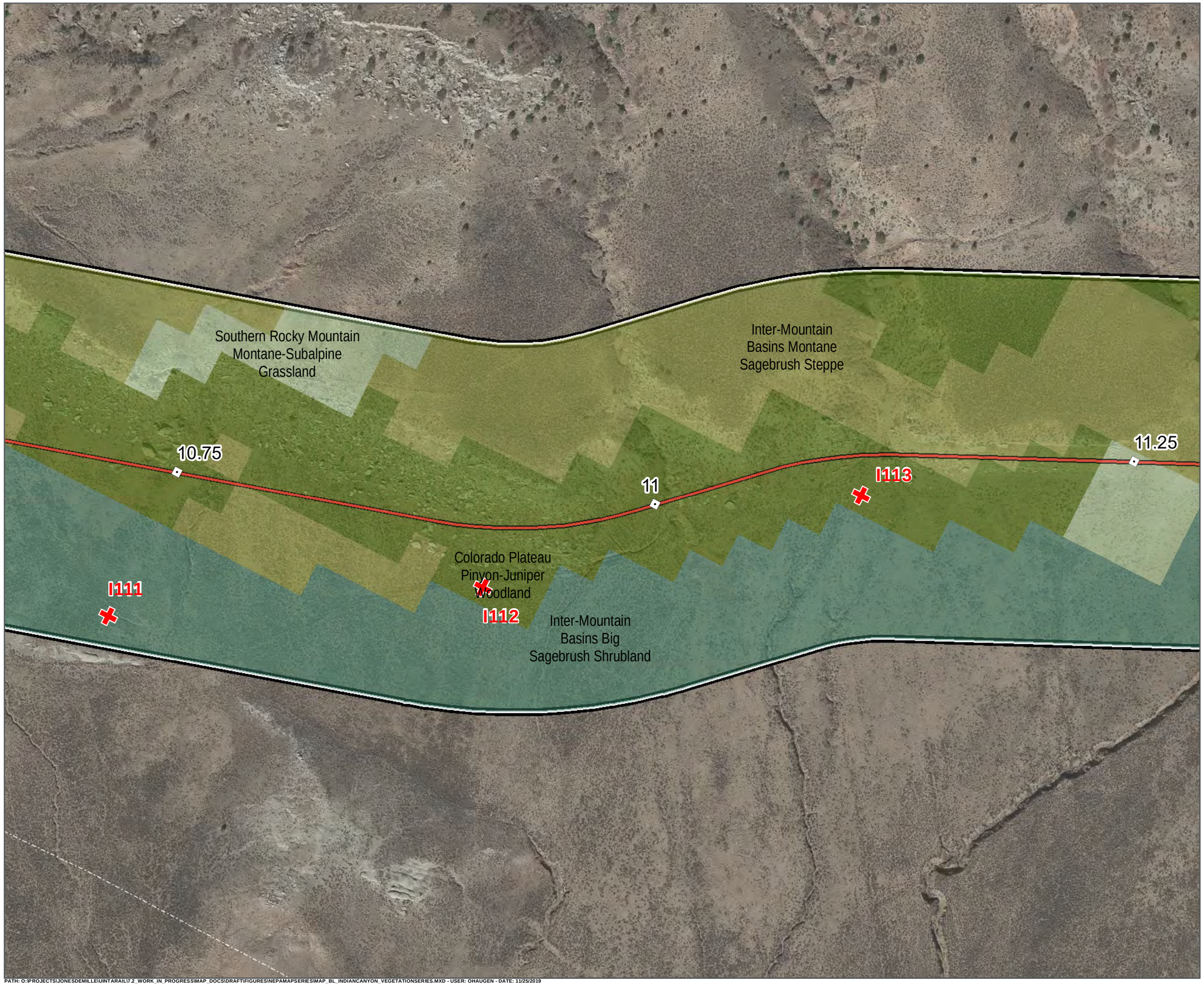

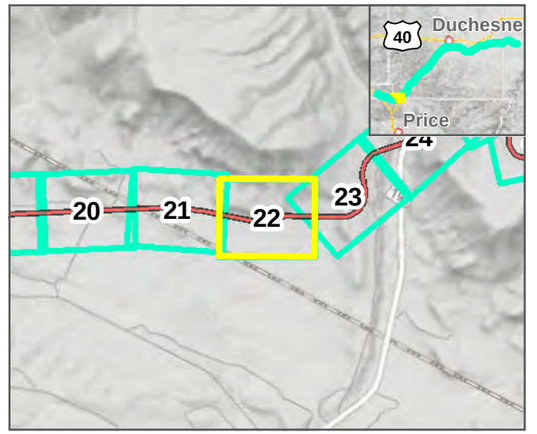

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Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Southern Rocky Mountain Montane-Subalpine Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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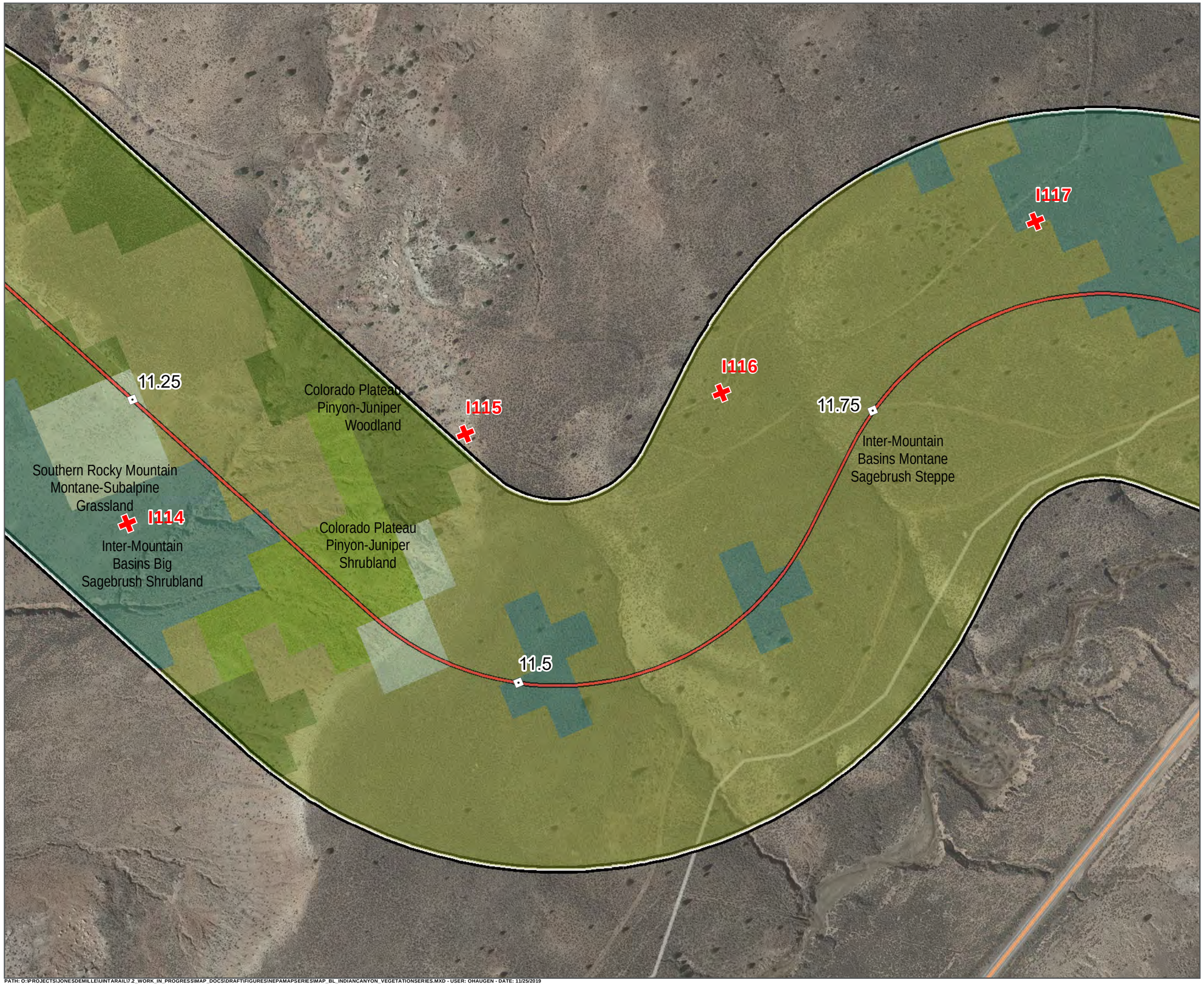

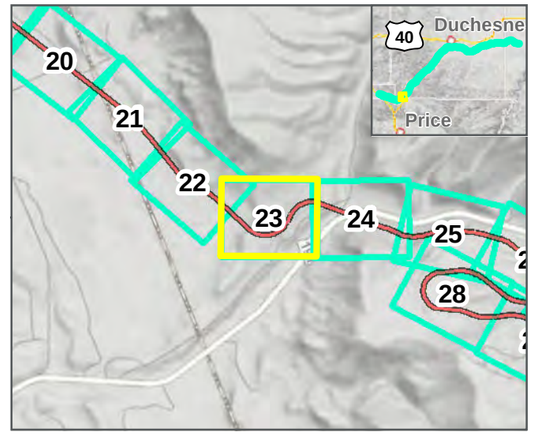

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Southern Rocky Mountain Montane-Subalpine Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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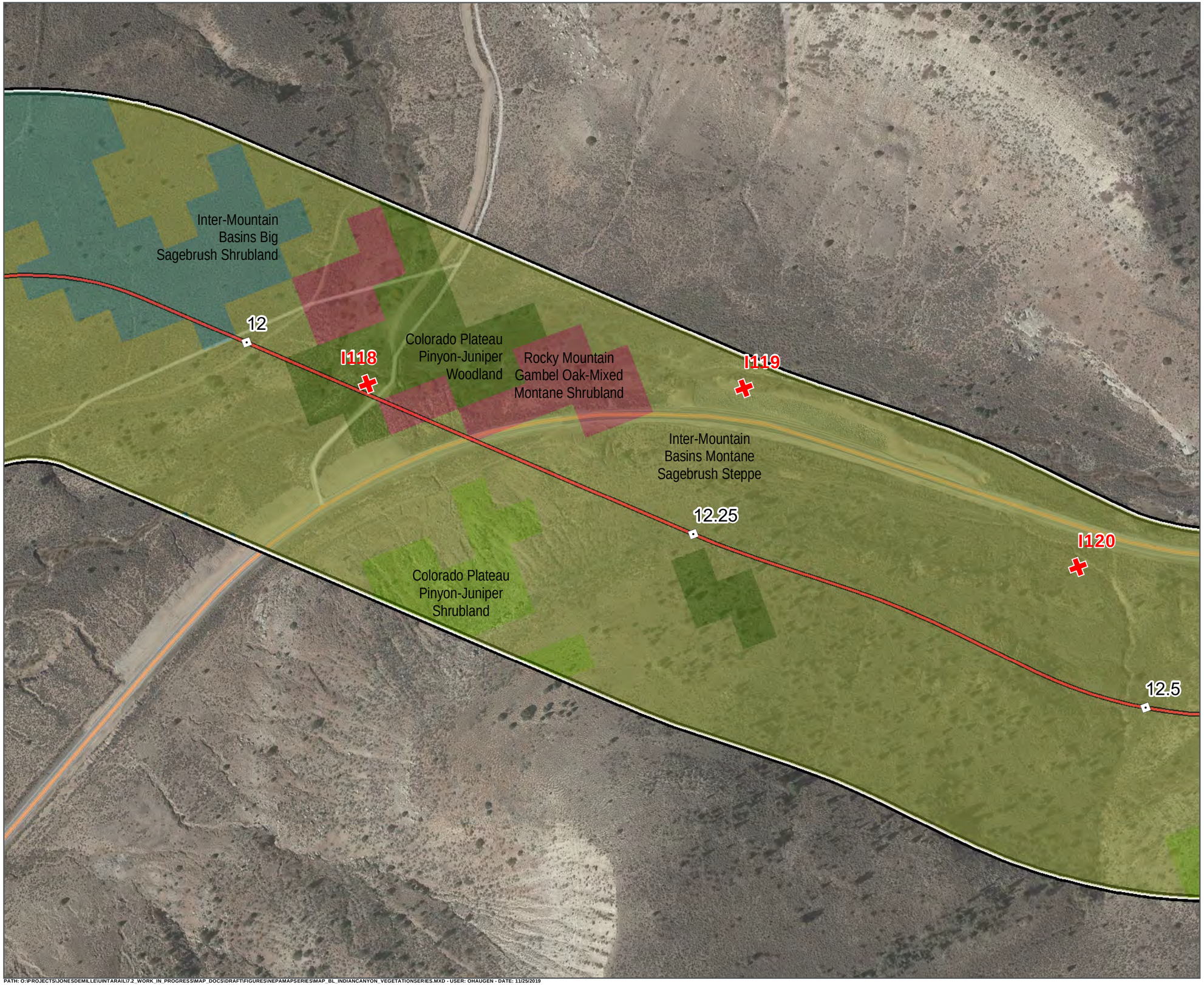

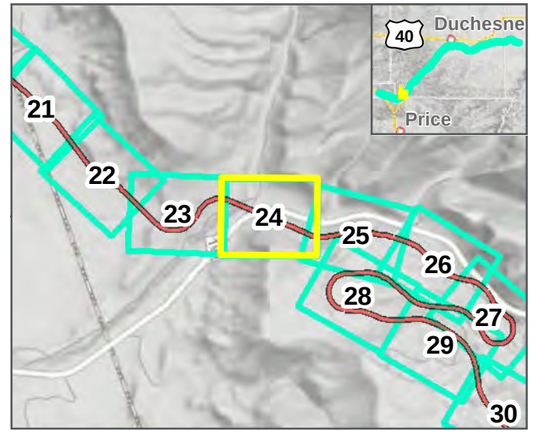

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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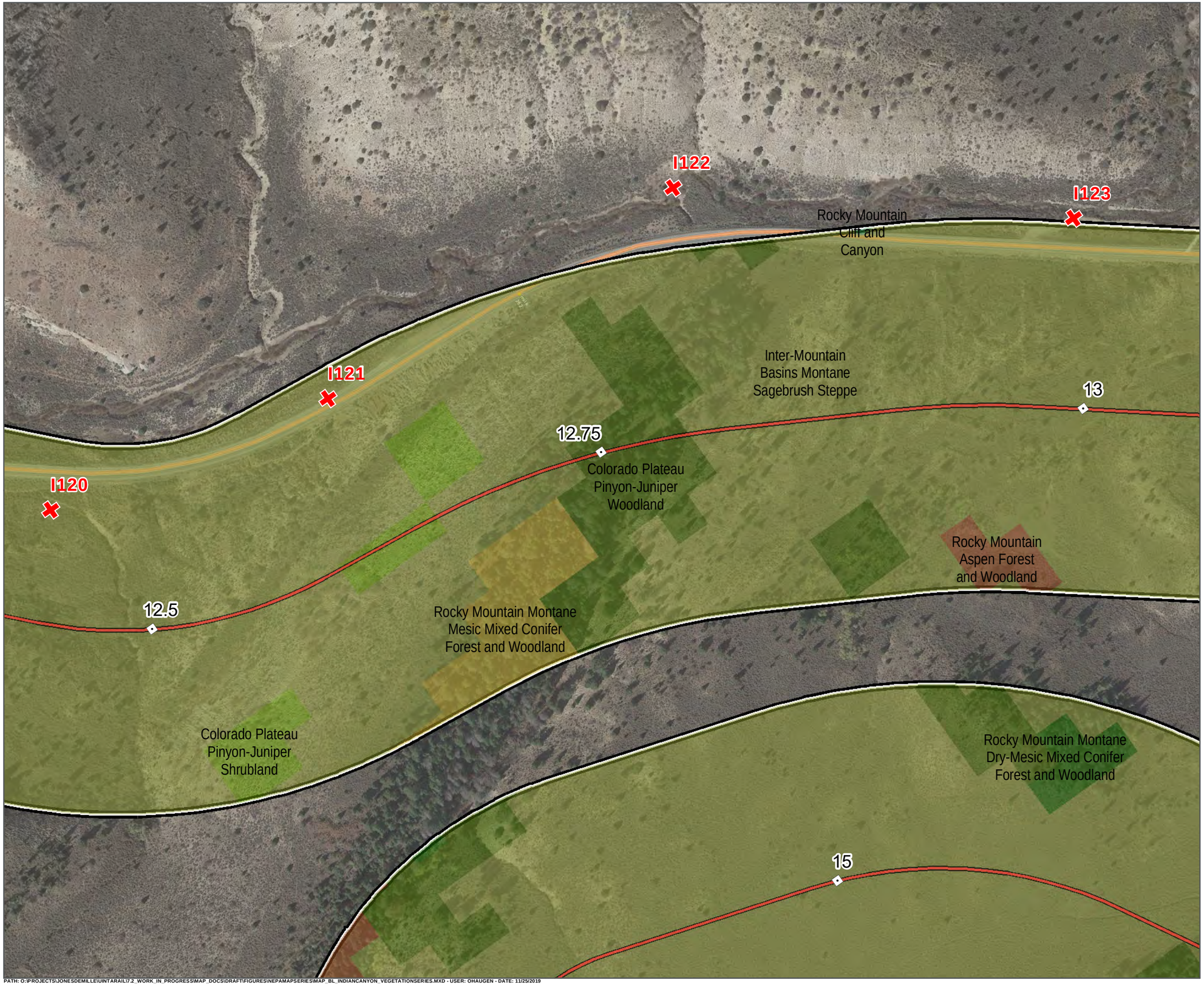

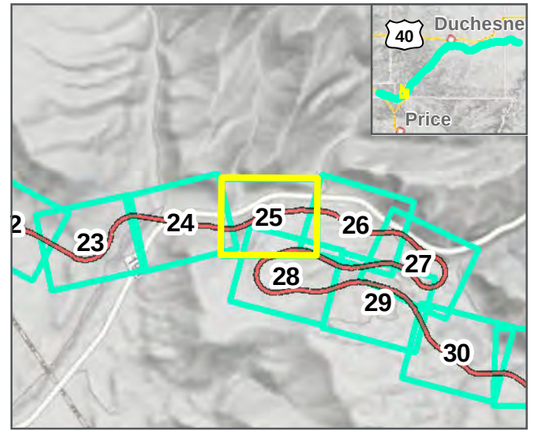

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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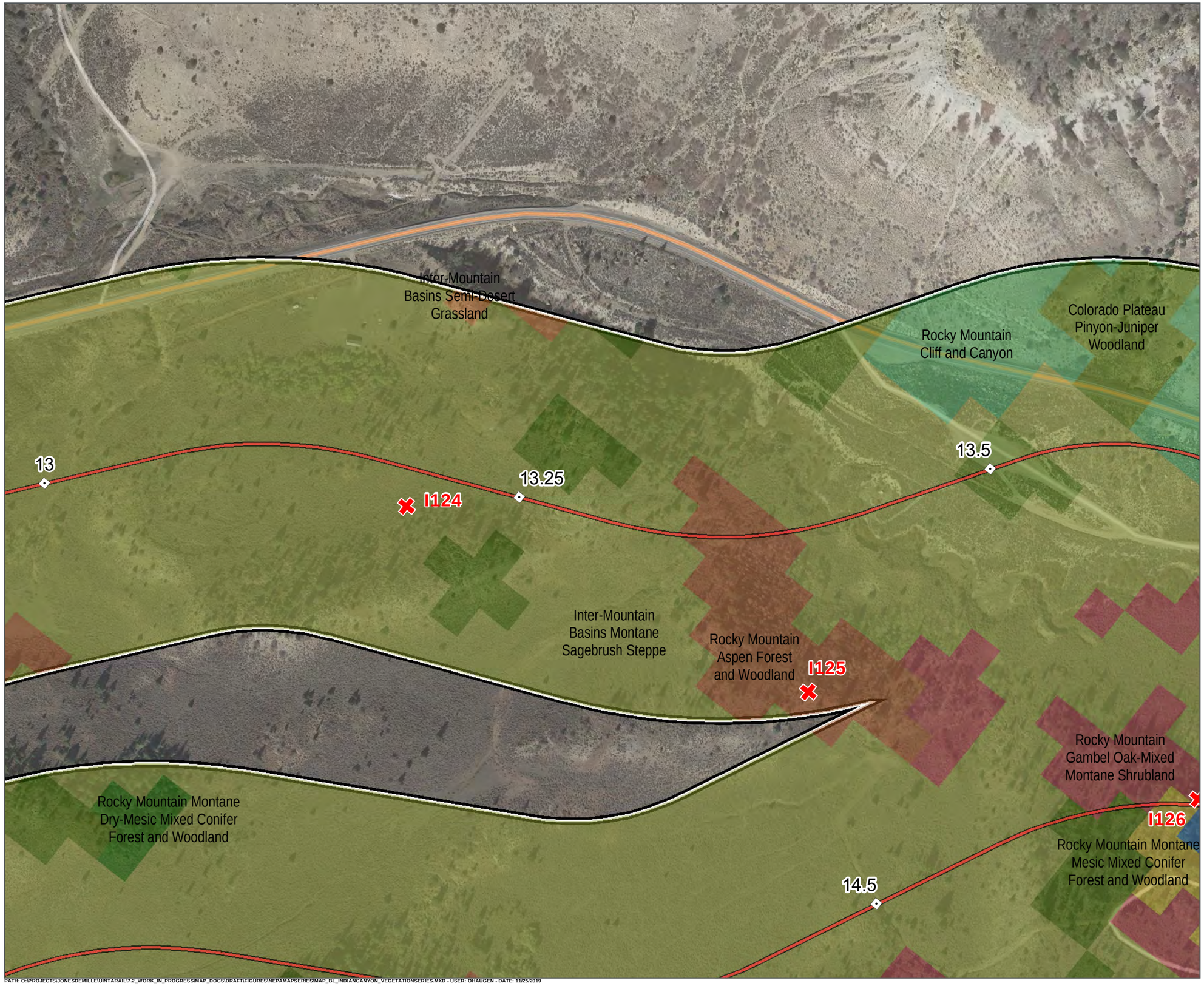

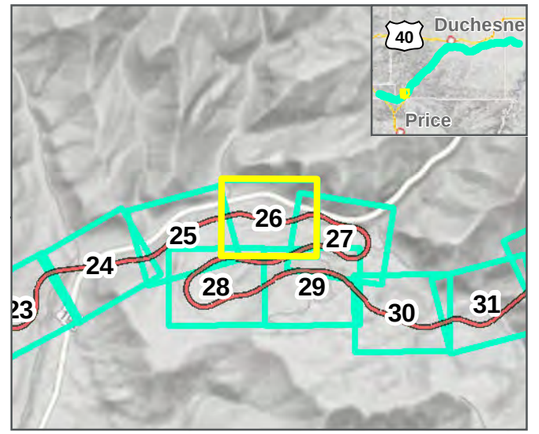

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain Basins Semi-Desert Grassland
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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Rocky Mountain Montane
Dry-Mesic Mixed Conifer
Forest and Woodland

Rocky Mountain
Cliff and
Canyon

Colorado Plateau
Pinyon-Juniper
Woodland

Rocky Mountain
Gambel Oak-Mixed
Montane Shrubland

Rocky Mountain Lower
Montane Riparian
Woodland and Shrubland

Rocky Mountain Montane
Mesic Mixed Conifer
Forest and Woodland

Inter-Mountain
Basins Montane
Sagebrush Steppe

Rocky Mountain
Aspen Forest
and Woodland

13.5
13.75
14
14.25
14.5
16
16.25

I230
I127
I126

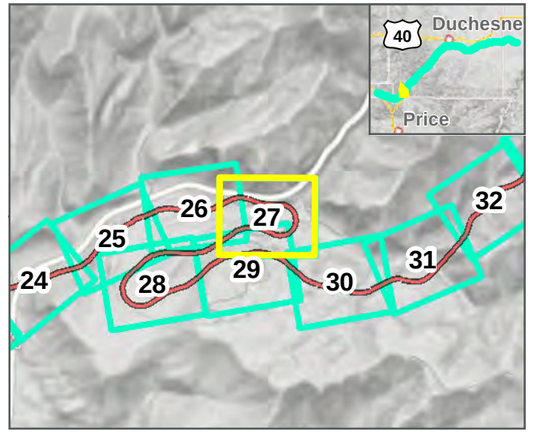

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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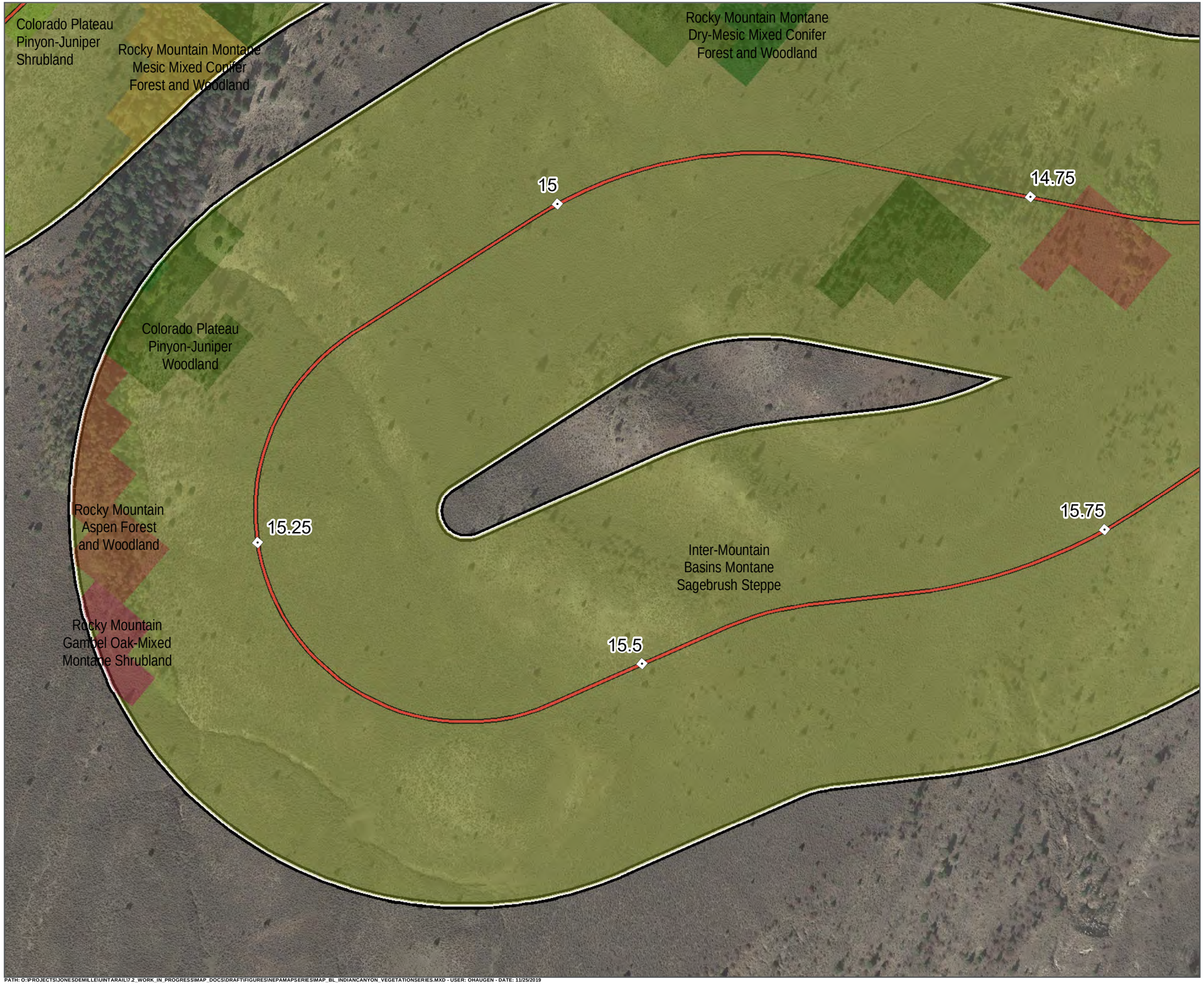

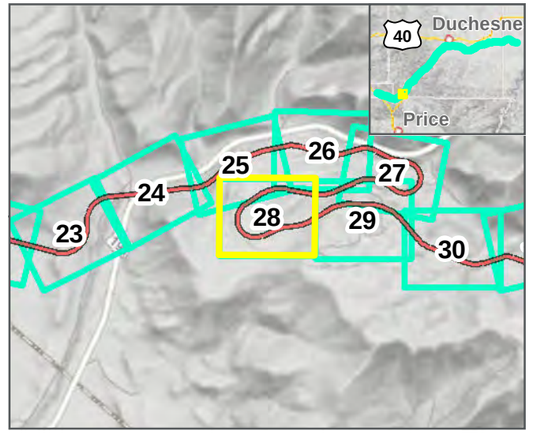

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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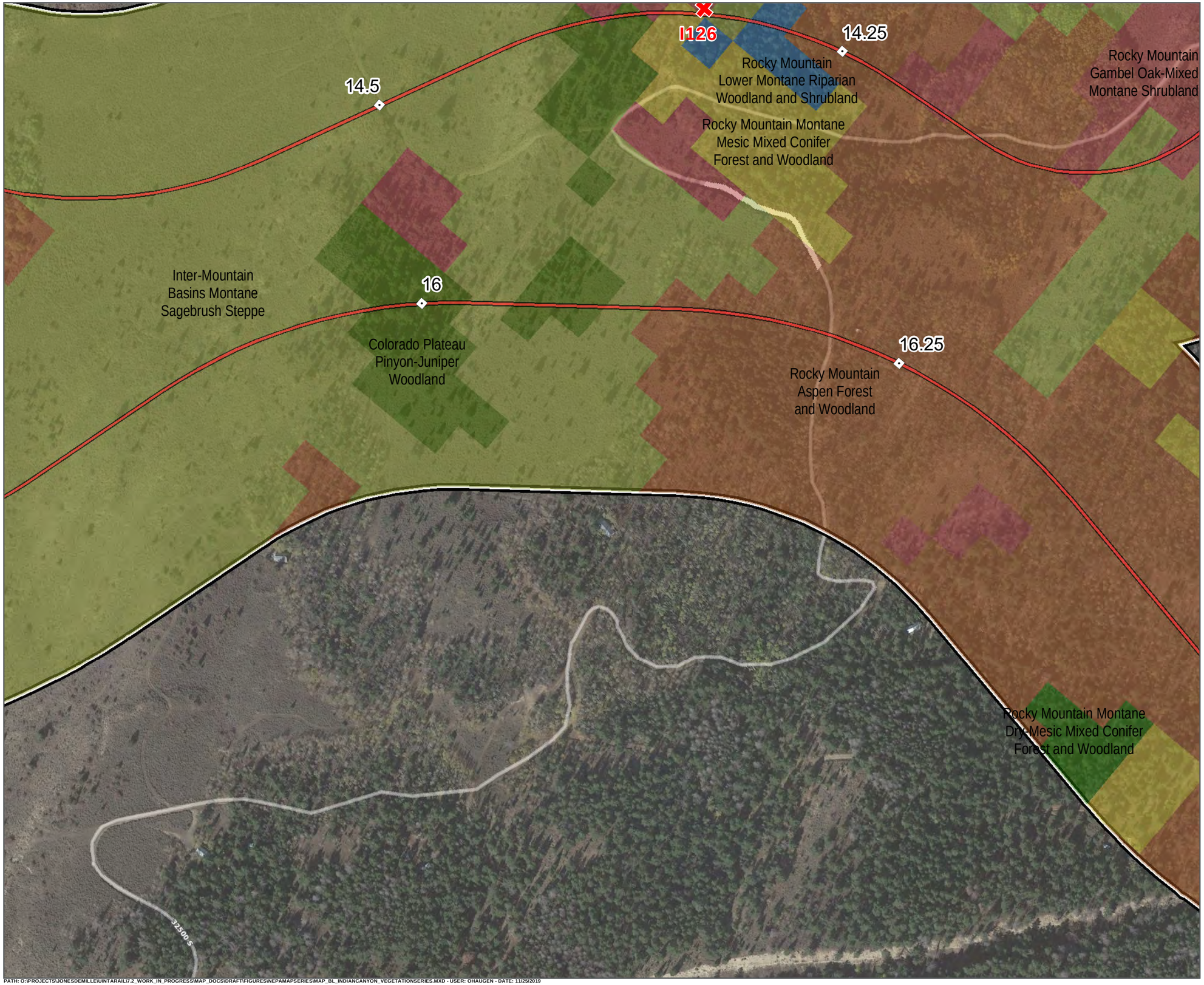

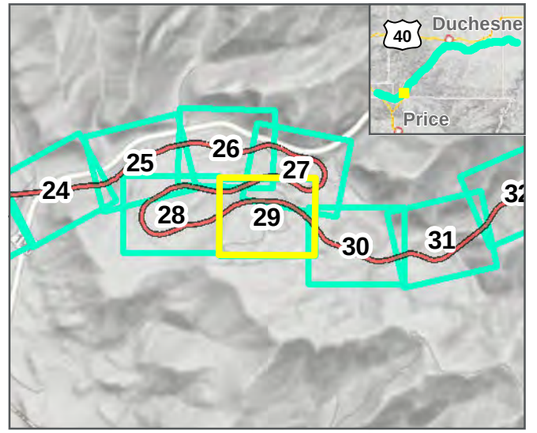

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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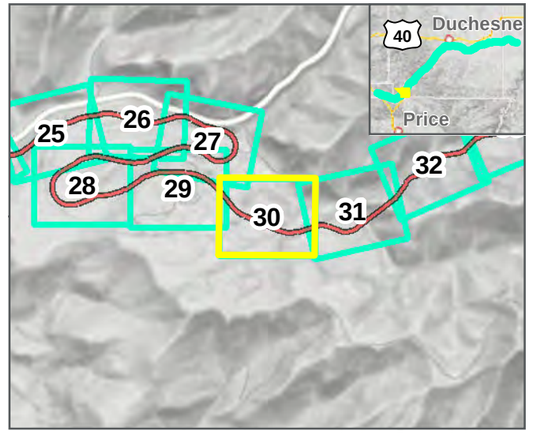

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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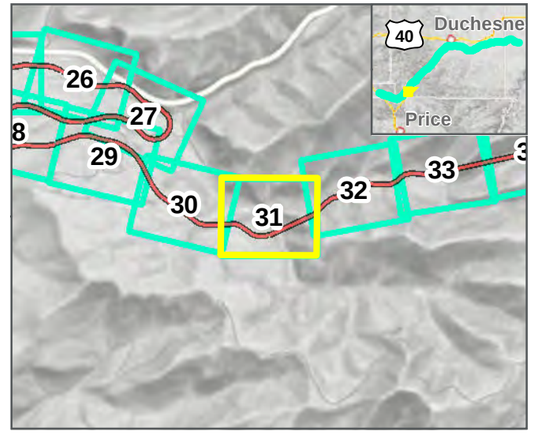

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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SEVEN COUNTY INFRASTRUCTURE COALITION

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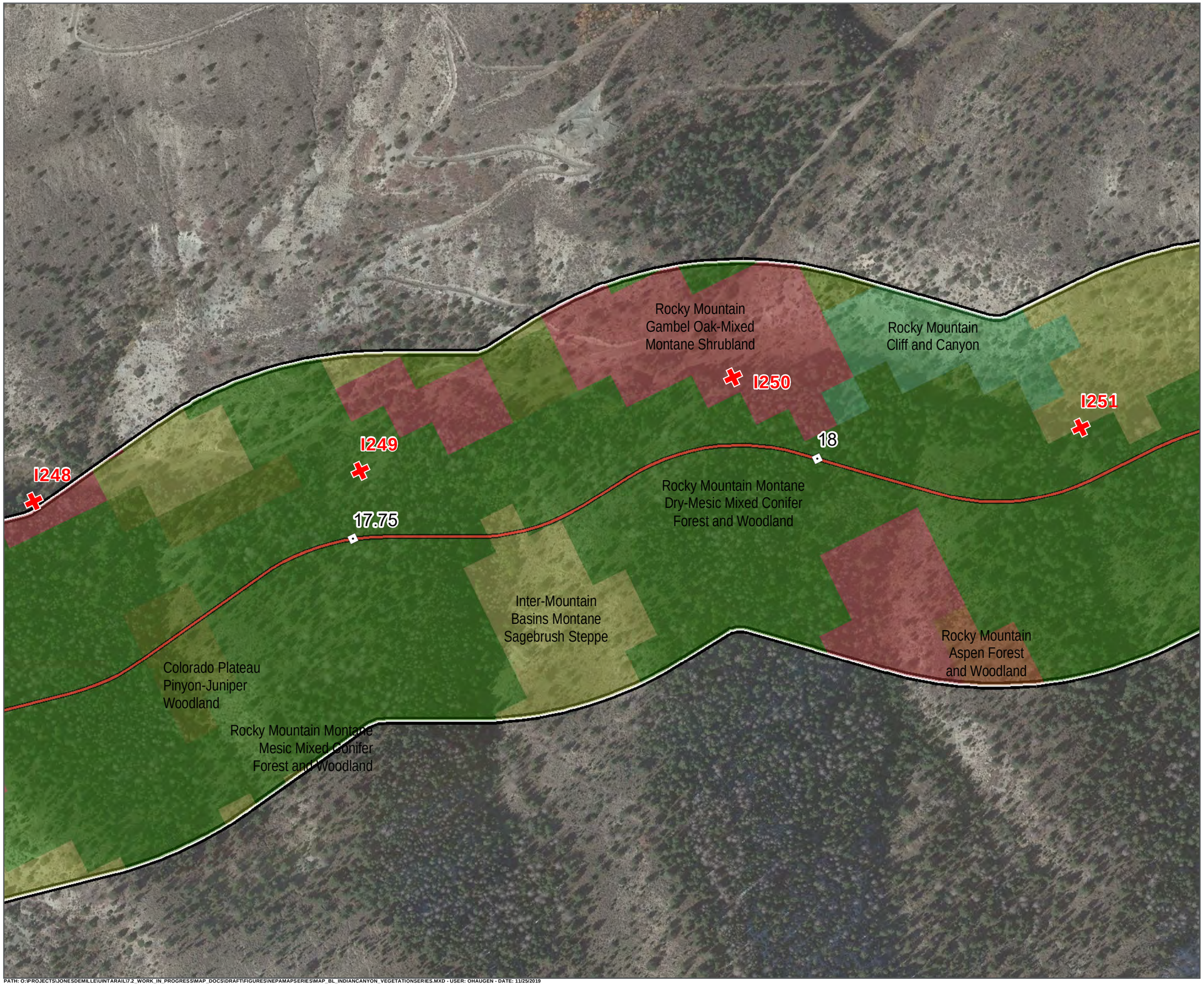

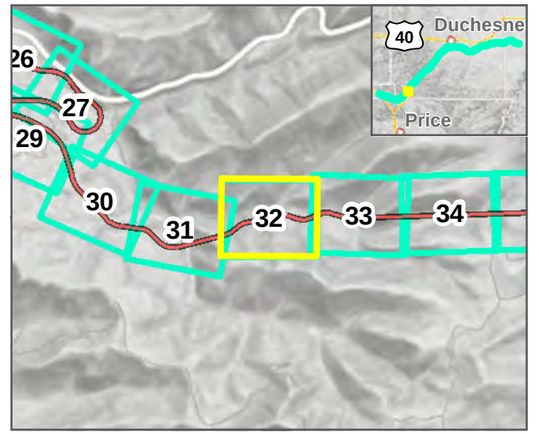

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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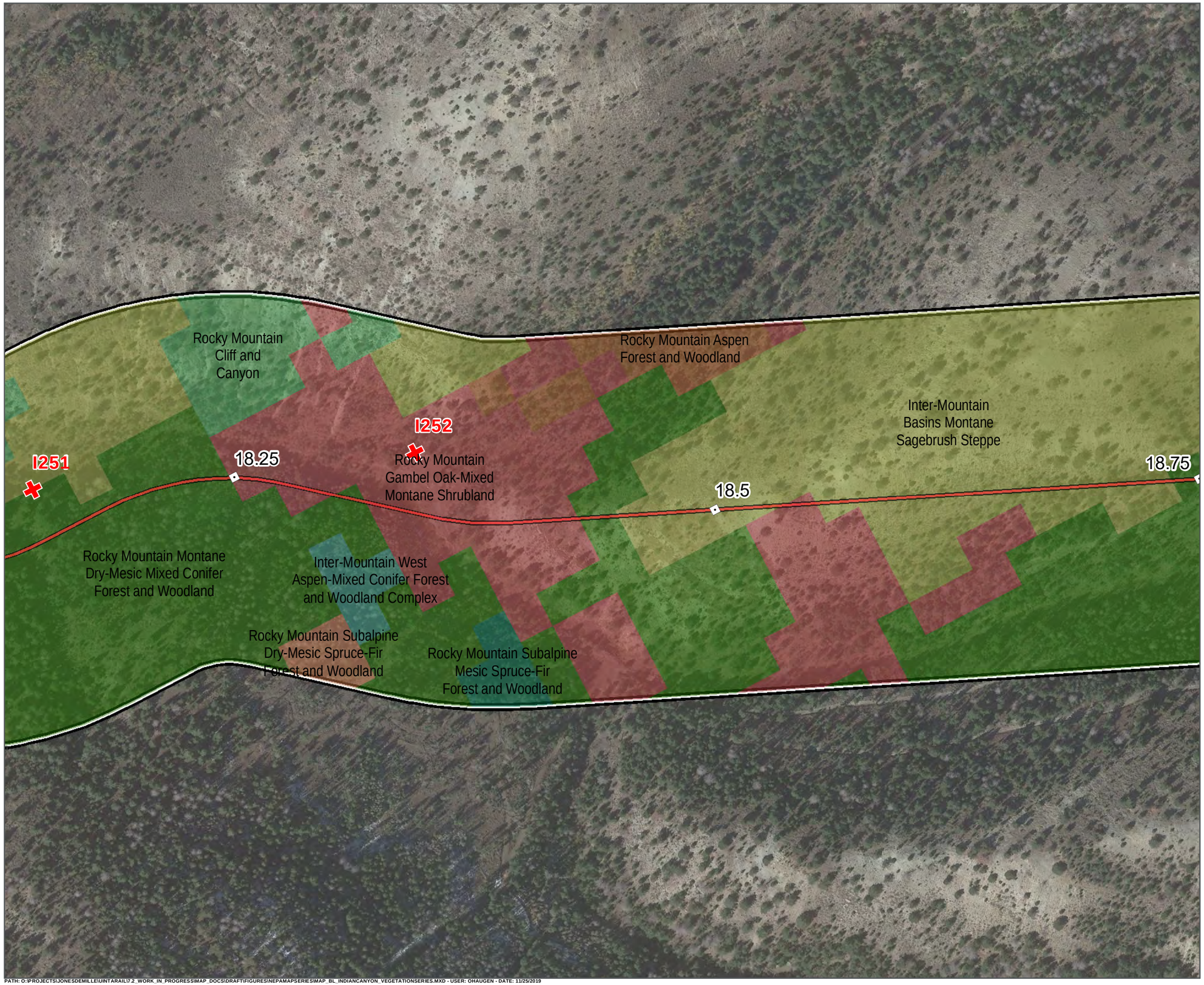

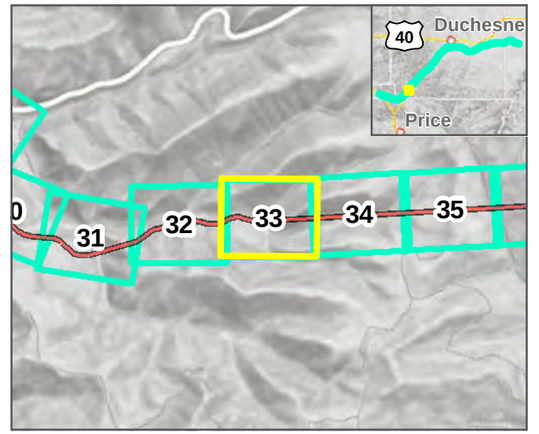

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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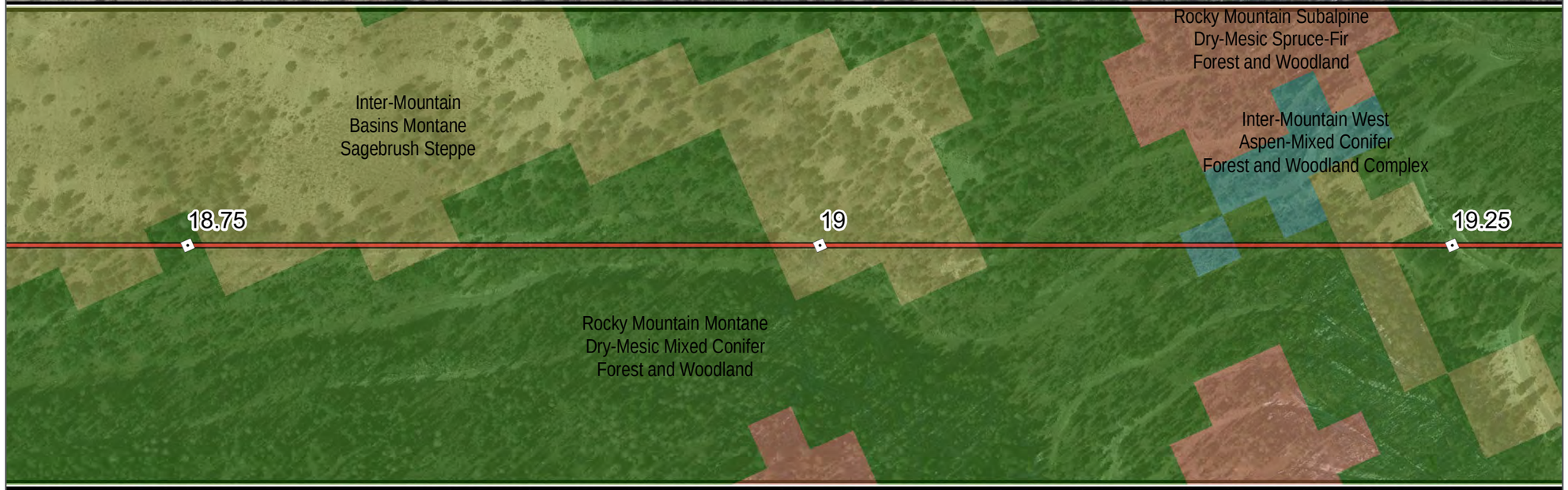

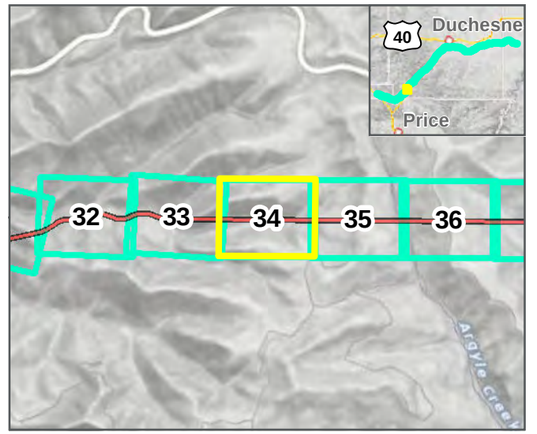

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
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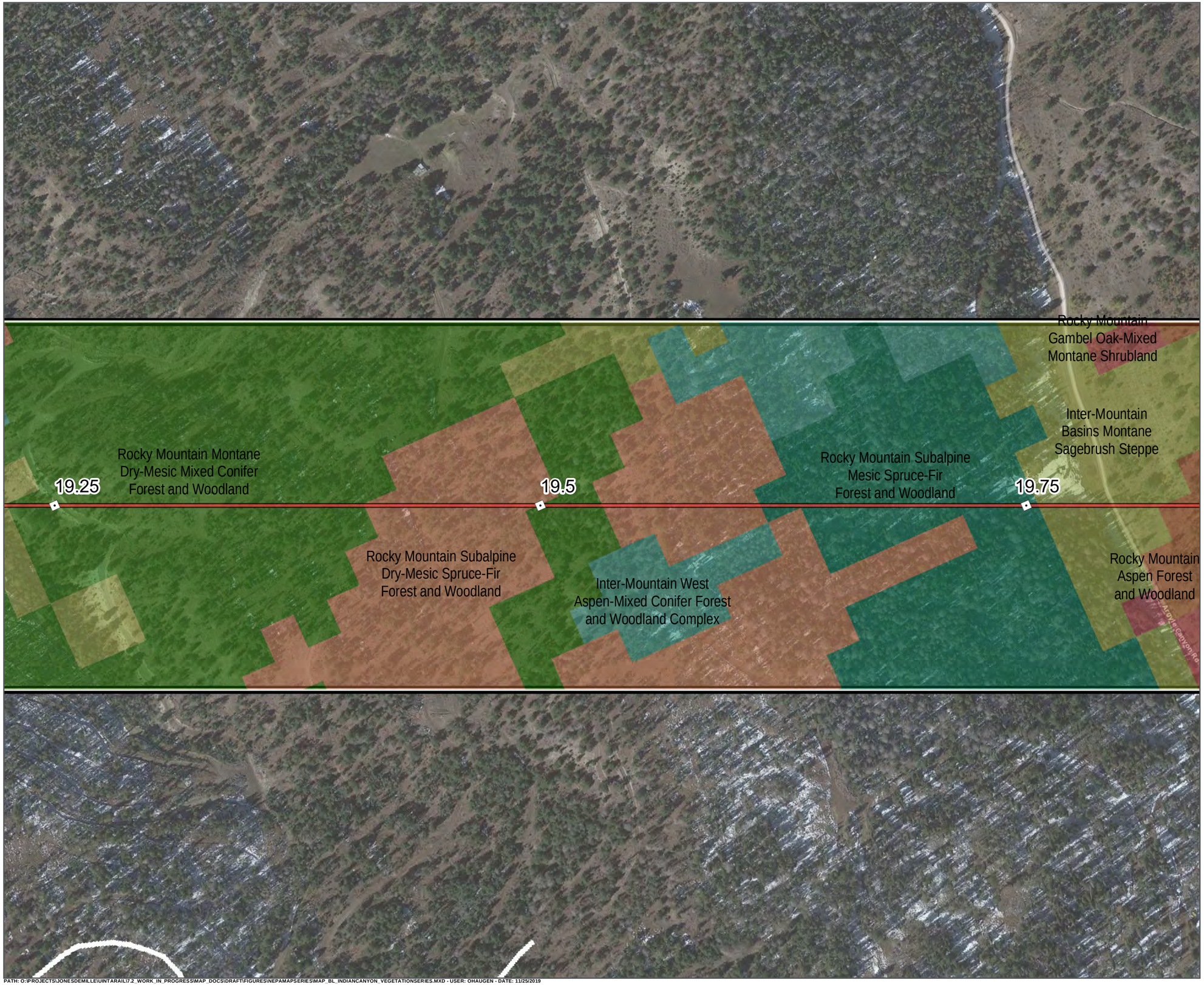

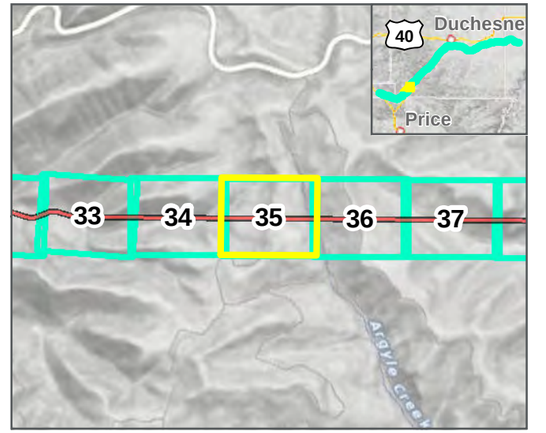

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Mileposts
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Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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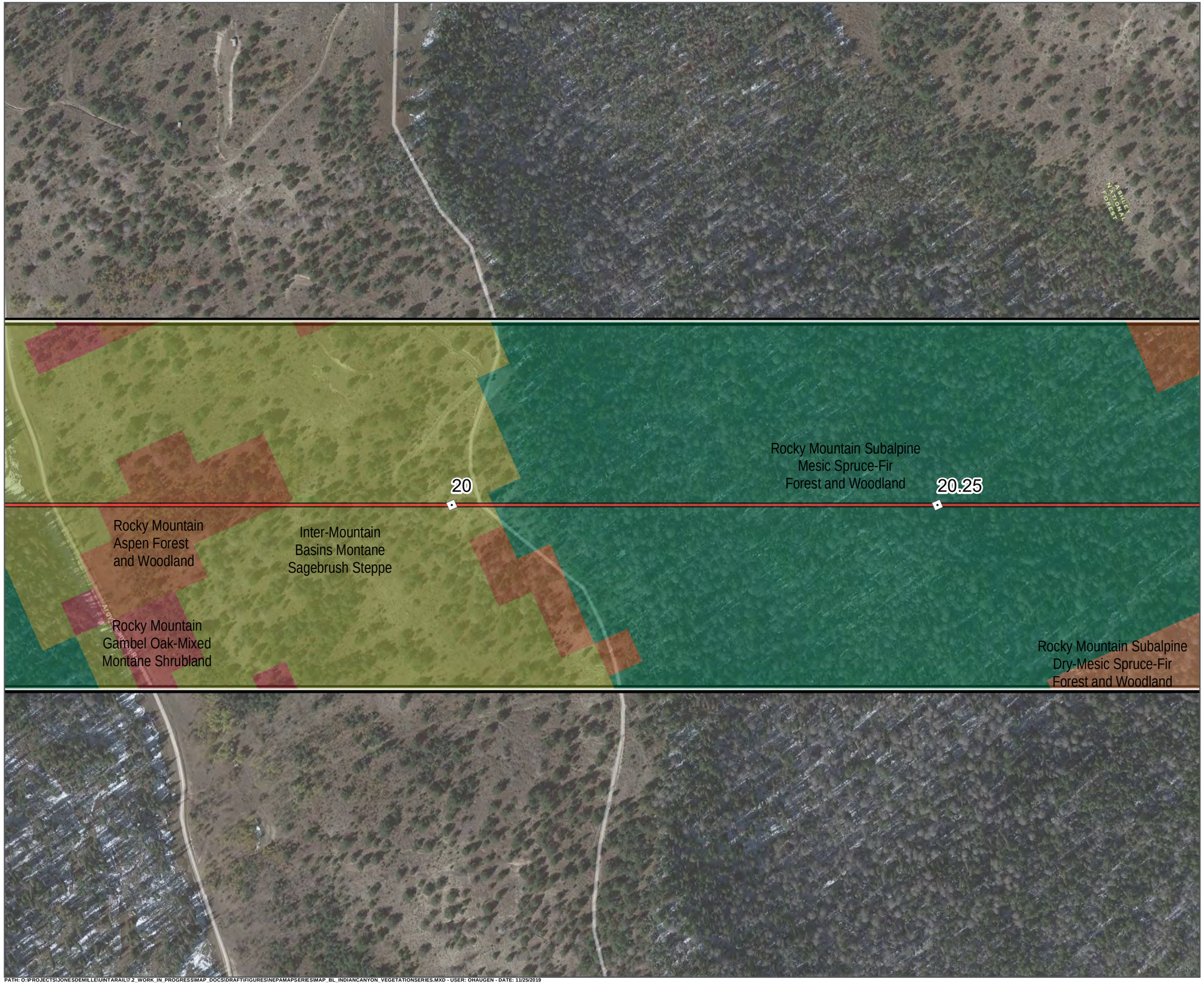

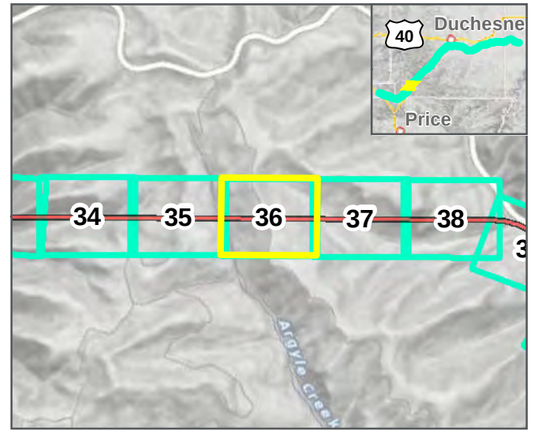

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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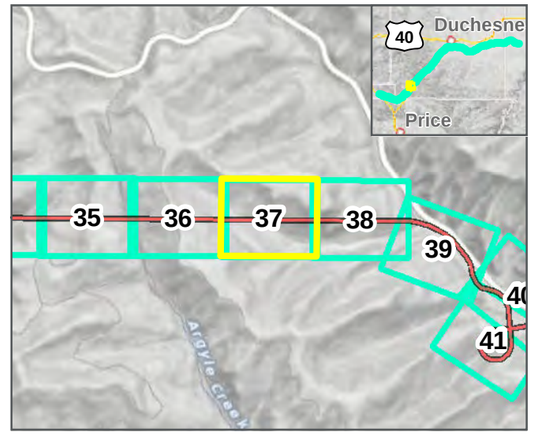

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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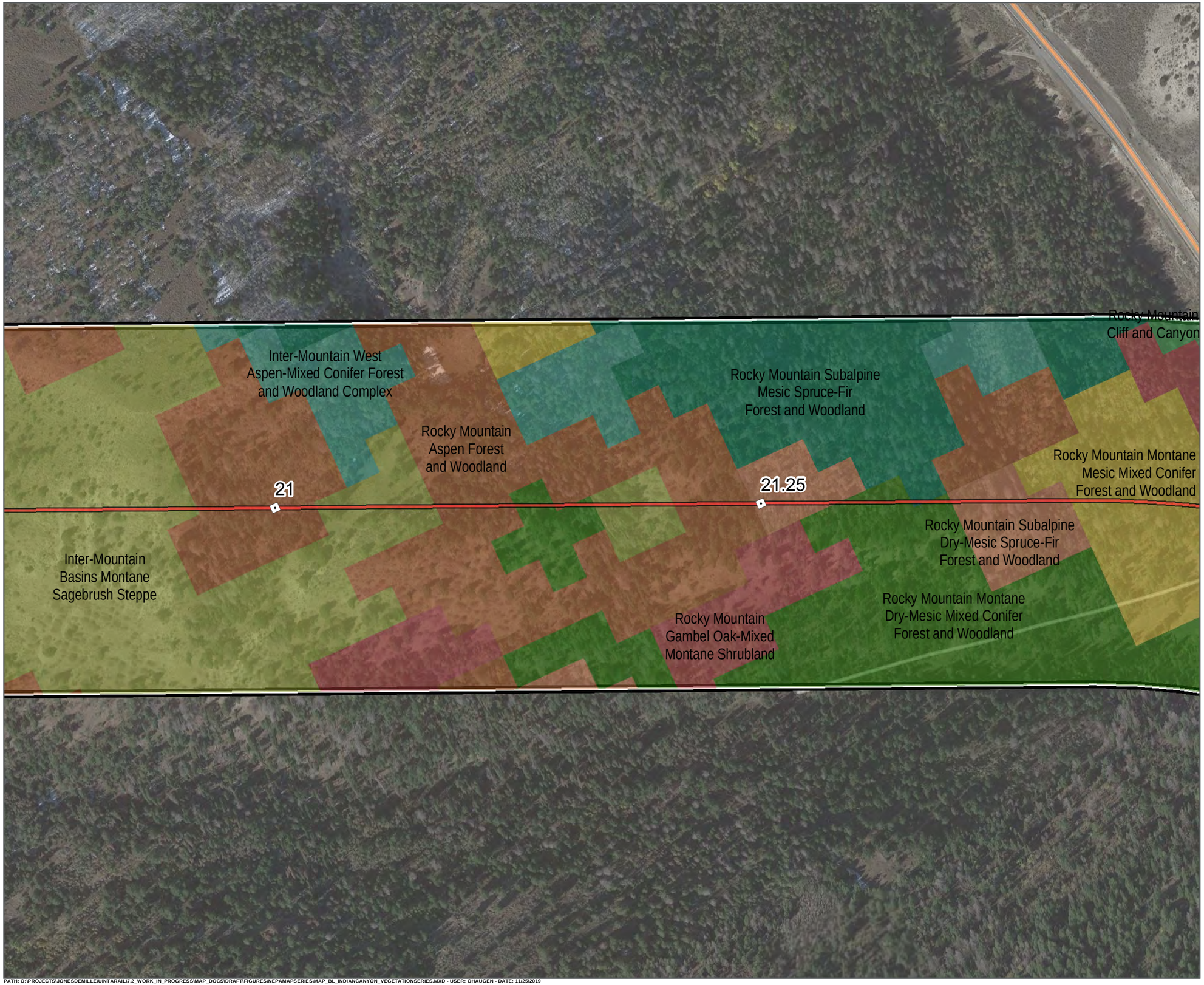

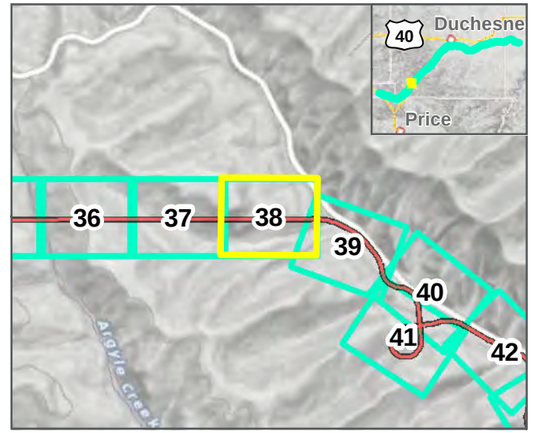

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Study Area
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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

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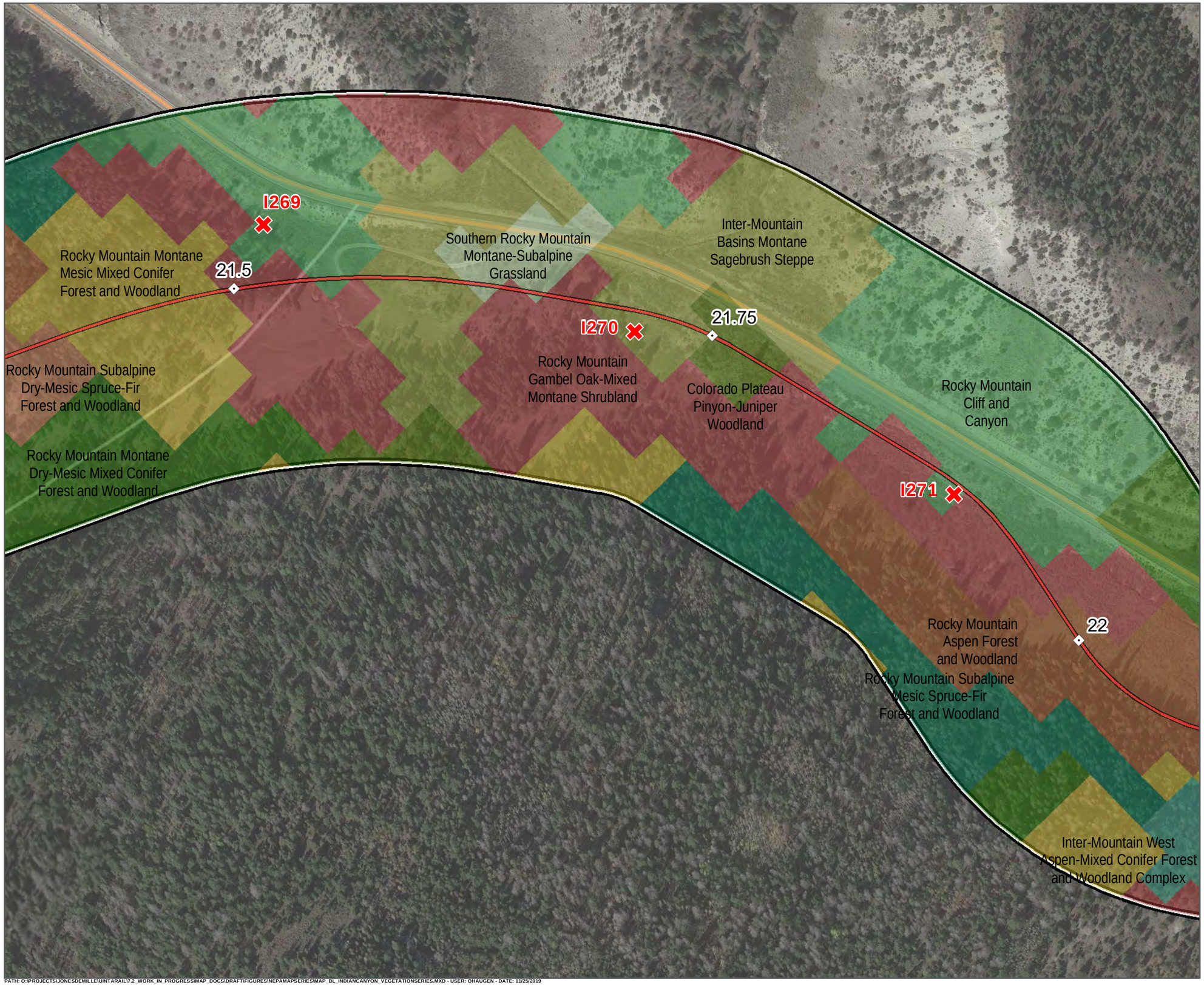

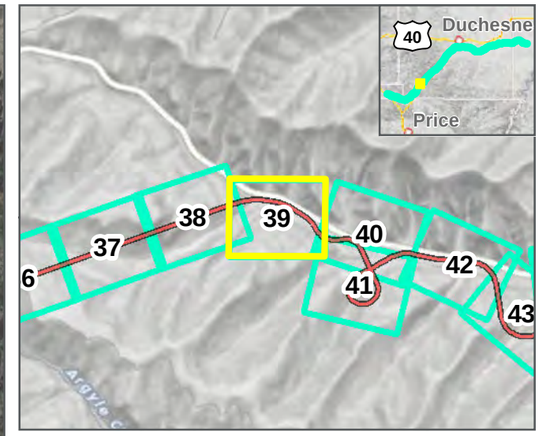

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Mileposts
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Study Area
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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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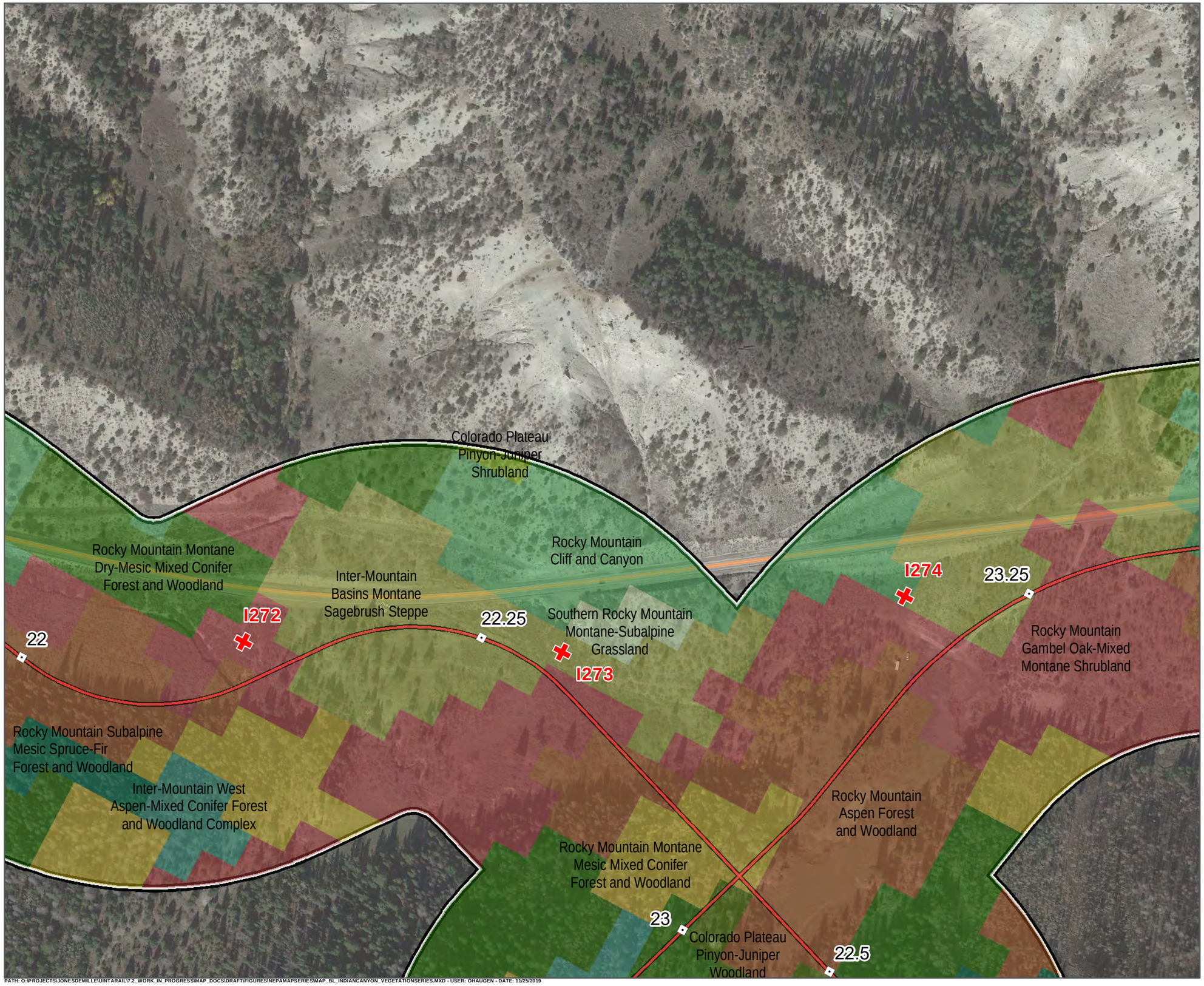

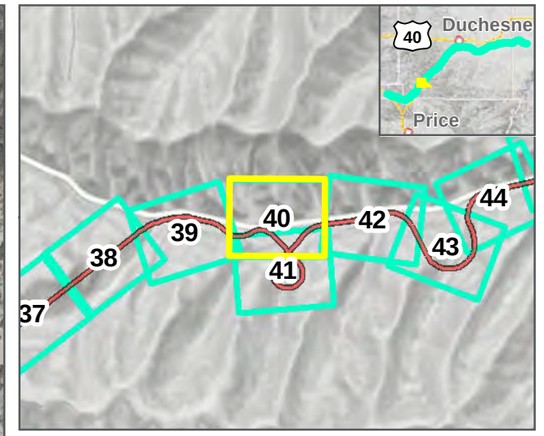

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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
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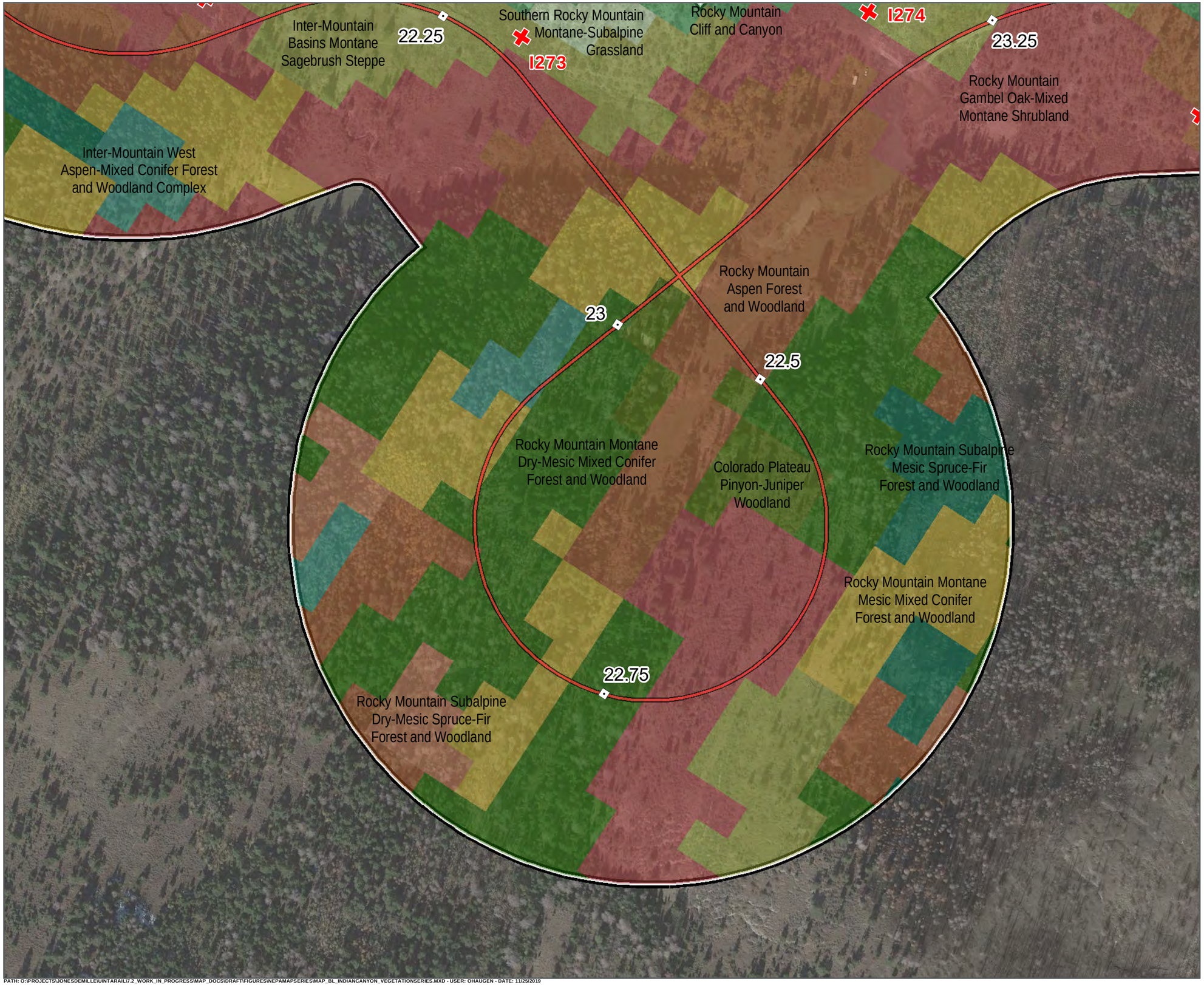

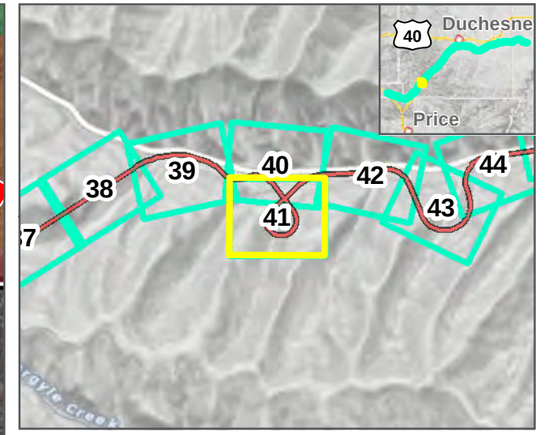

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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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COODINATE SYSTEM:
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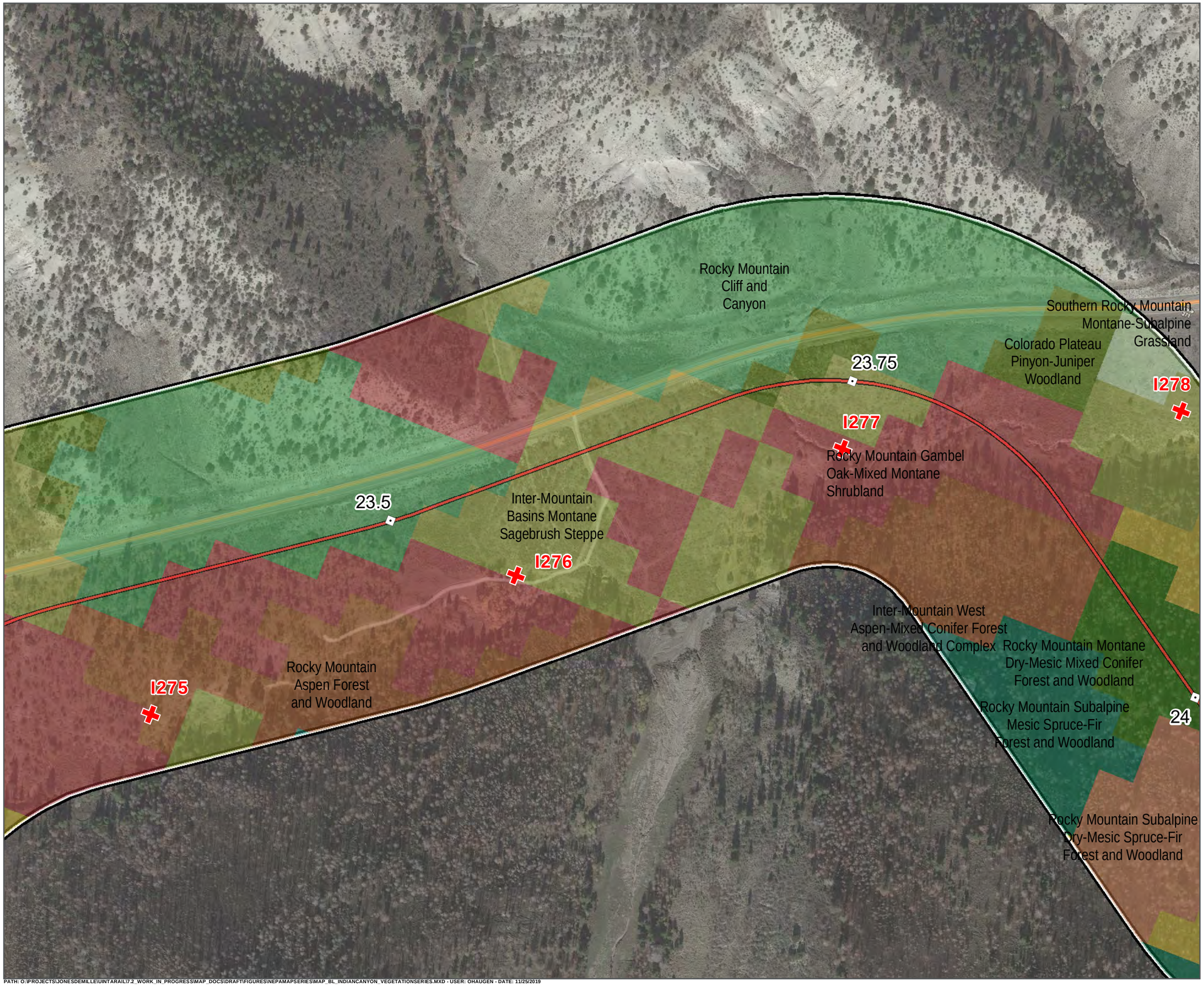

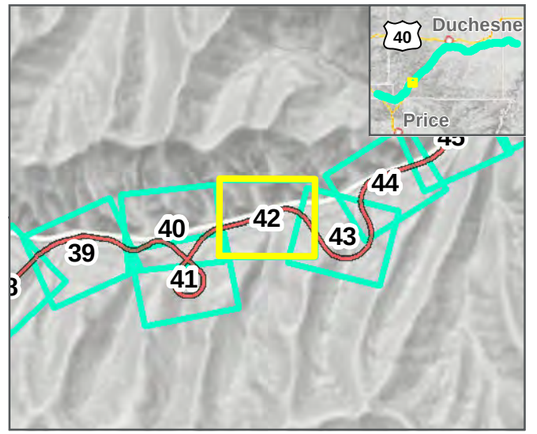

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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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SEVEN COUNTY INFRASTRUCTURE COALITION

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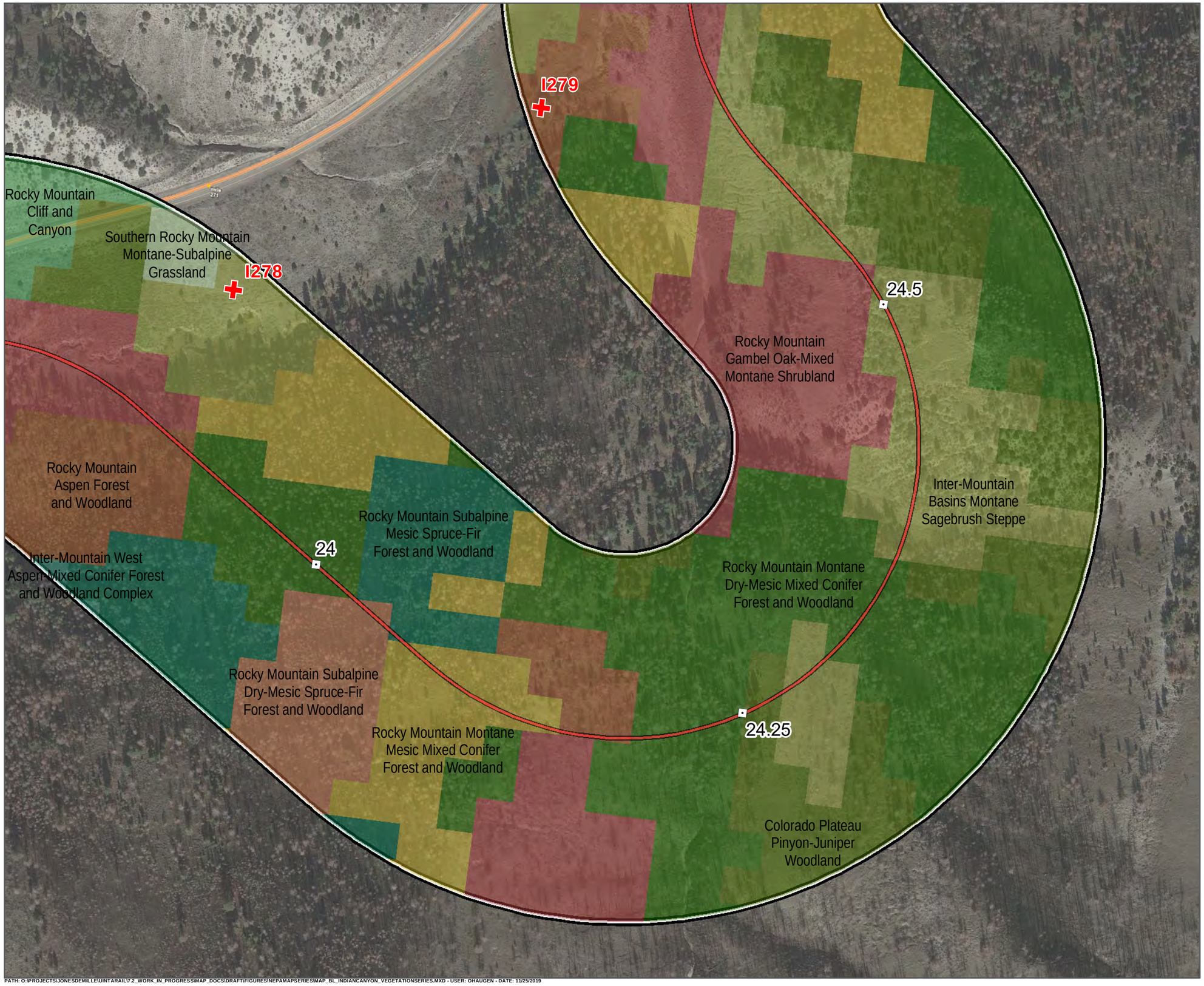

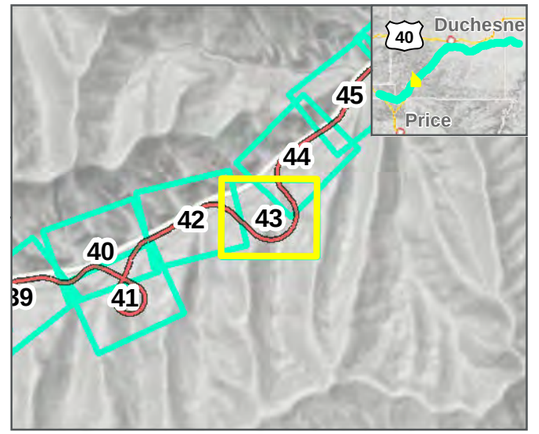

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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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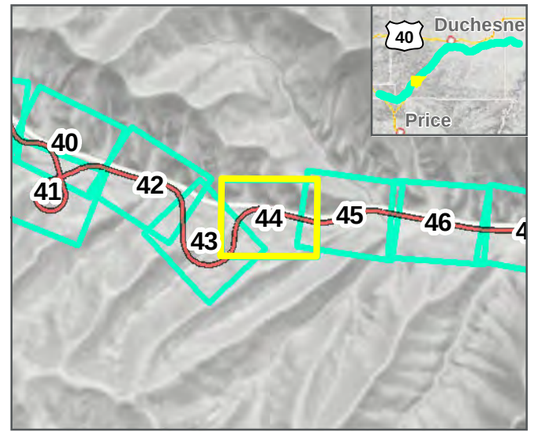

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Vegetation Communities

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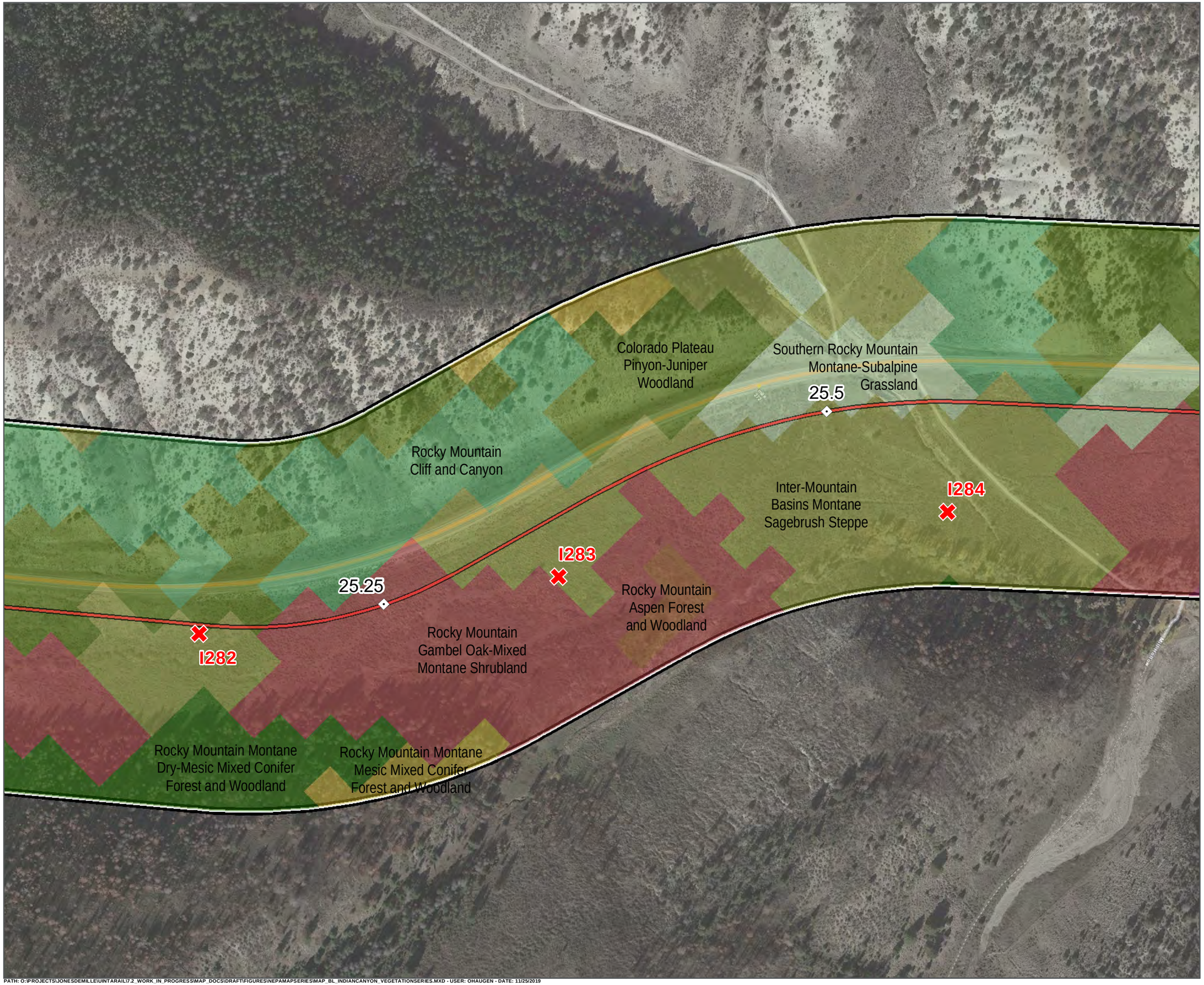

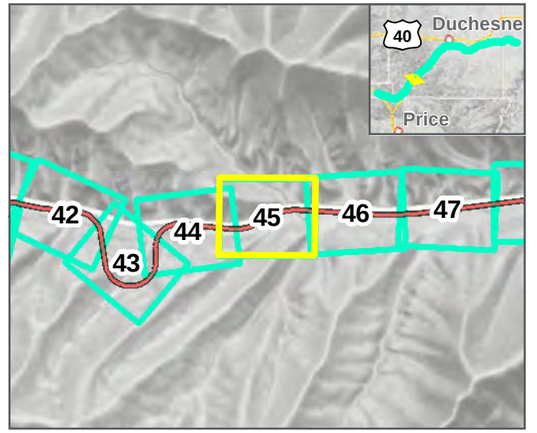

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Vegetation Communities

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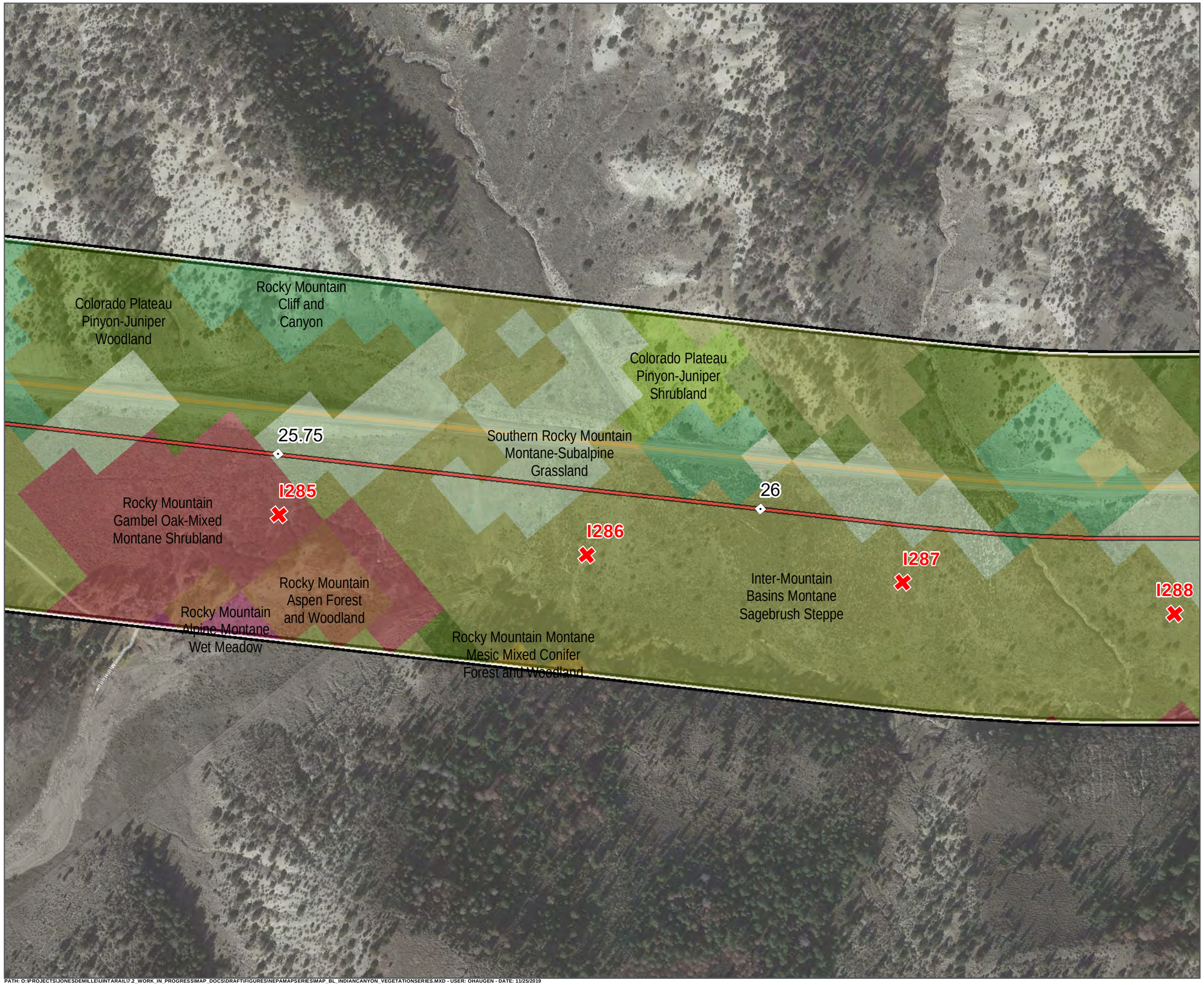

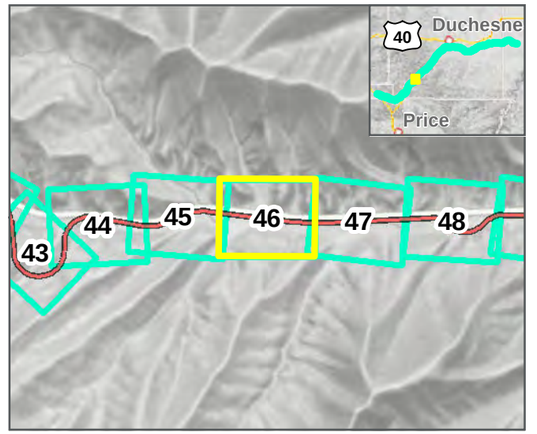

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INDIAN CANYON ALTERNATIVE: 5/30/2019

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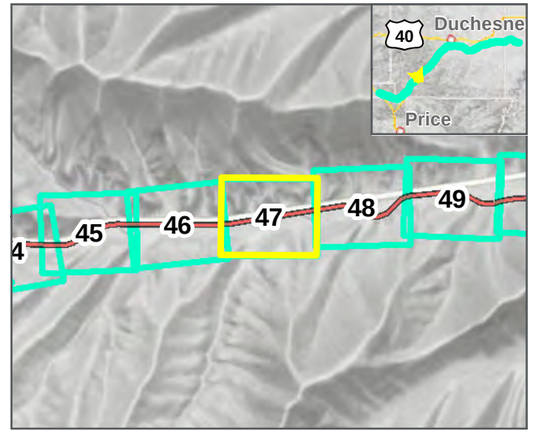

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Vegetation Communities

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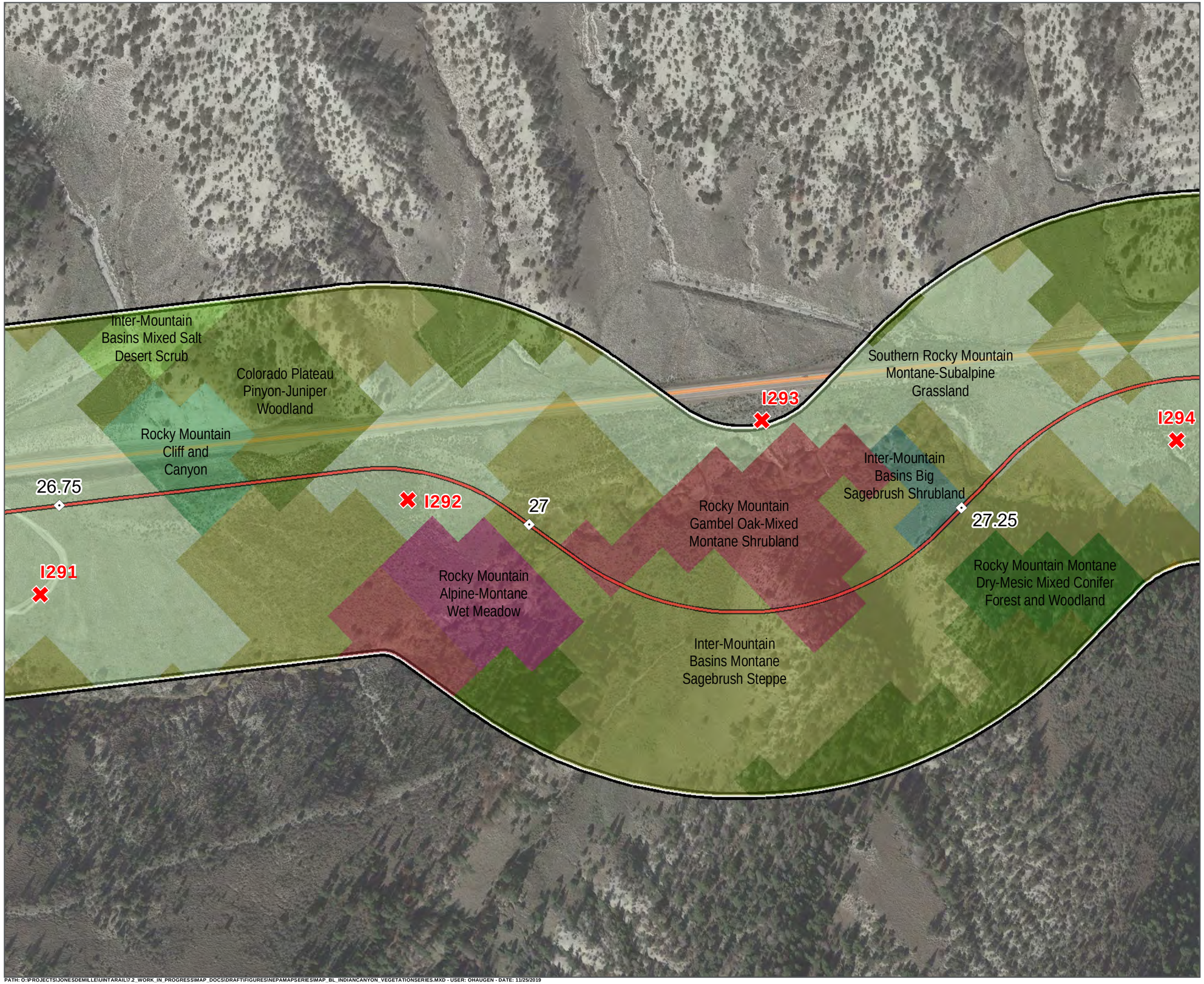

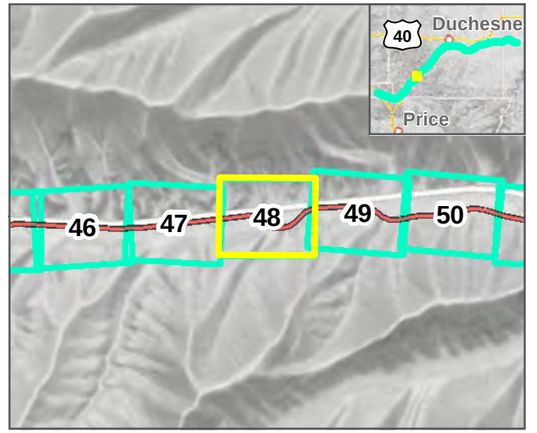

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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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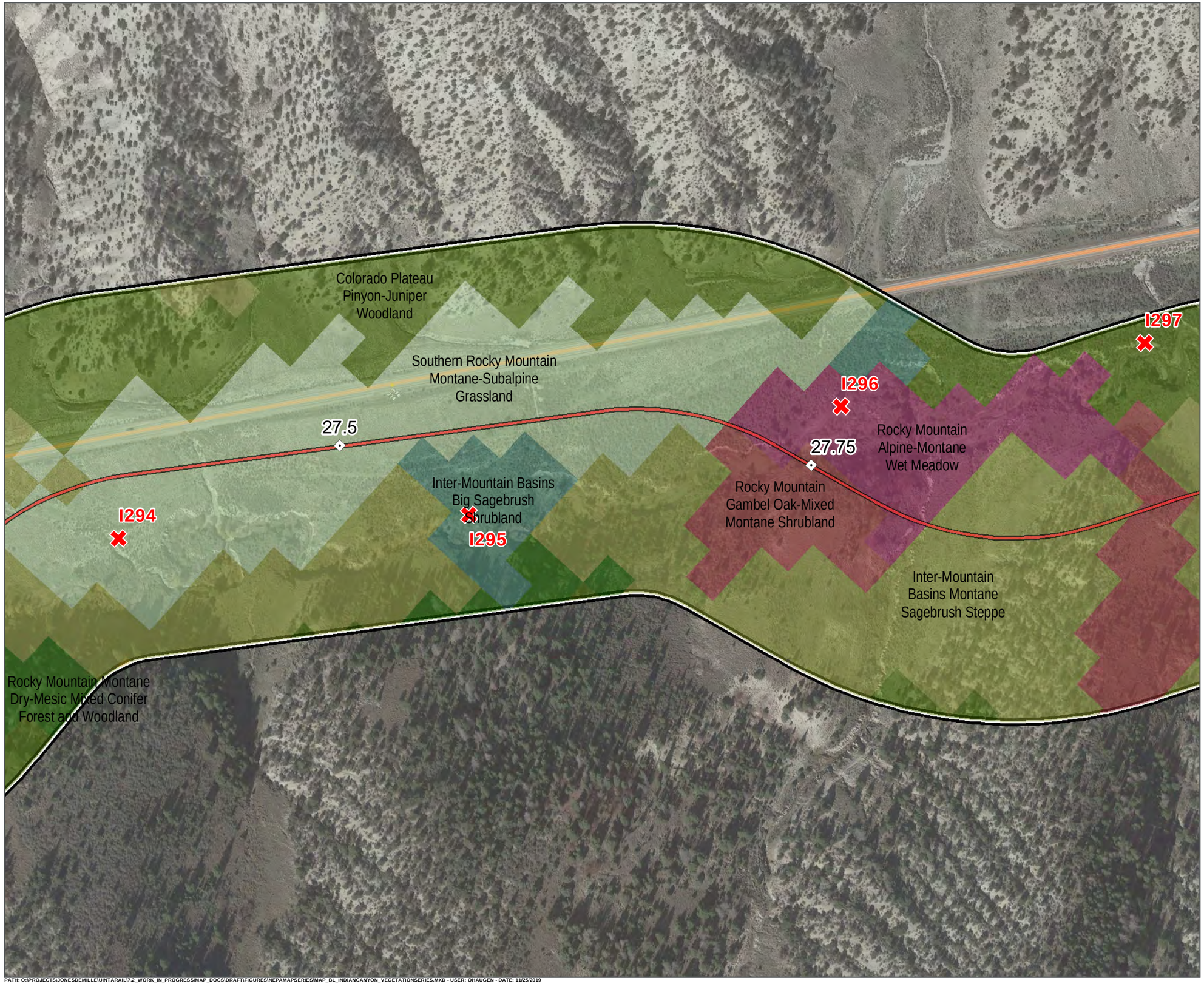

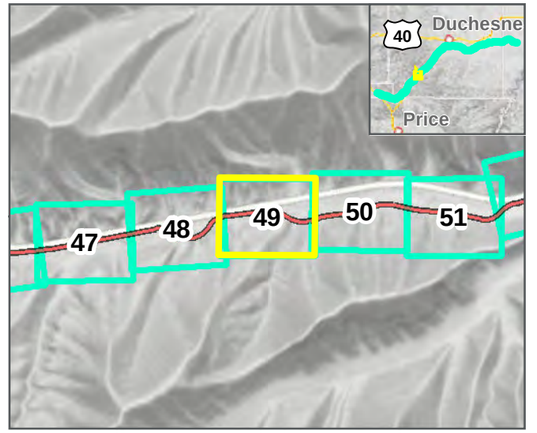

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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- Southern Rocky Mountain Montane-Subalpine Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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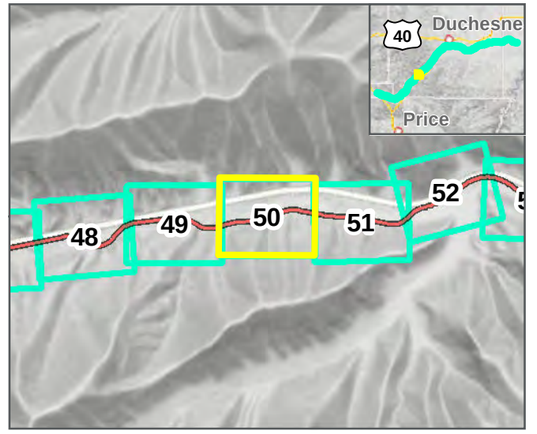

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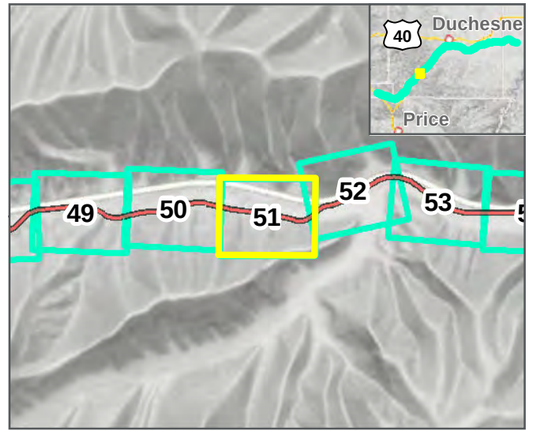

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Vegetation Communities

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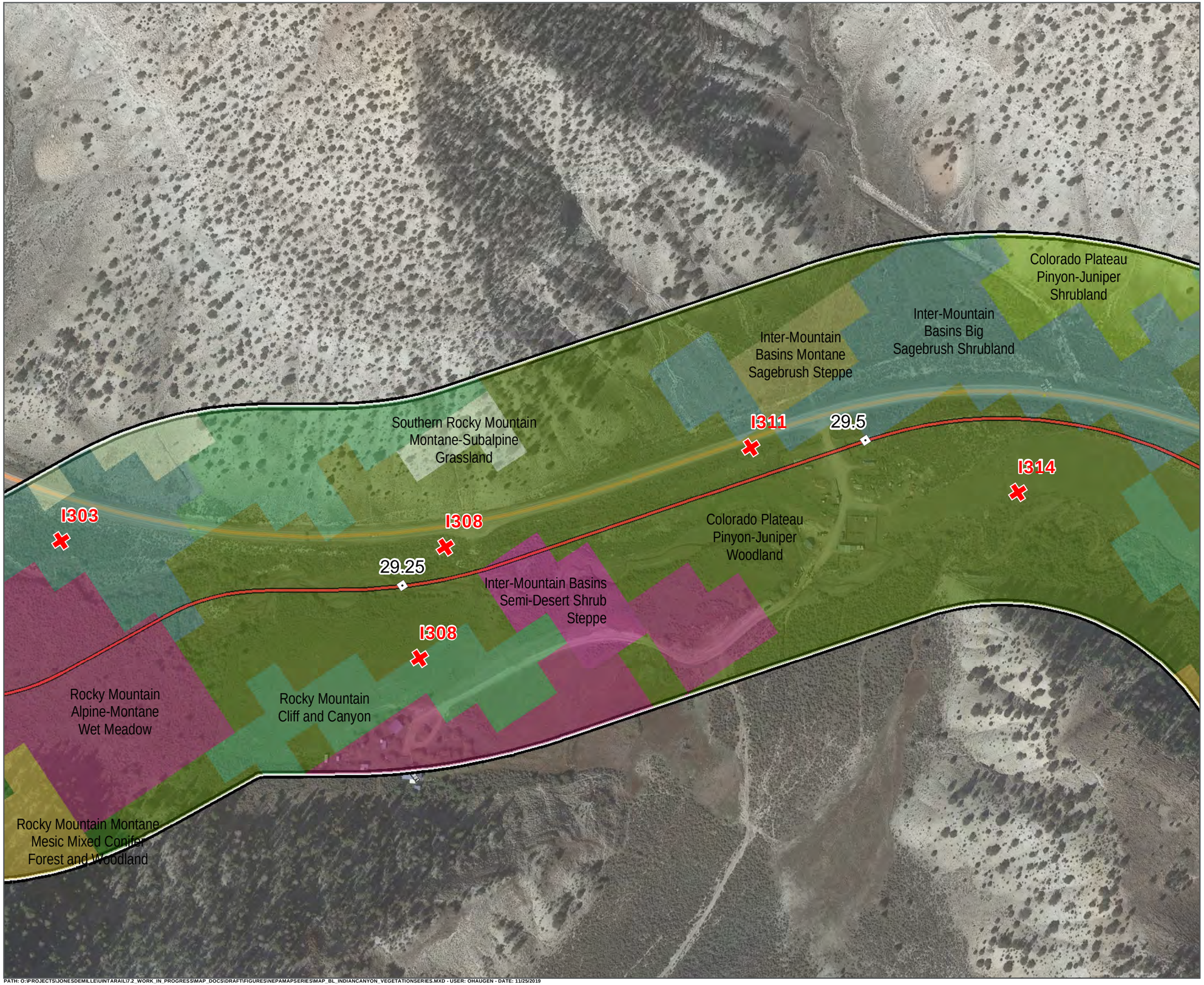

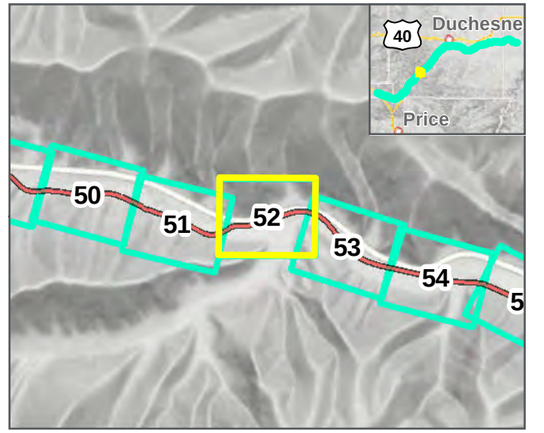

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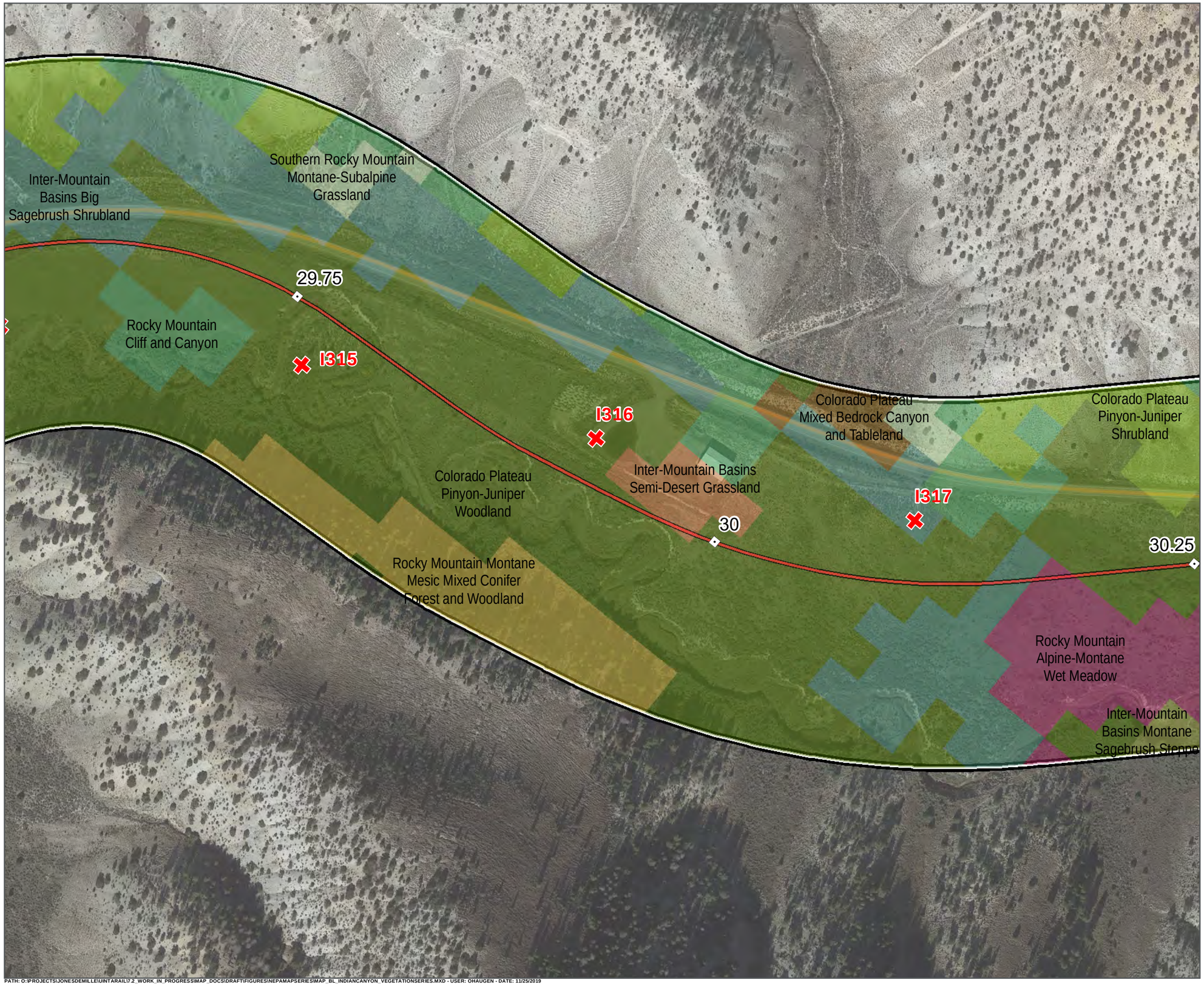

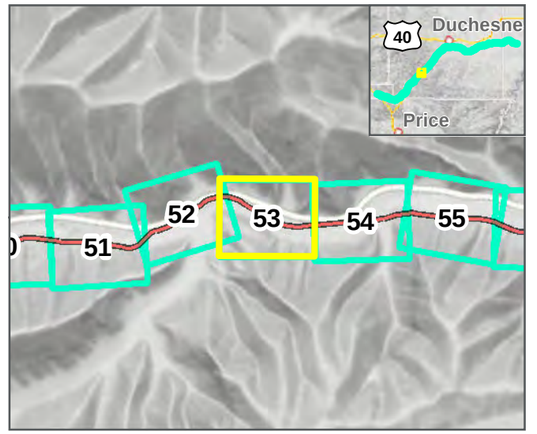

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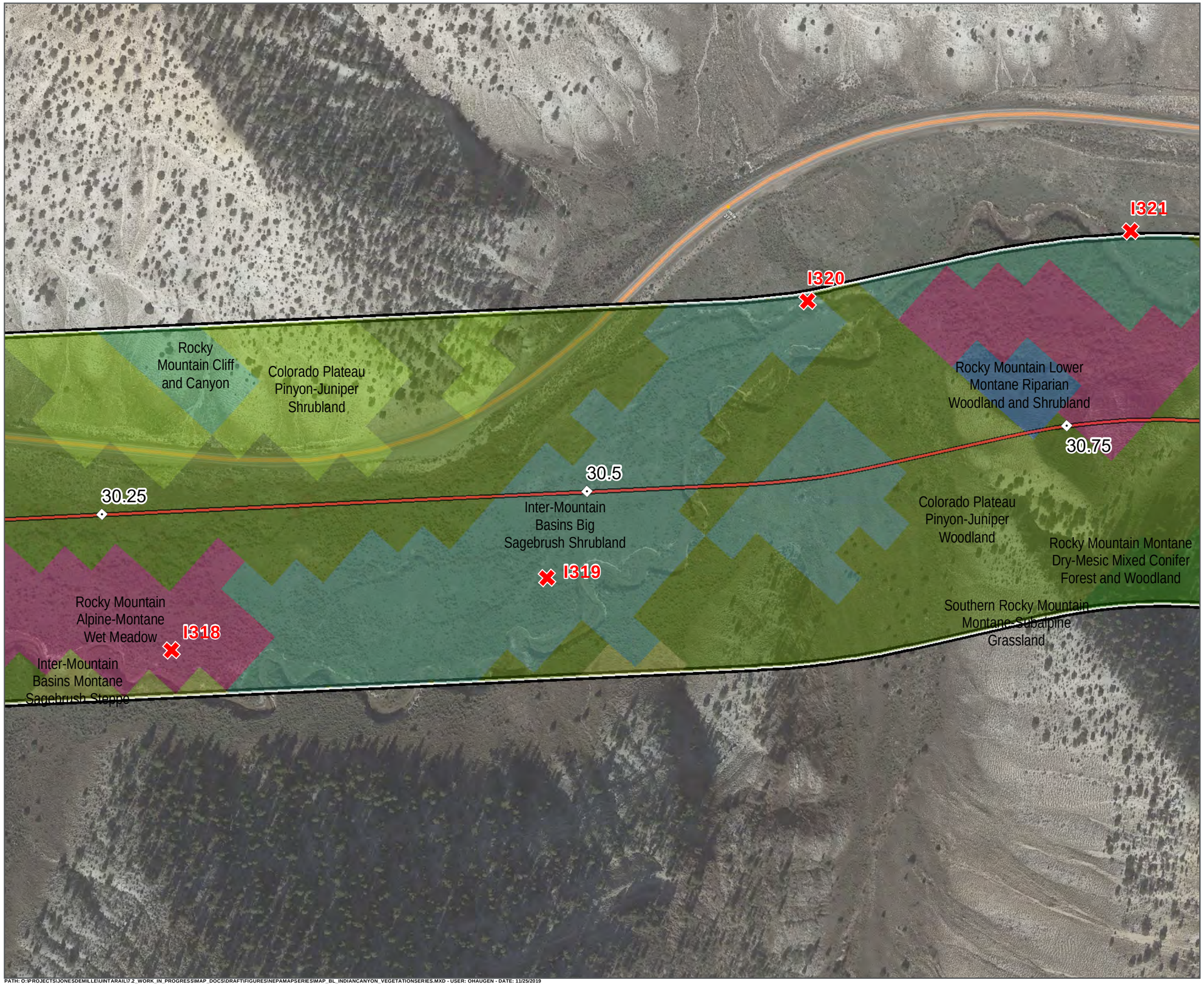

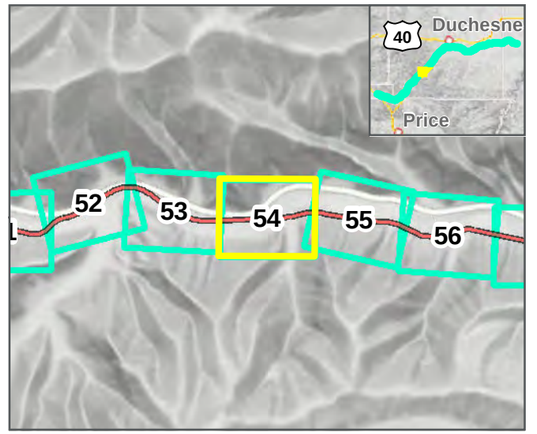

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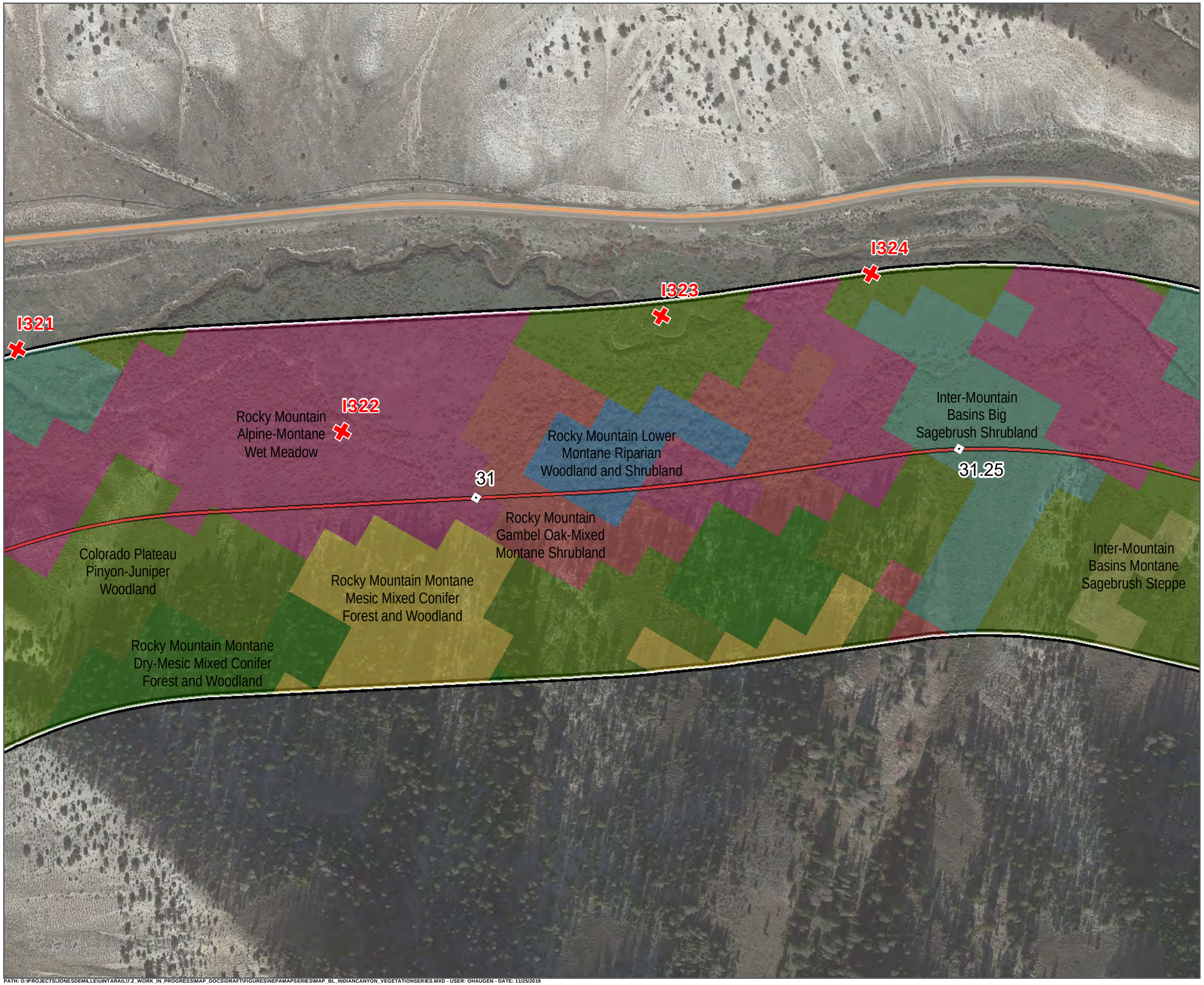

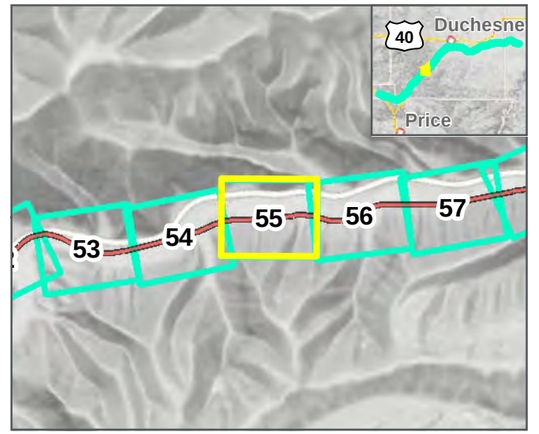

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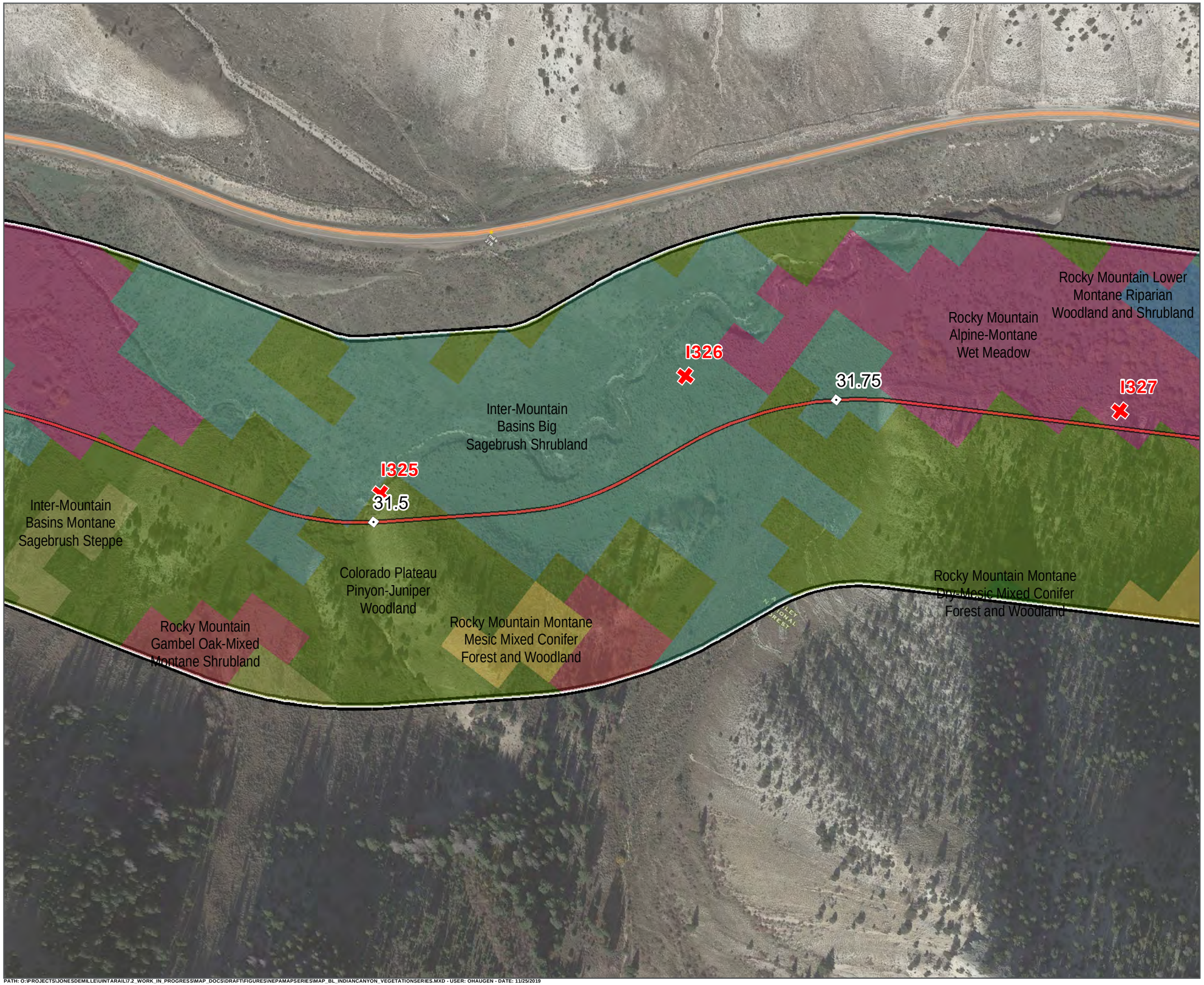

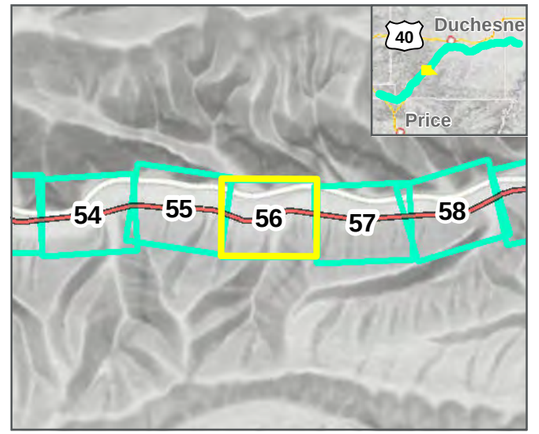

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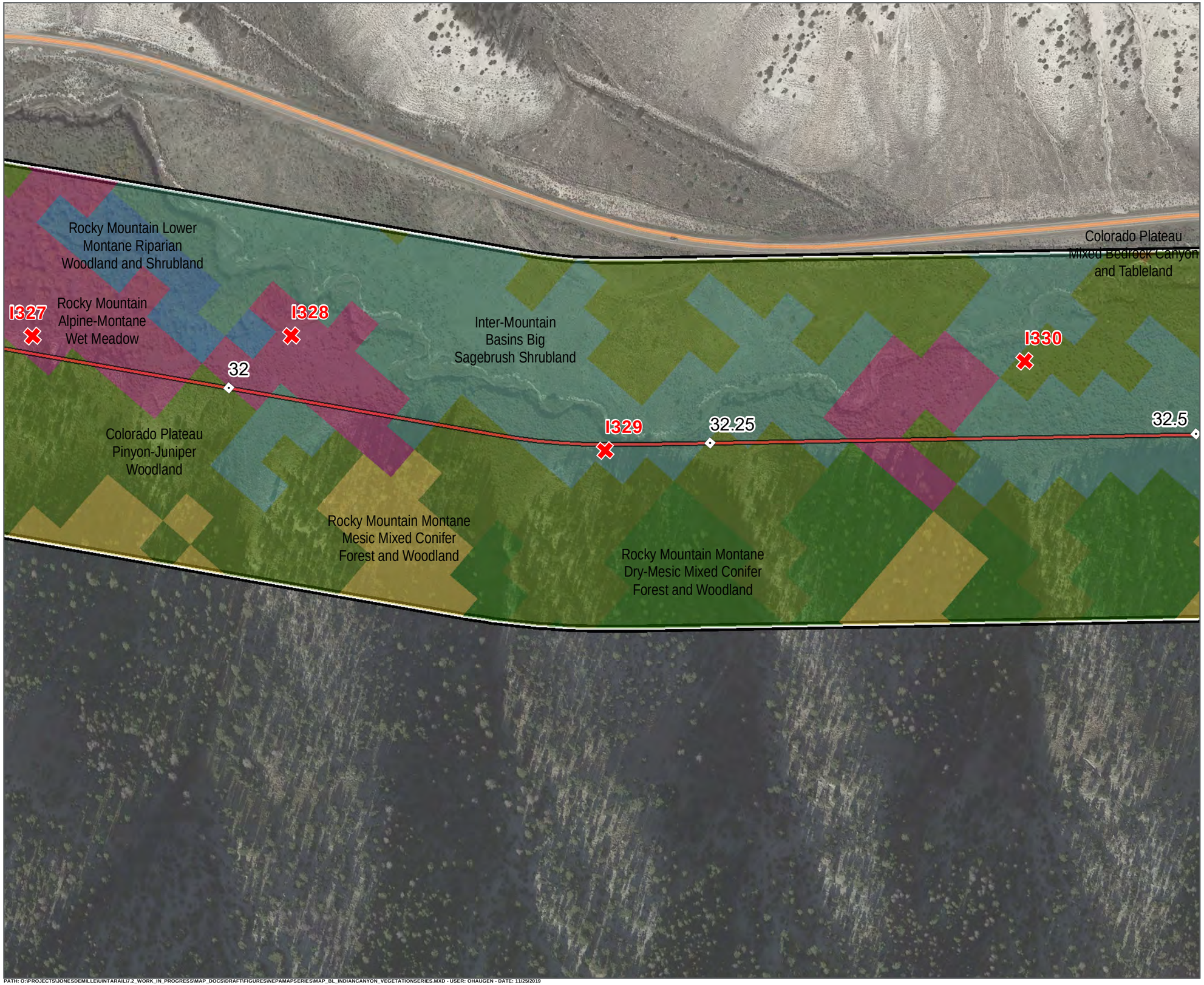

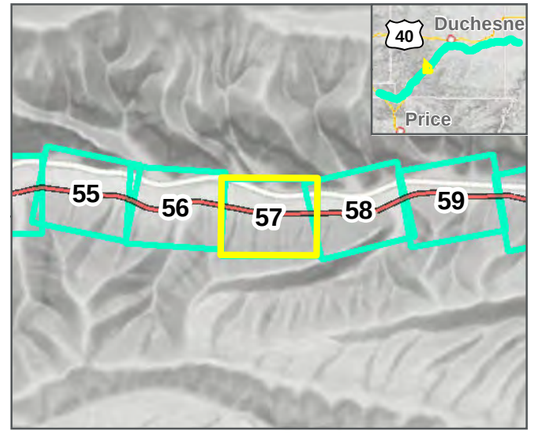

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Vegetation Communities

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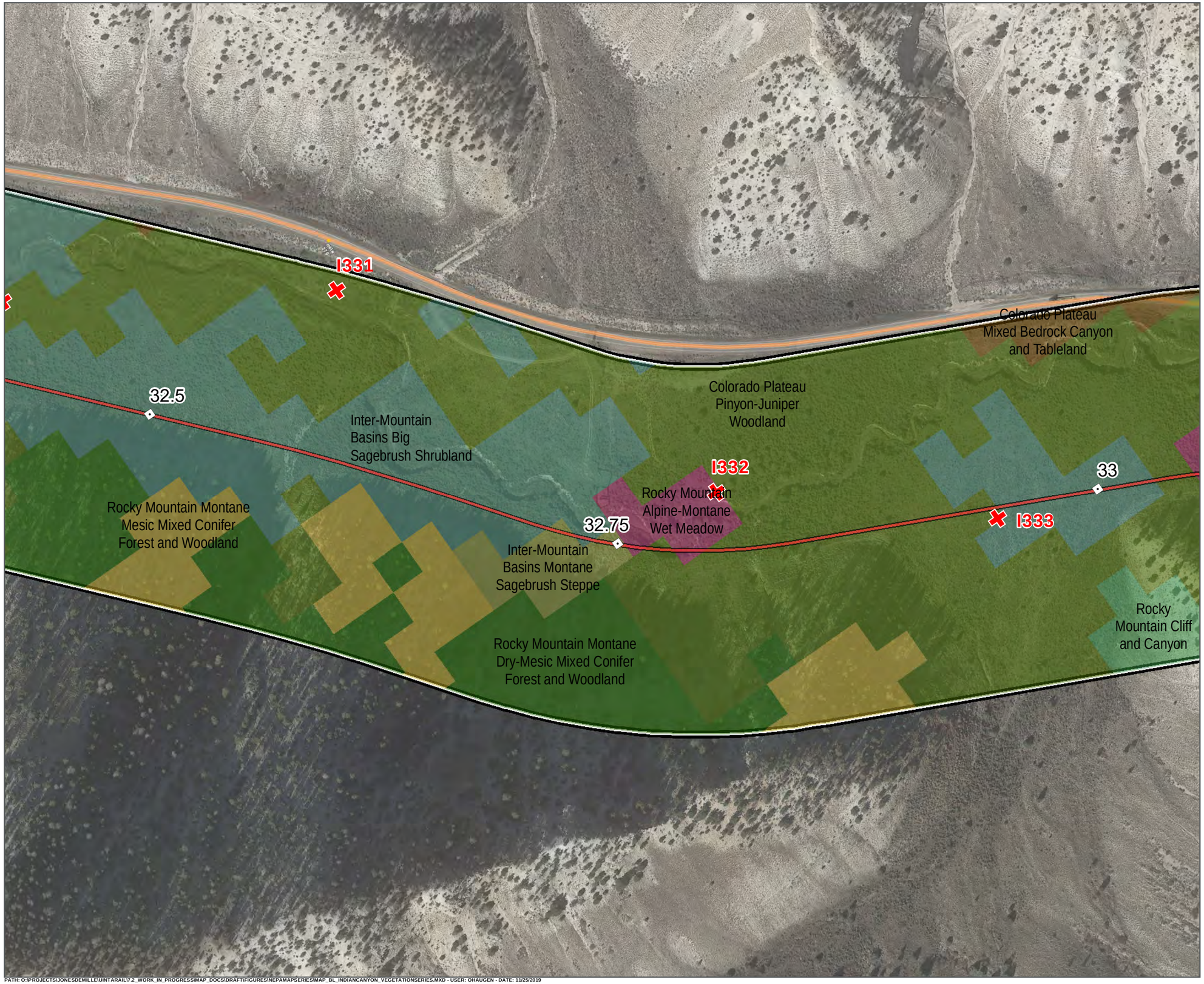

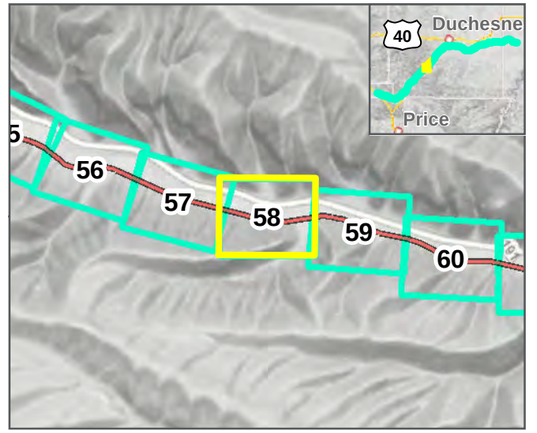

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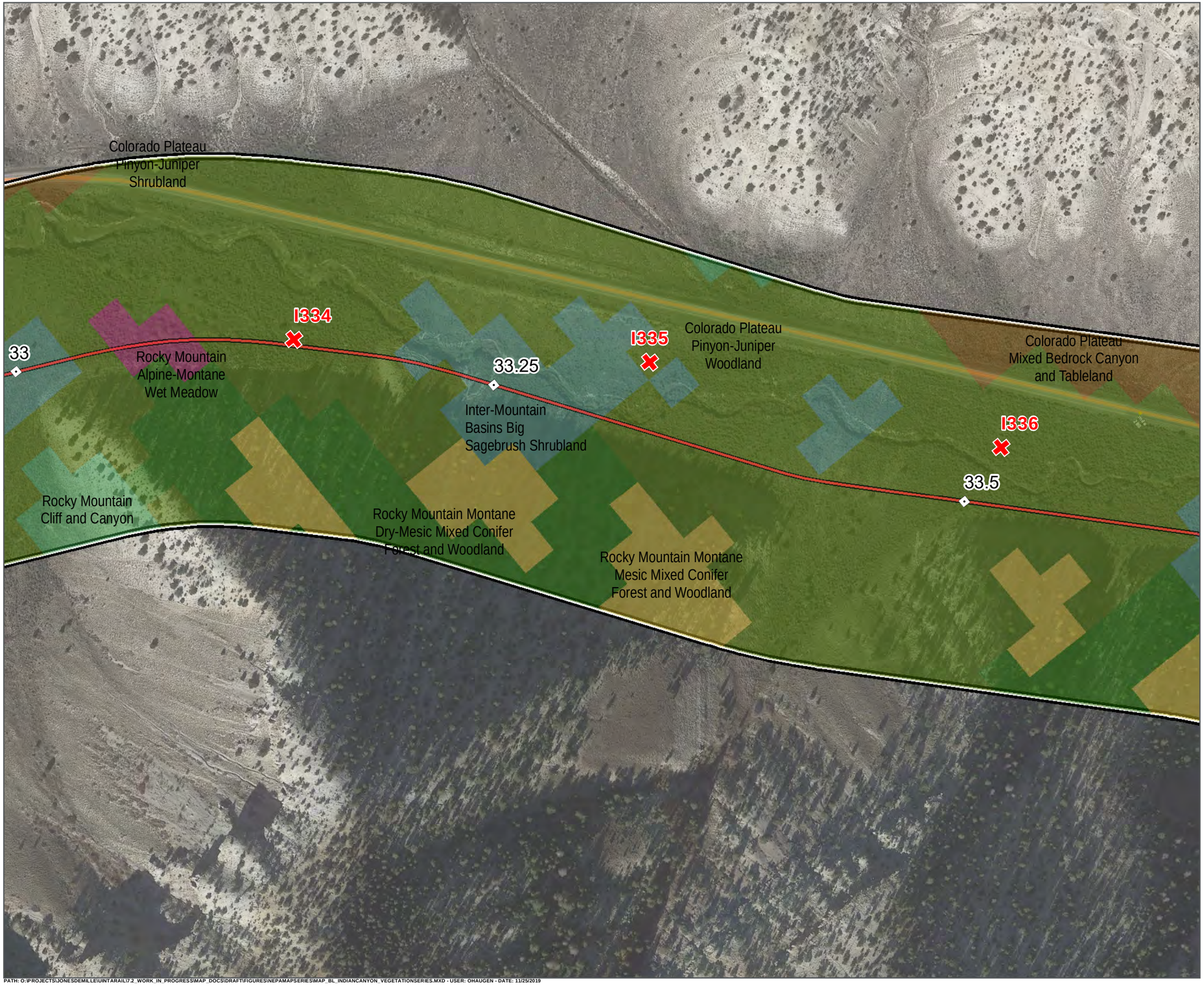

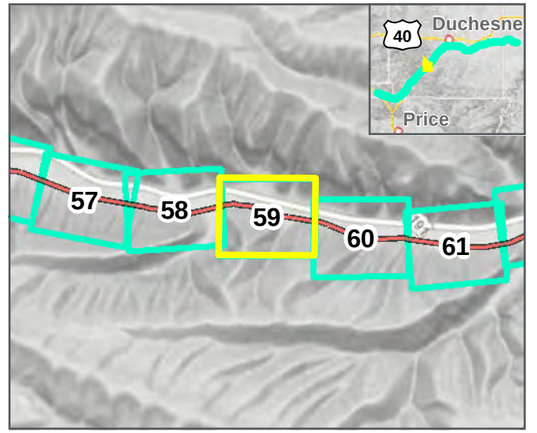

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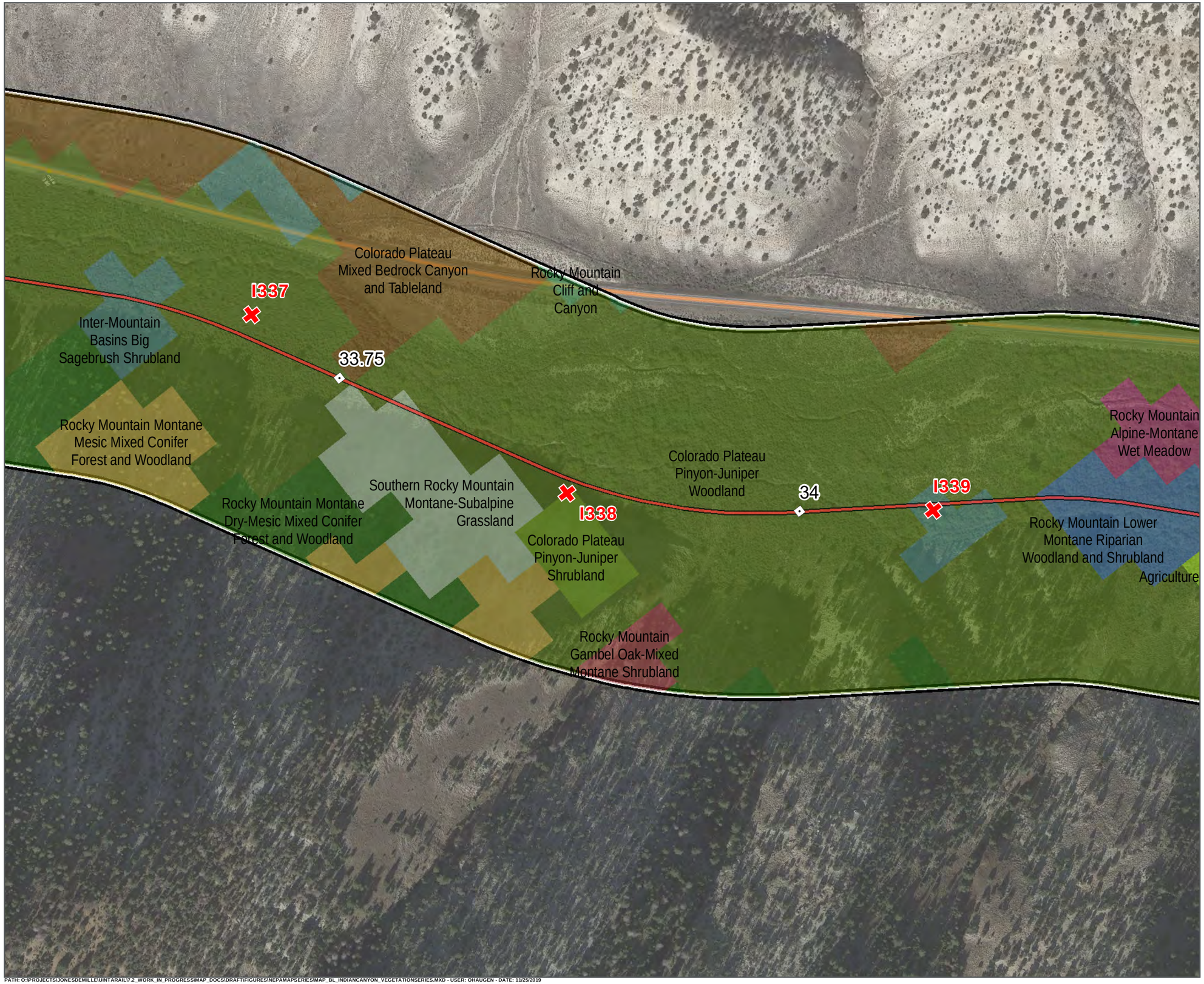

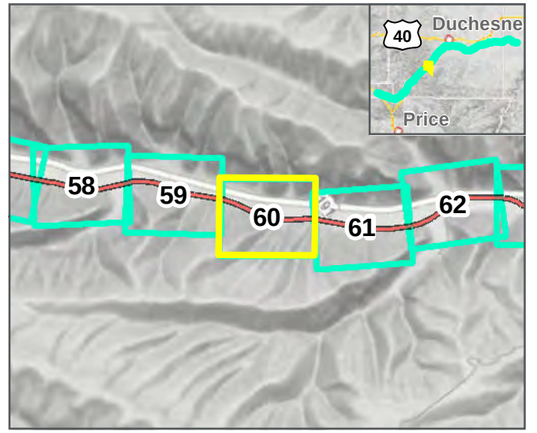

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Vegetation Communities

- Agriculture
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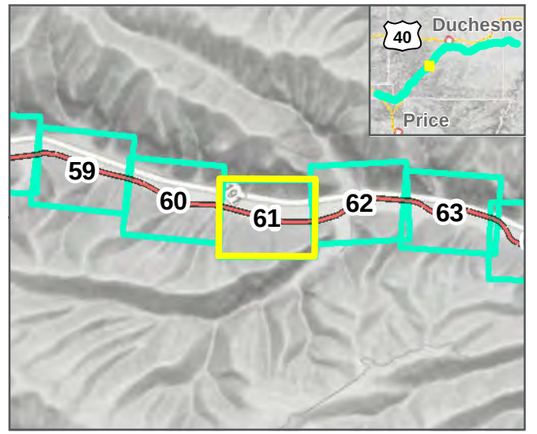

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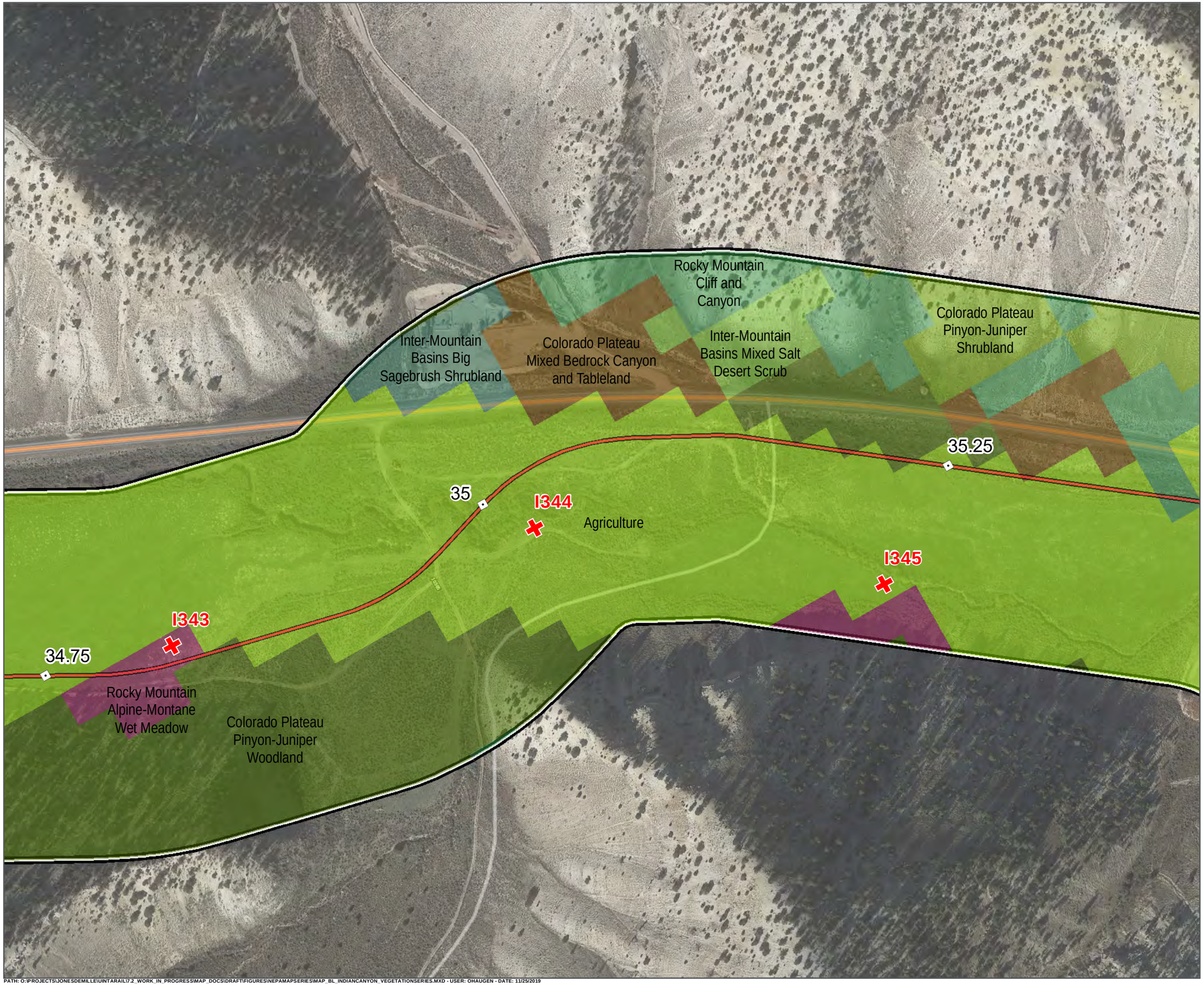


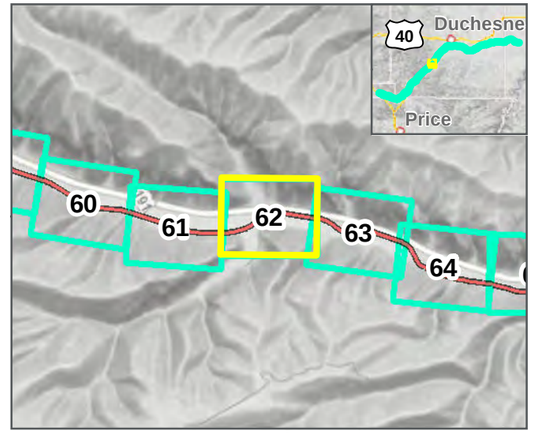


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

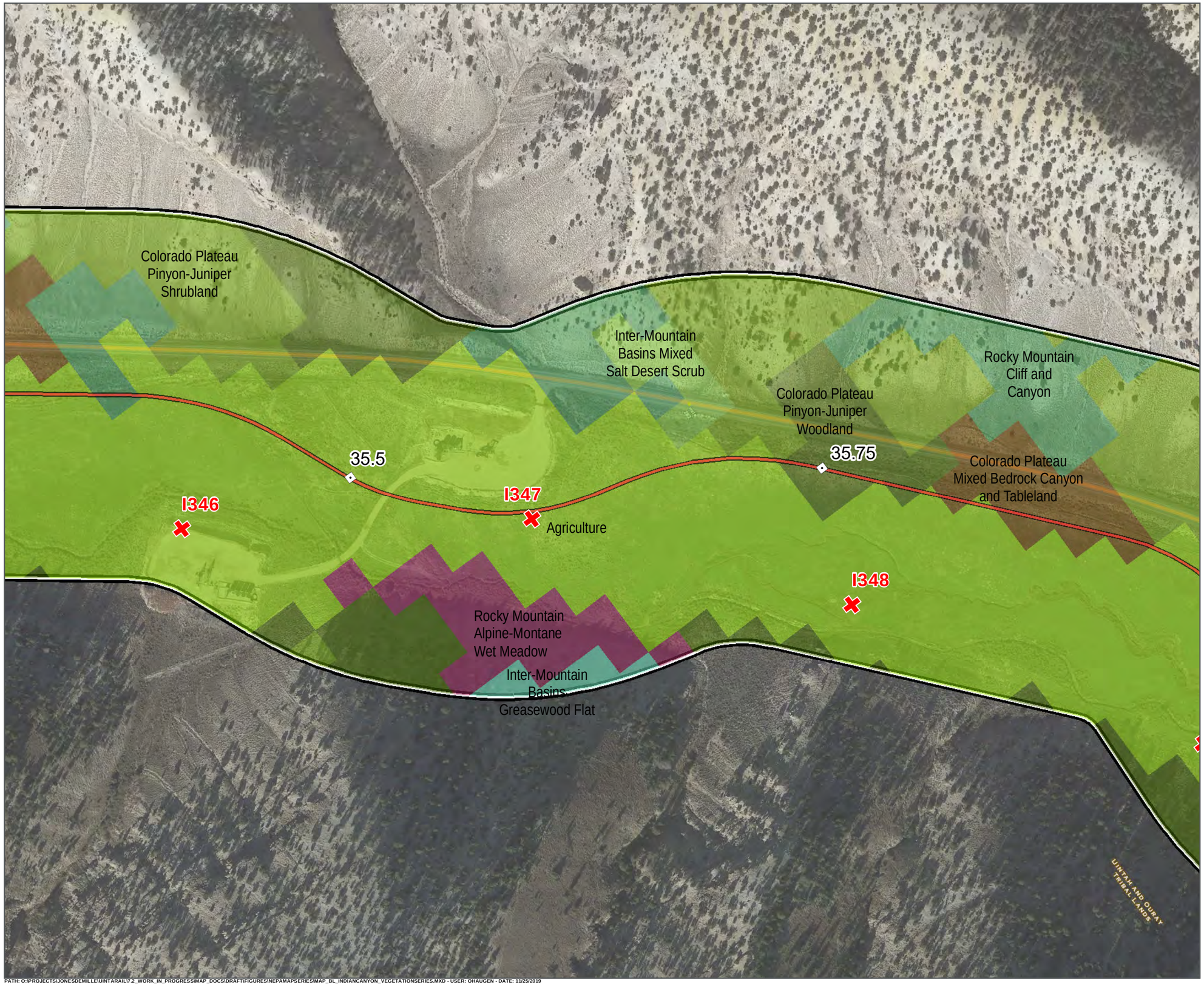
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



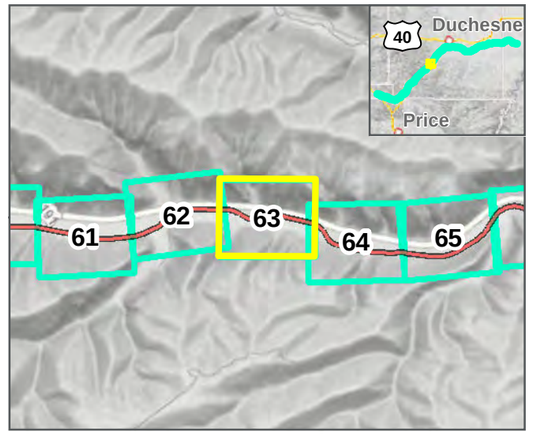


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

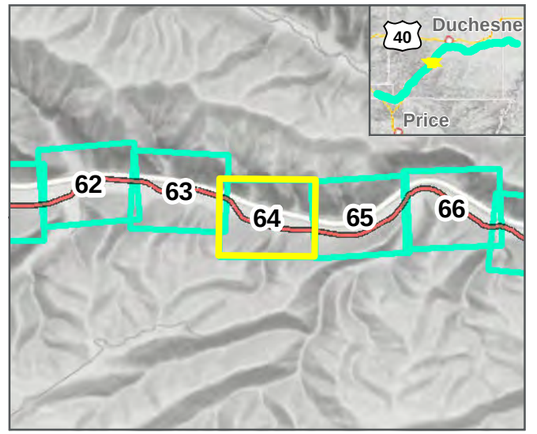


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Southern Rocky Mountain Montane-Subalpine Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

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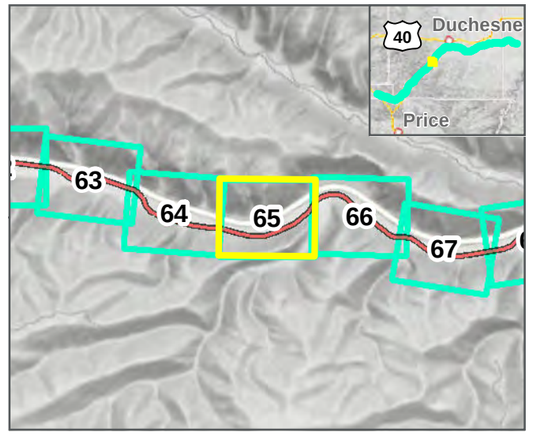


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

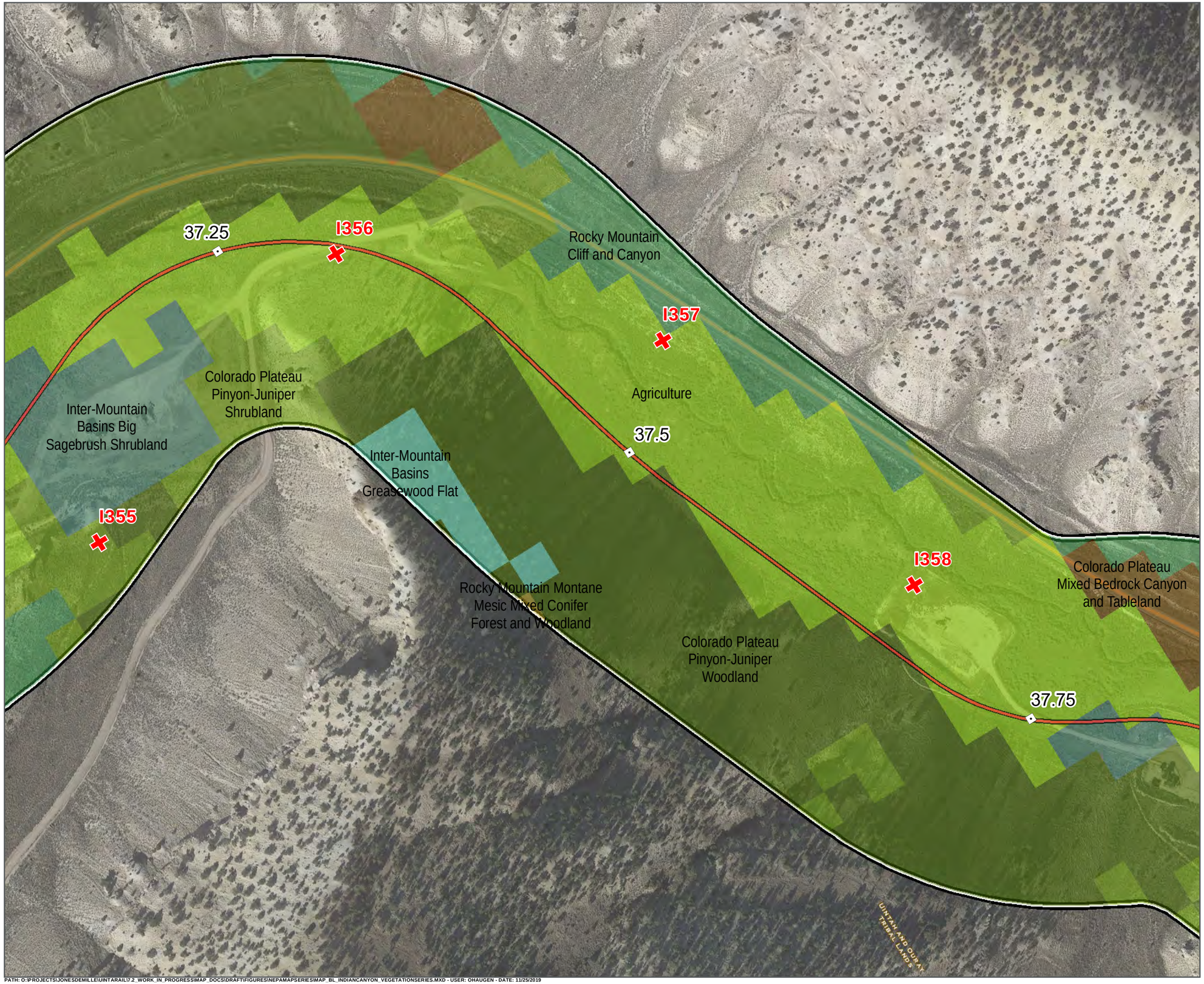
INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7-2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



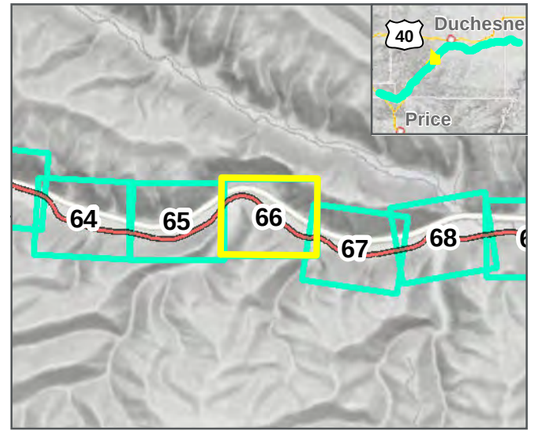


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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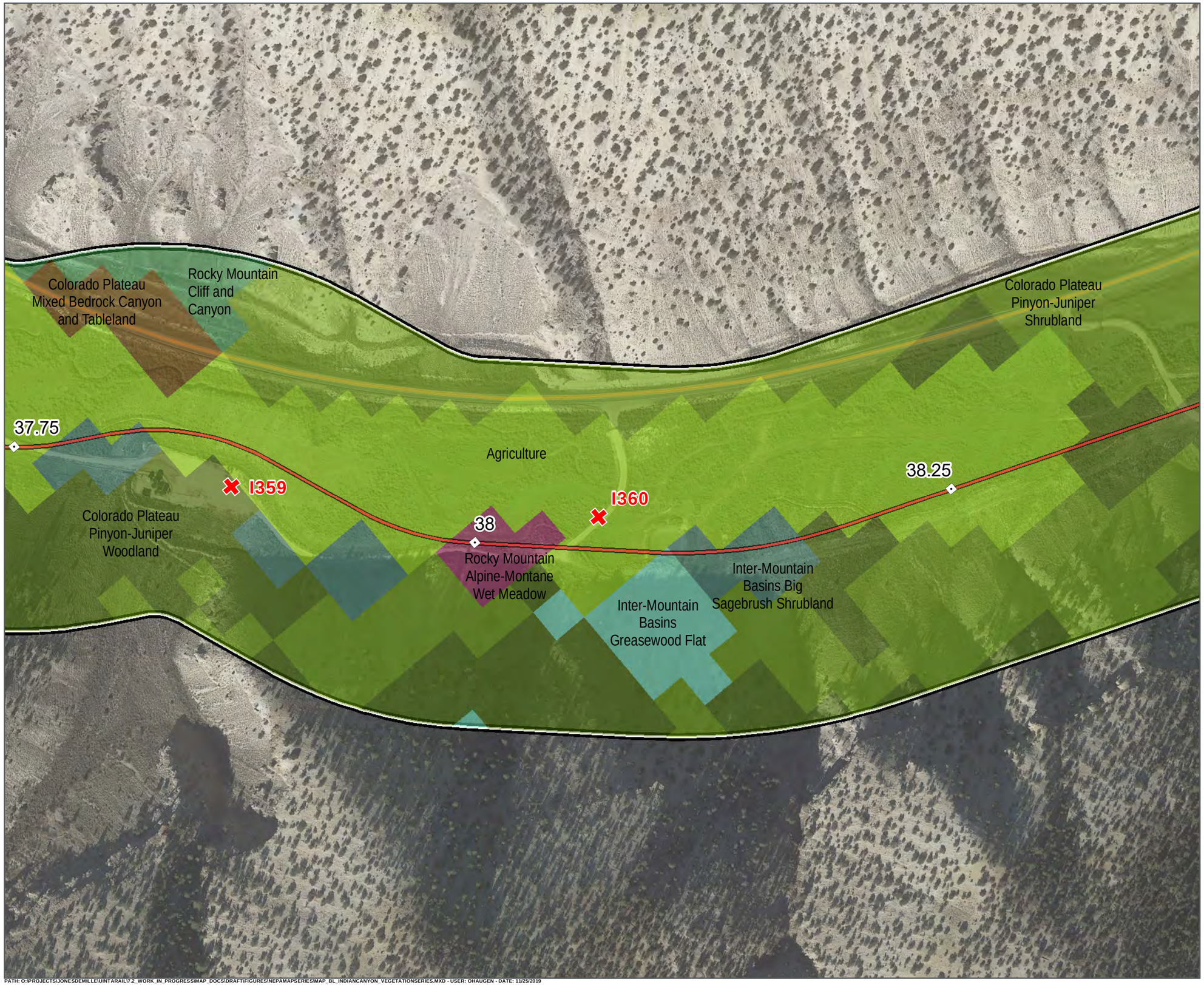

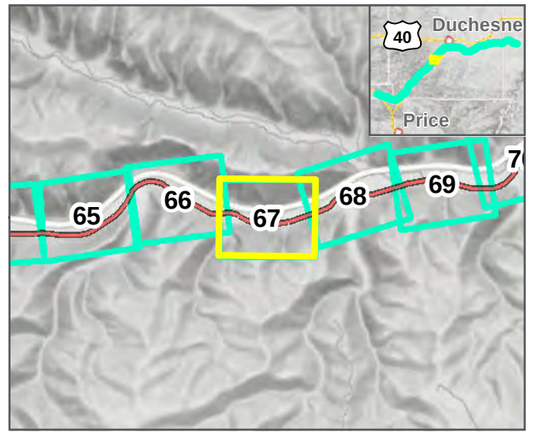

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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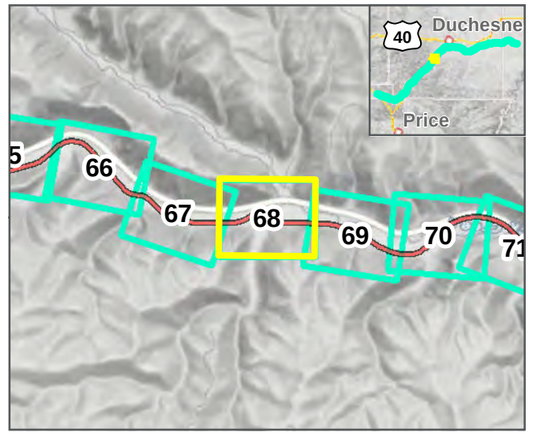

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Rocky Mountain Cliff and Canyon

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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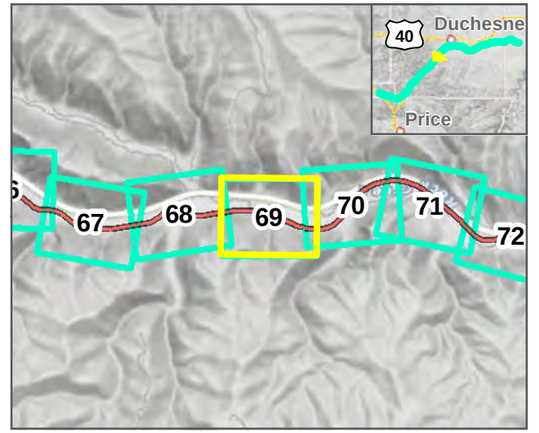

- Photo Points
- Mileposts
- Indian Canyon Centerline
- Study Area
- Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Developed, Medium - High Intensity
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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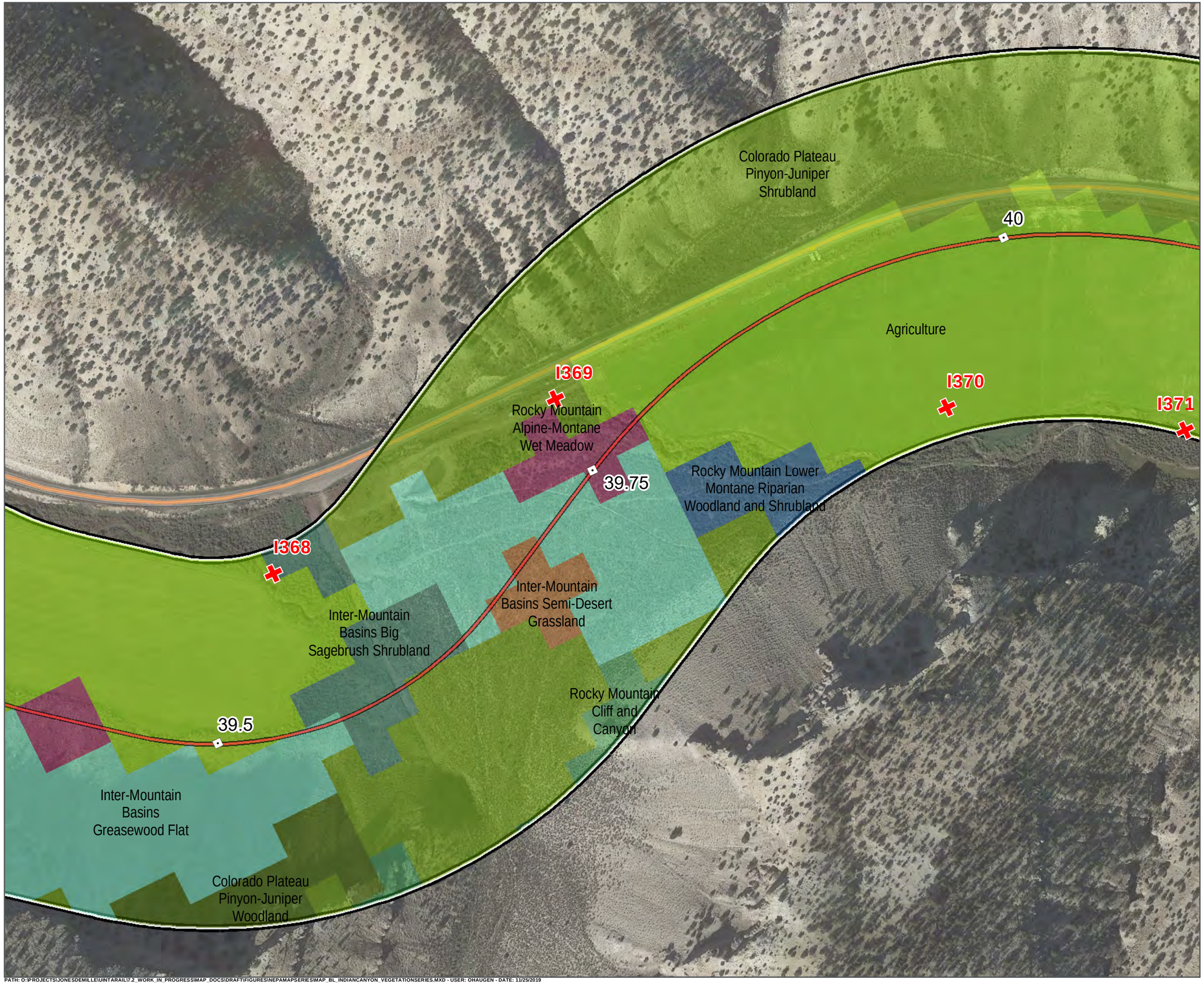

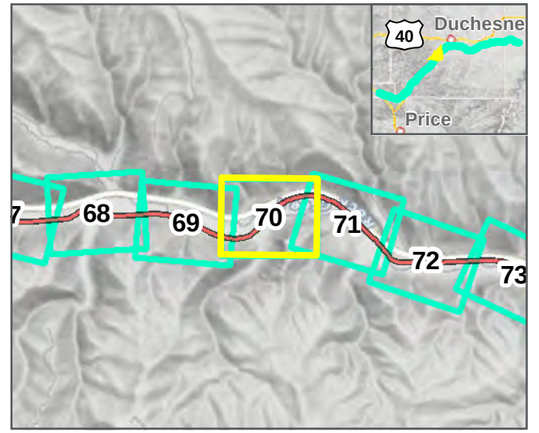

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Semi-Desert Grassland
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

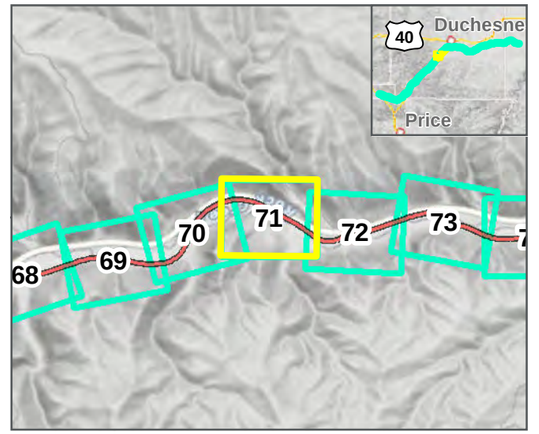

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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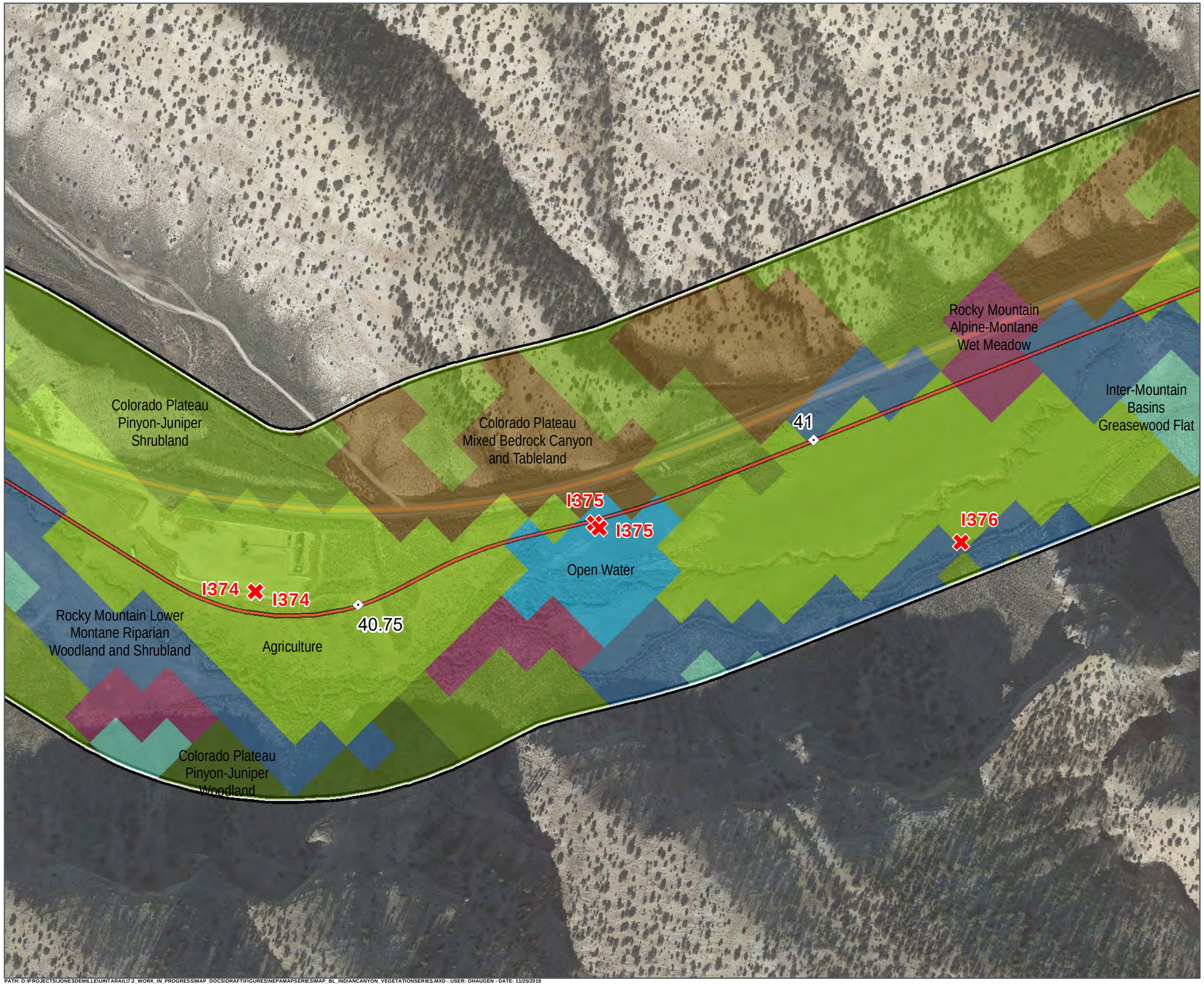

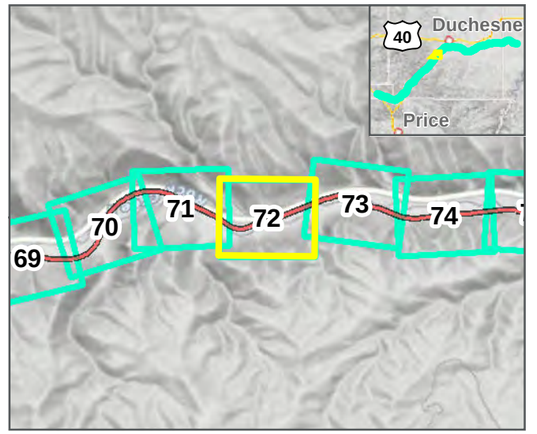

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Open Water
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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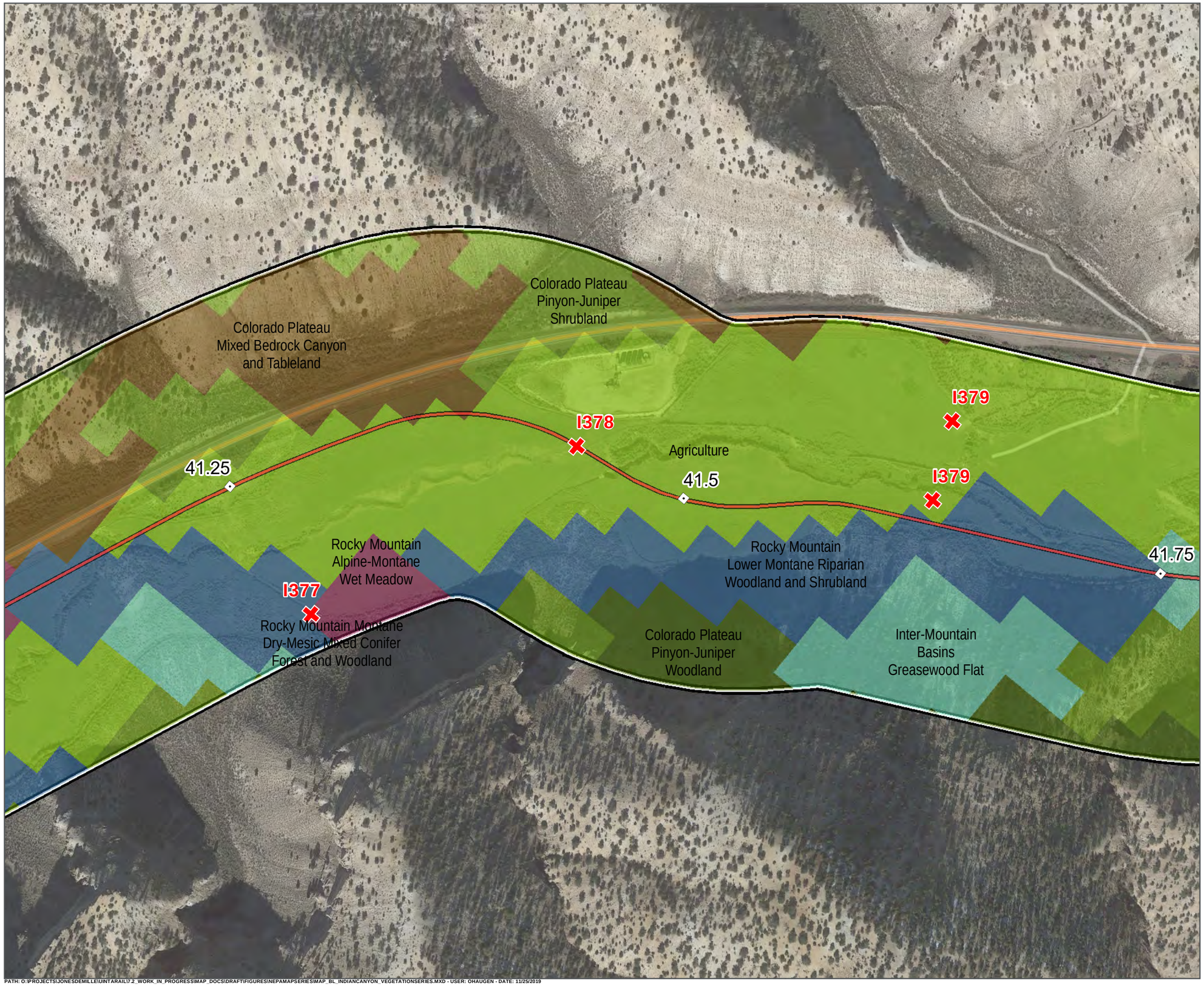


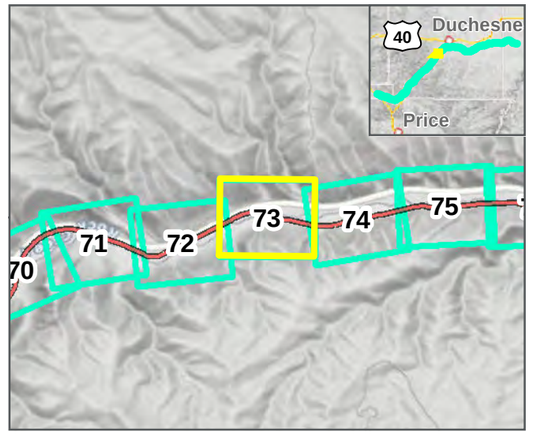


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

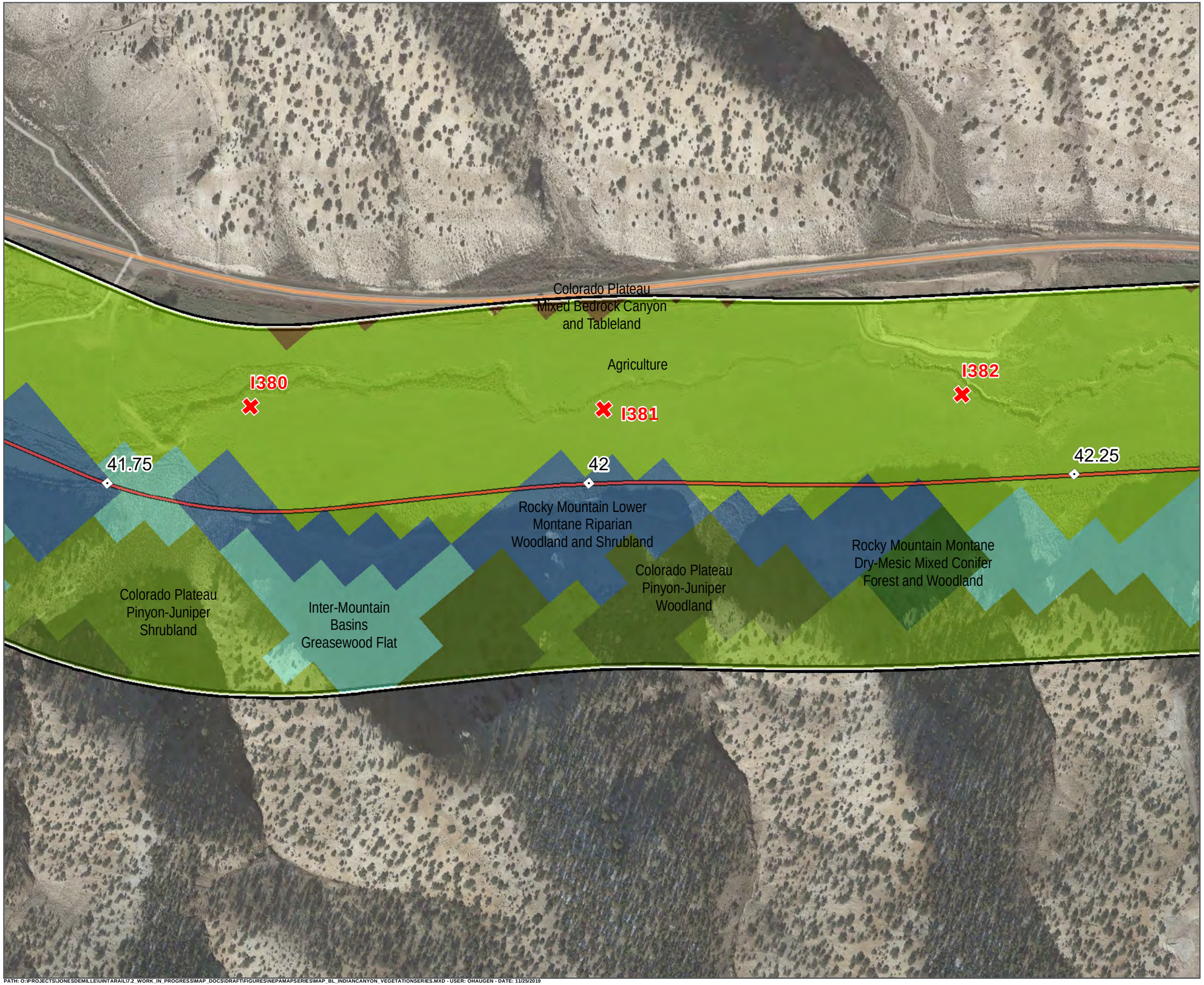
INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\72_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



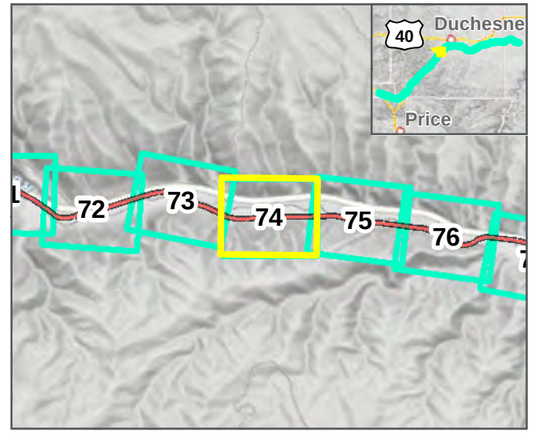


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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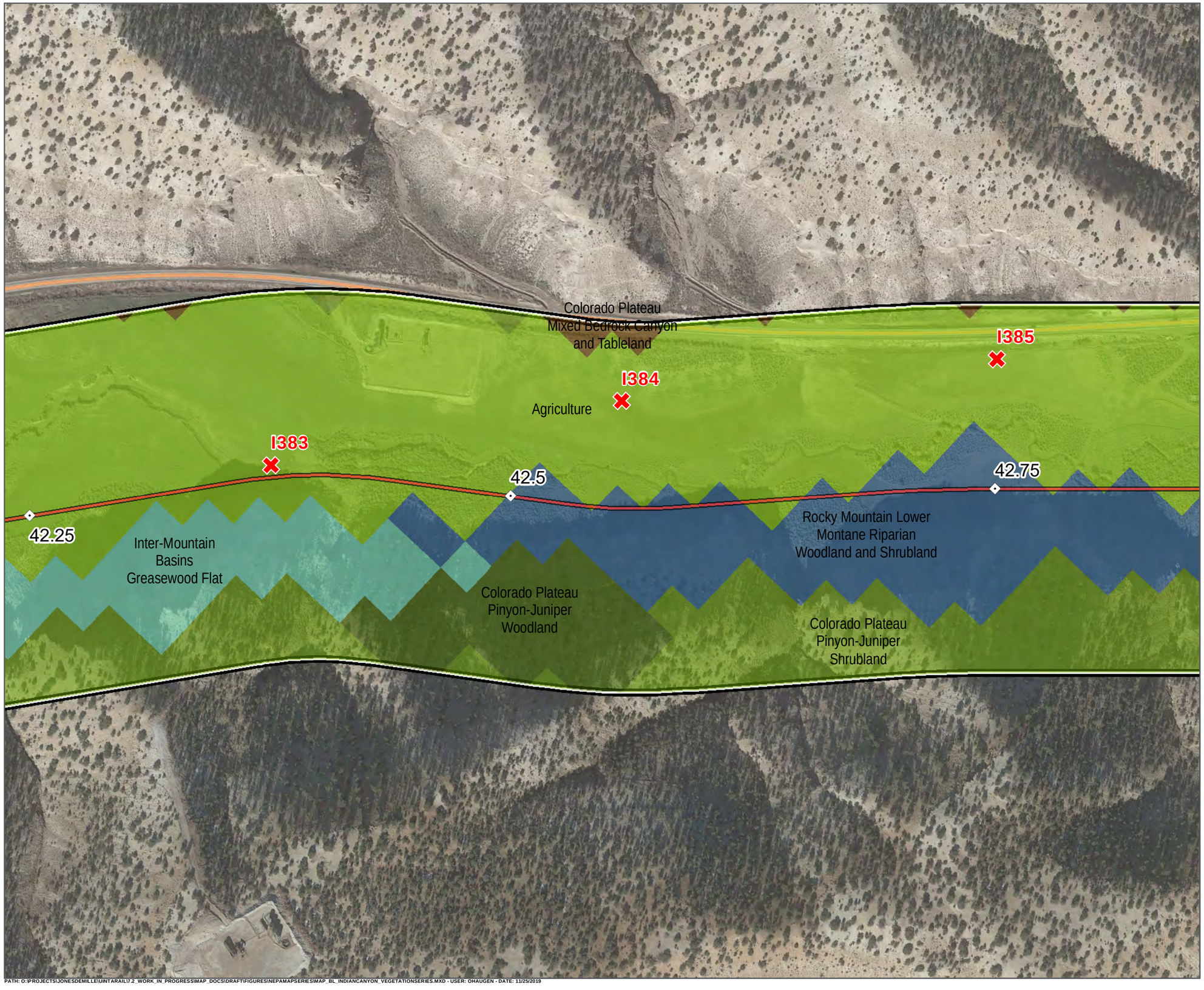

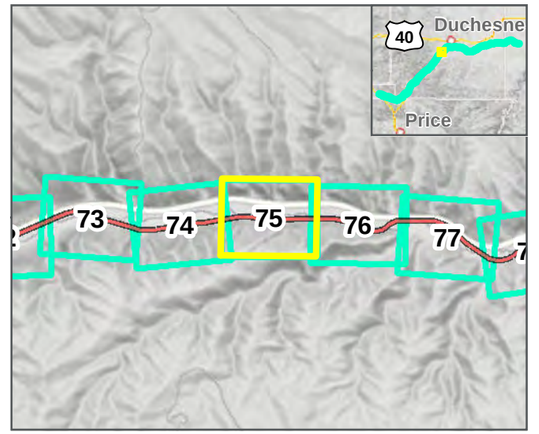

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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DATA SOURCES:
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HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

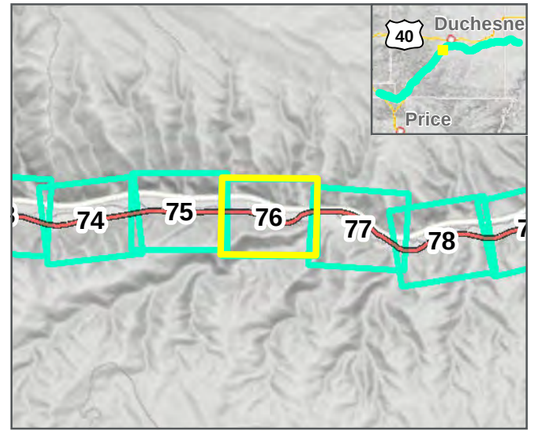

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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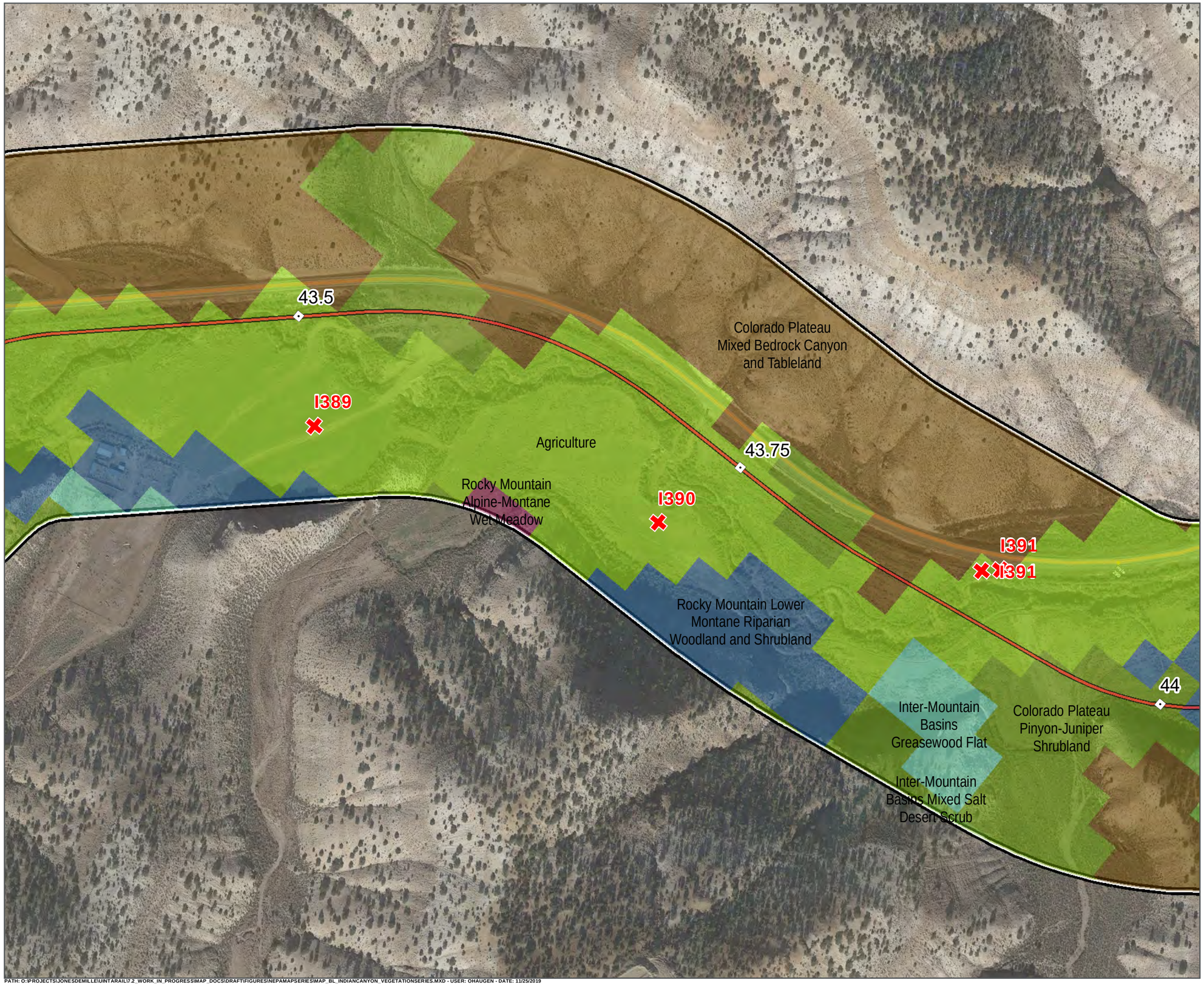

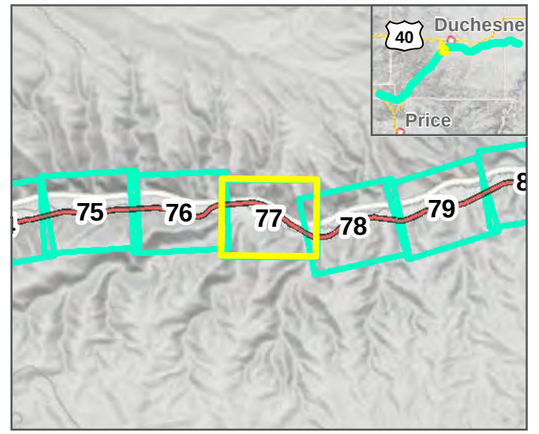

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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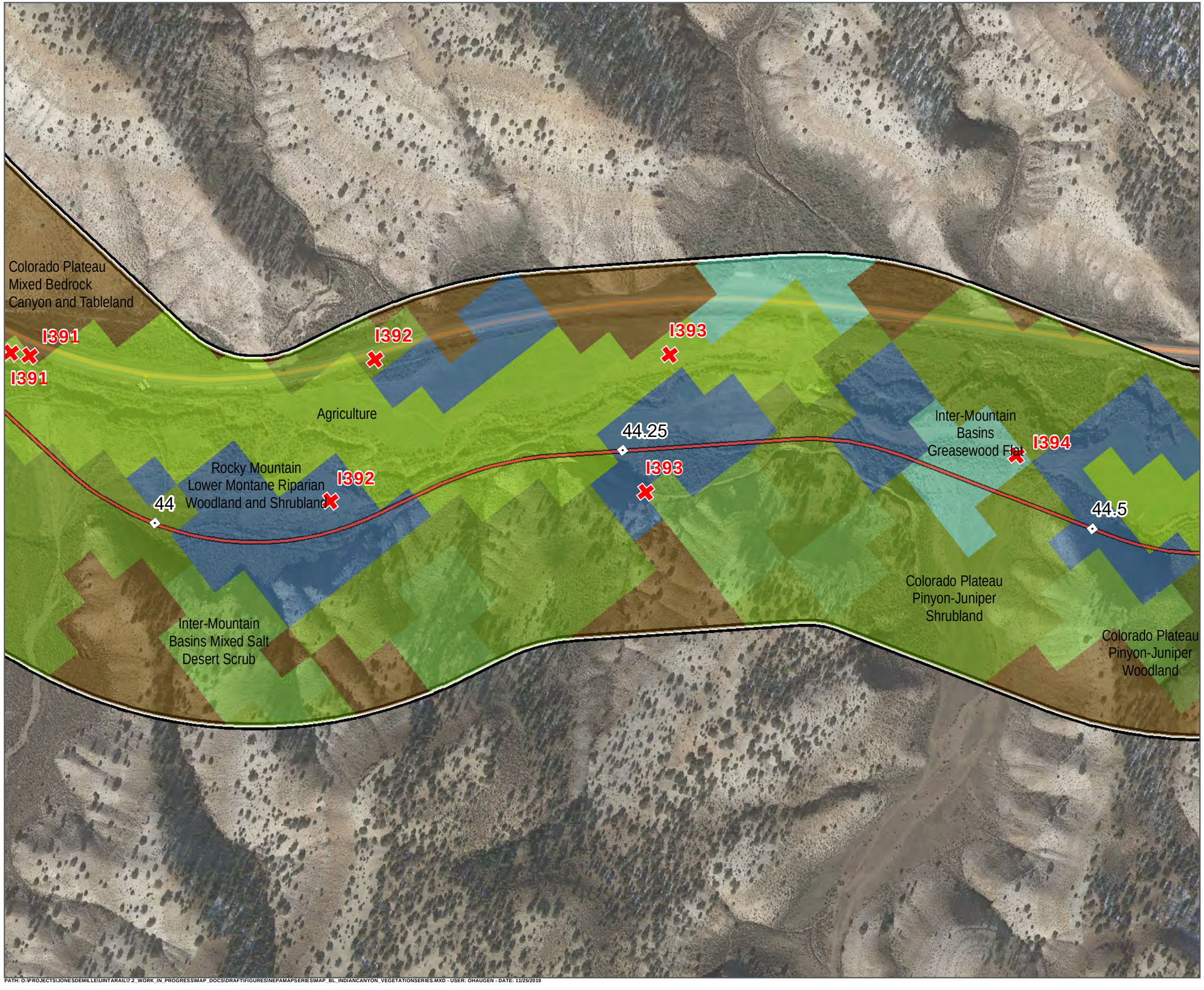

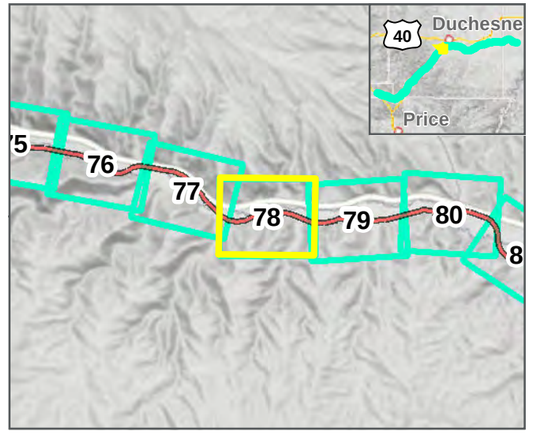

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Indian Canyon Centerline
Study Area
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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
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- Colorado Plateau Pinyon-Juniper Woodland
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- Inter-Mountain Basins Mixed Salt Desert Scrub
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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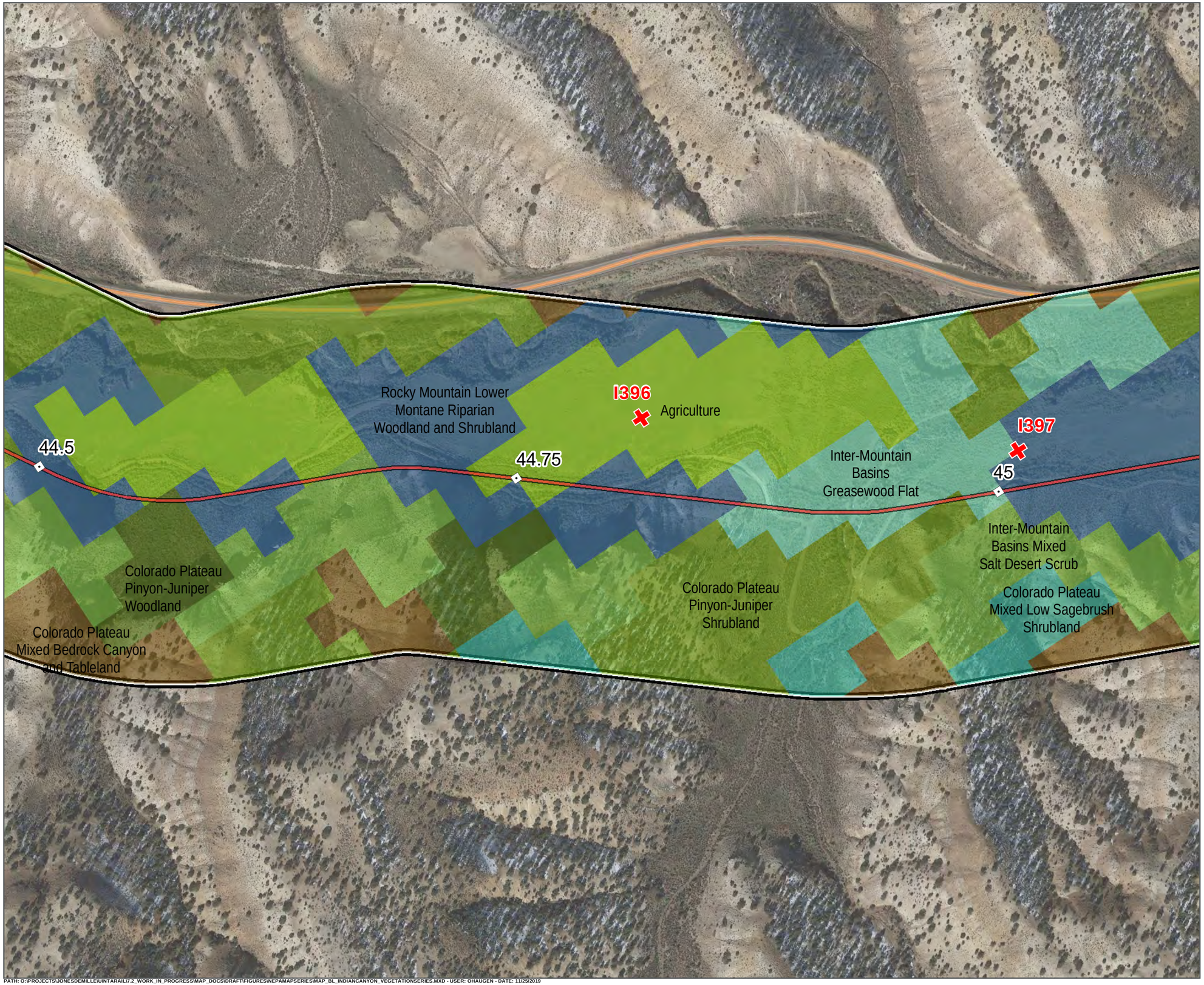

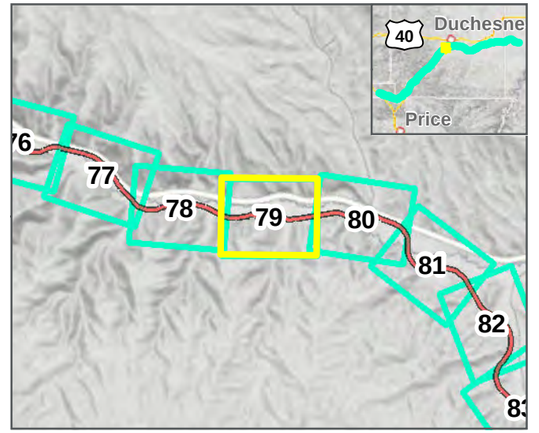

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Vegetation Communities

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- Colorado Plateau Mixed Low Sagebrush Shrubland
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- Colorado Plateau Pinyon-Juniper Woodland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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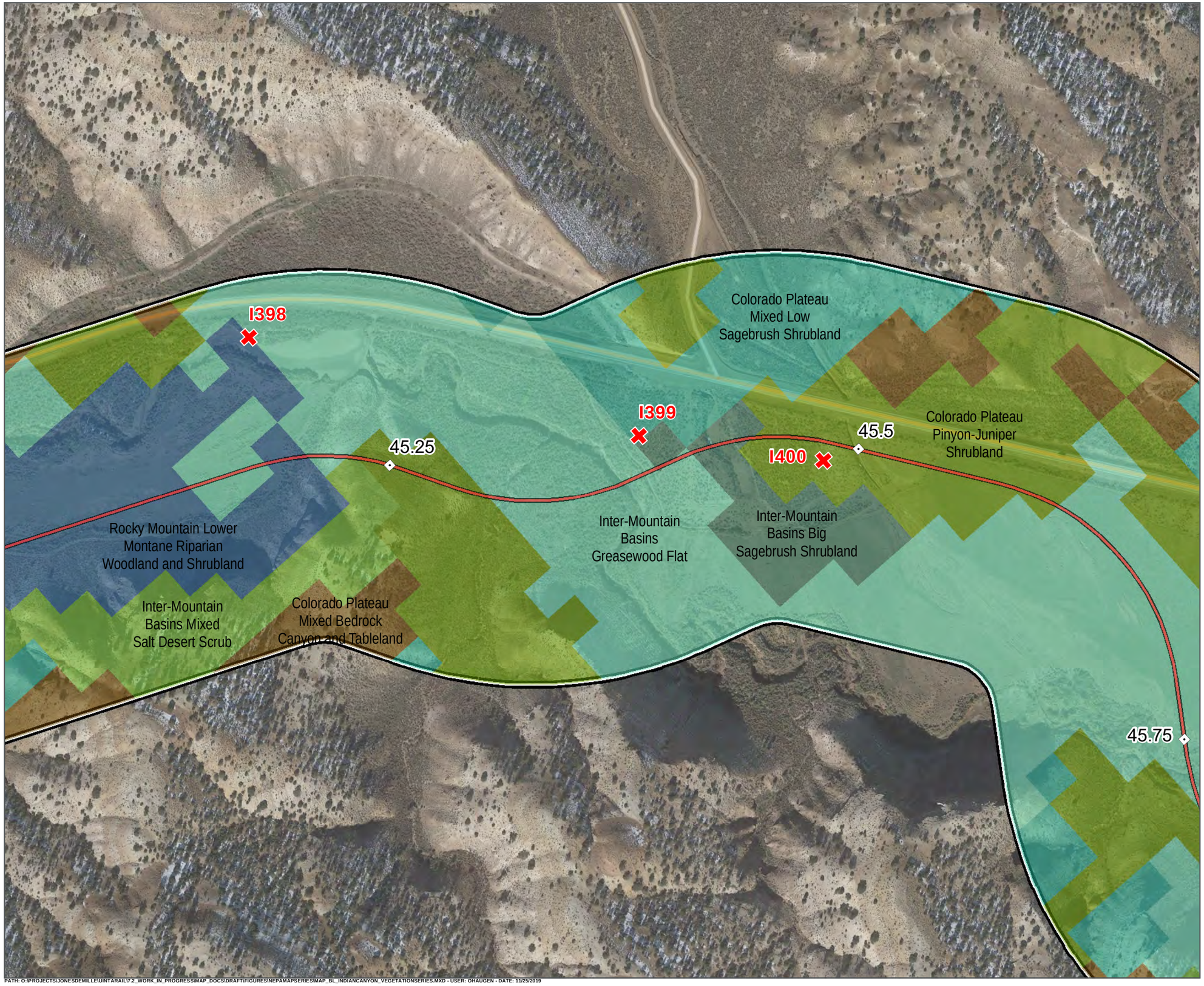

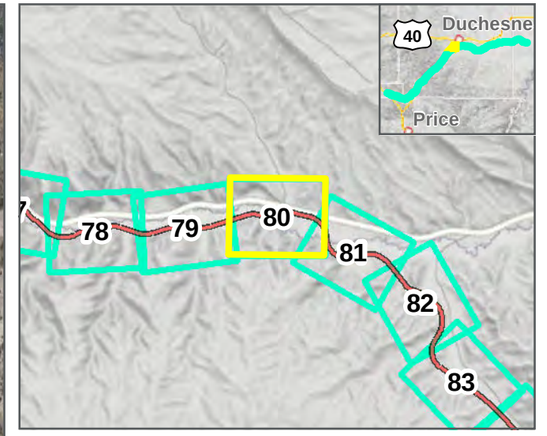

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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
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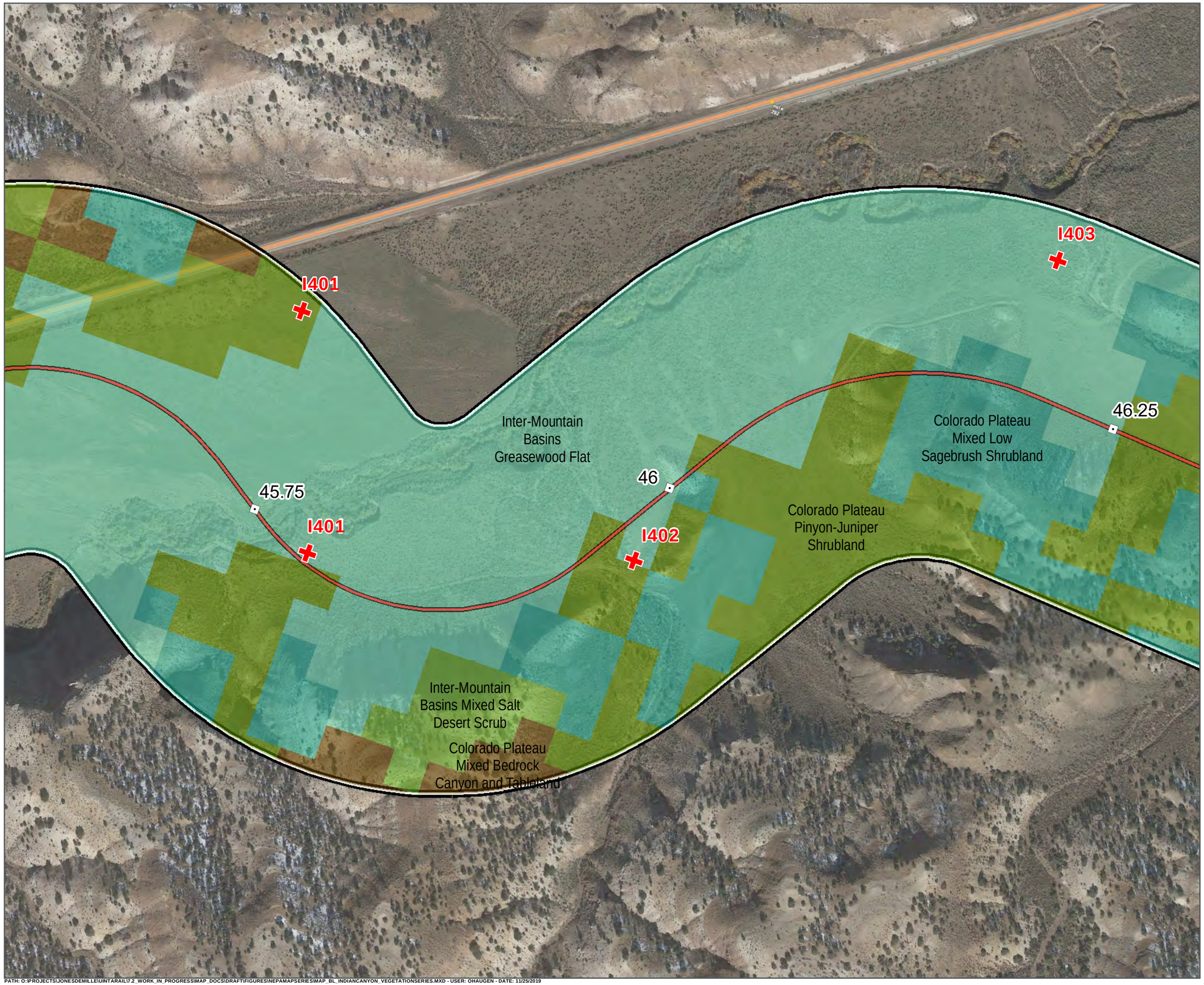

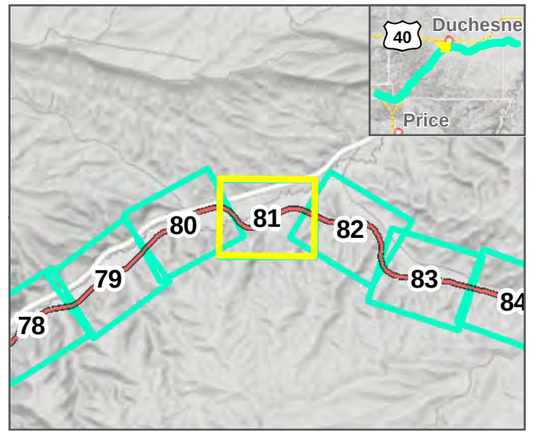

Photo Points
Mileposts
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Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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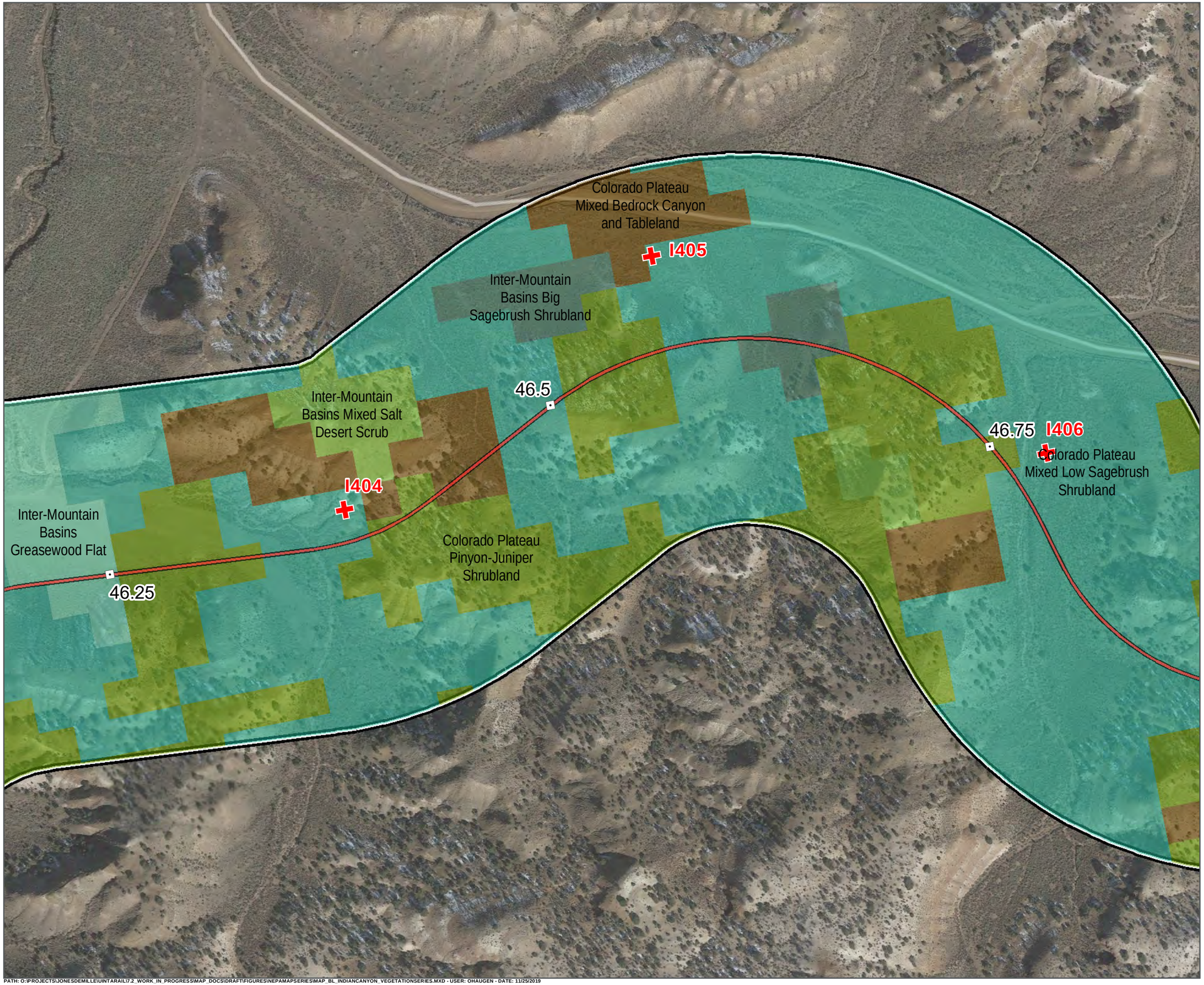

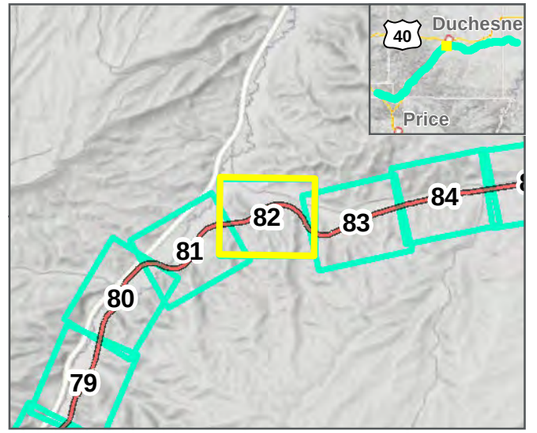

Photo Points
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Study Area
Map Extent (current view in yellow)

Vegetation Communities

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- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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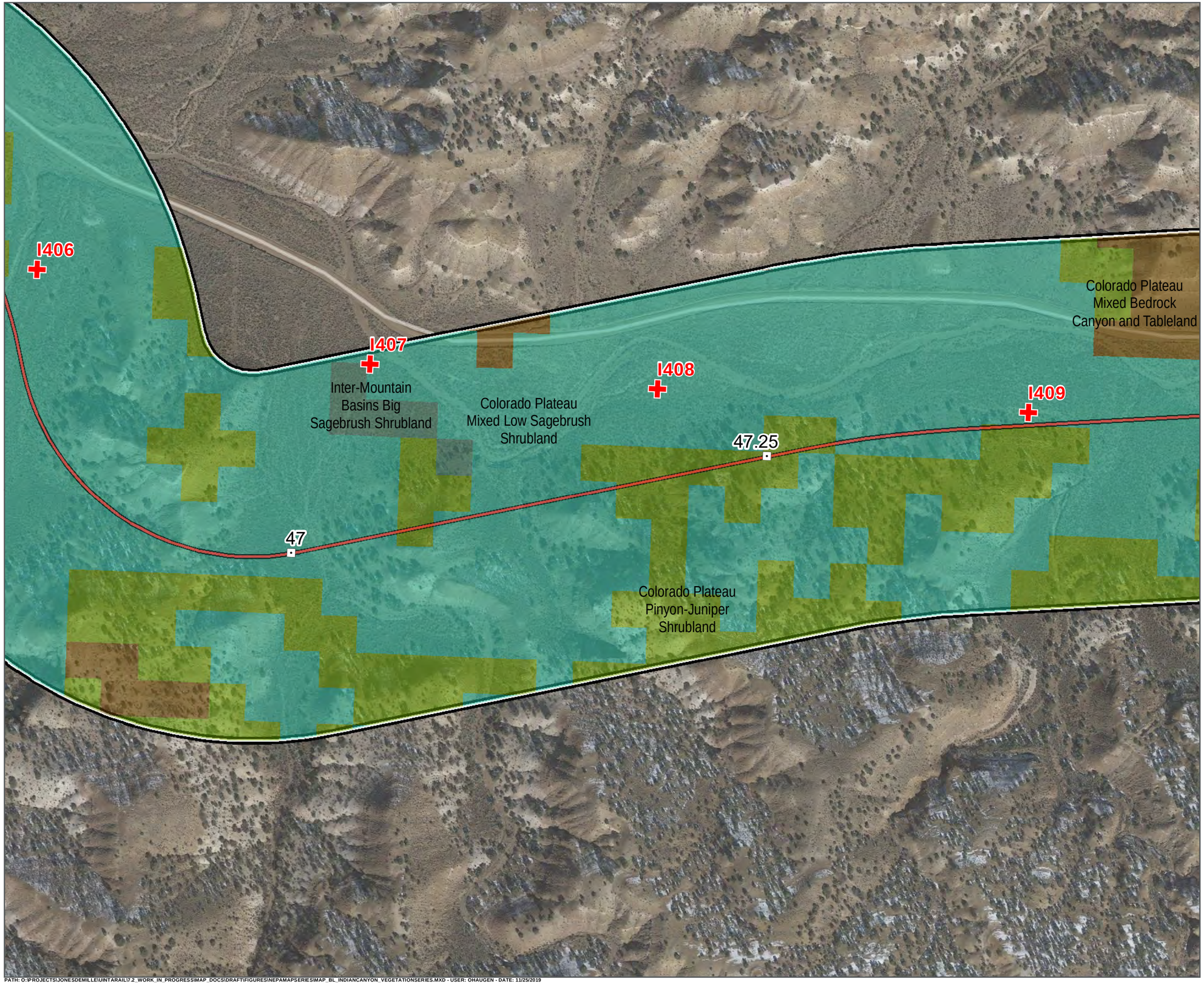

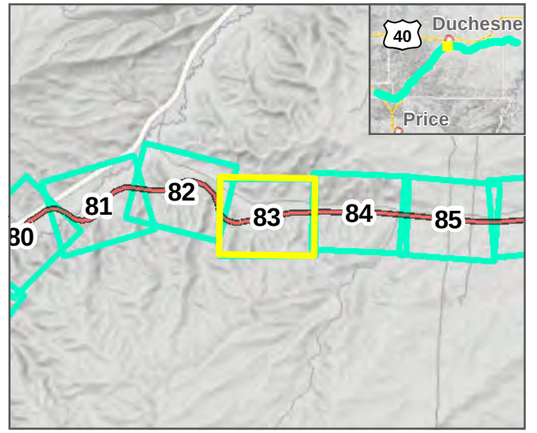

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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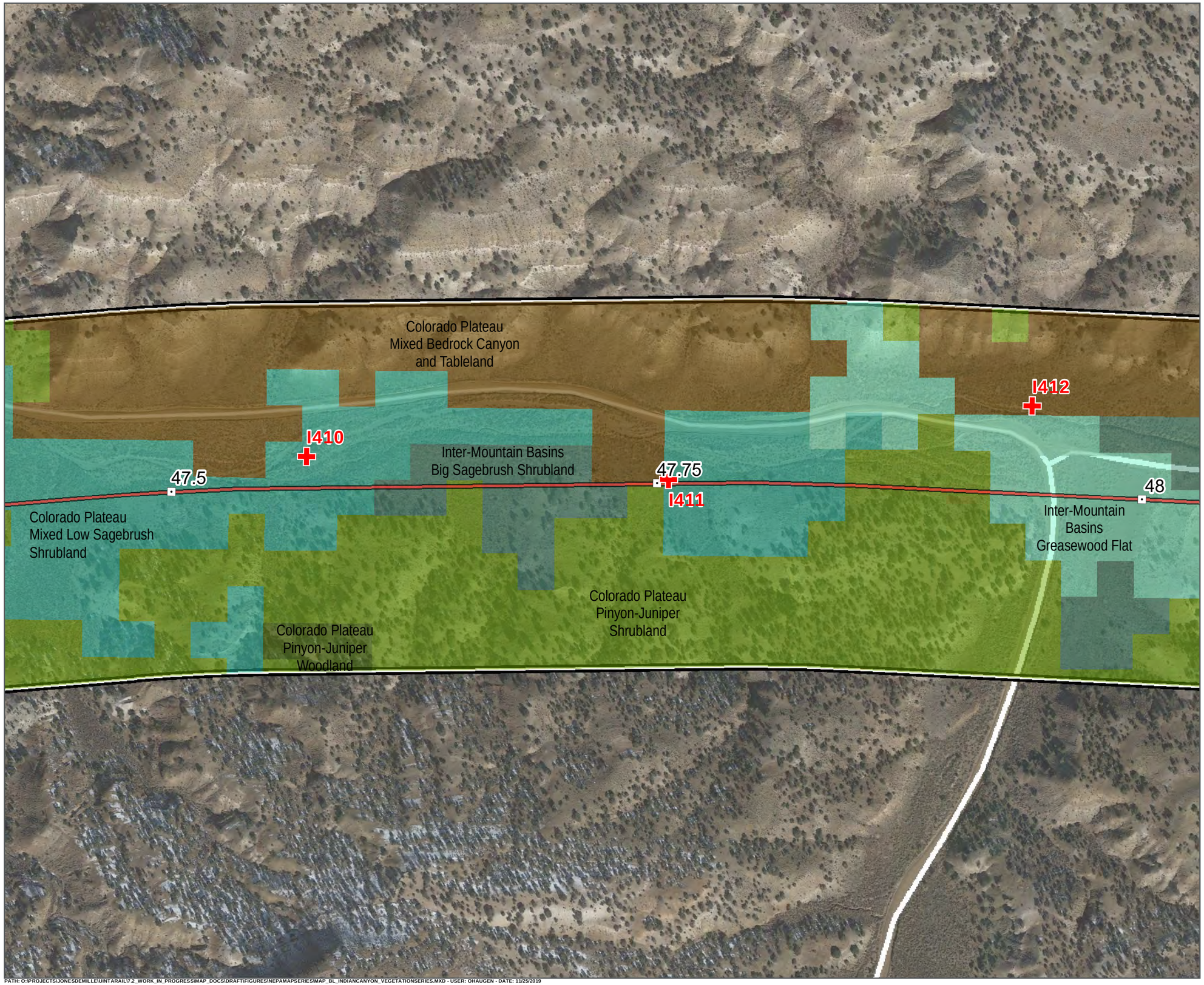

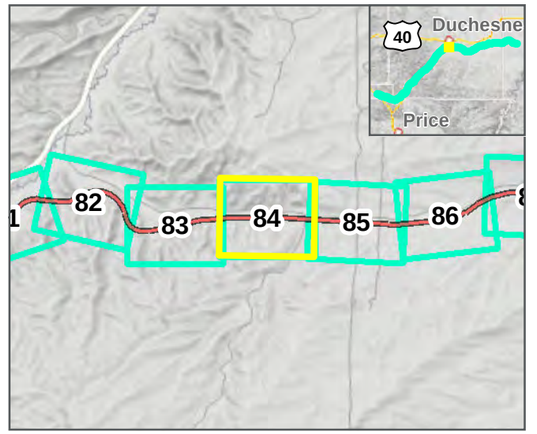

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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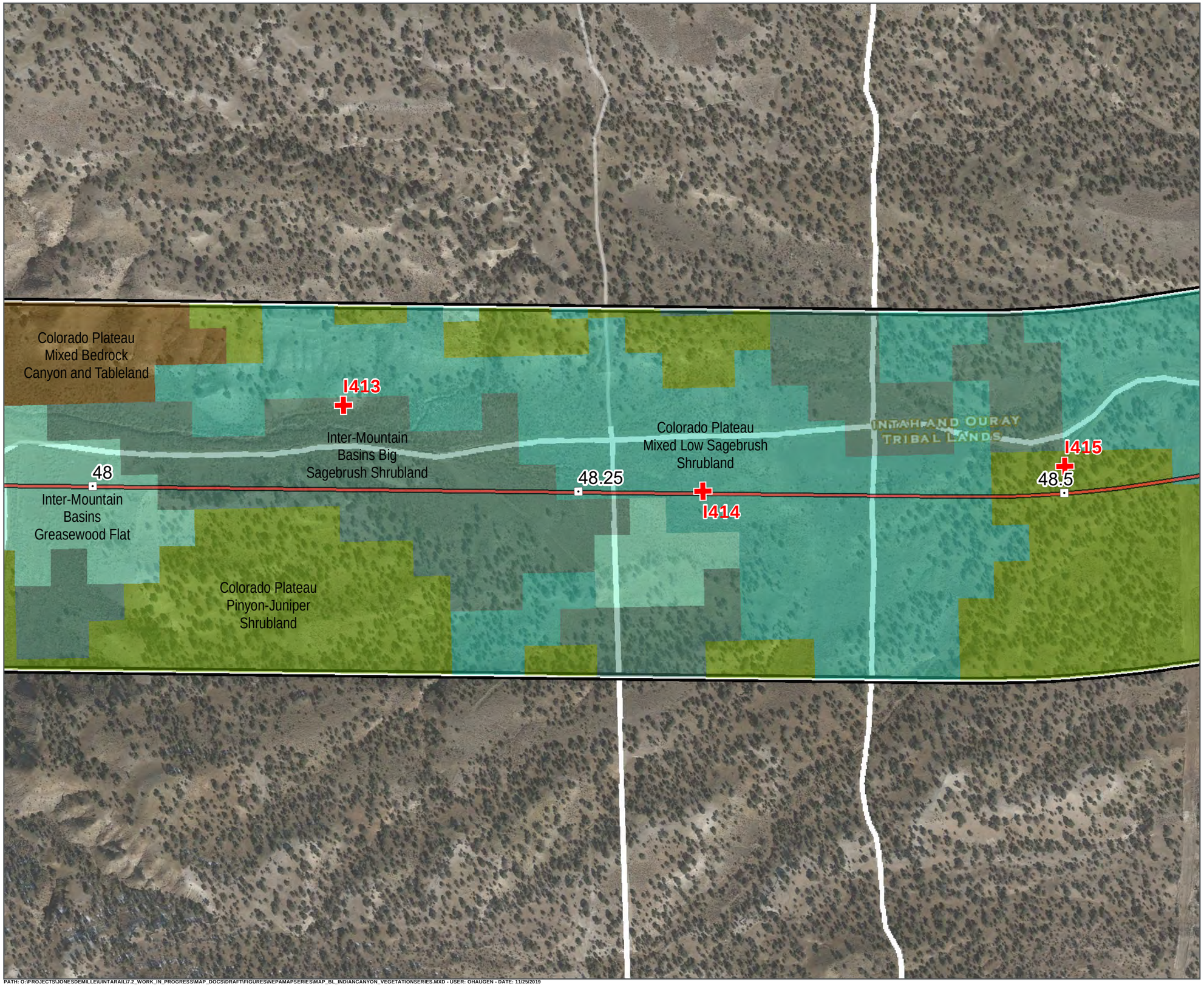

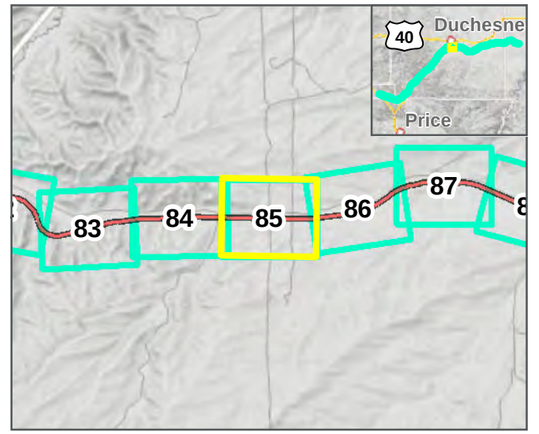

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Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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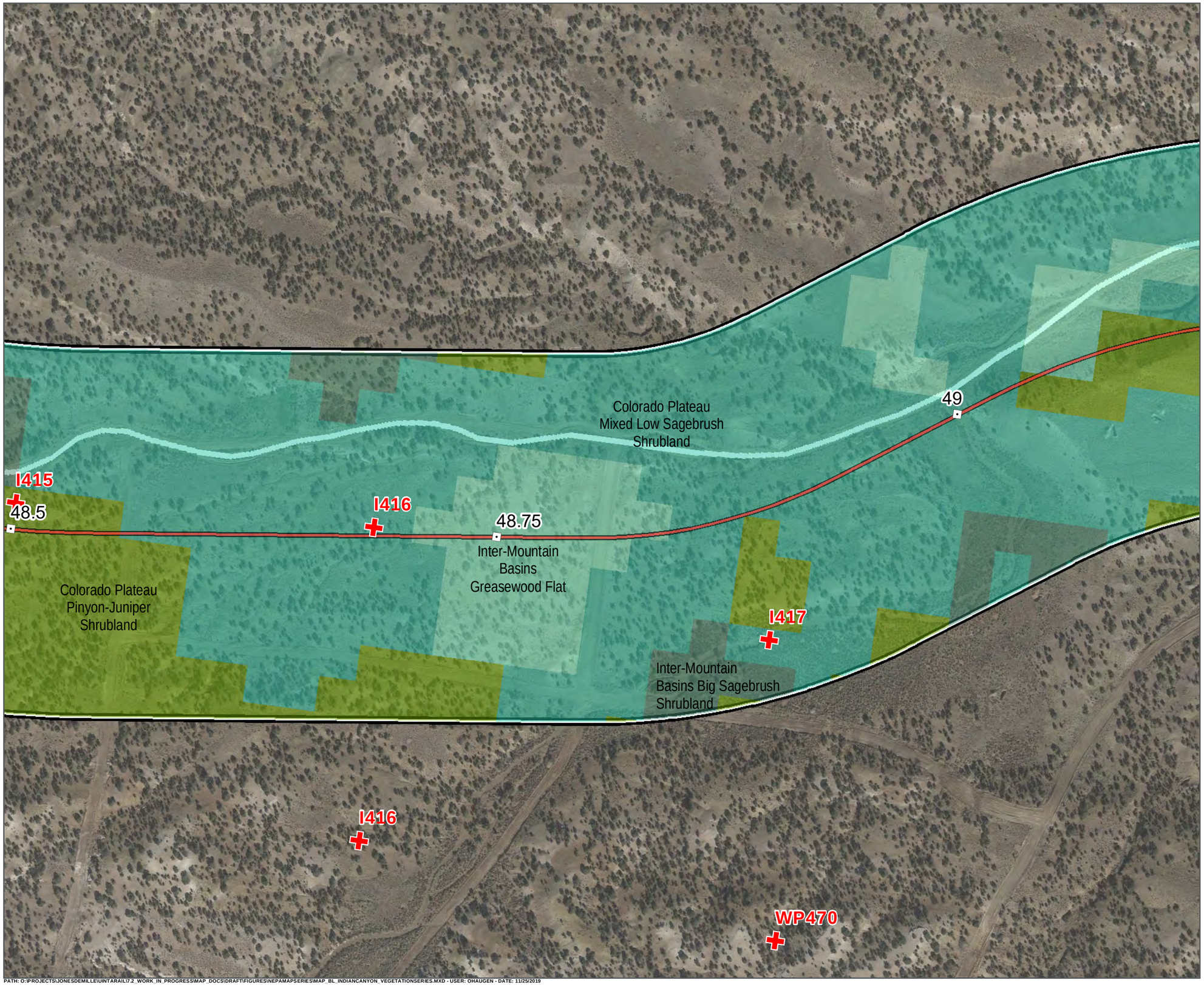

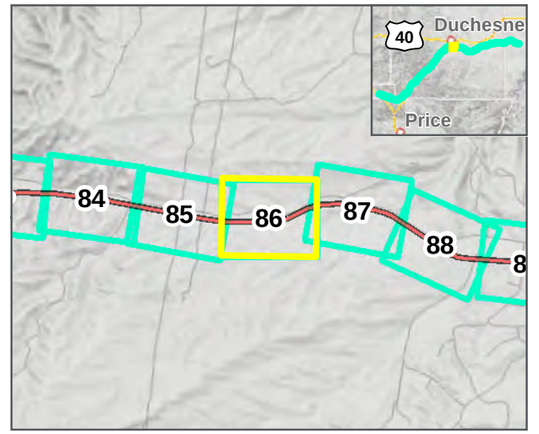

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Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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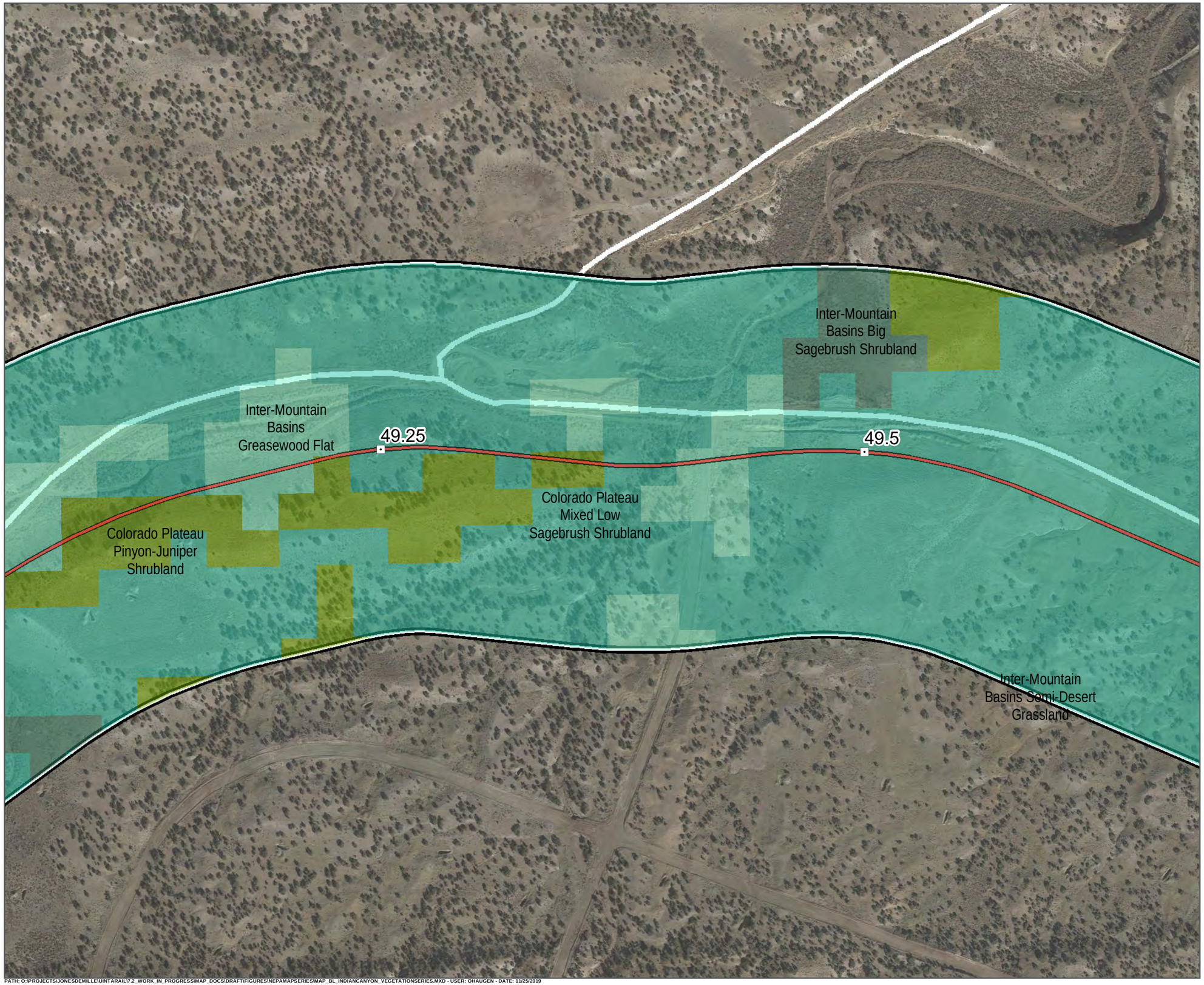

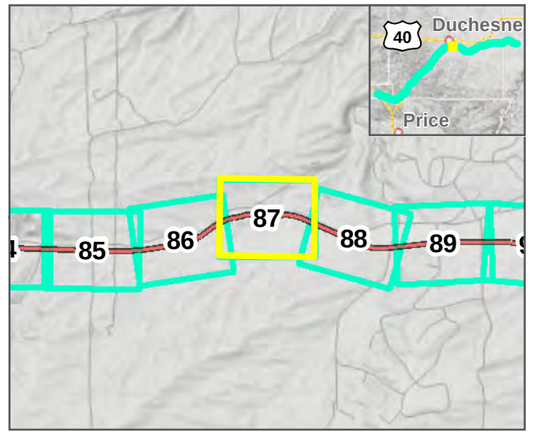

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Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
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- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Semi-Desert Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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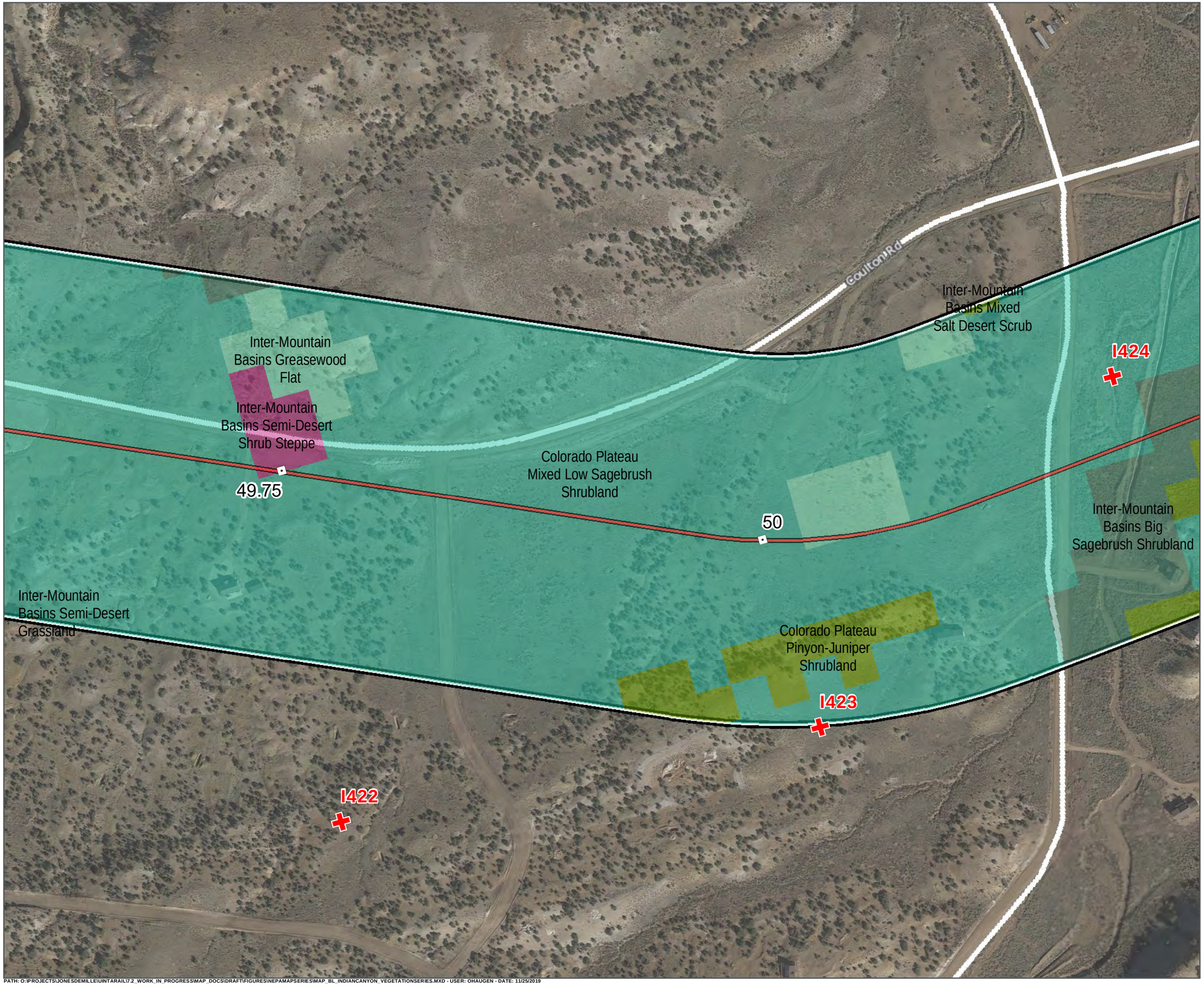

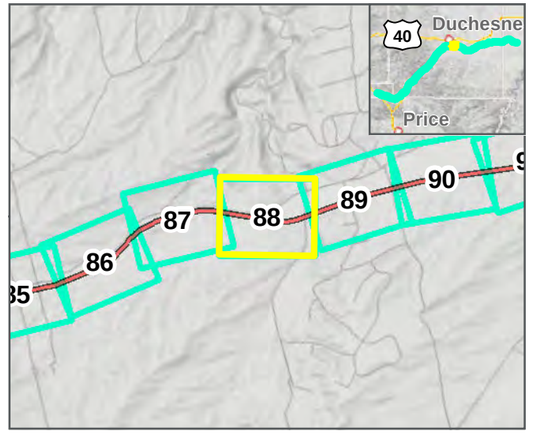

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Vegetation Communities

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- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub Steppe

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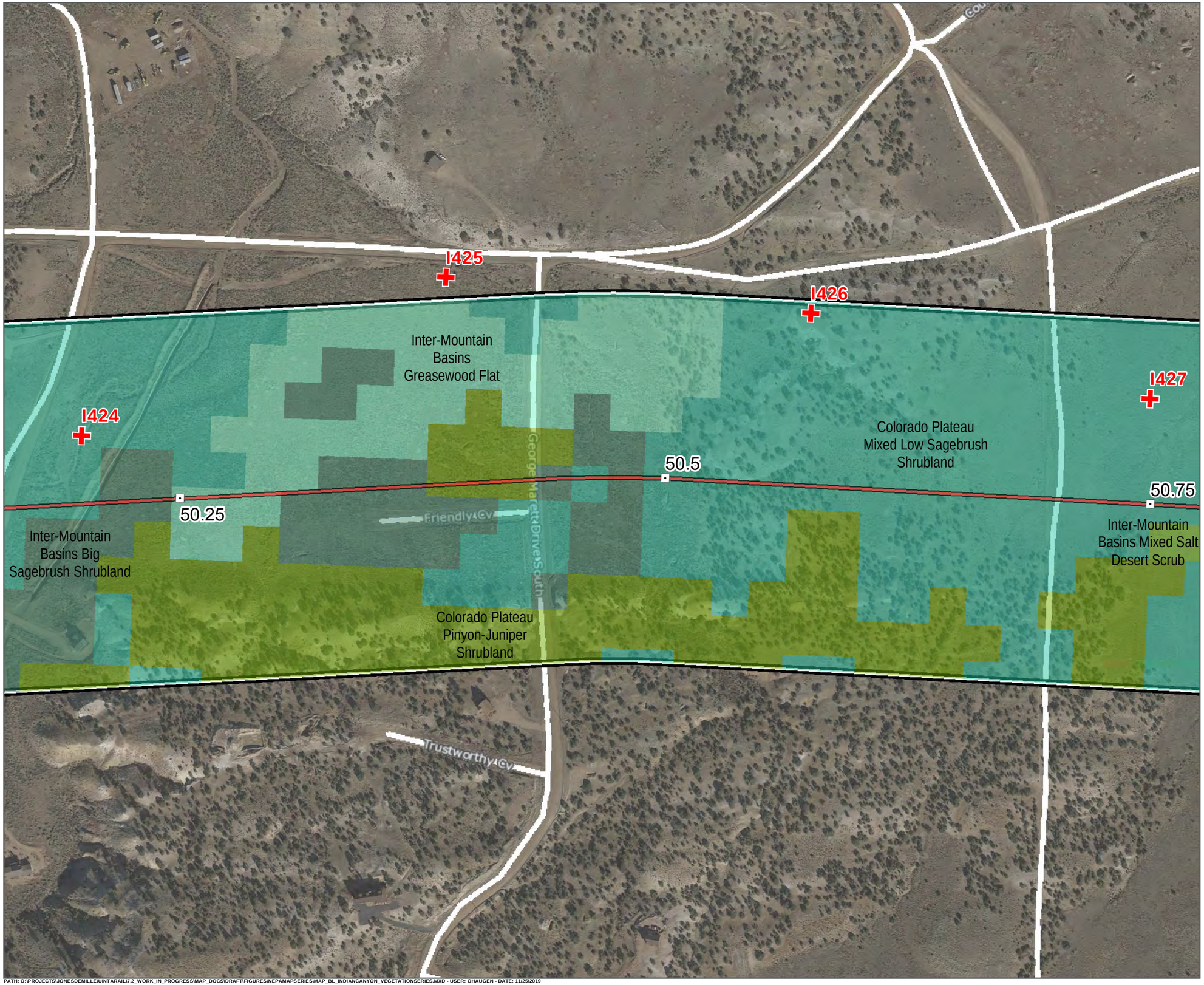

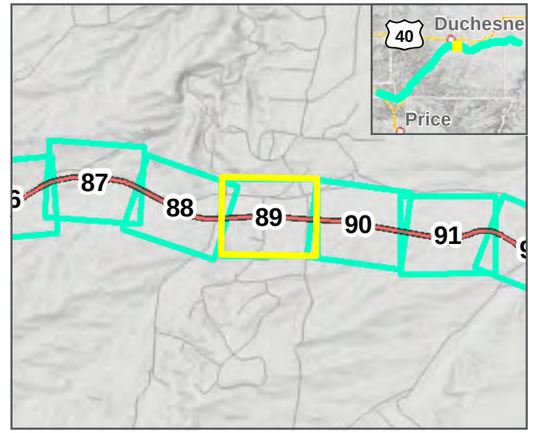

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Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

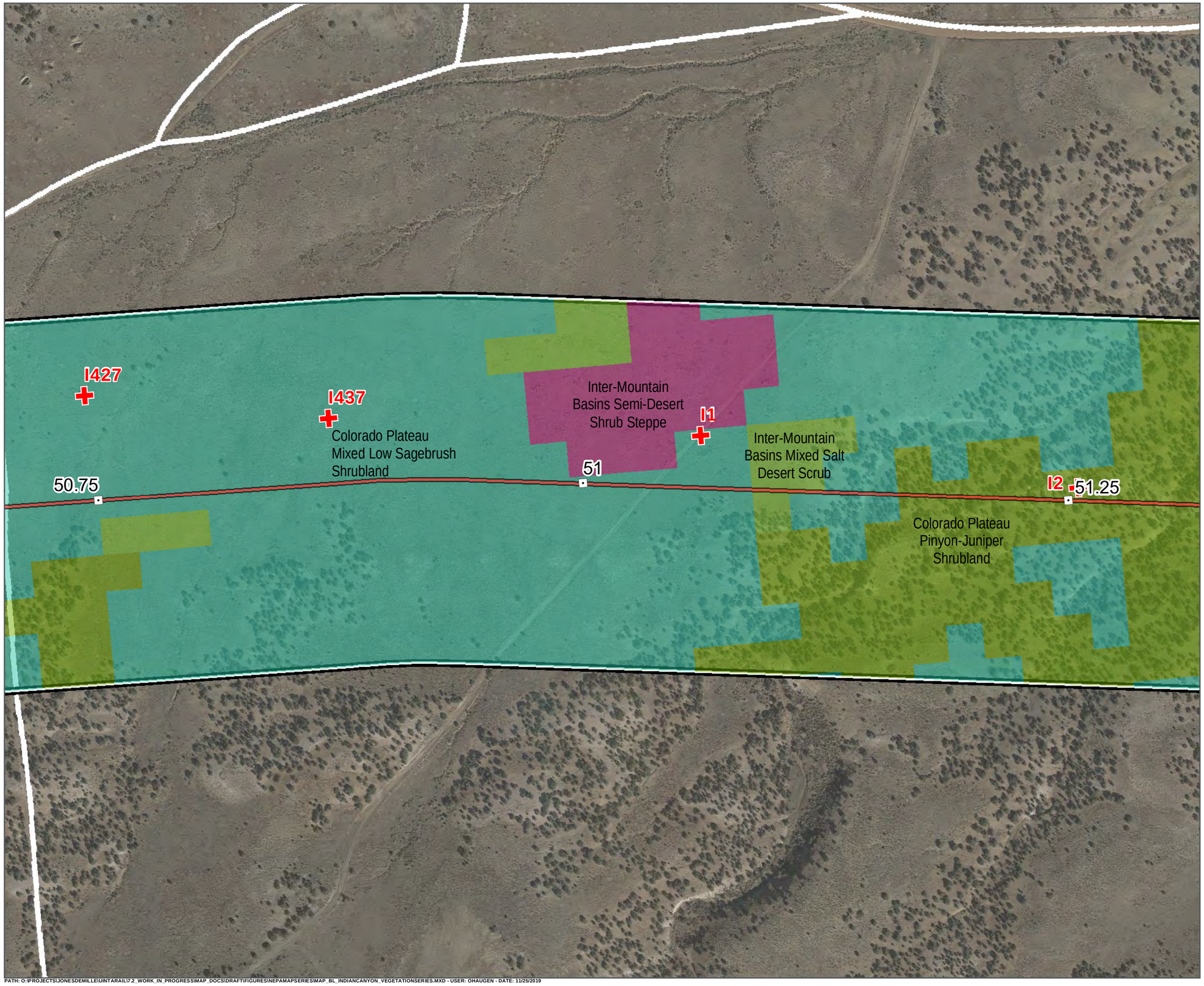
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



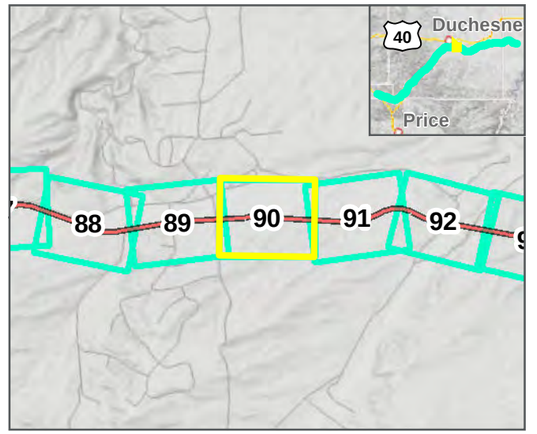


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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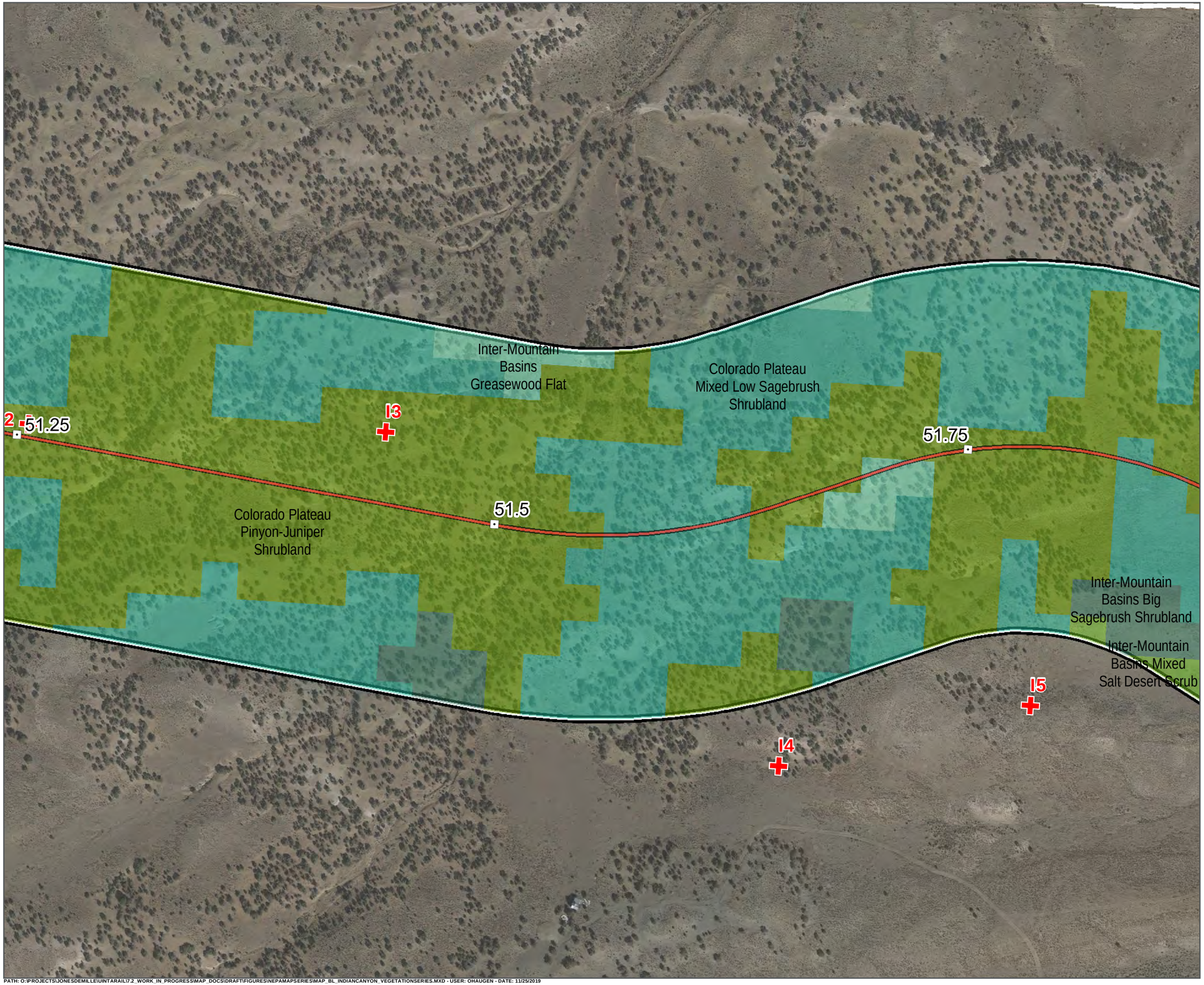

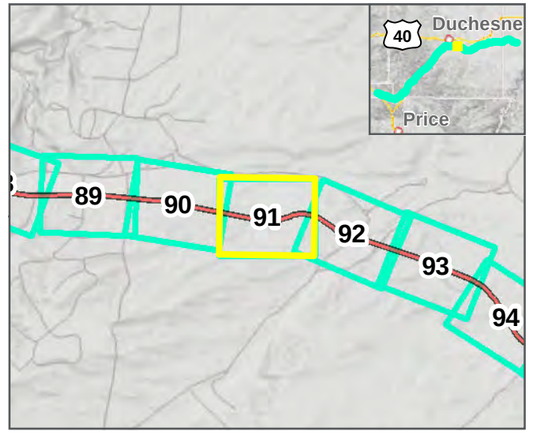

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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Utah Google Imagery
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Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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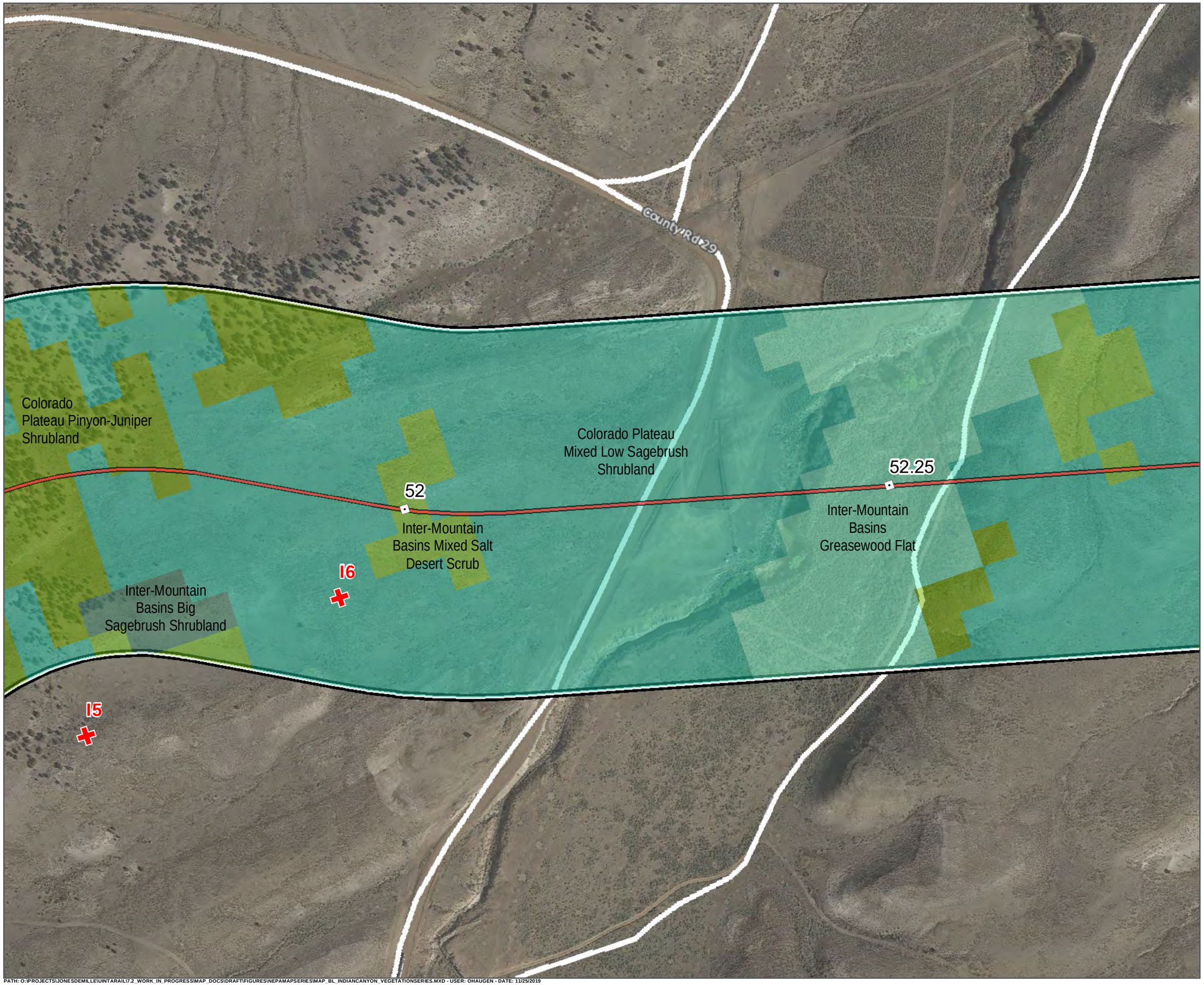

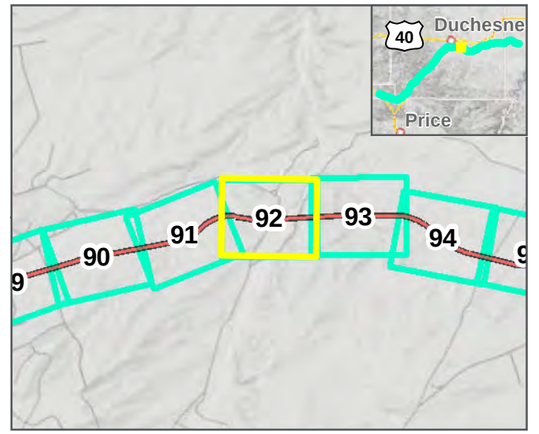

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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COODINATE SYSTEM:
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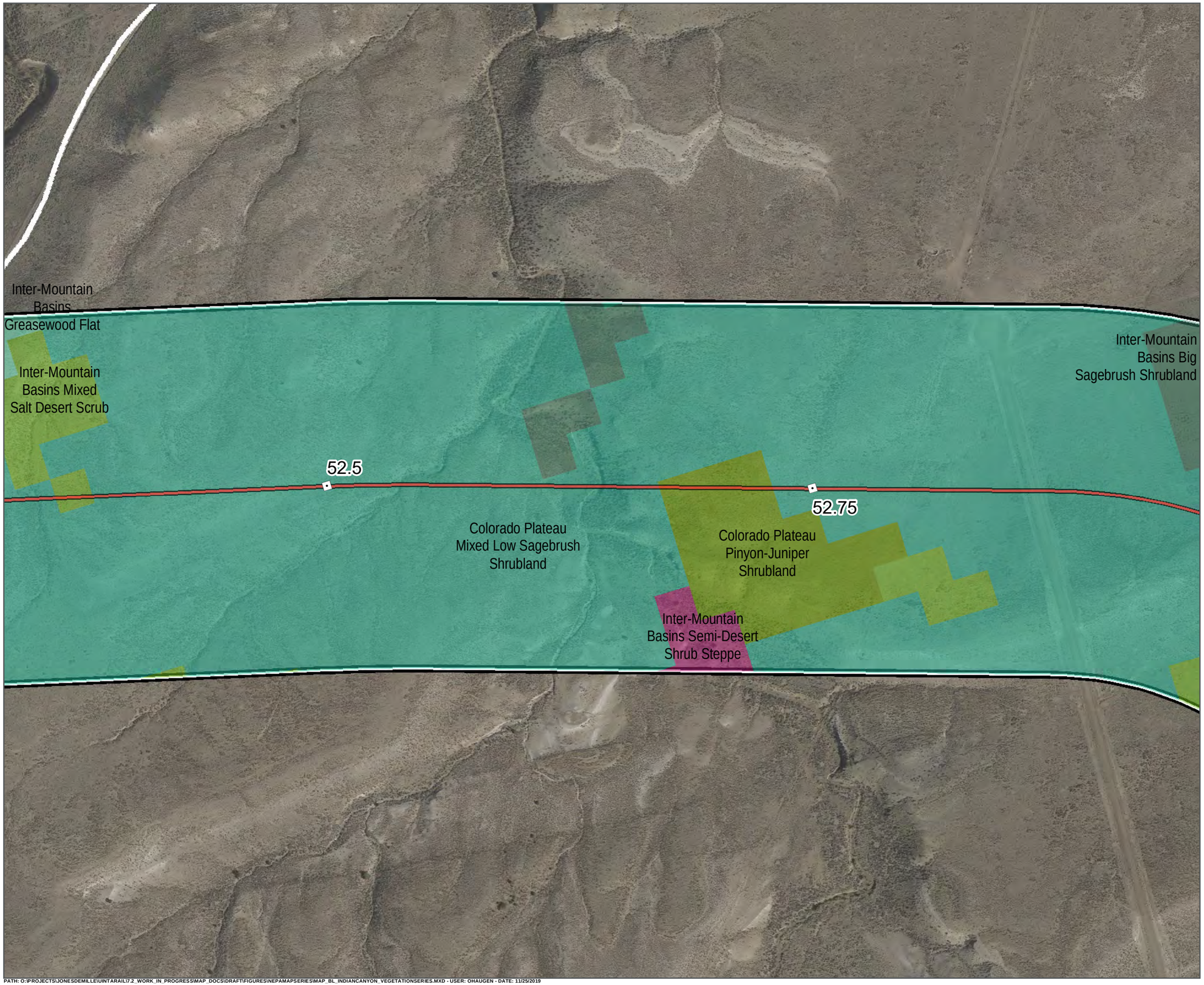

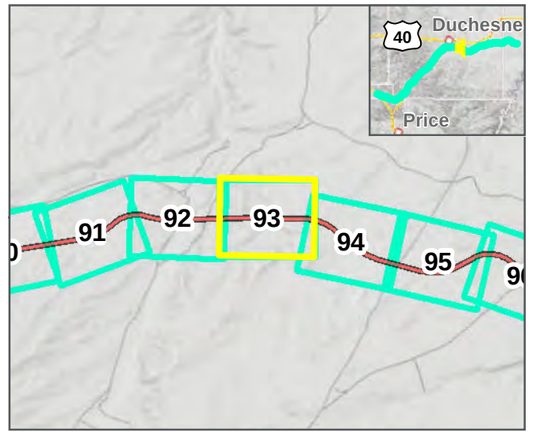

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

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- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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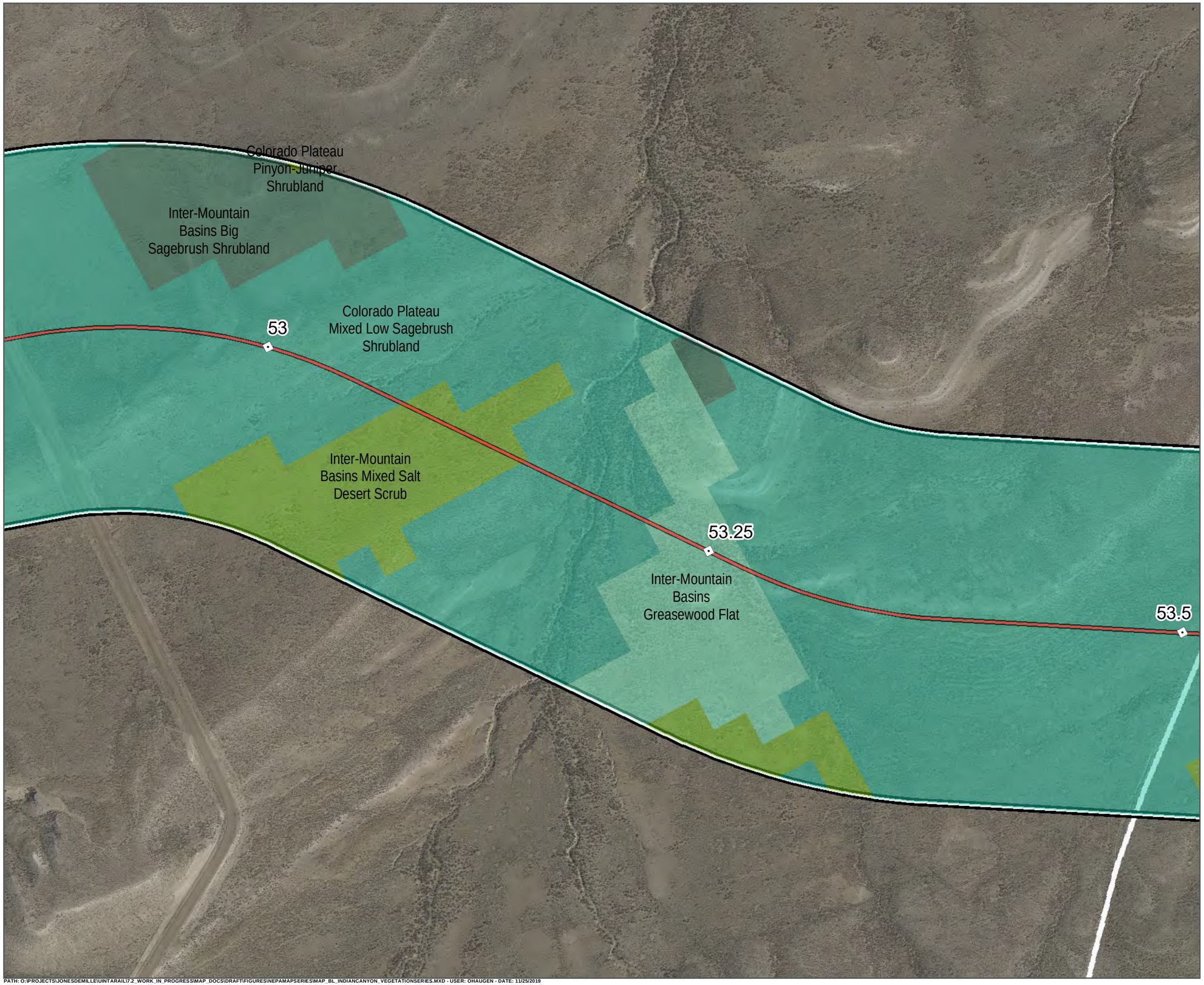

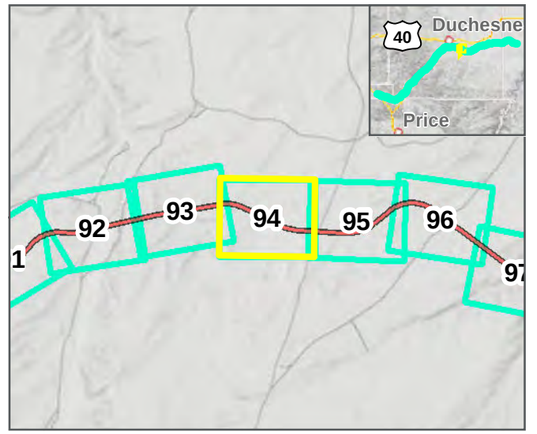

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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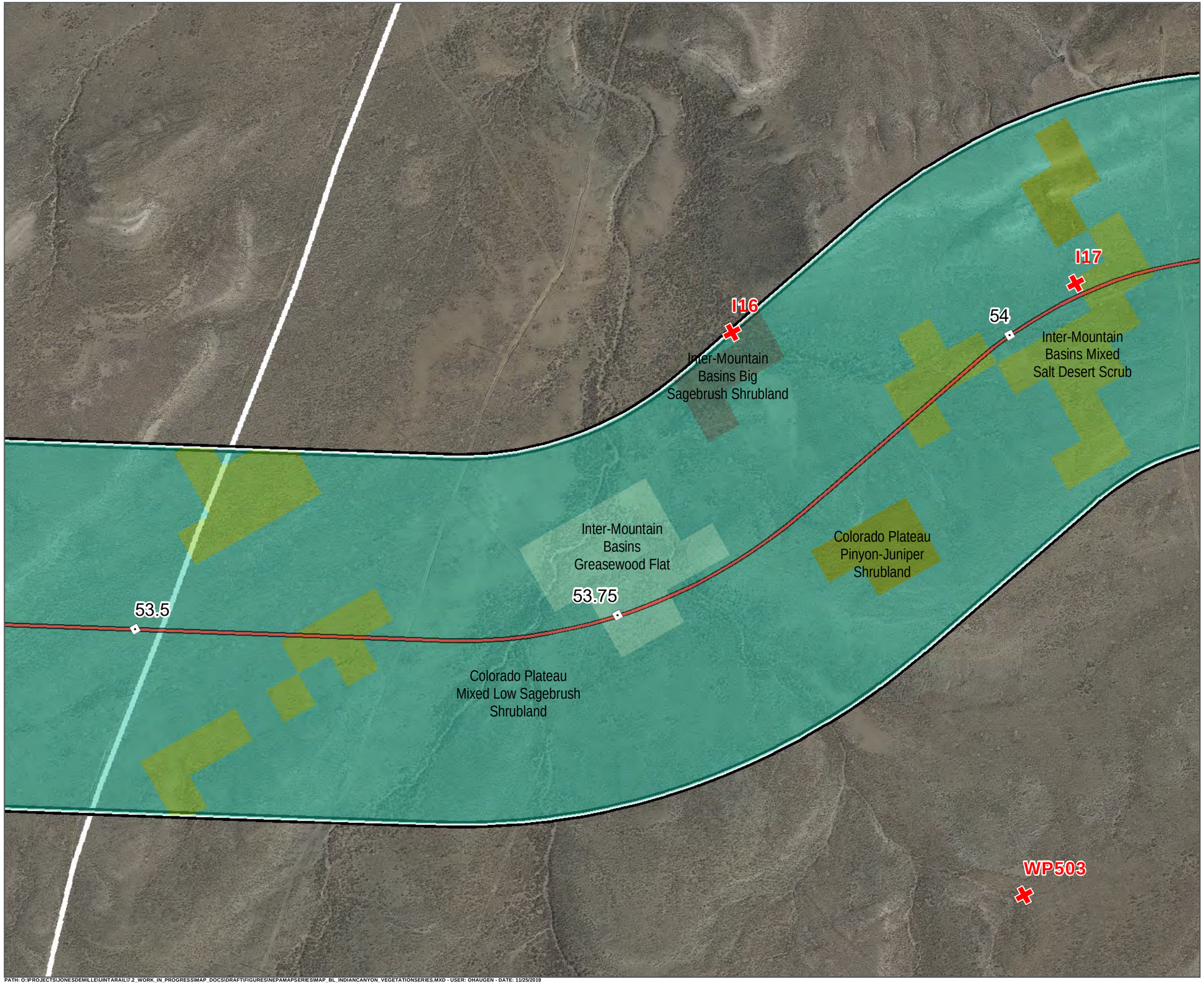

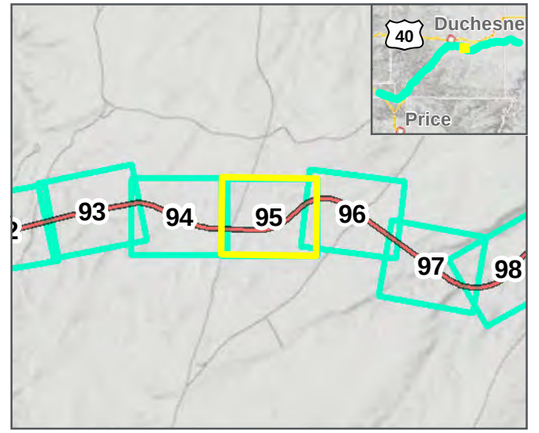

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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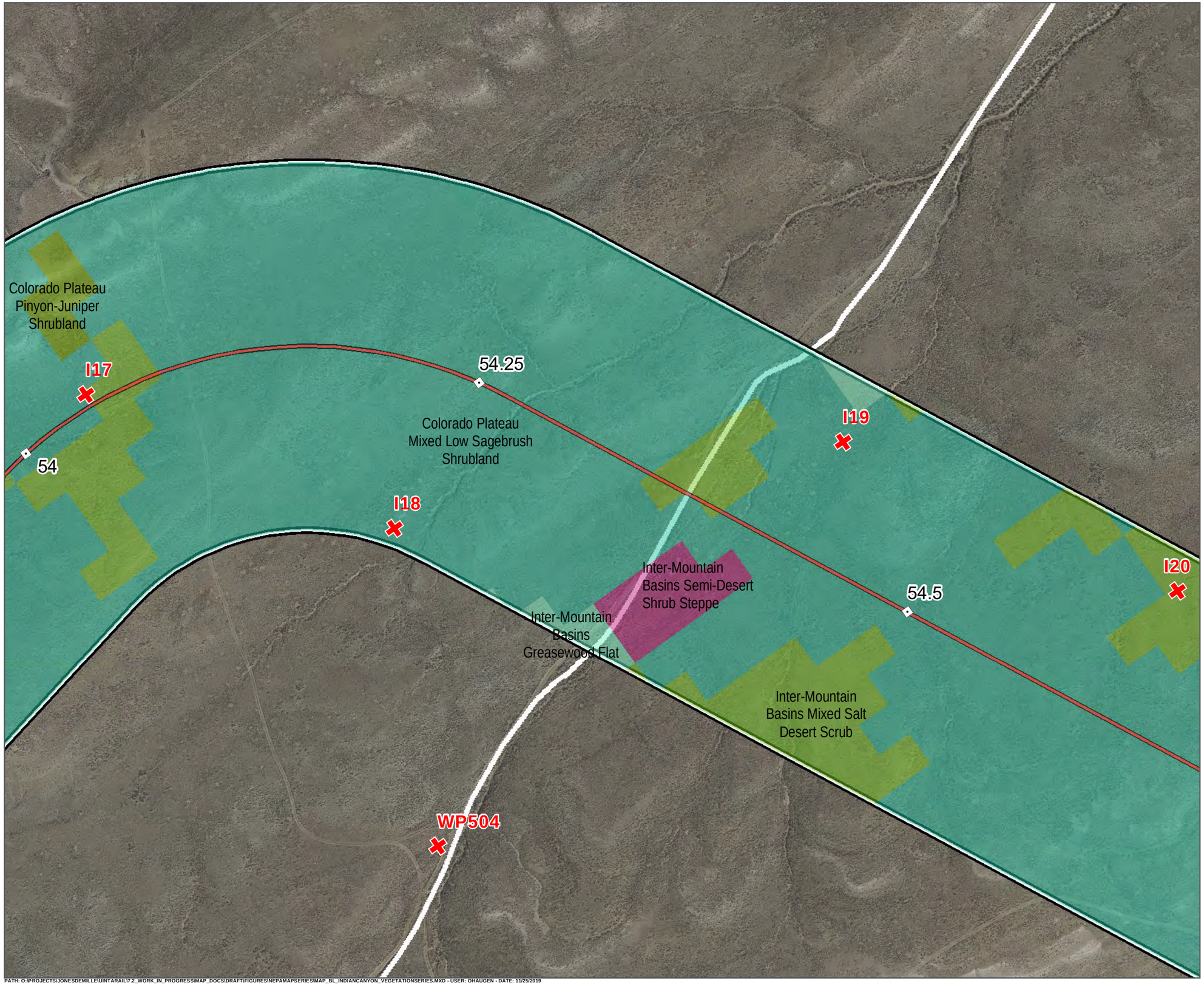

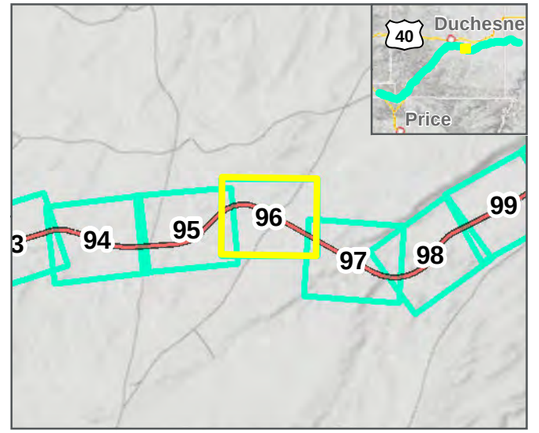

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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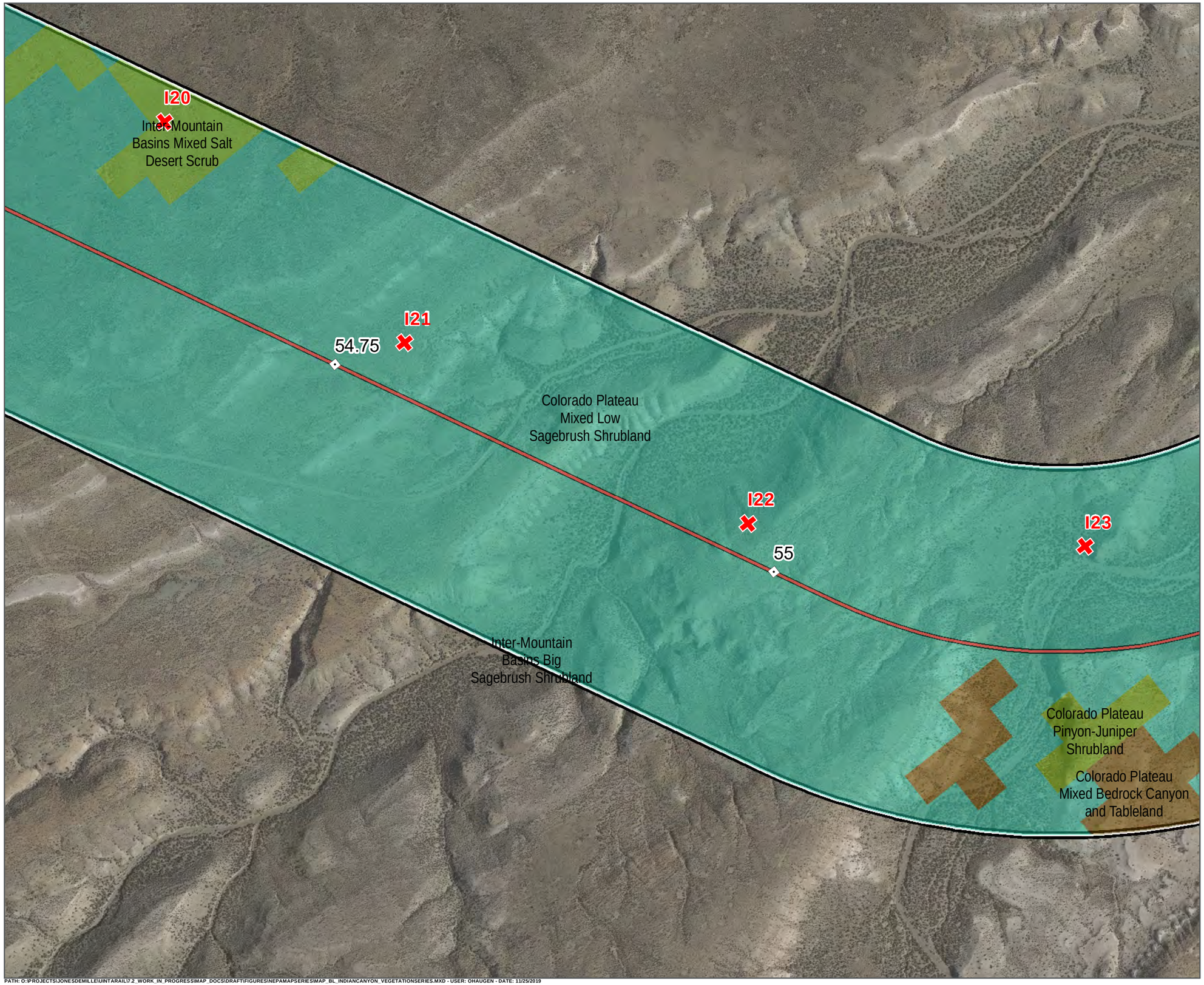

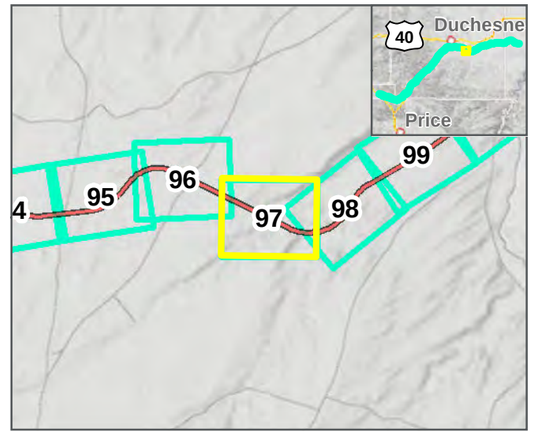

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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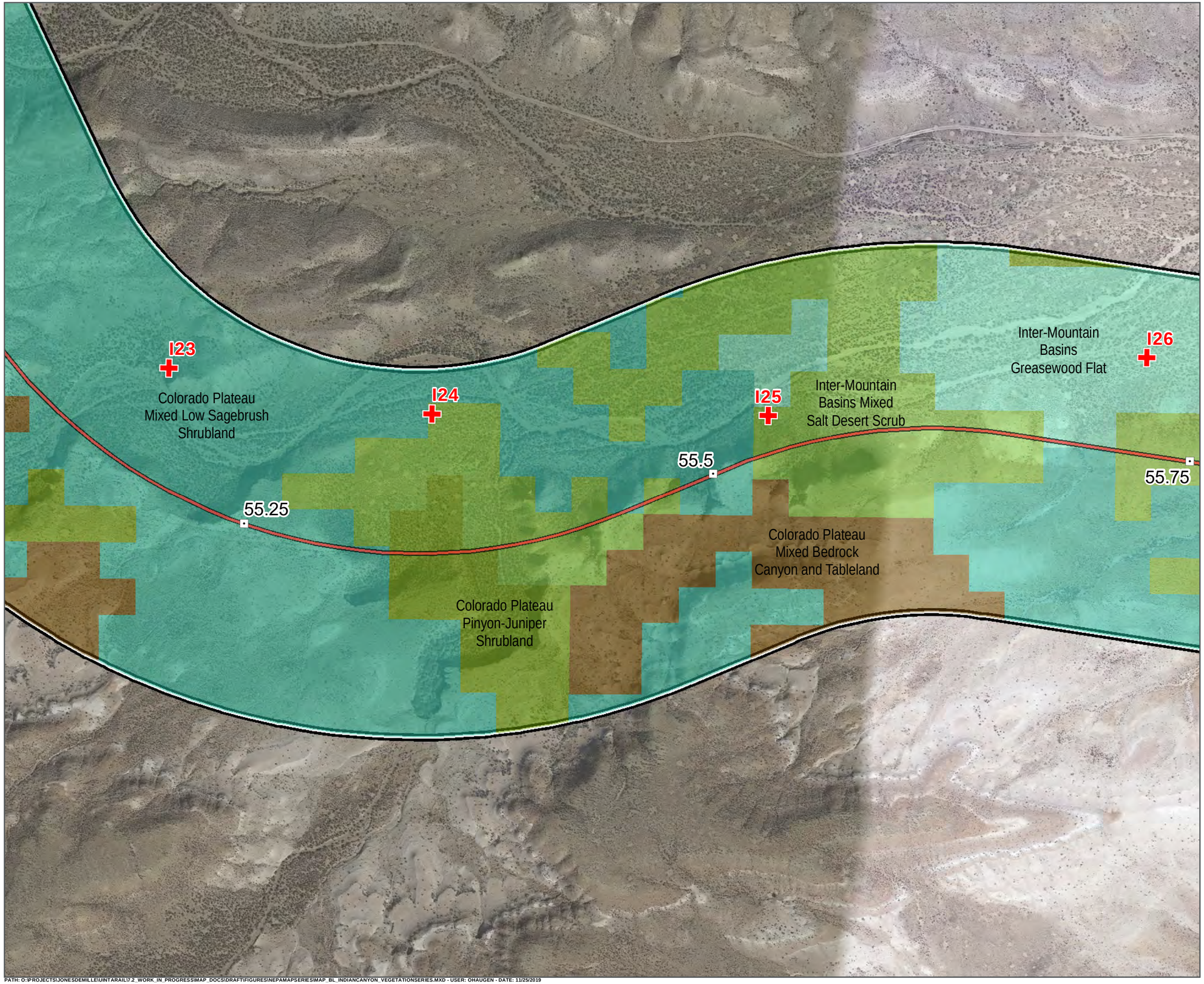

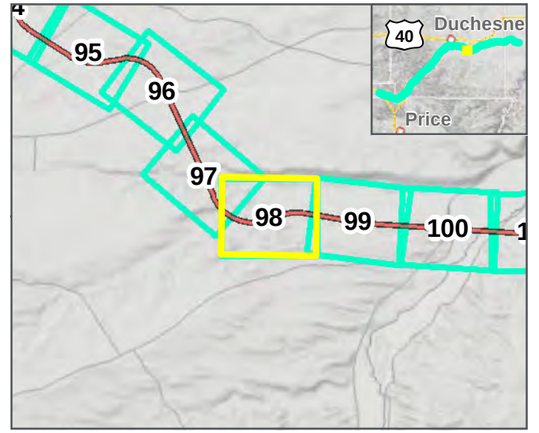

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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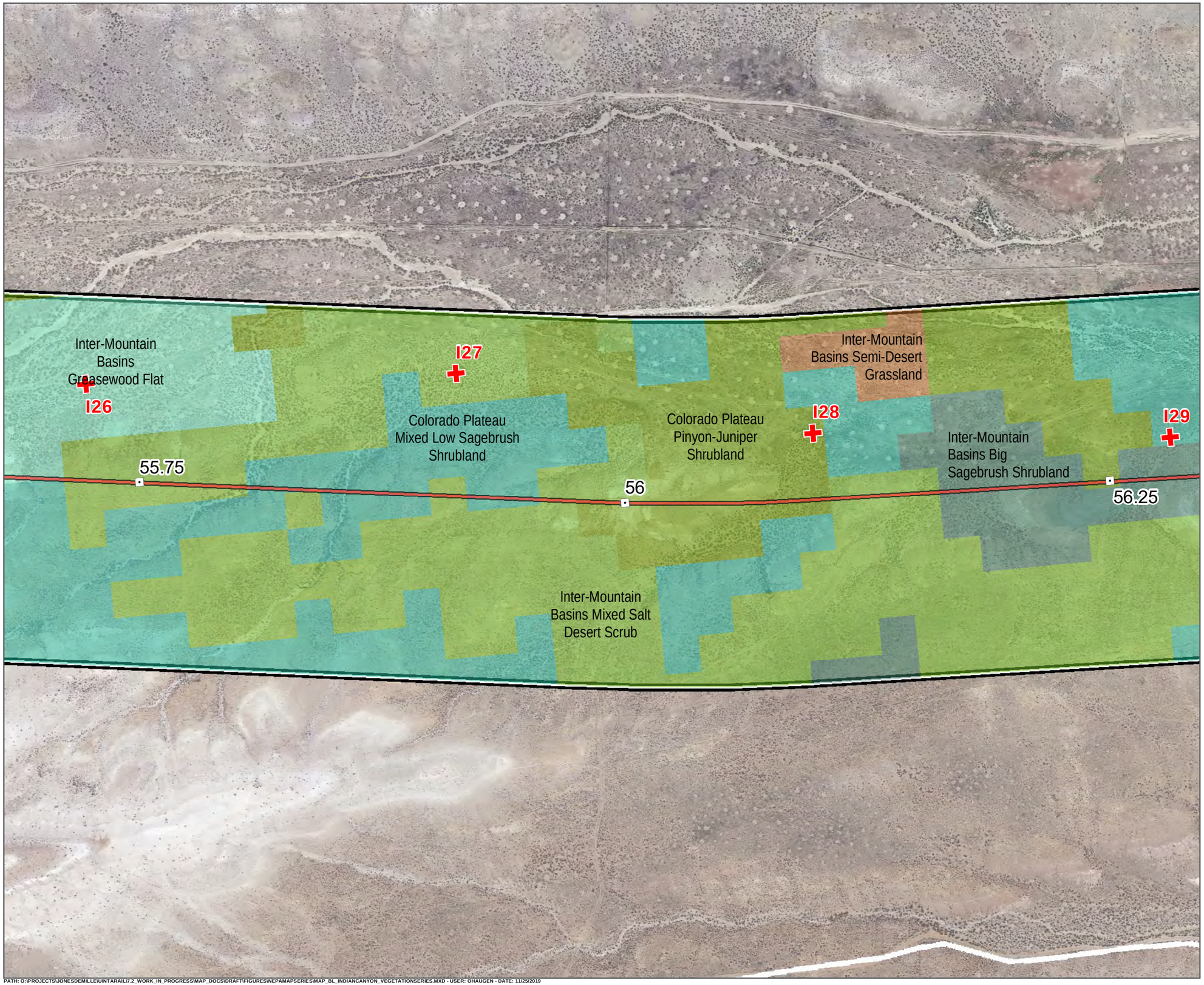

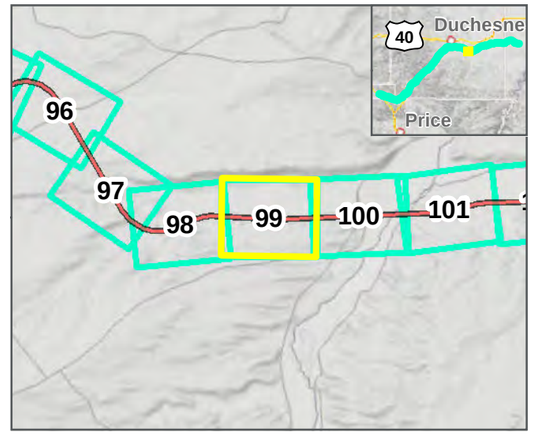

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
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Utah Google Imagery
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Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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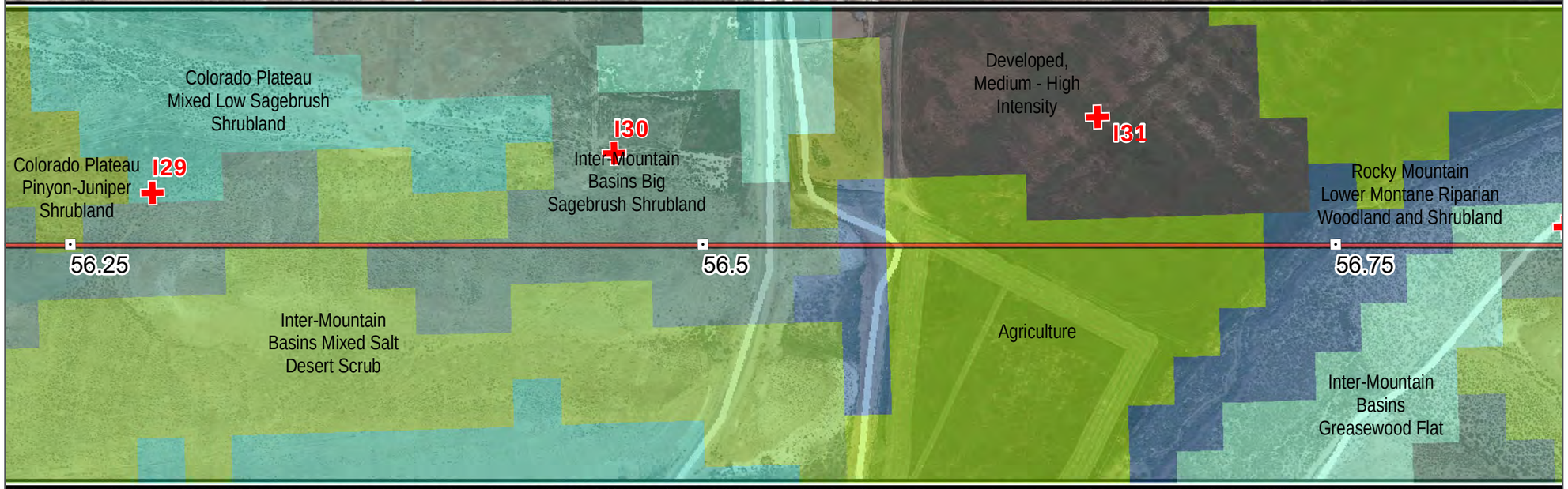

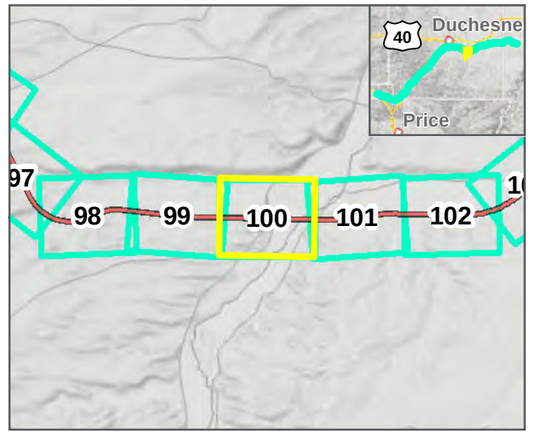

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Developed, Medium - High Intensity
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

7A SEVEN COUNTY INFRASTRUCTURE COALITION

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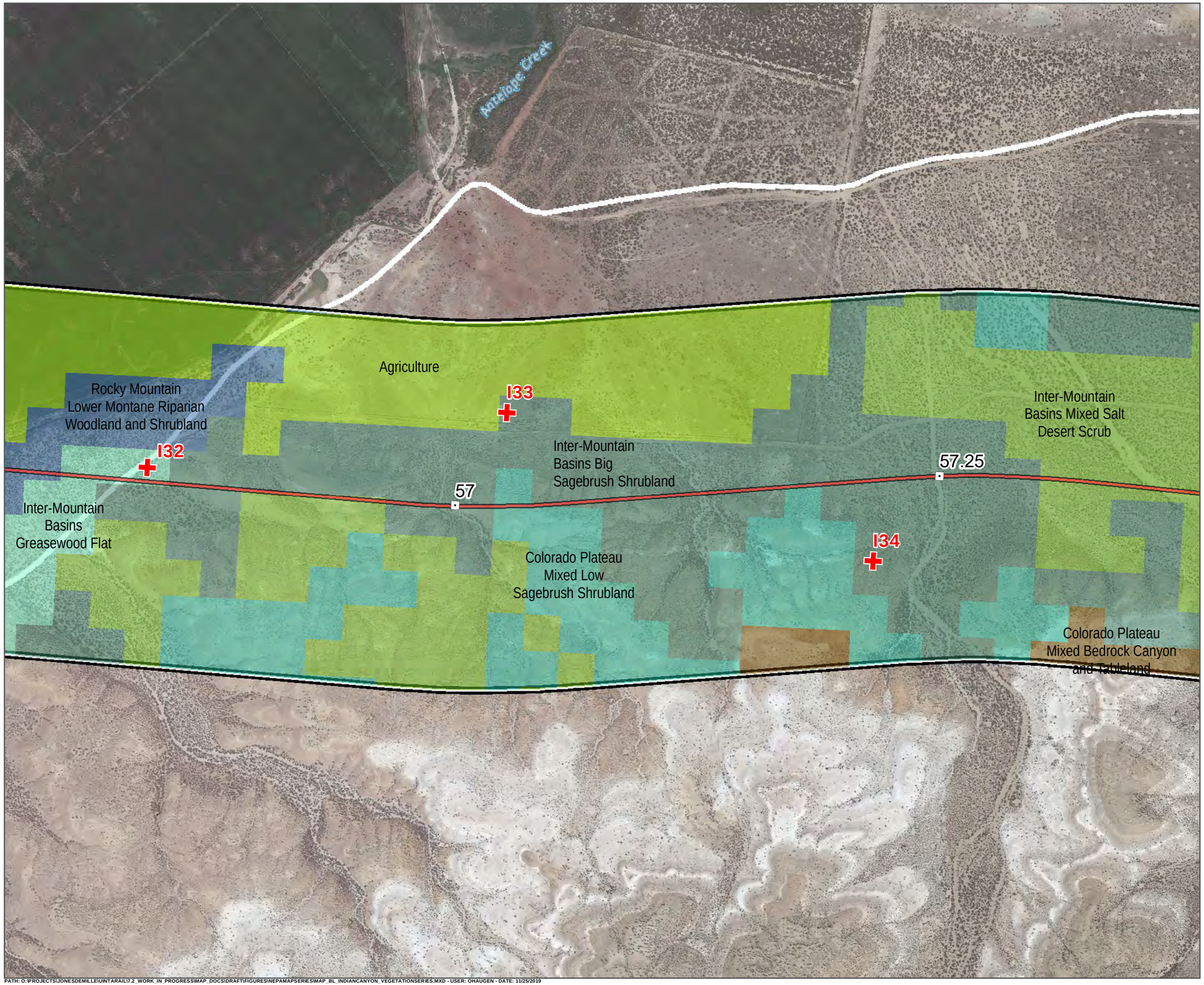

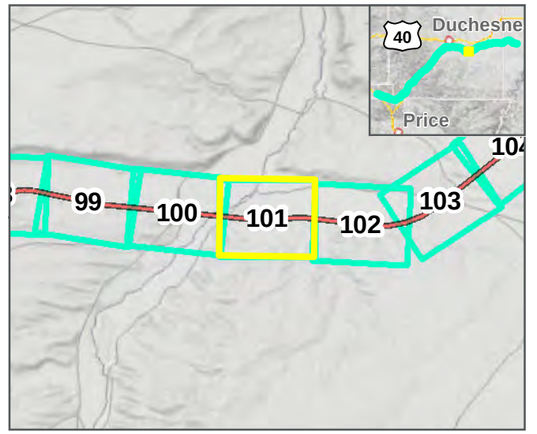

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
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- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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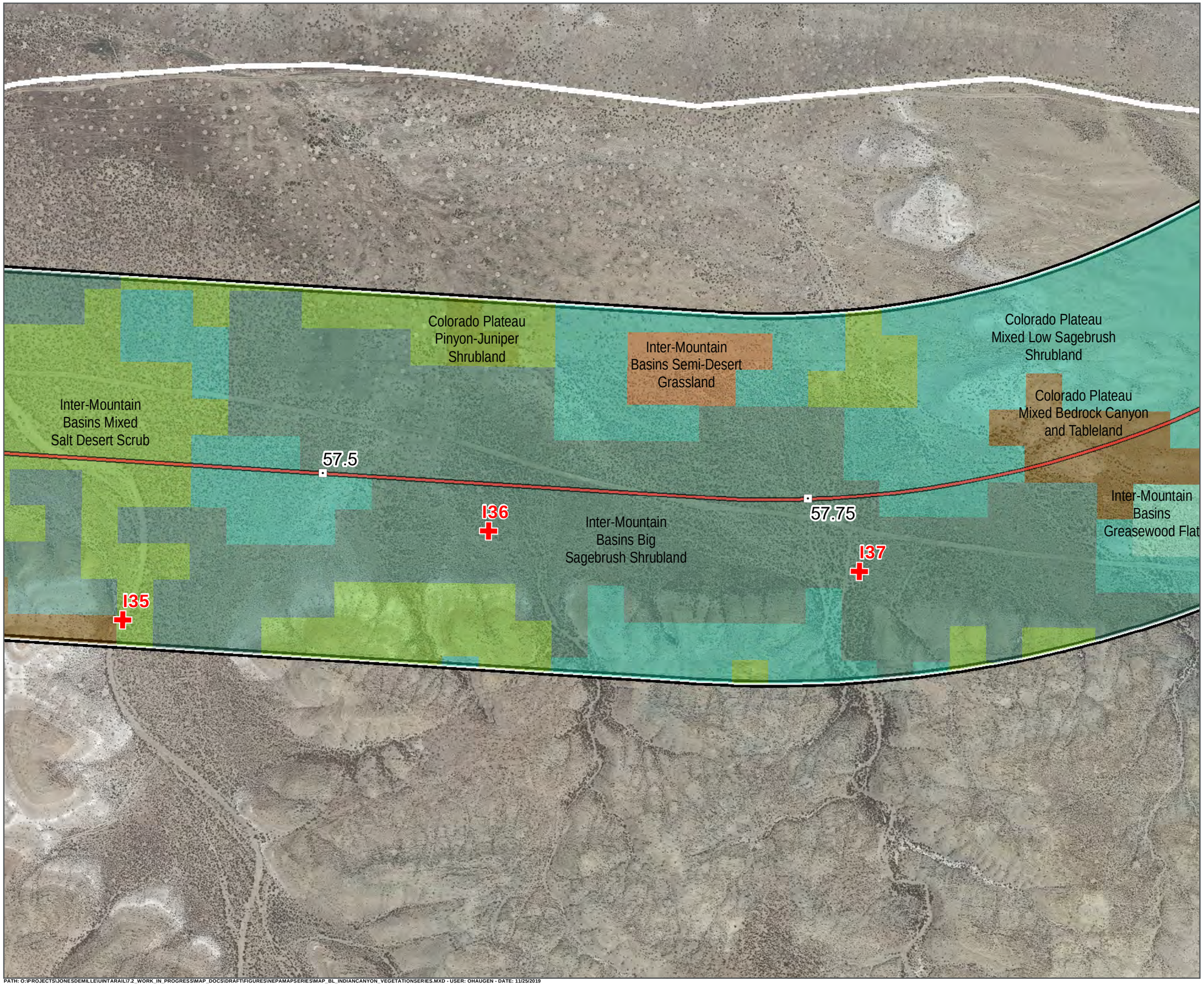

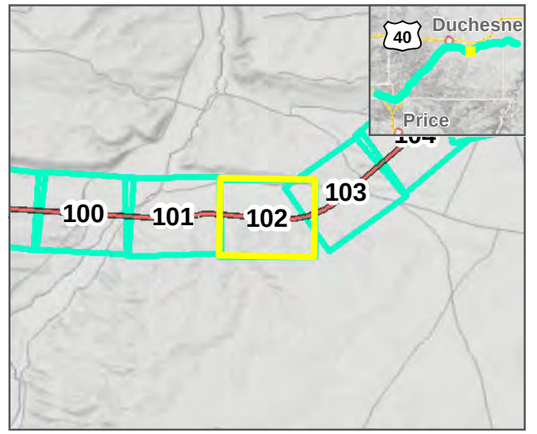

Photo Points ⊡ Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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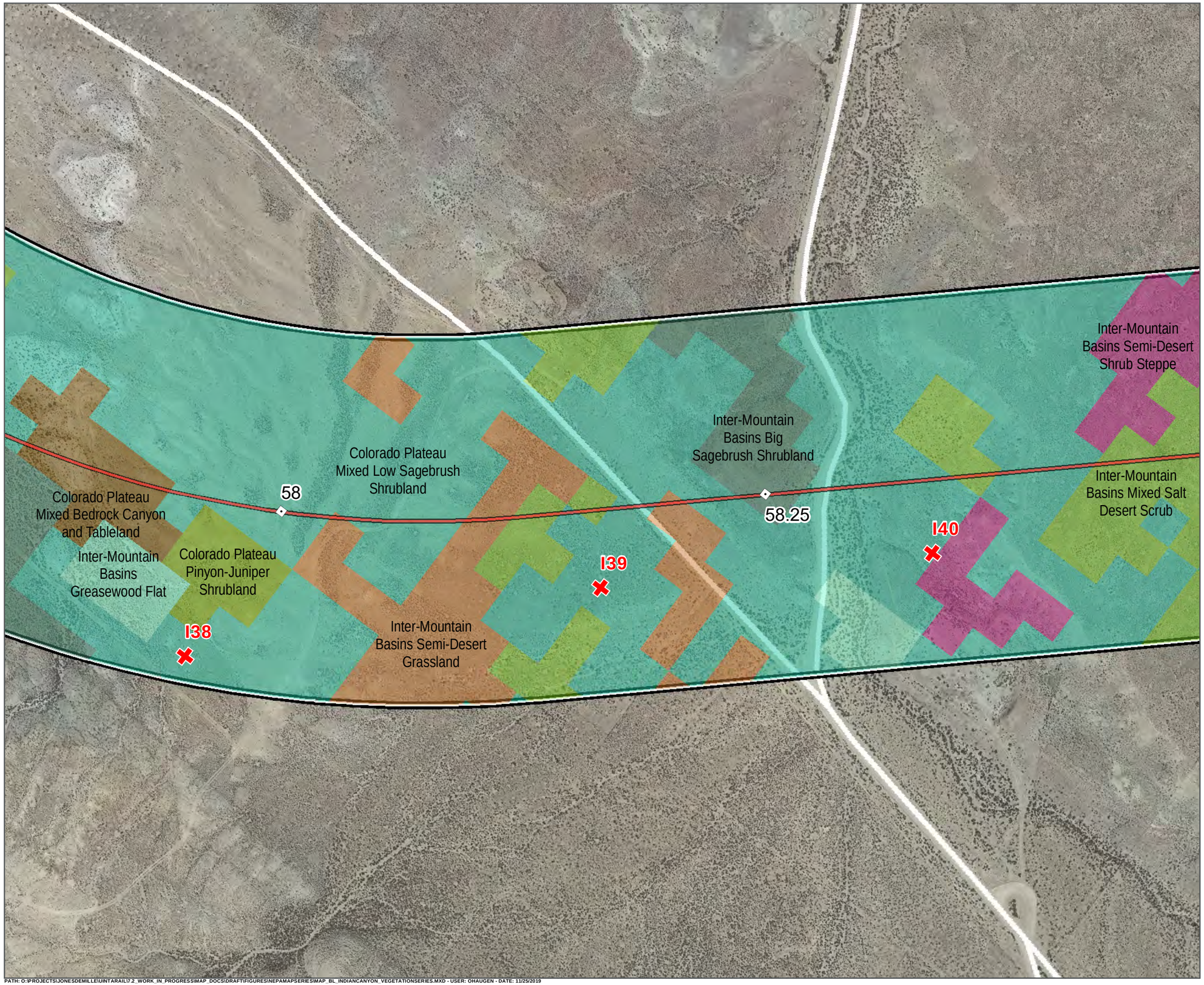
HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7-2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



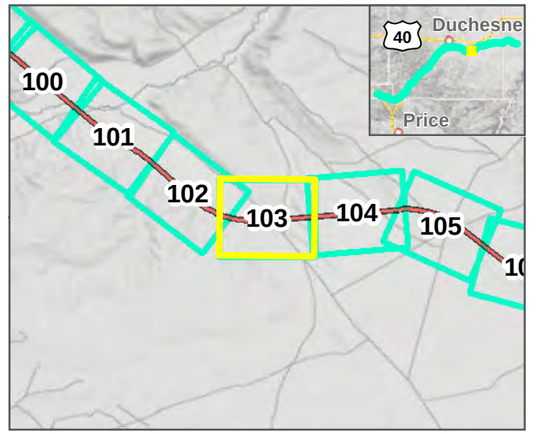


Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub Steppe

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

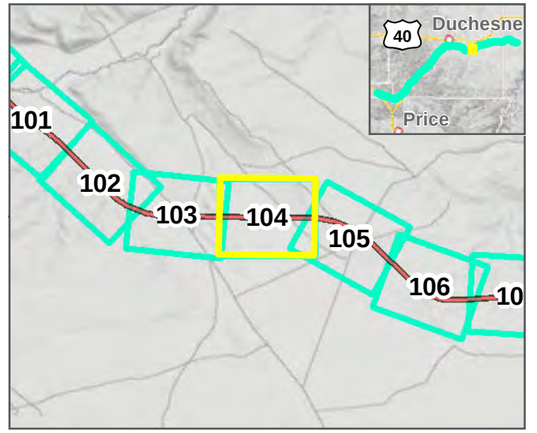


Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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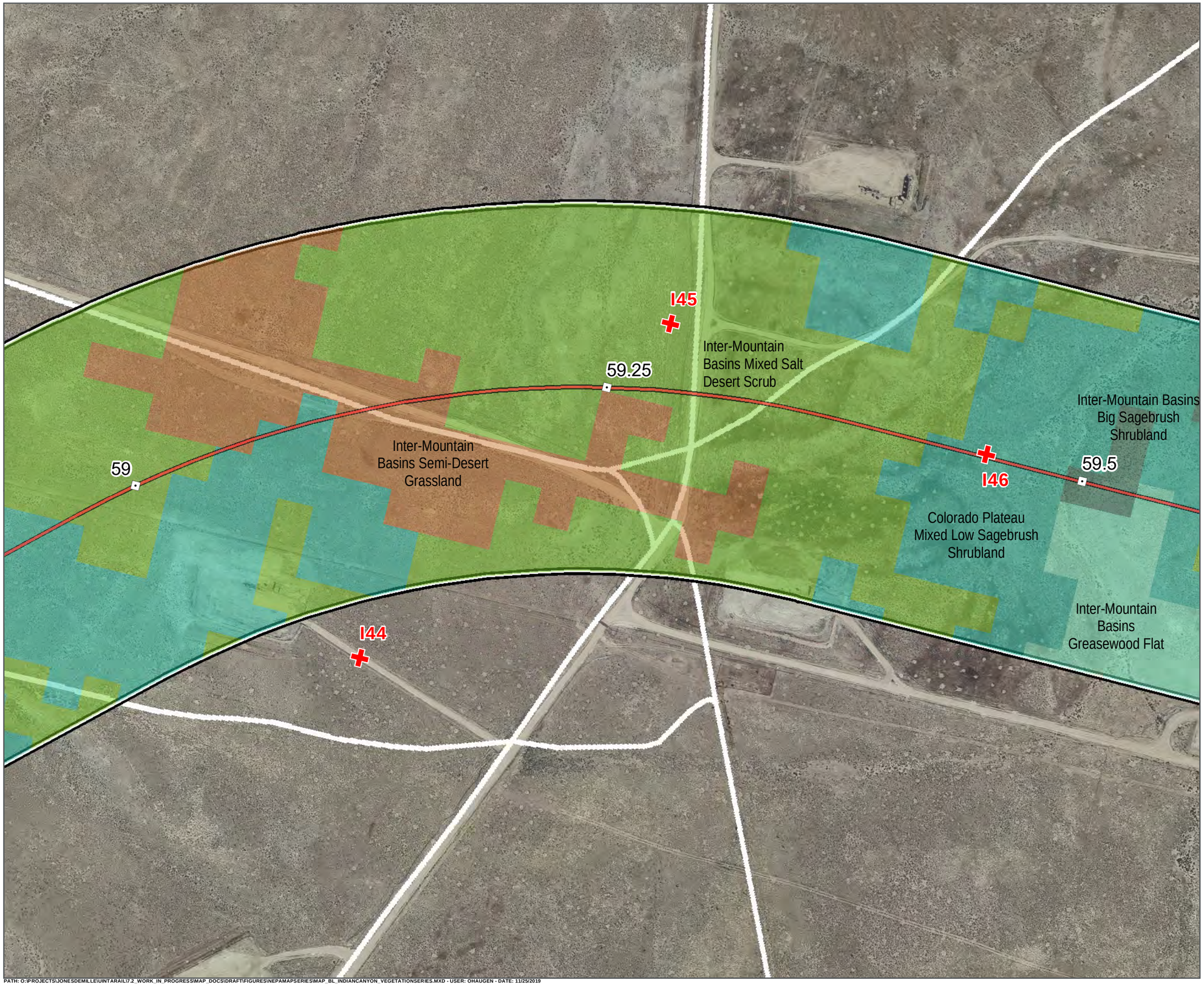

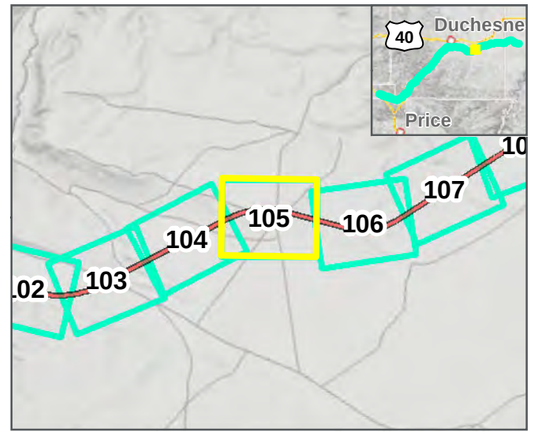

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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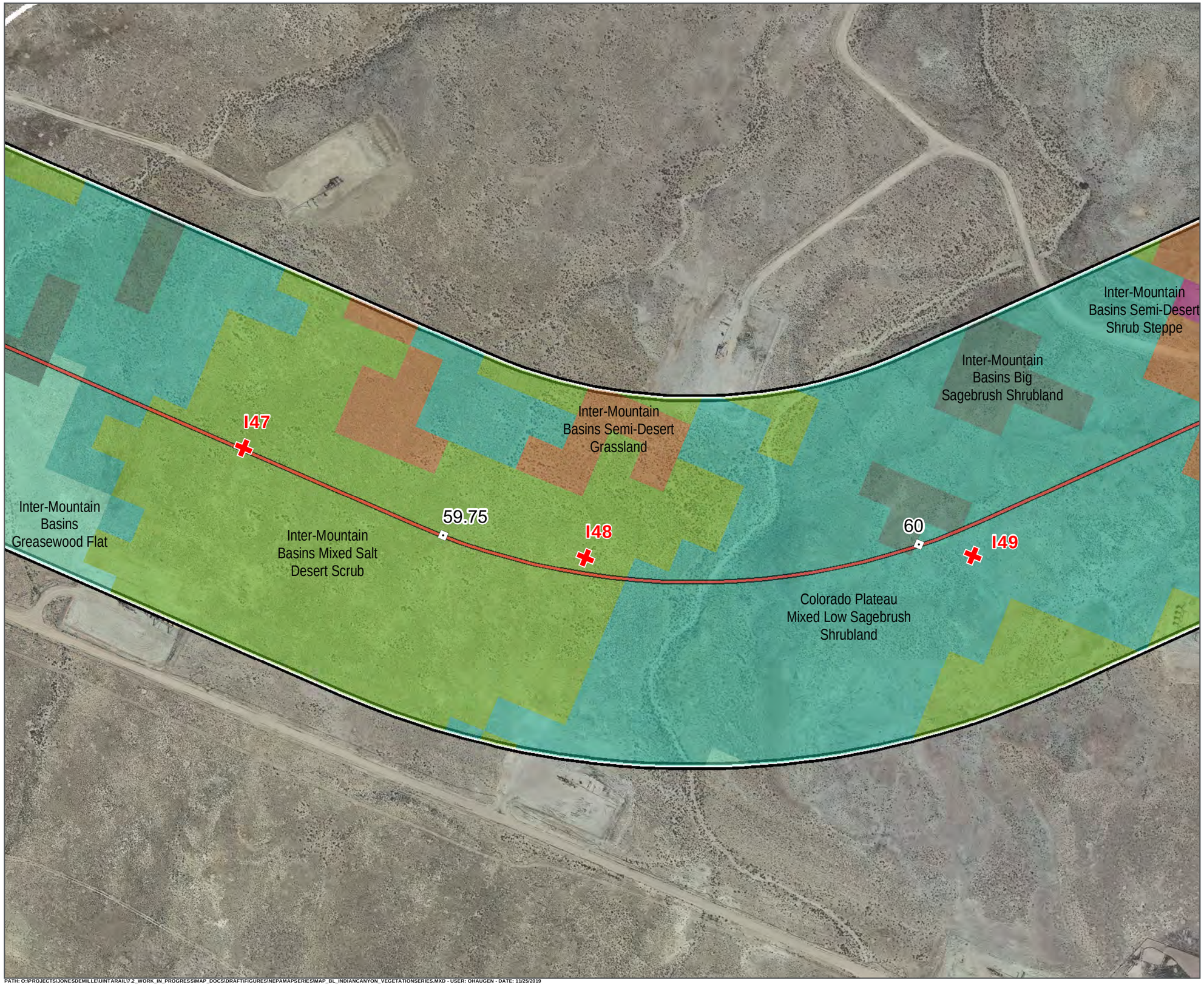

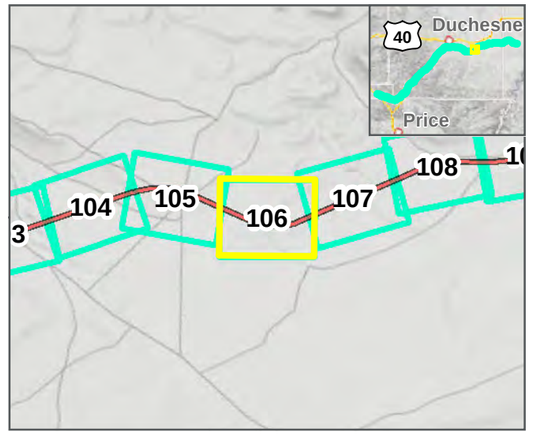

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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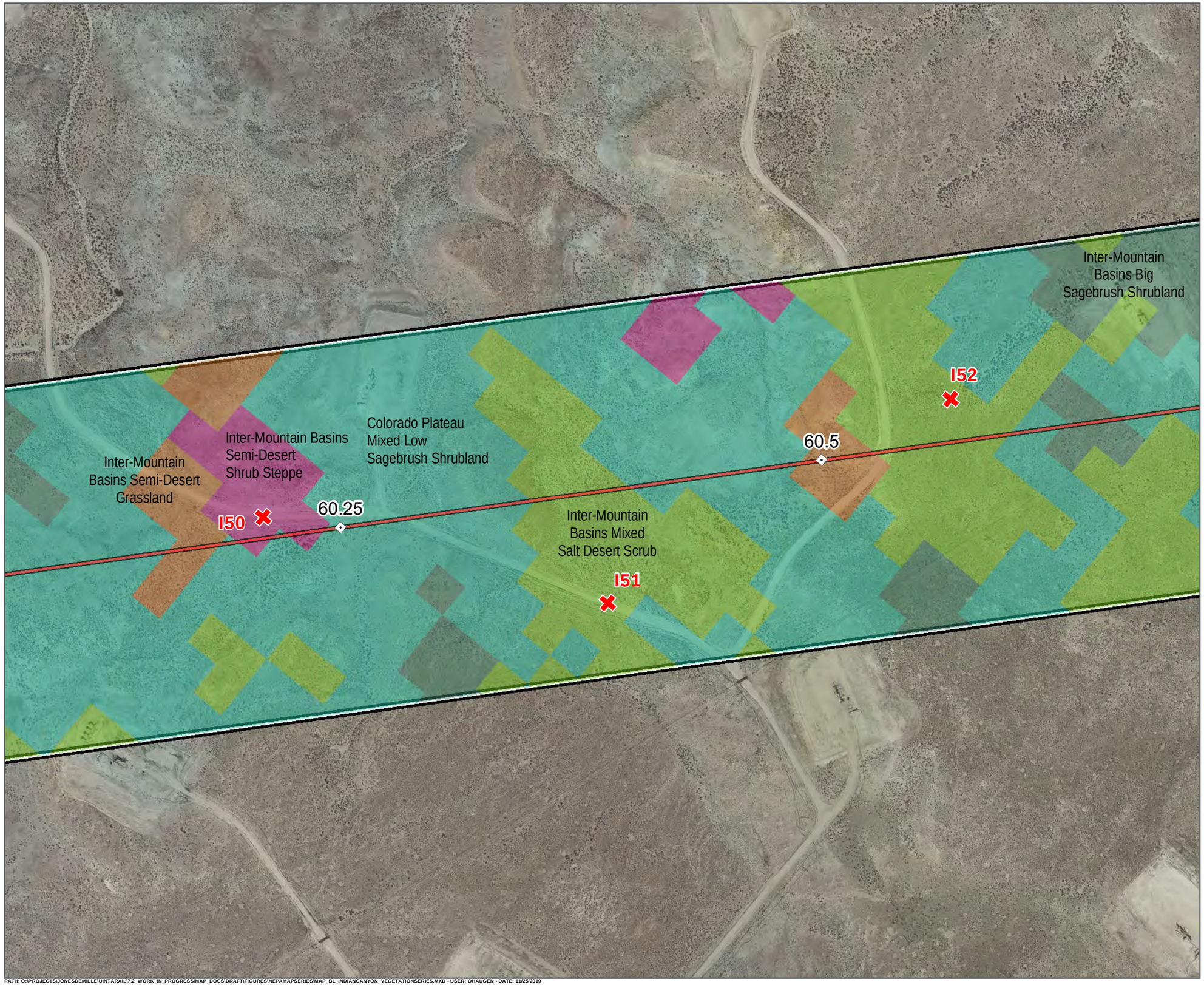

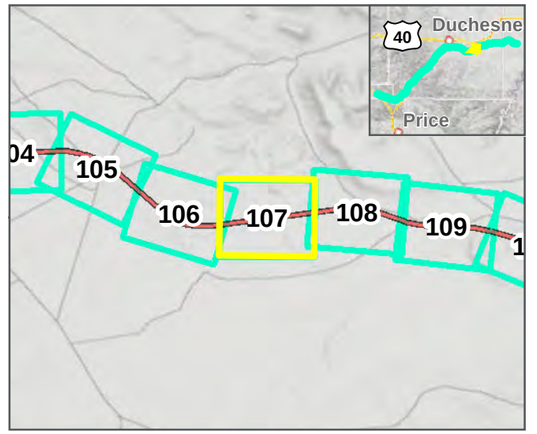

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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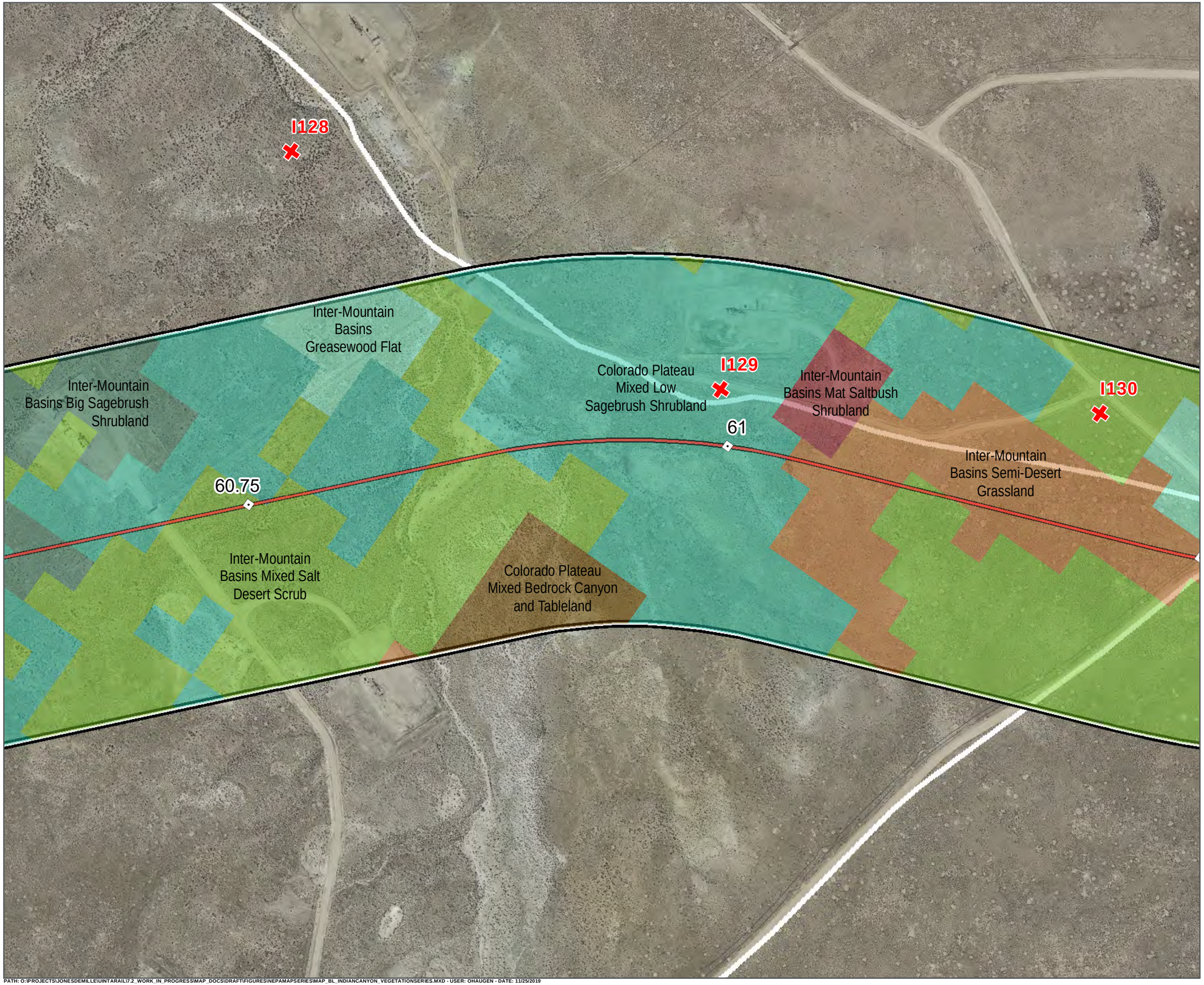

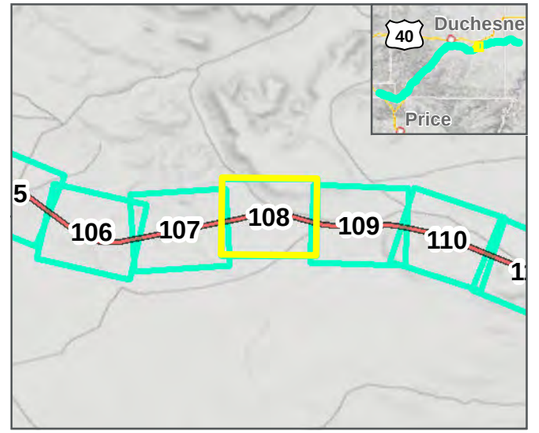

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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COODINATE SYSTEM:
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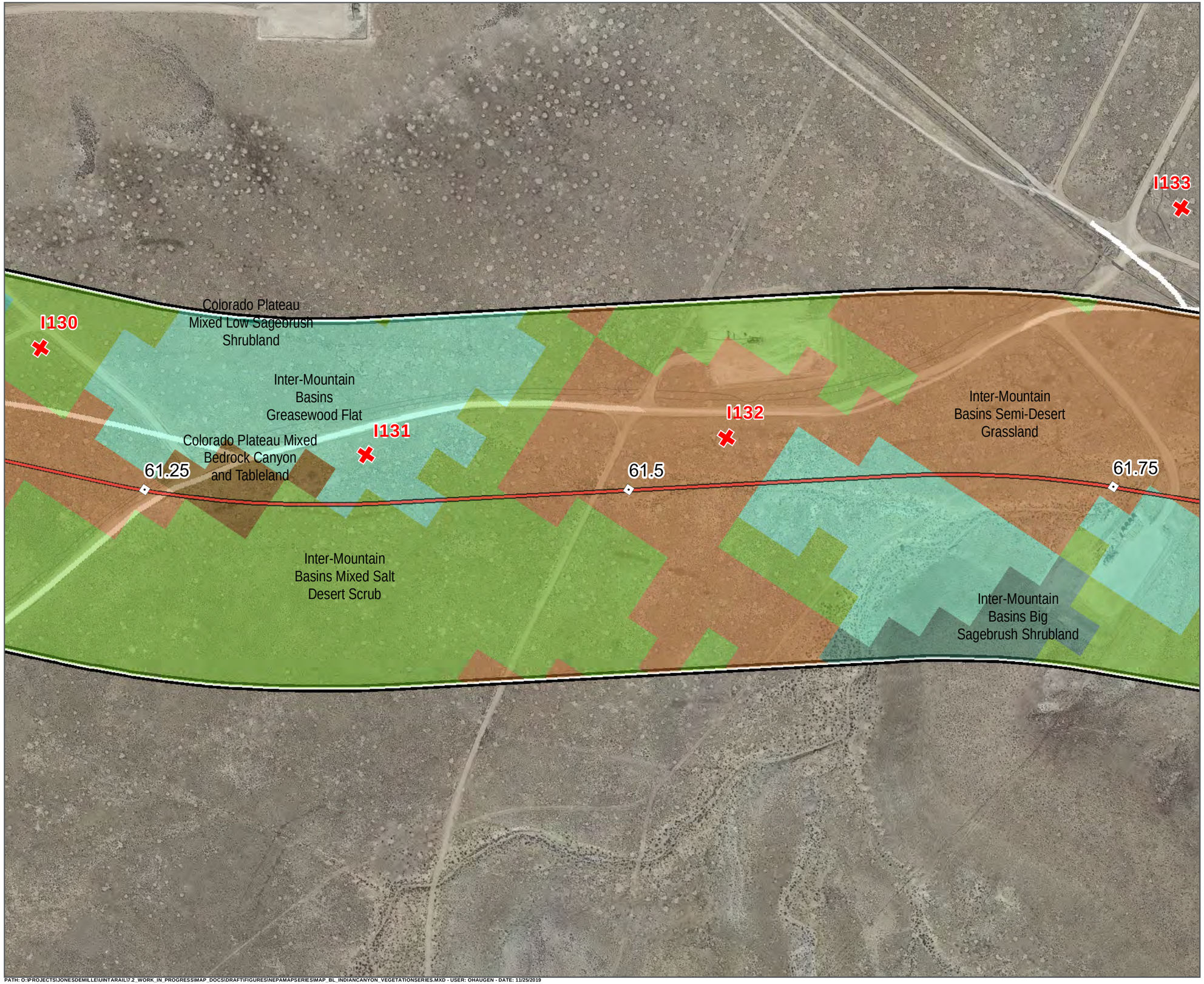

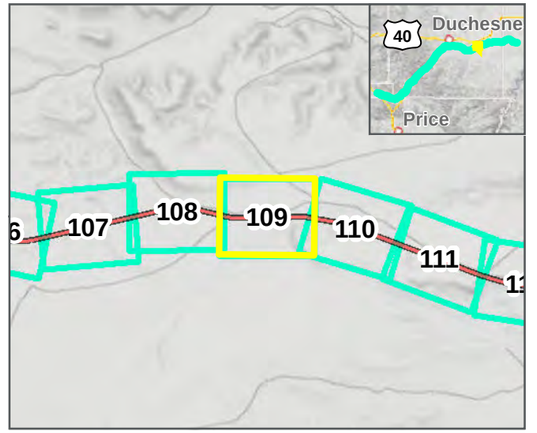

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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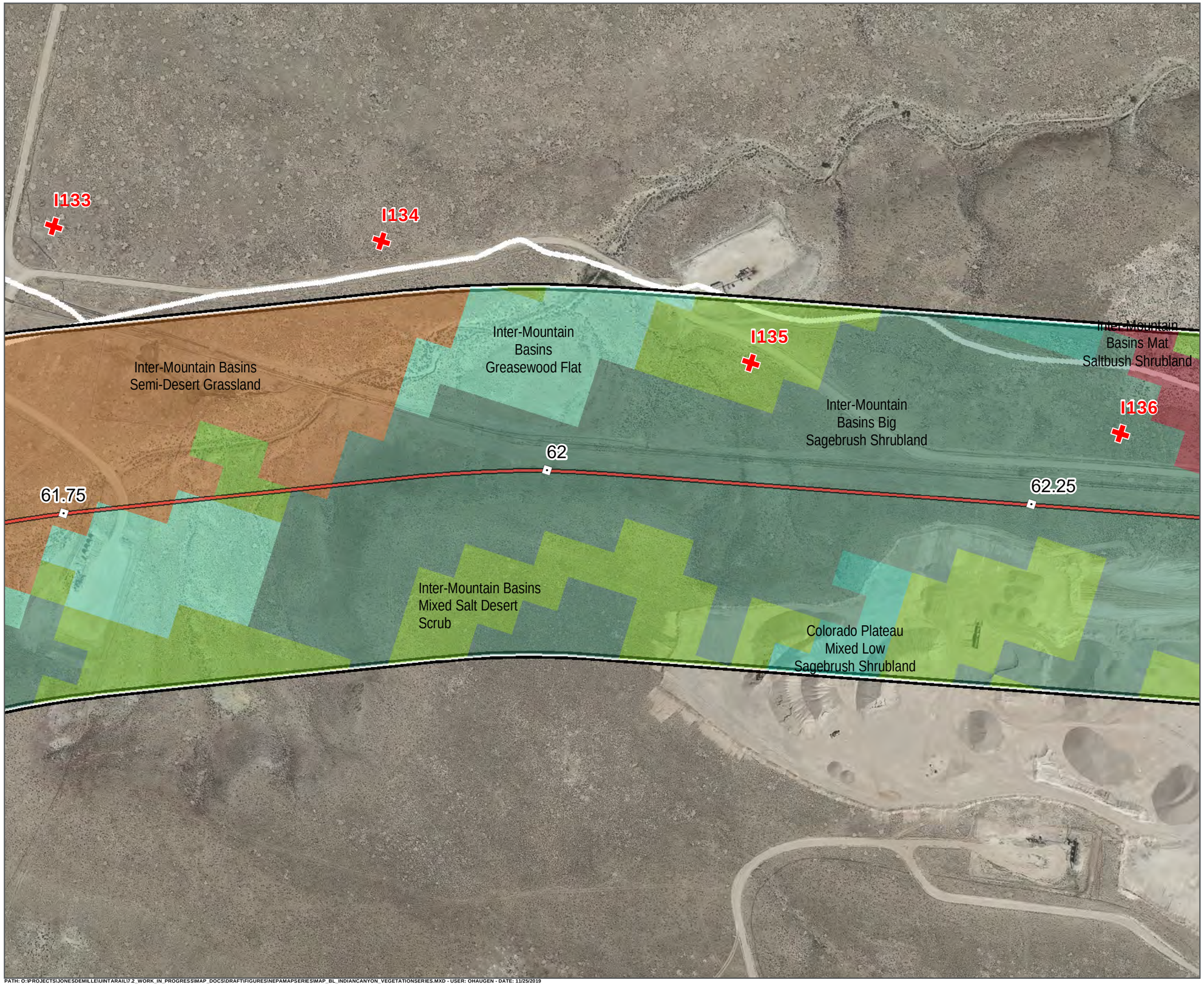

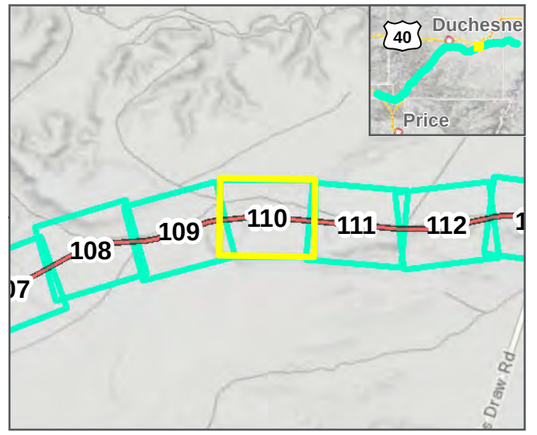

Photo Points
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Study Area
Map Extent (current view in yellow)

Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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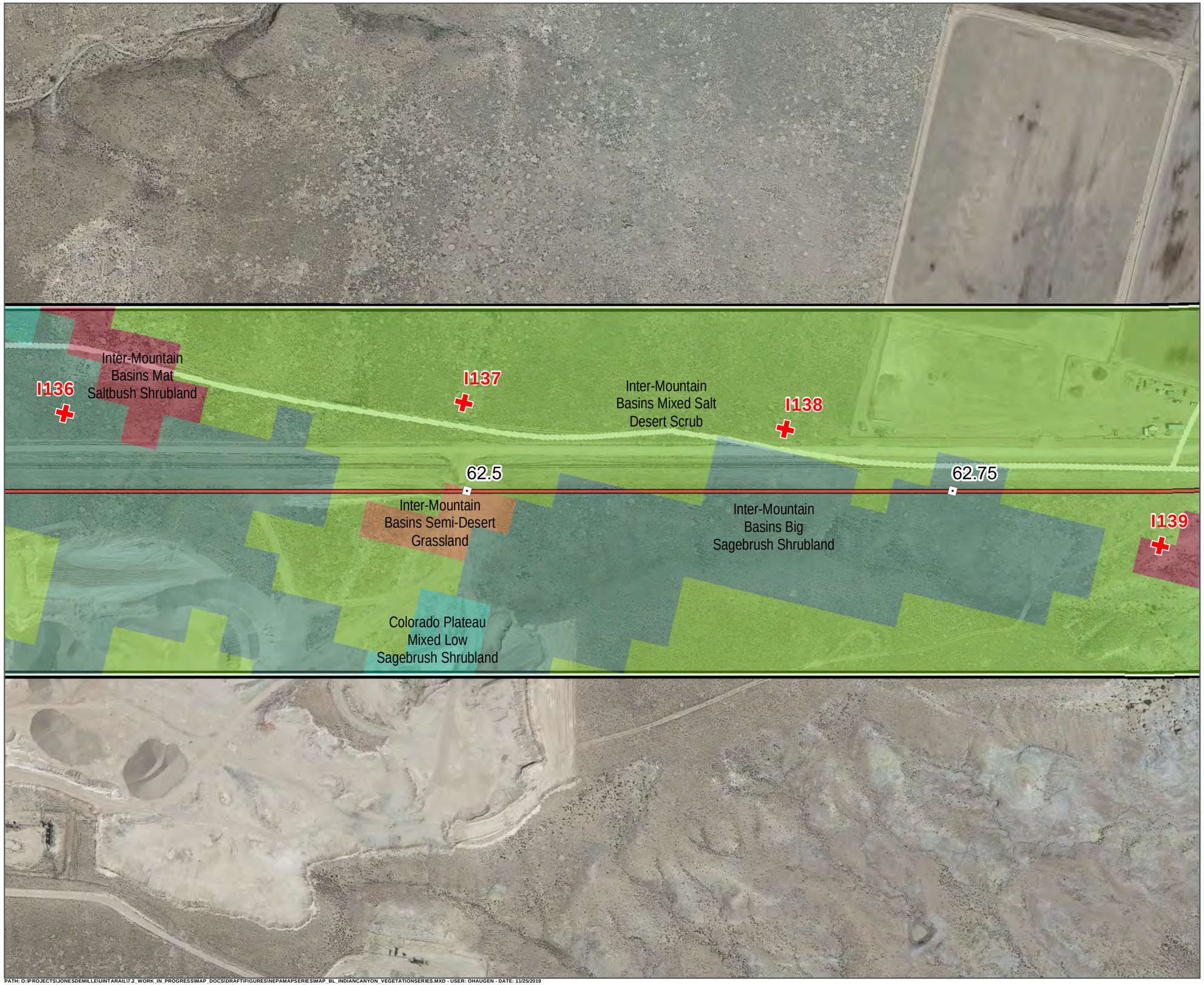

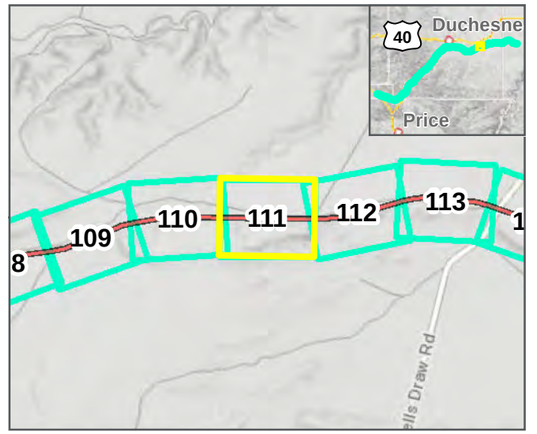

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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SEVEN COUNTY INFRASTRUCTURE COALITION

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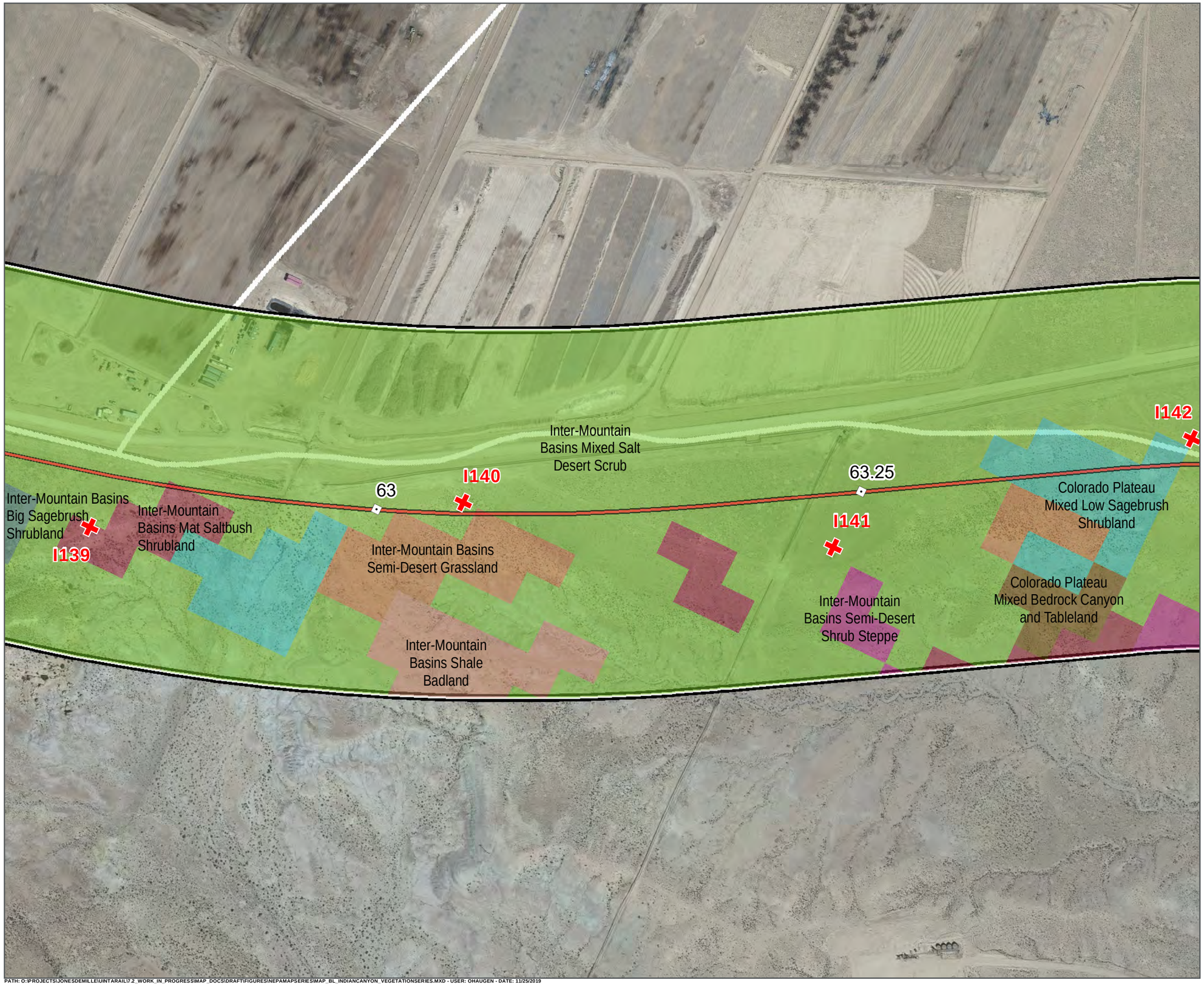

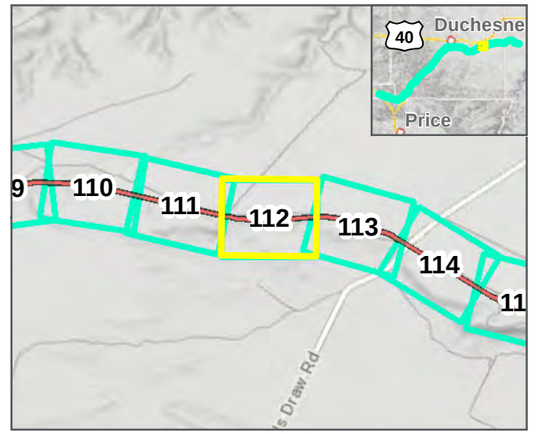

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
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Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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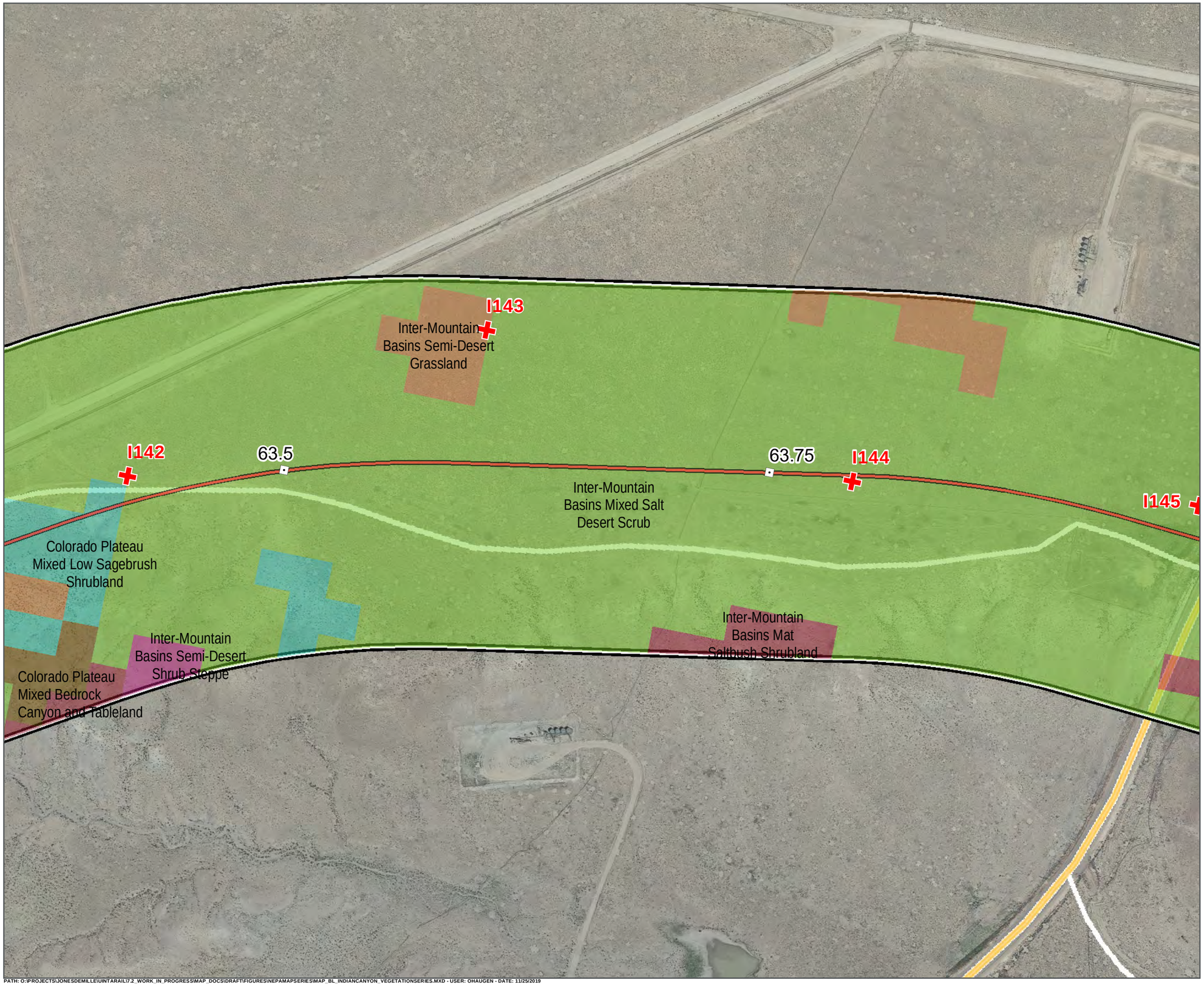

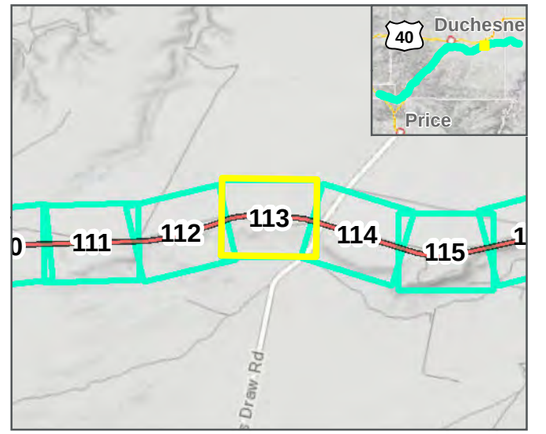

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
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Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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I147

I145

64

64.25

64.5

Inter-Mountain Basins Mixed Salt Desert Scrub

Inter-Mountain Basins Mat Saltbush Shrubland

Inter-Mountain Basins Big Sagebrush Shrubland

I146

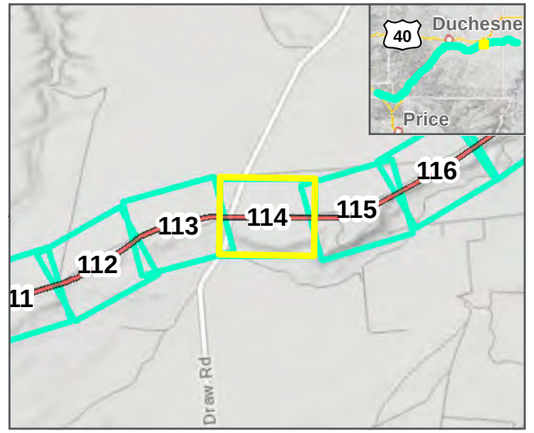

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

Inter-Mountain Basins Big Sagebrush Shrubland

Inter-Mountain Basins Mat Saltbush Shrubland

Inter-Mountain Basins Mixed Salt Desert Scrub

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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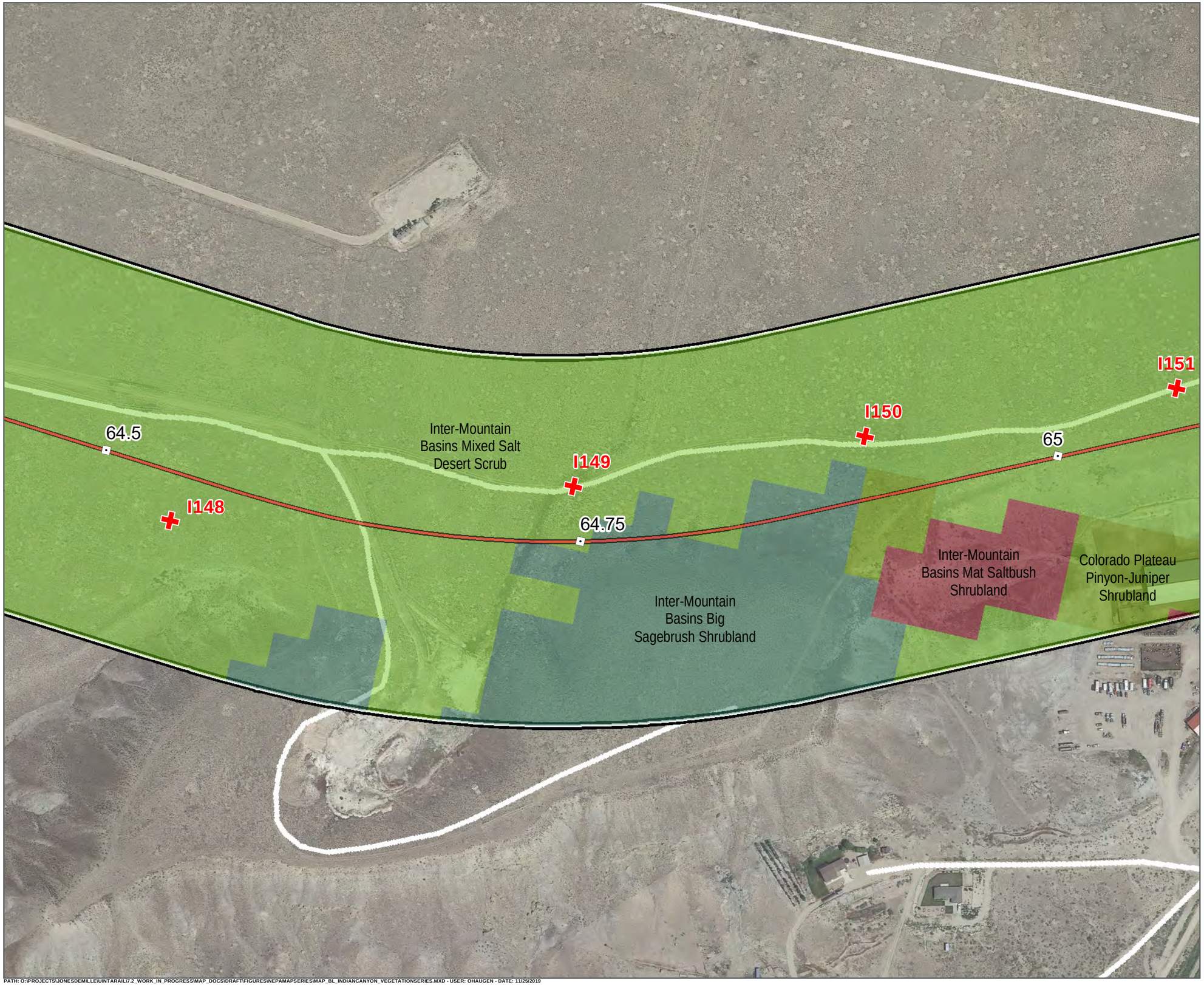

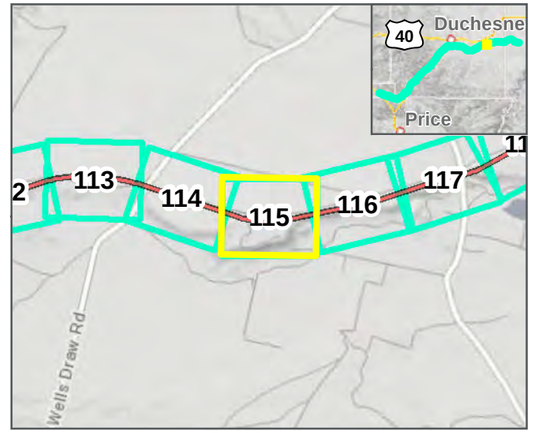

Photo Points
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Vegetation Communities

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INDIAN CANYON ALTERNATIVE: 5/30/2019

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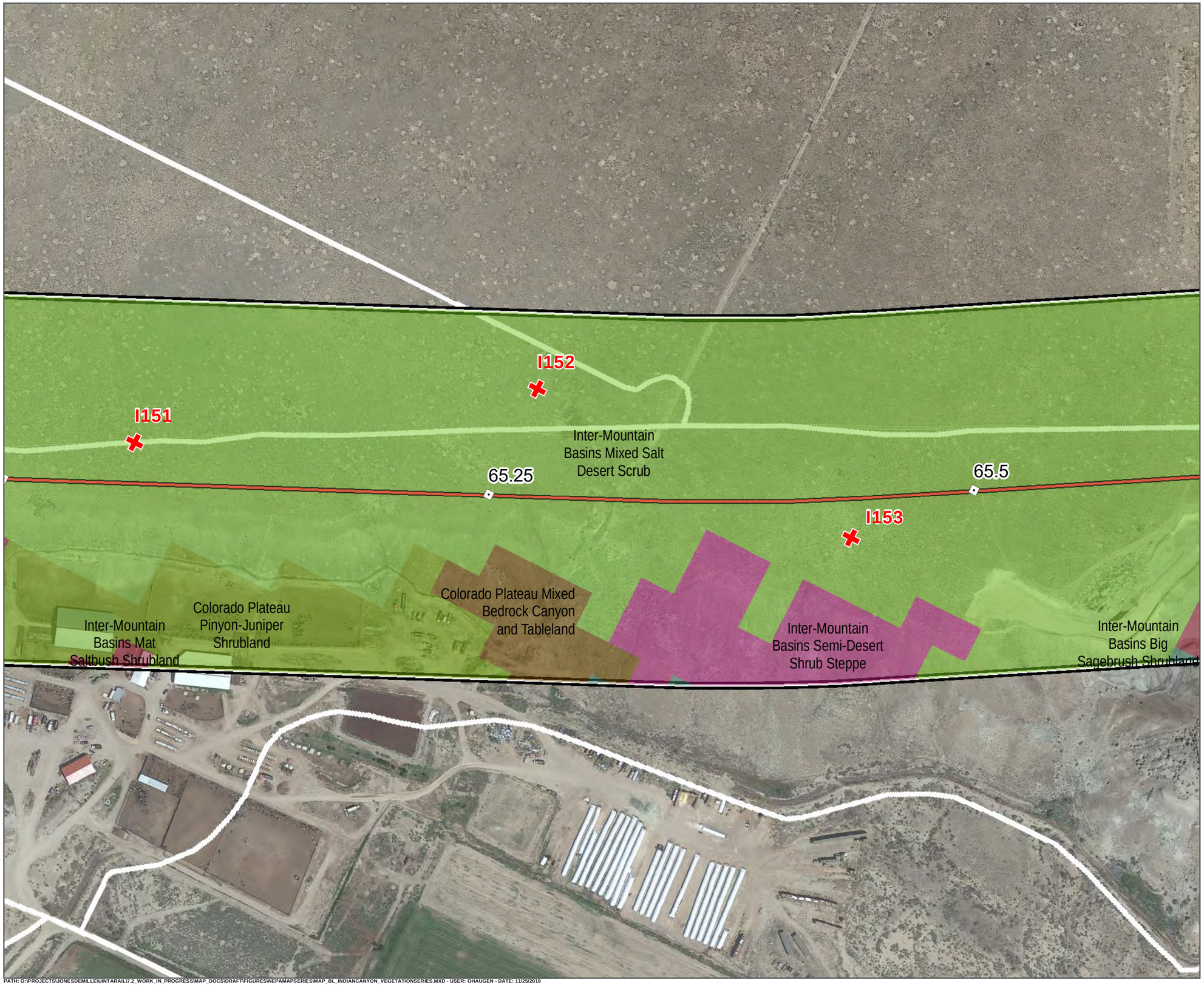

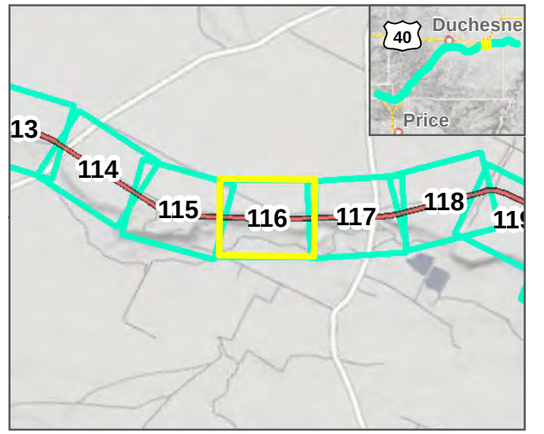

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- Inter-Mountain Basins Big Sagebrush Shrubland
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- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

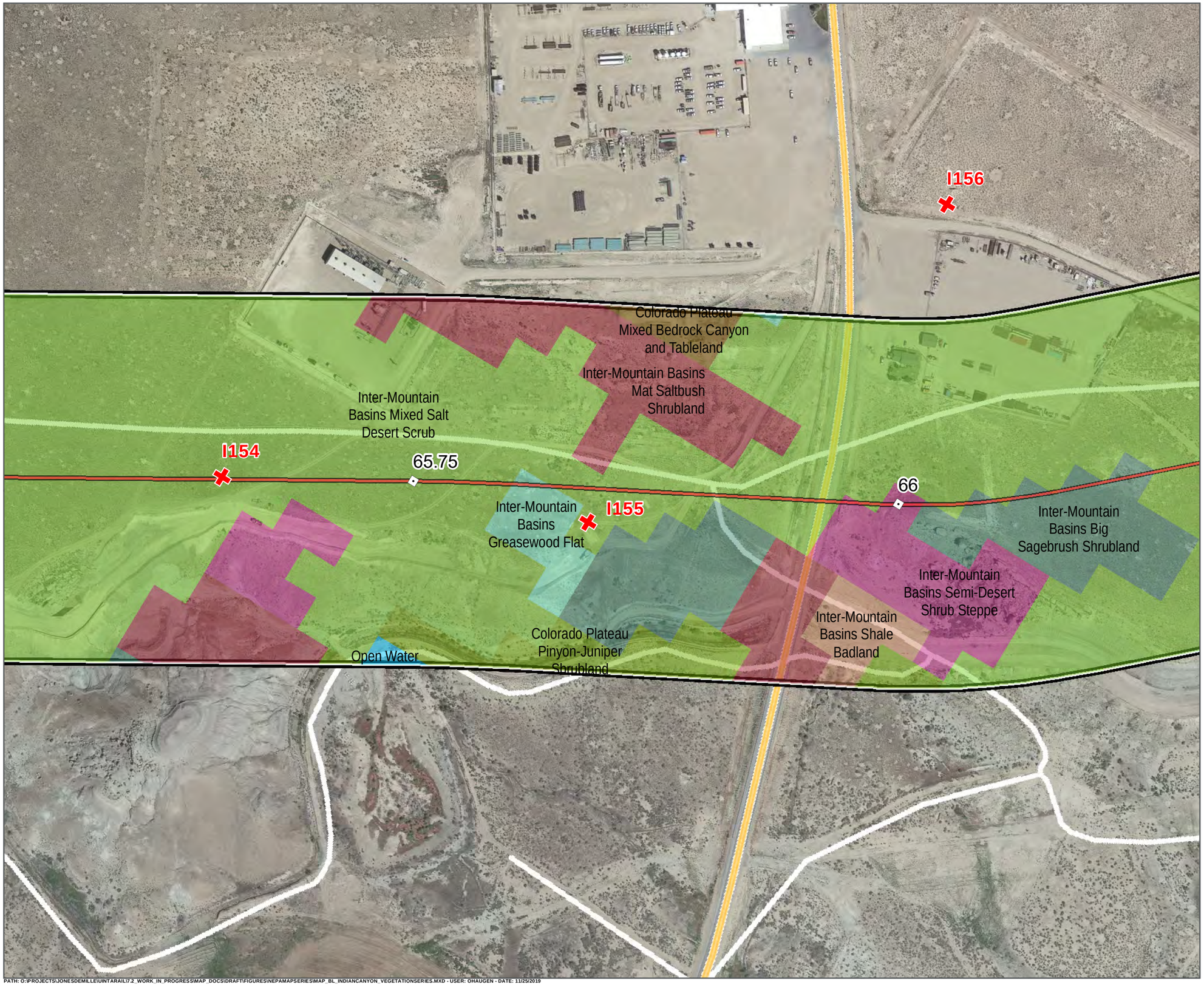
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



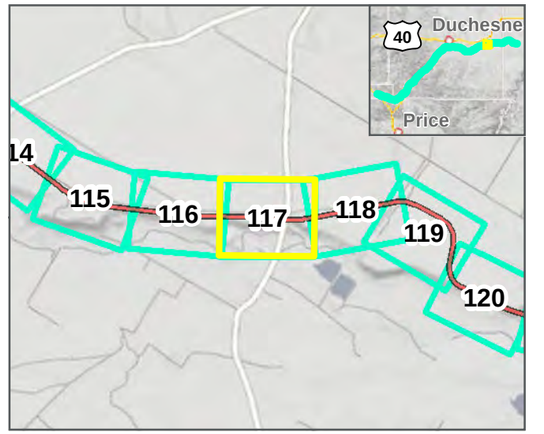


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland
- Open Water

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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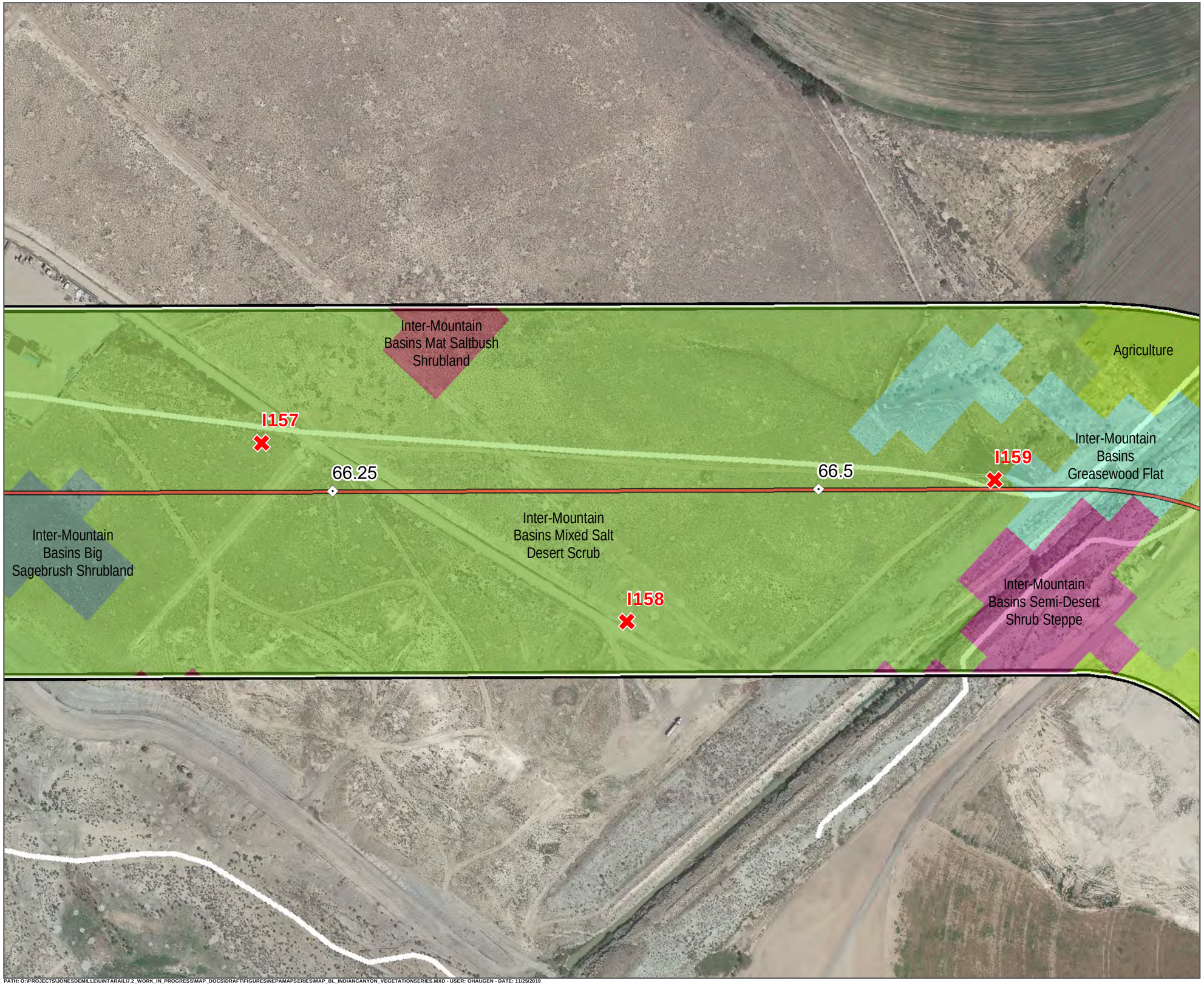

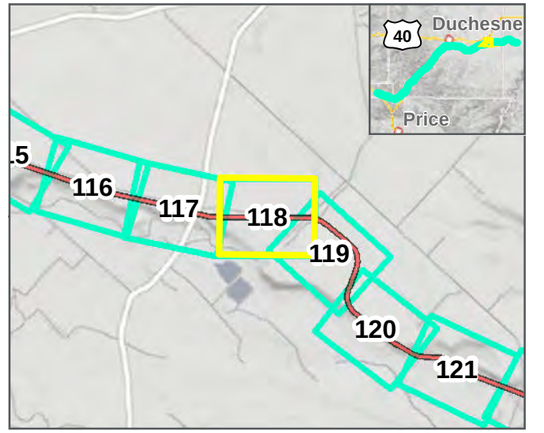

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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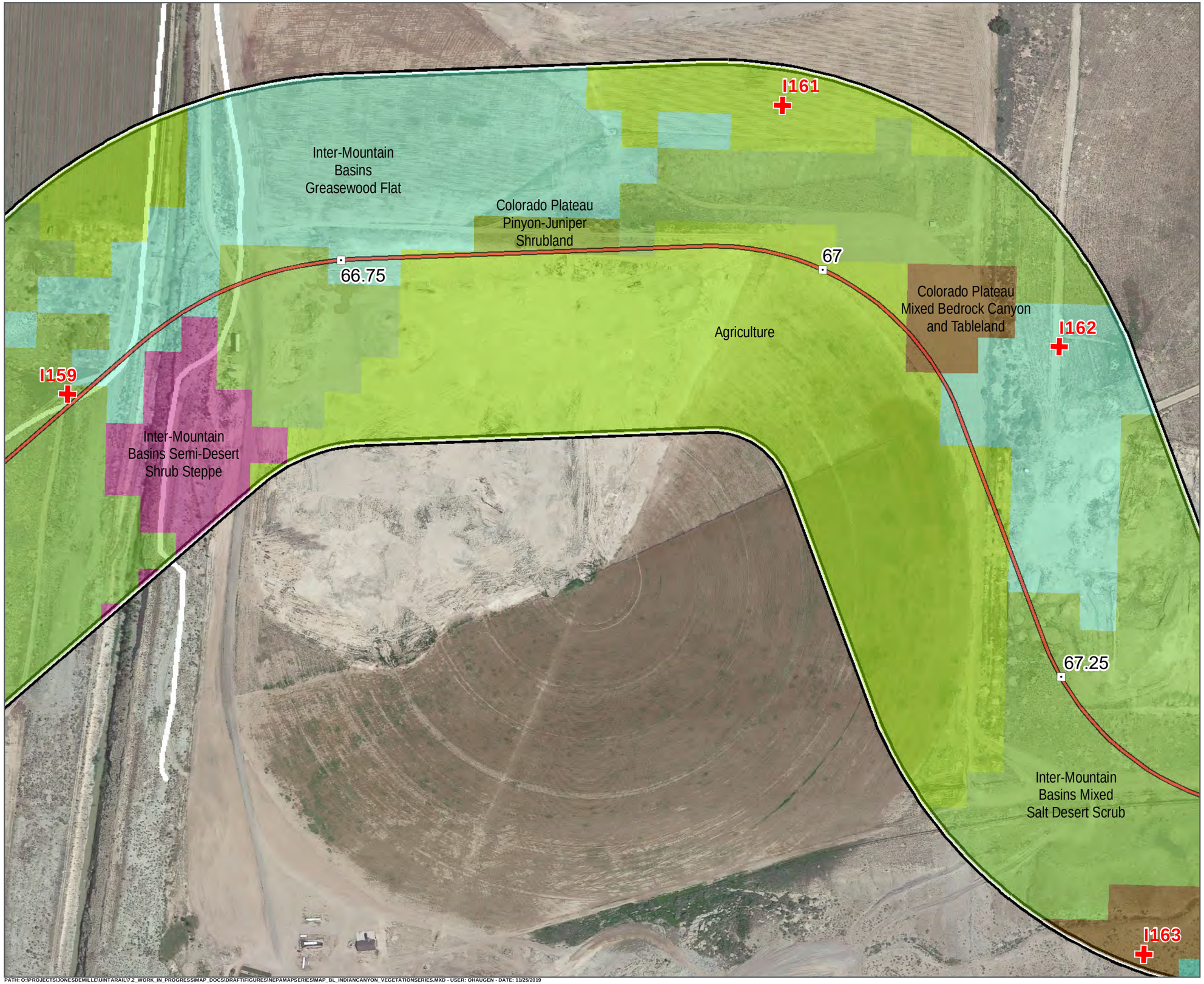

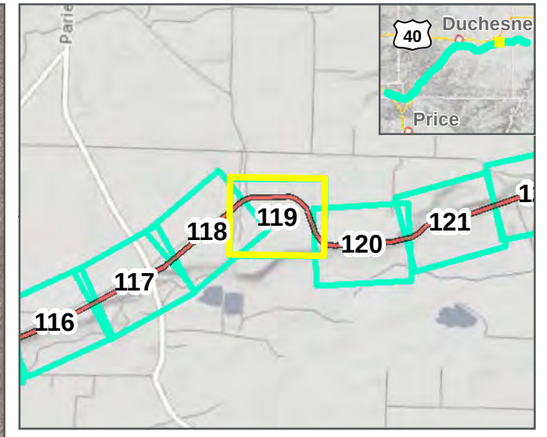

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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I162

Inter-Mountain Basins Greasewood Flat

67.25

Inter-Mountain Basins Mixed Salt Desert Scrub

Agriculture

Colorado Plateau Pinyon-Juniper Shrubland

Rocky Mountain Alpine-Montane Wet Meadow

67.5

67.75

Inter-Mountain Basins Semi-Desert Shrub Steppe

Colorado Plateau Mixed Bedrock Canyon and Tableland

I163

Colorado Plateau Mixed Low Sagebrush Shrubland

I164

Inter-Mountain Basins Big Sagebrush Shrubland

I165

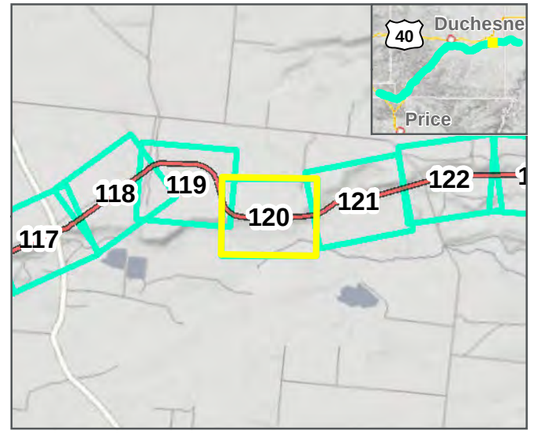

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

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Vegetation Communities

- Agriculture
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- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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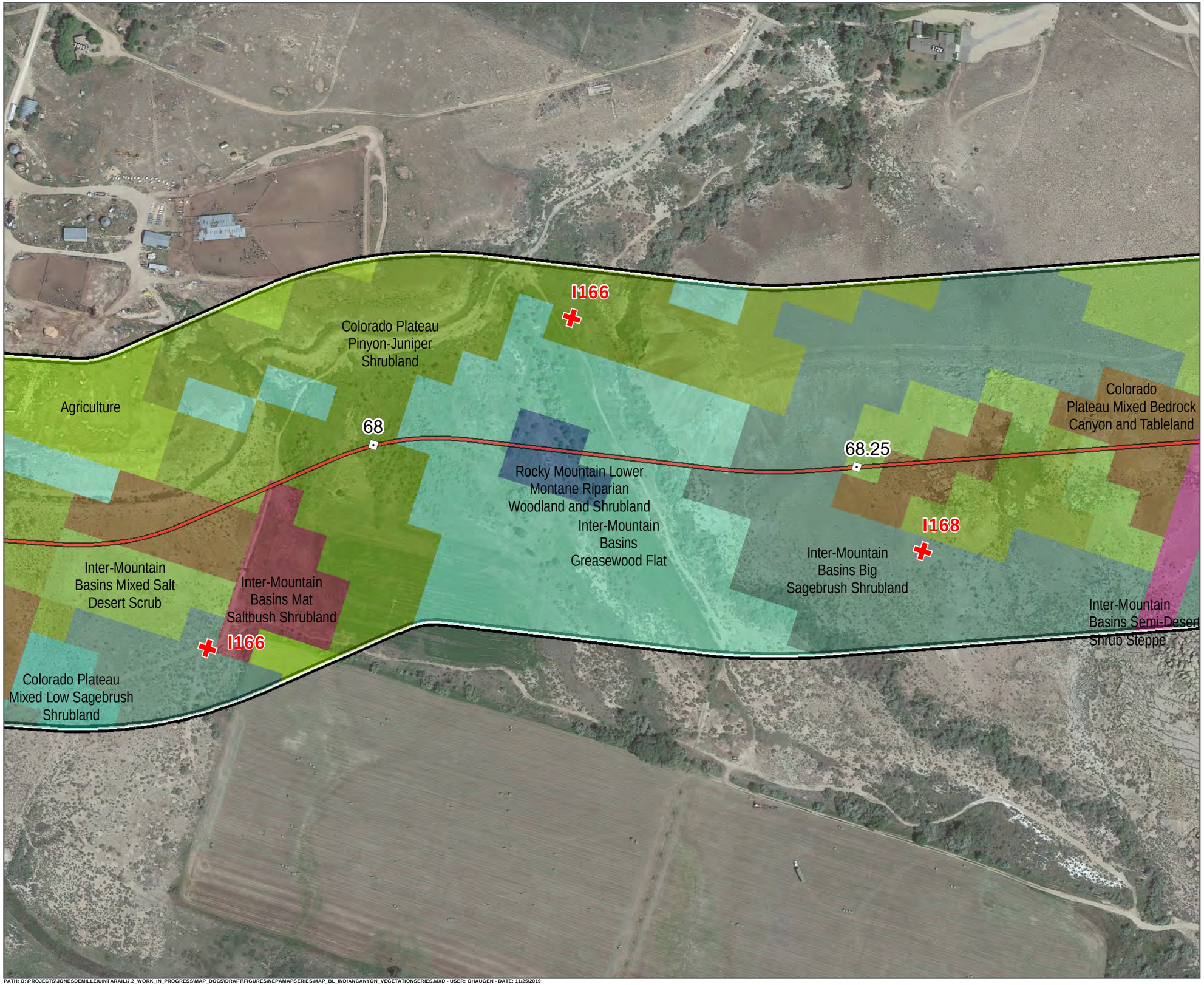

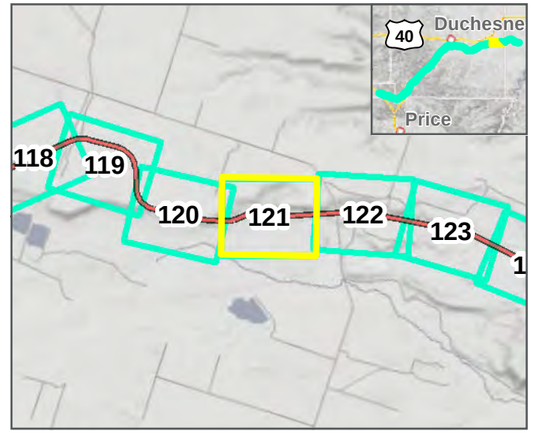

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
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- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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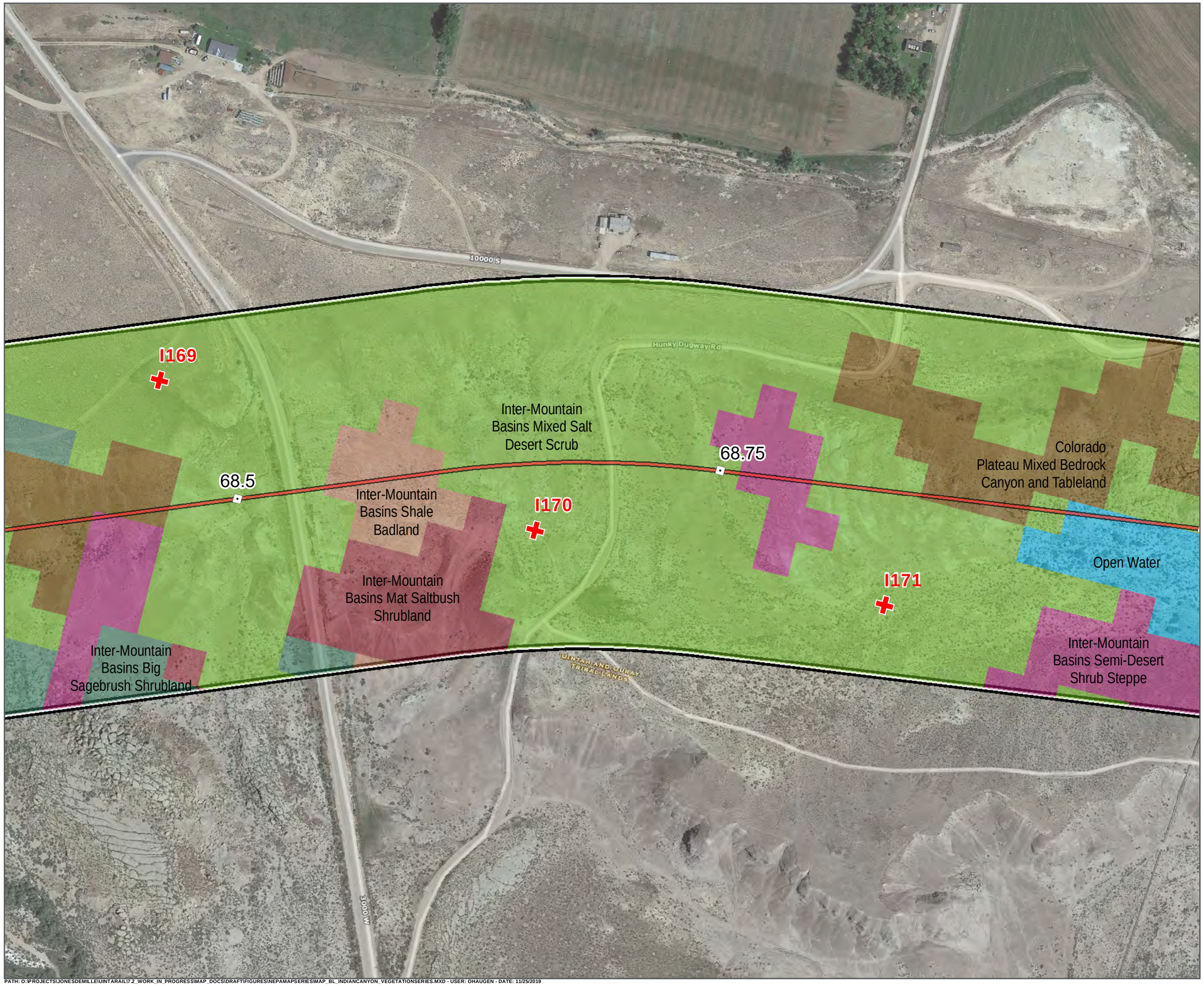

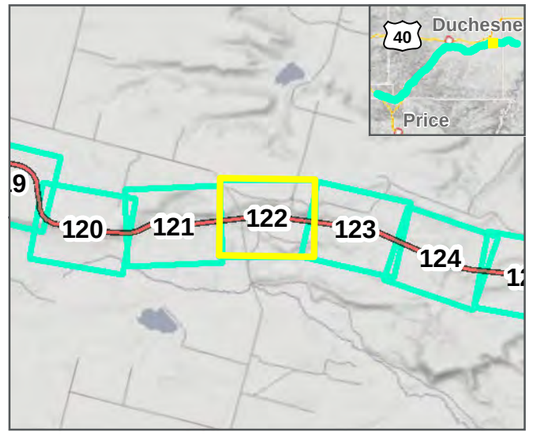

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
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- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland
- Open Water

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

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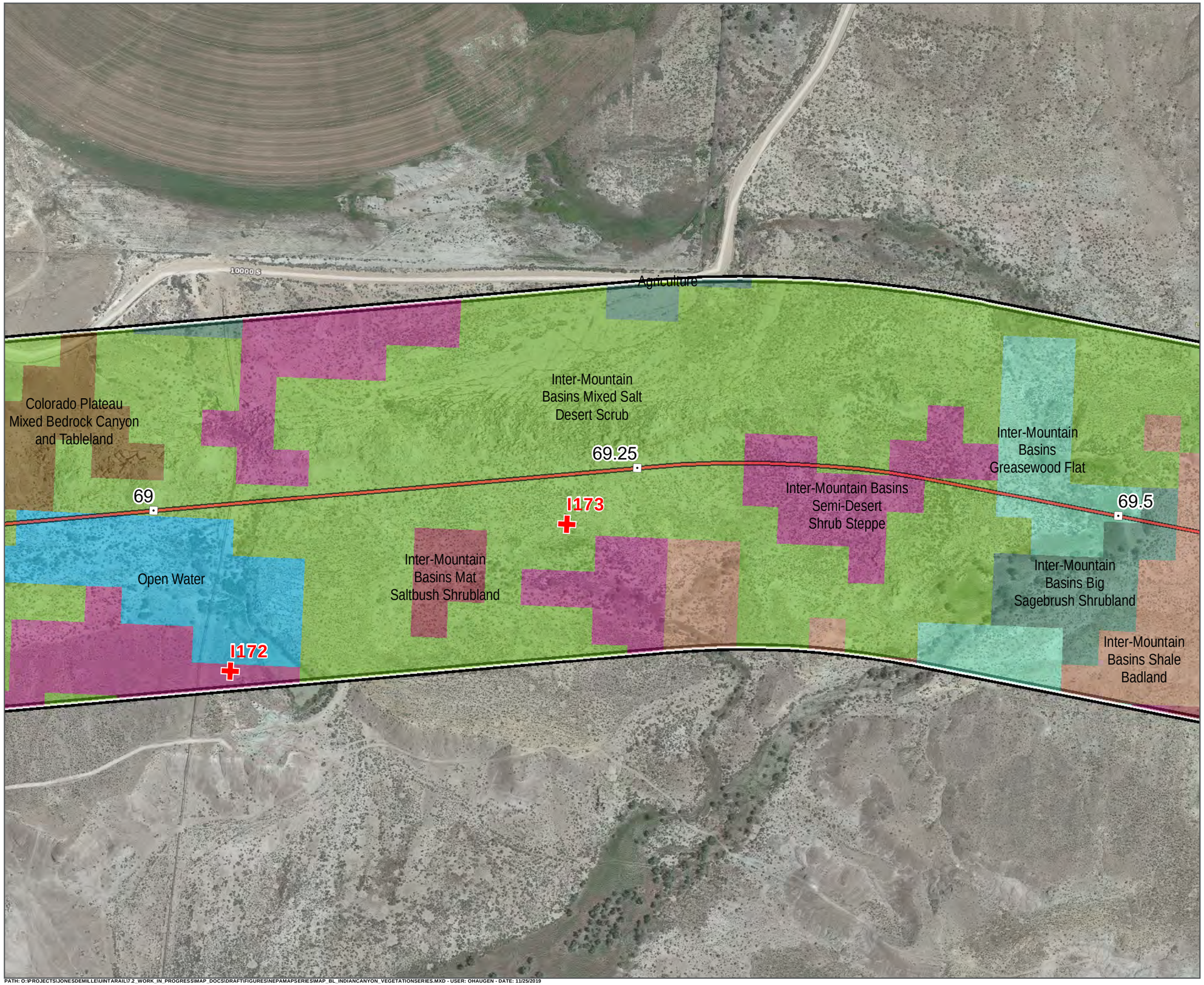

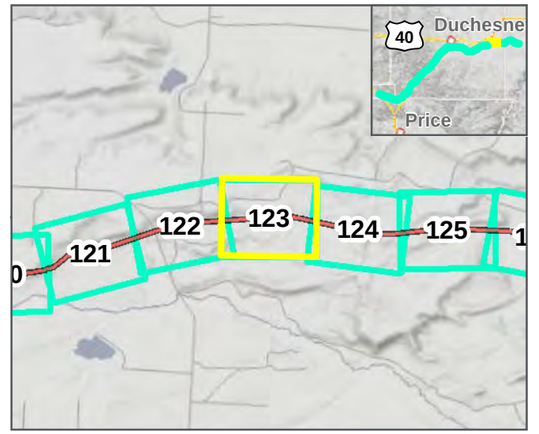

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
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- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland
- Open Water

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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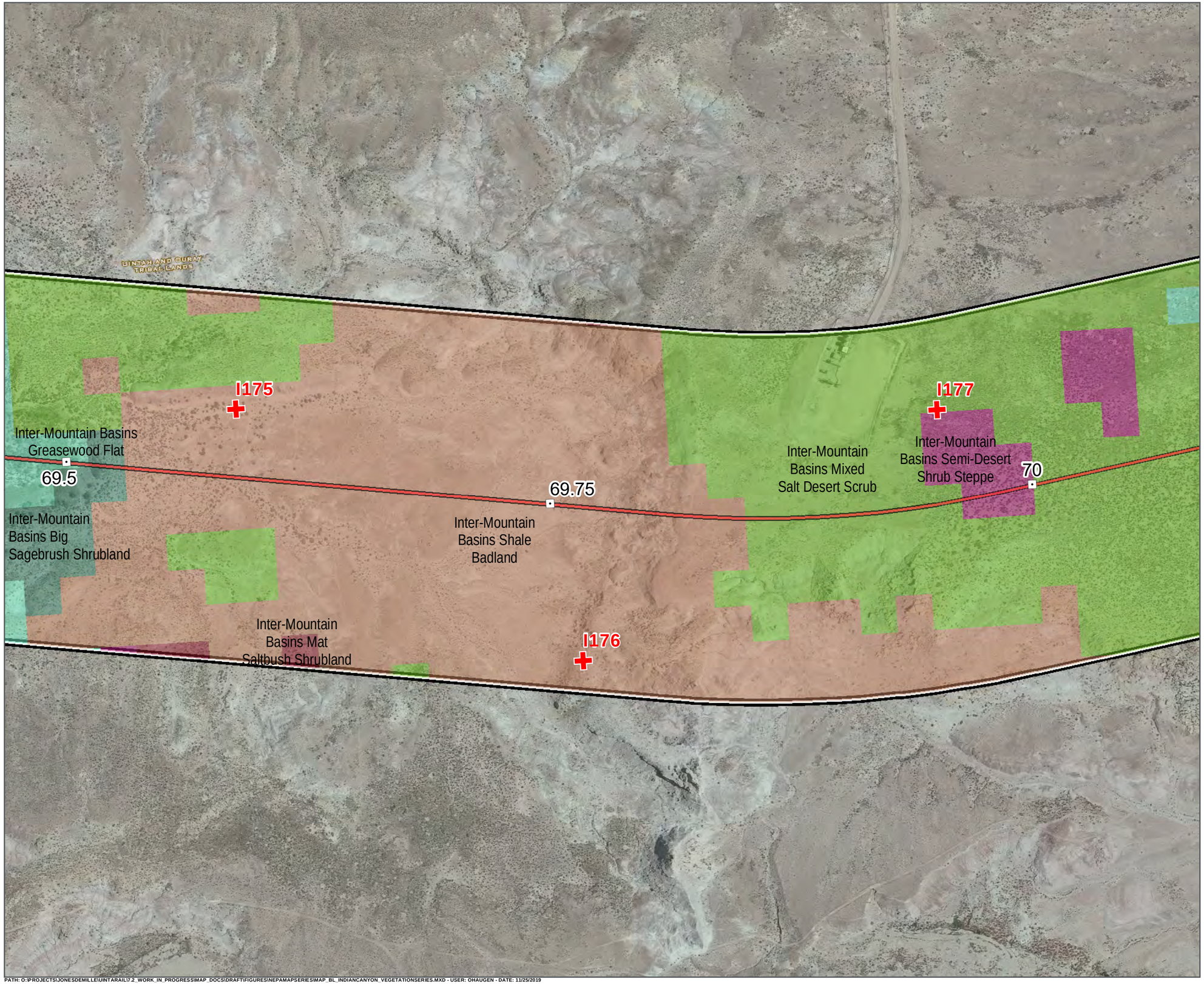

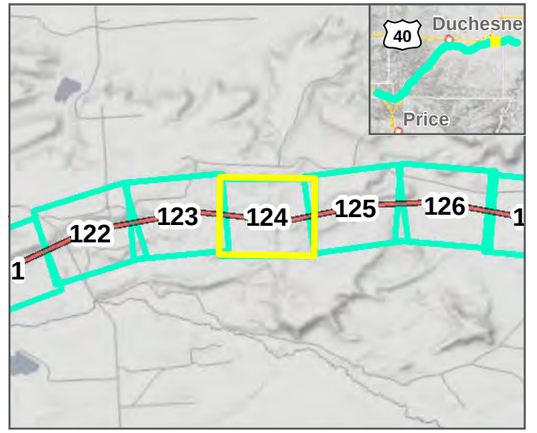

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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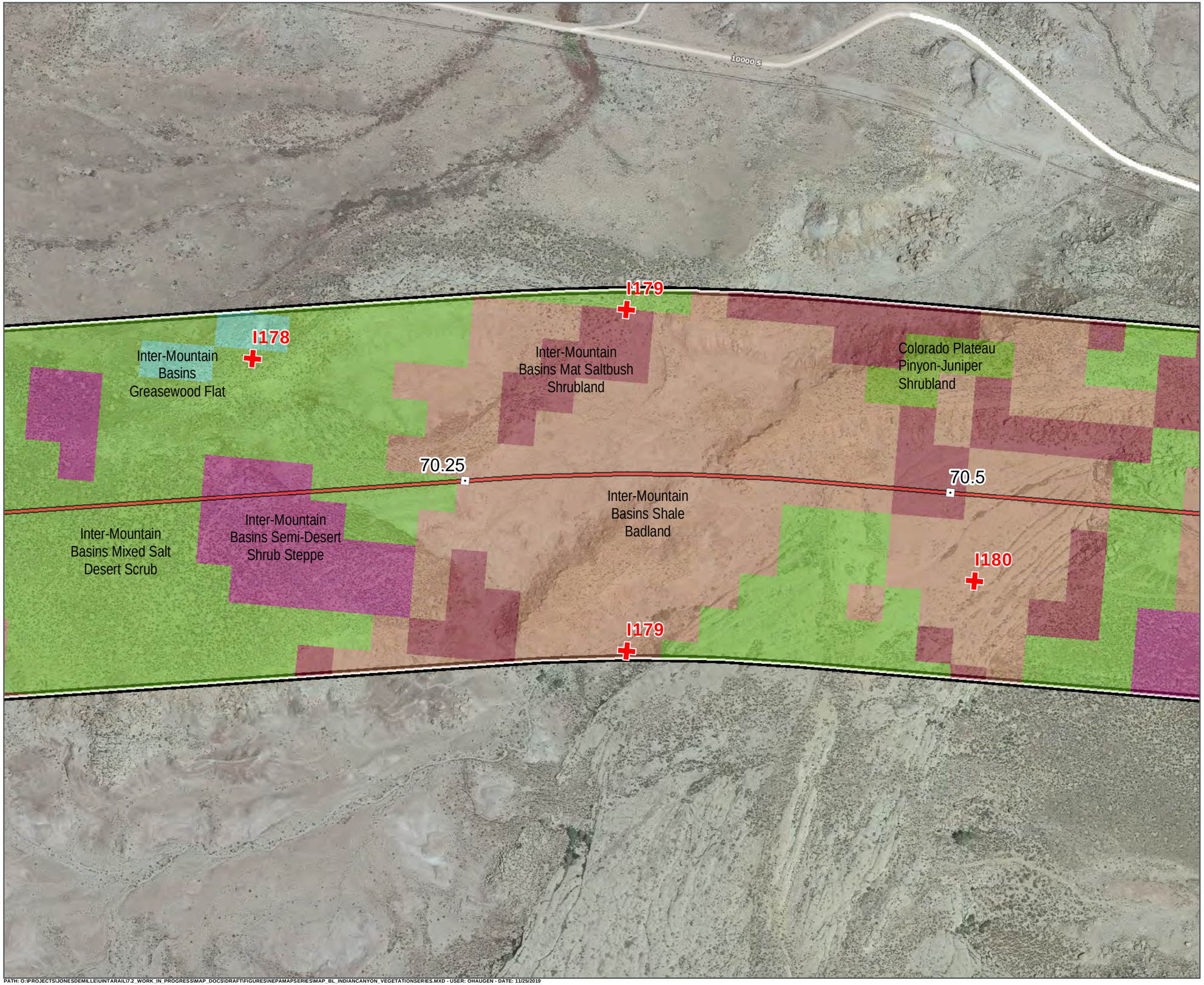

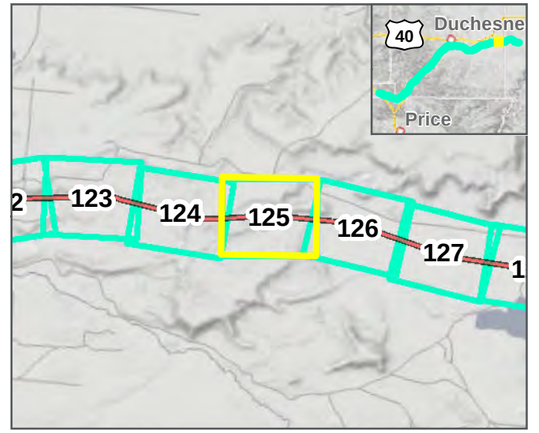

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
SWReGAP Landcover
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COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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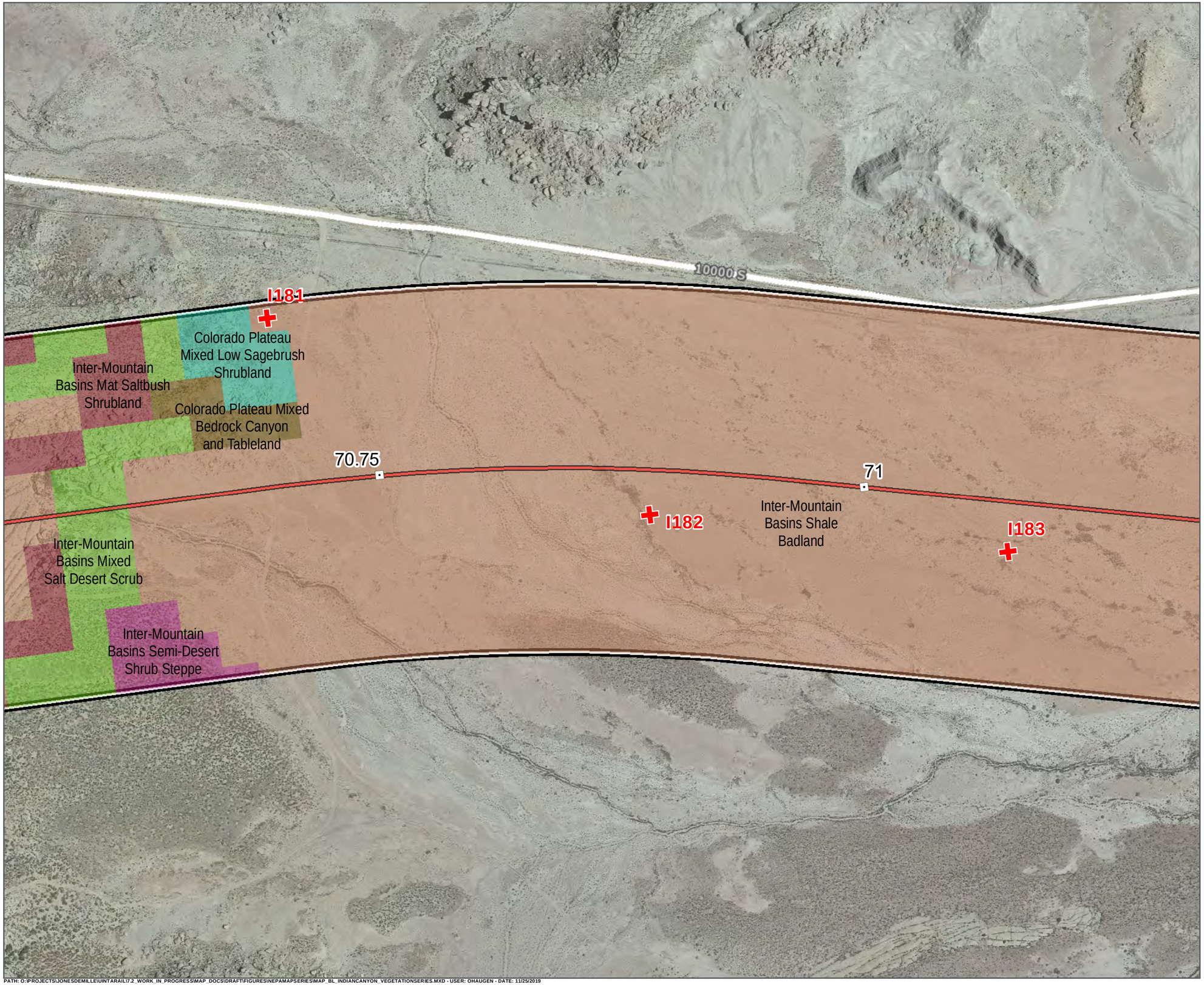

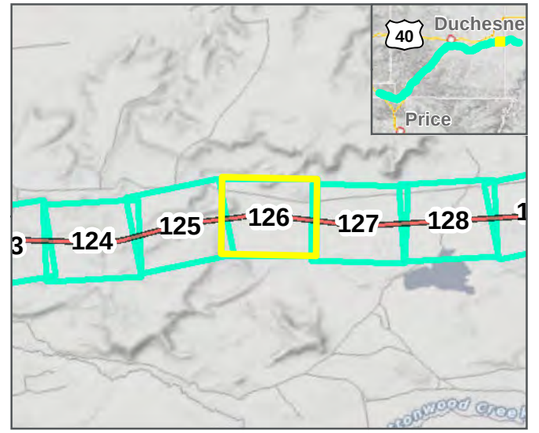

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Mat Saltbush Shrubland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
SWReGAP Landcover
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Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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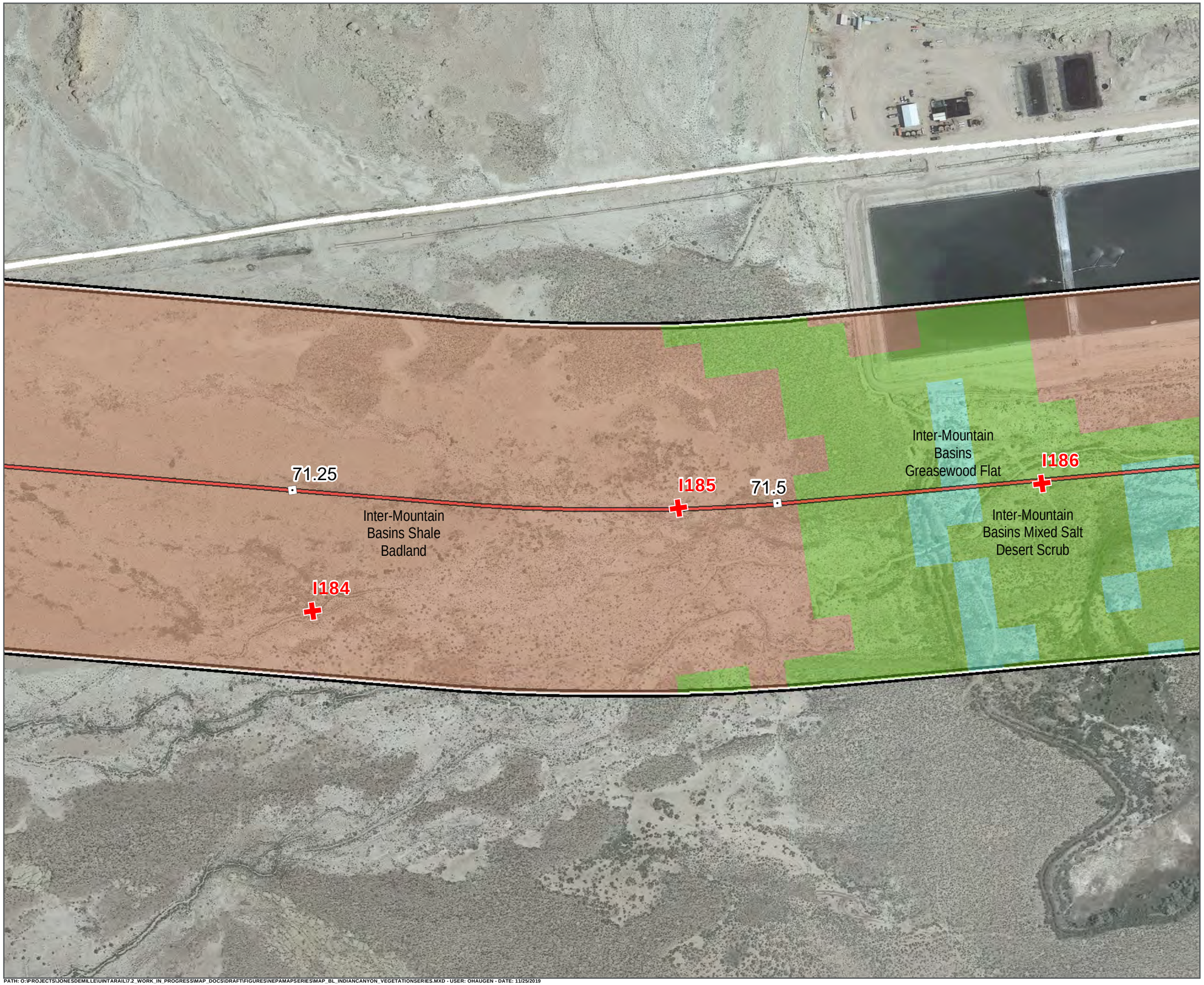

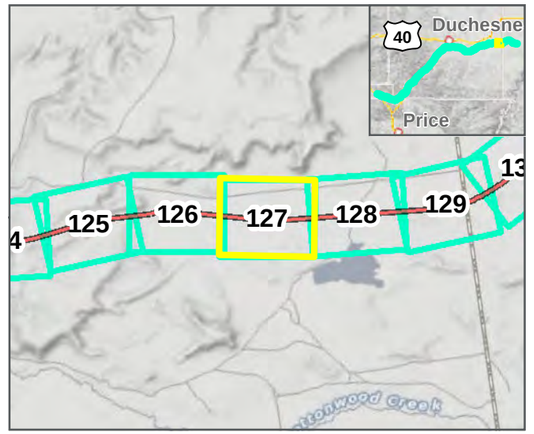

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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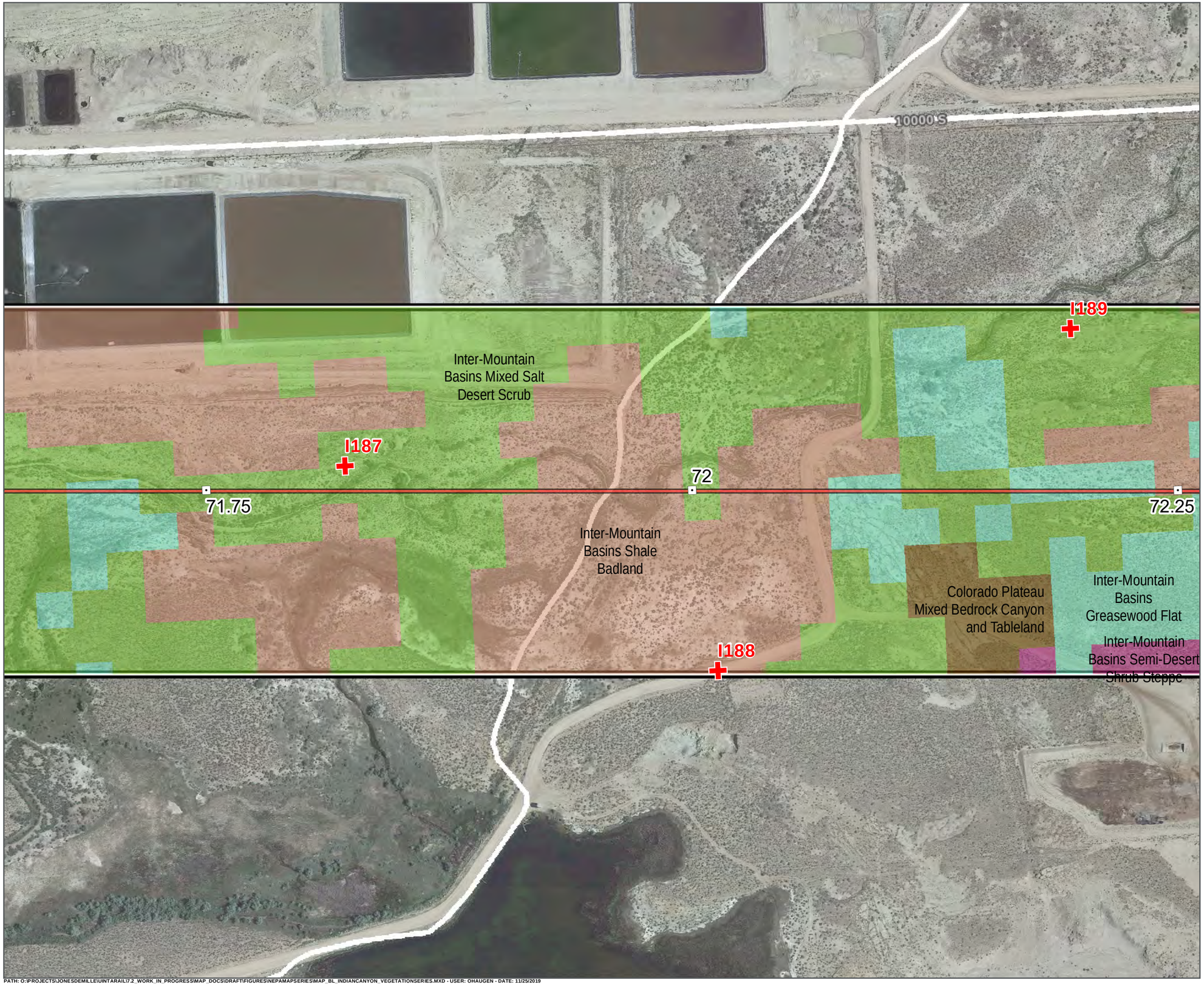

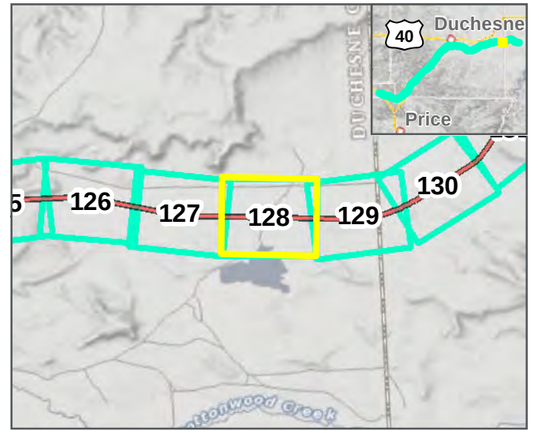

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

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Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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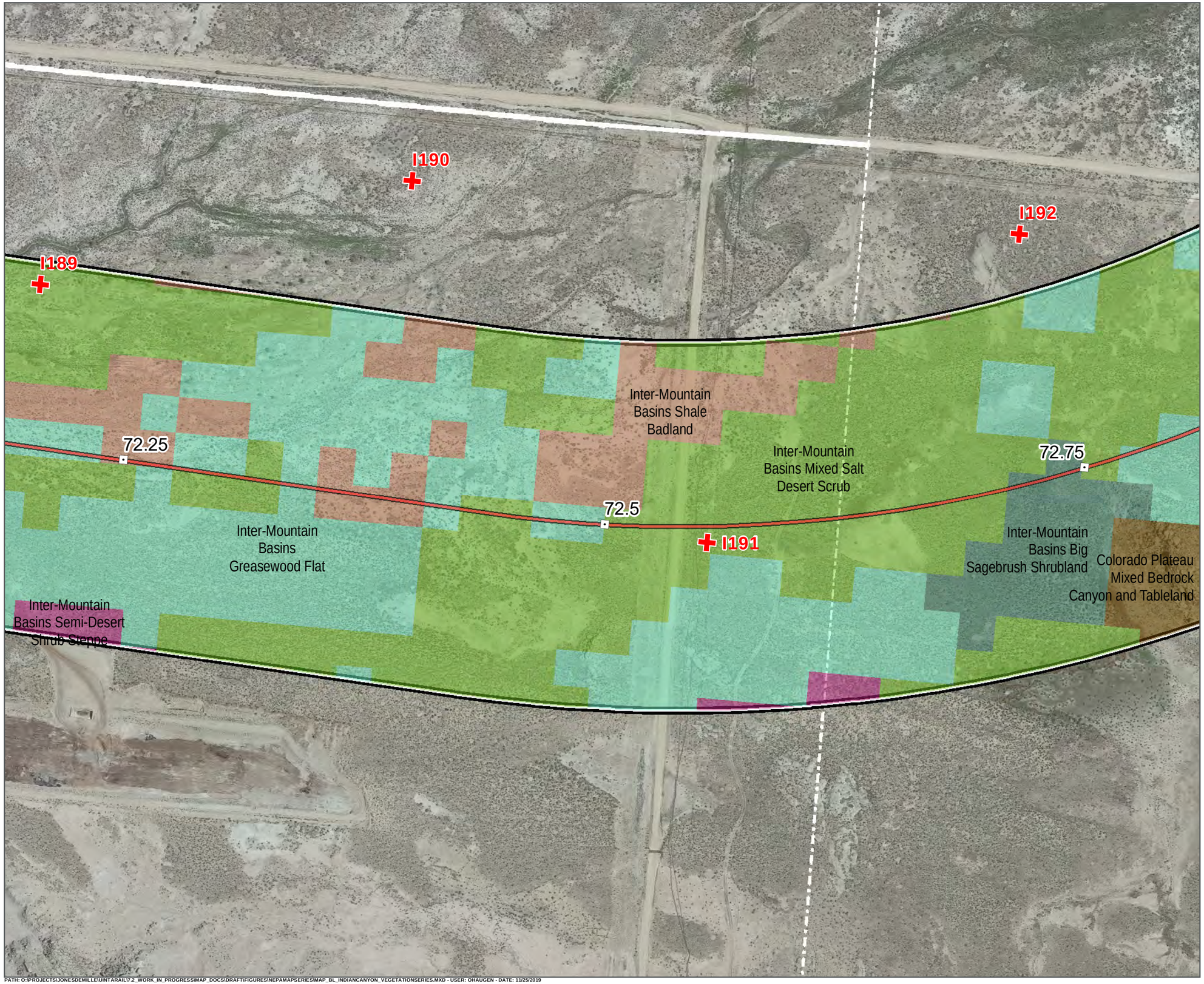

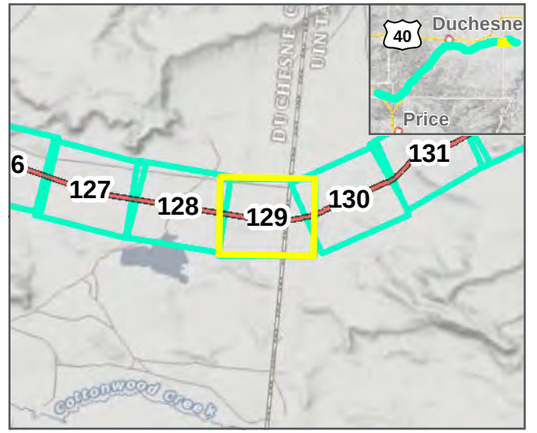

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Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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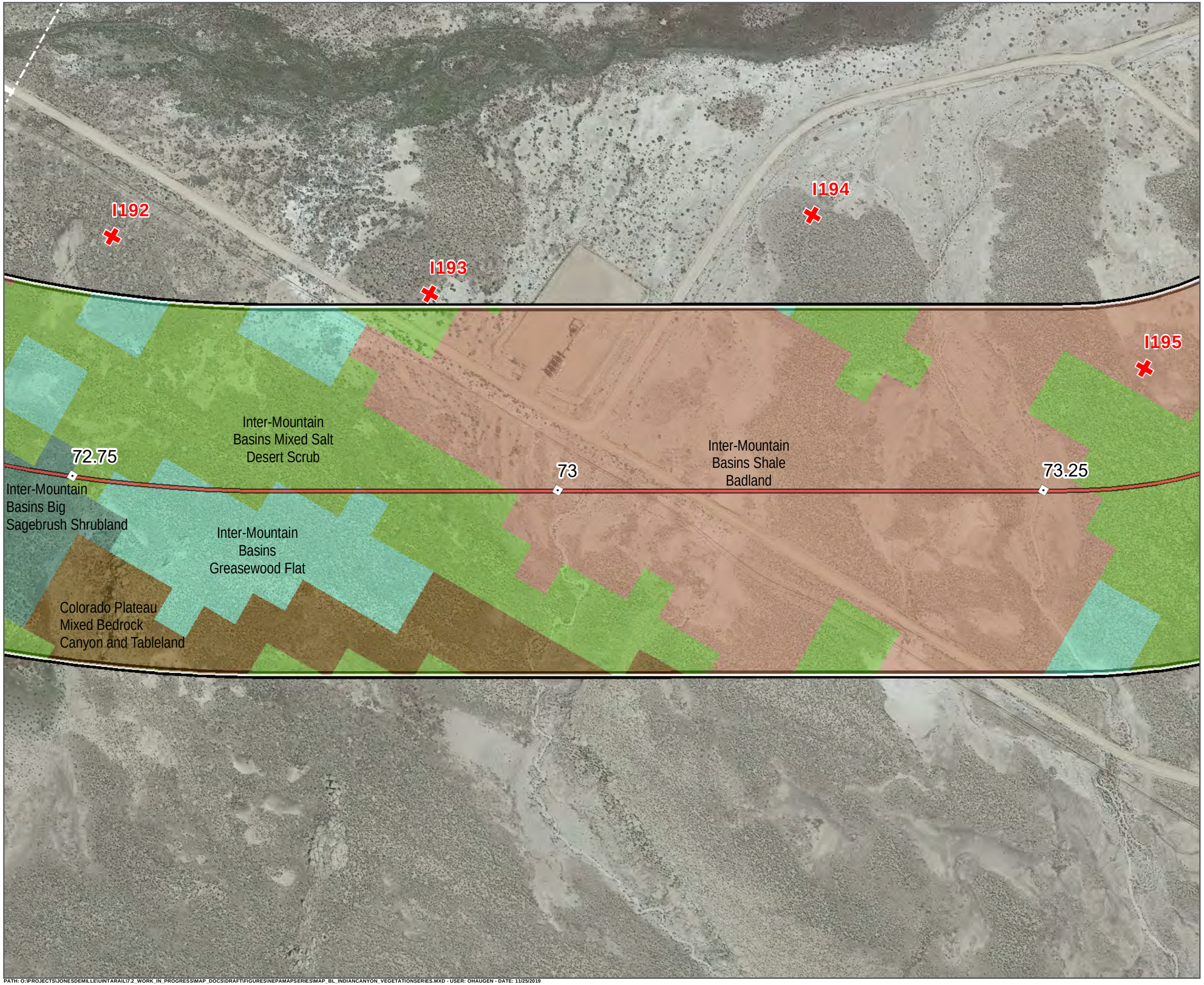
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



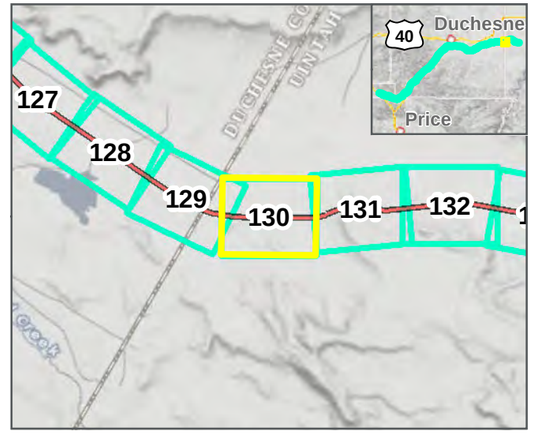


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland

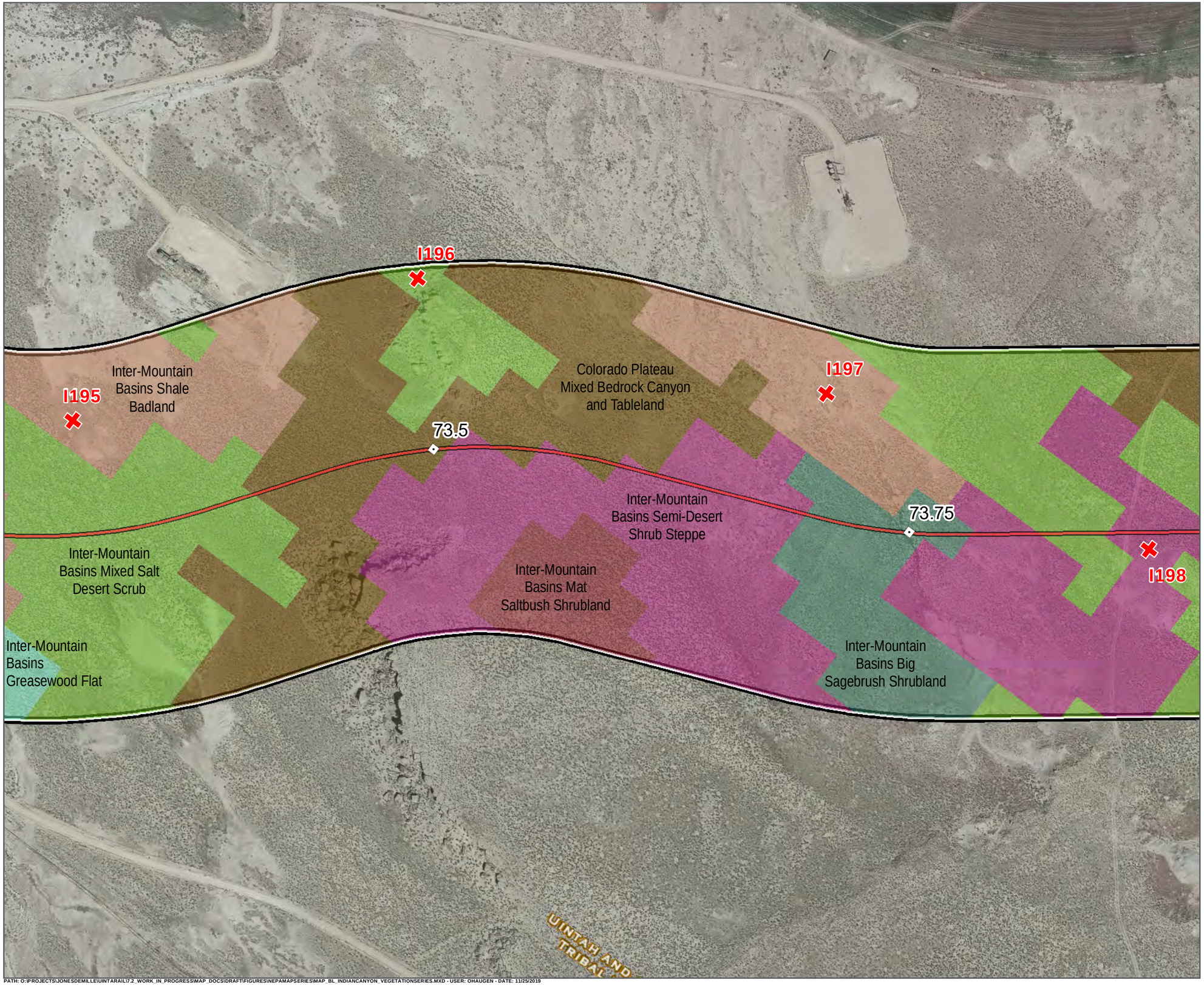
INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



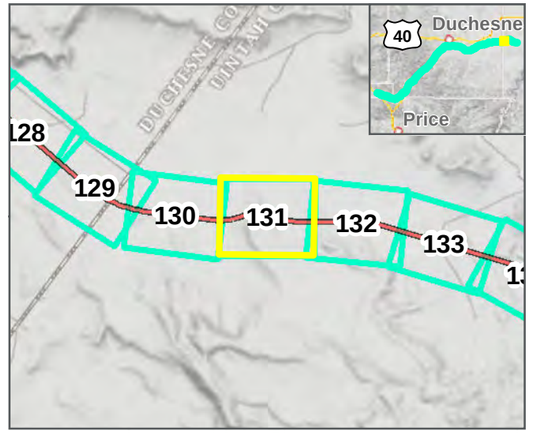


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
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- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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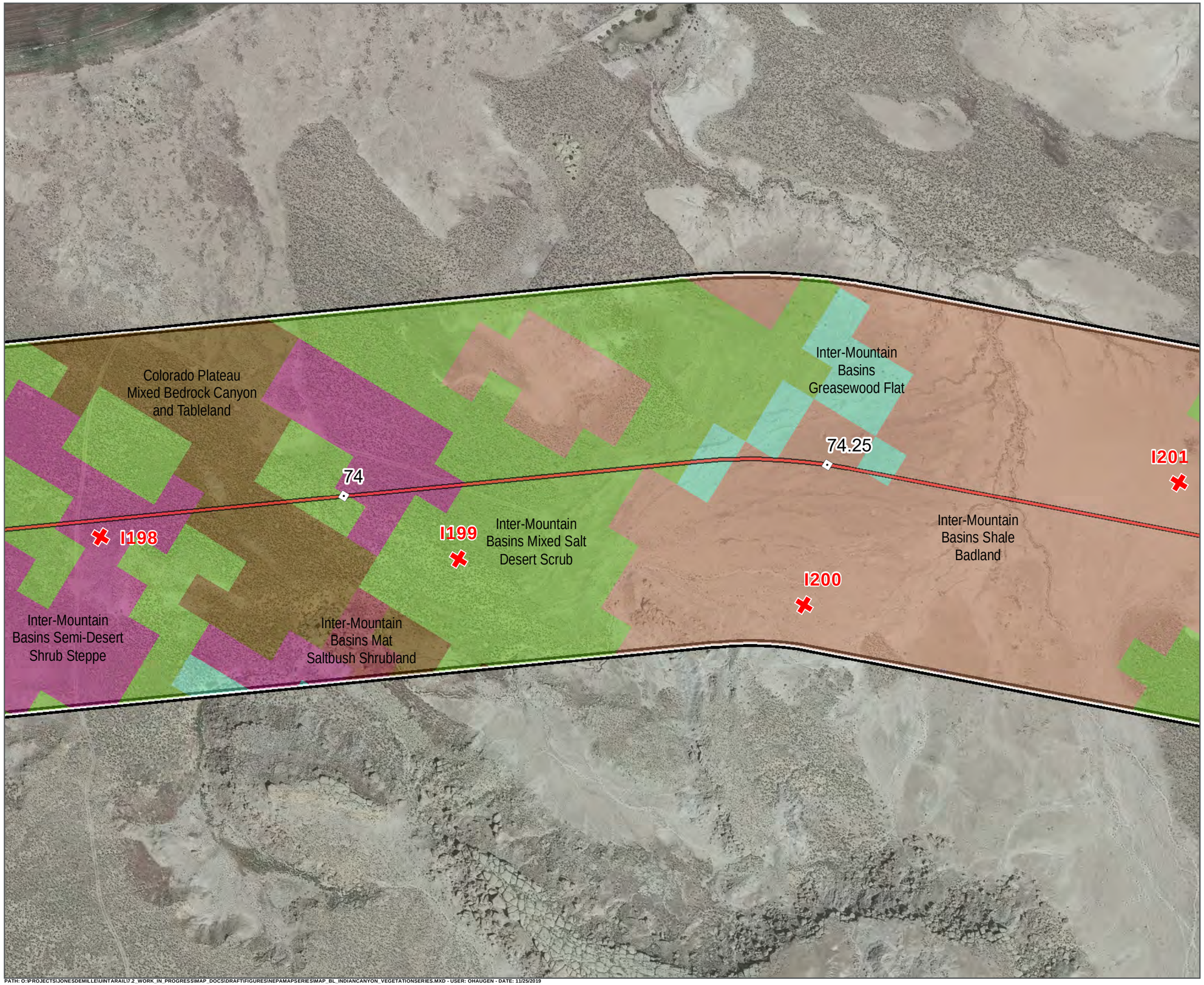

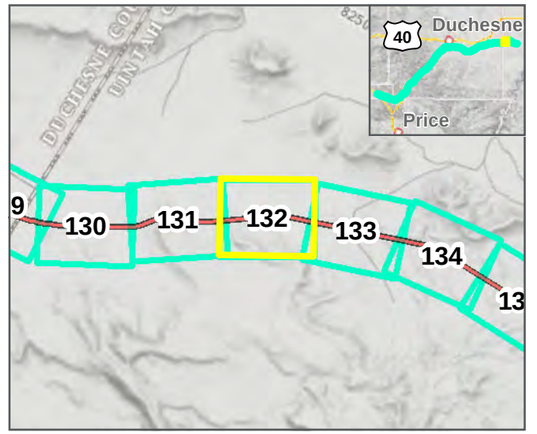

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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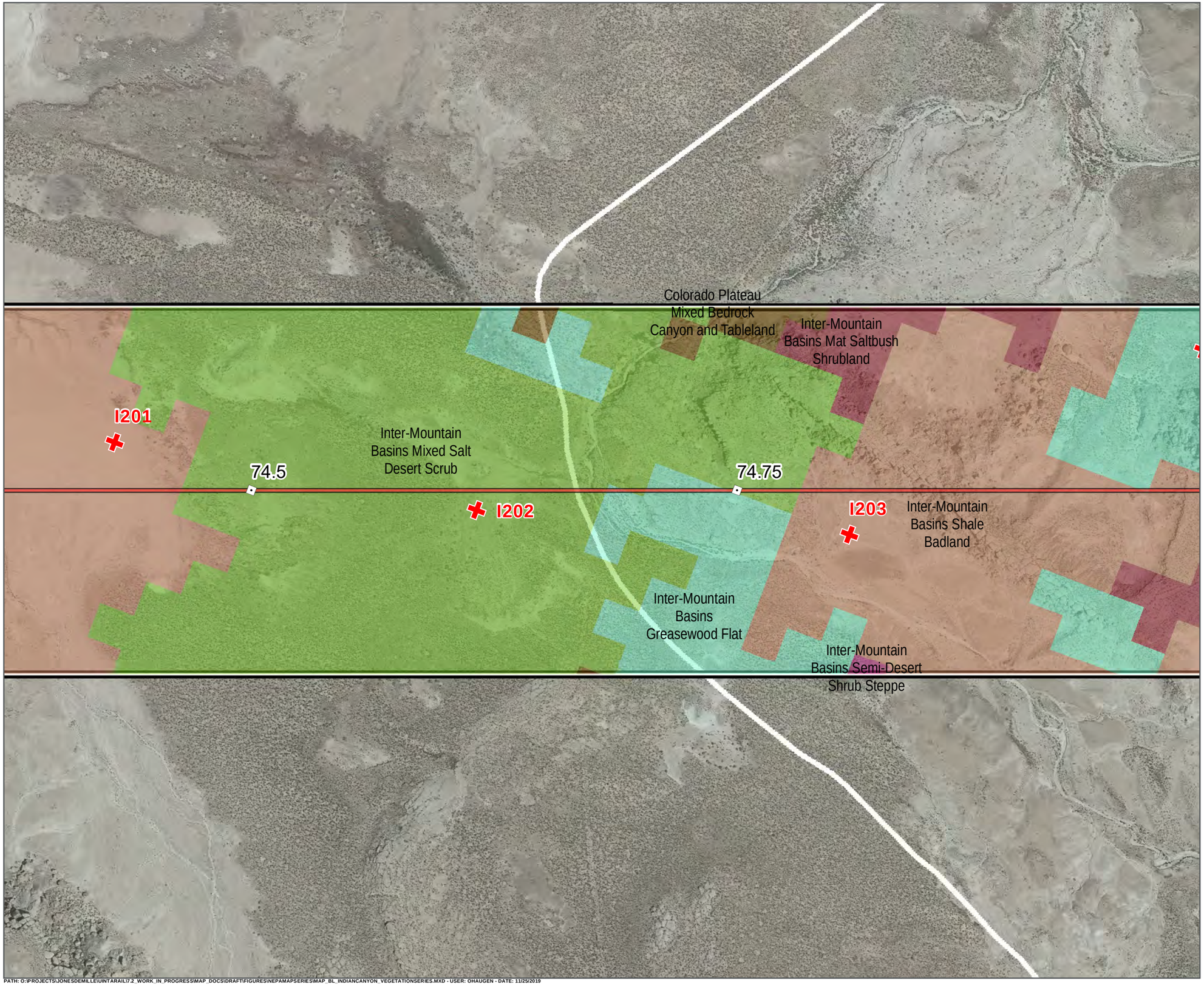

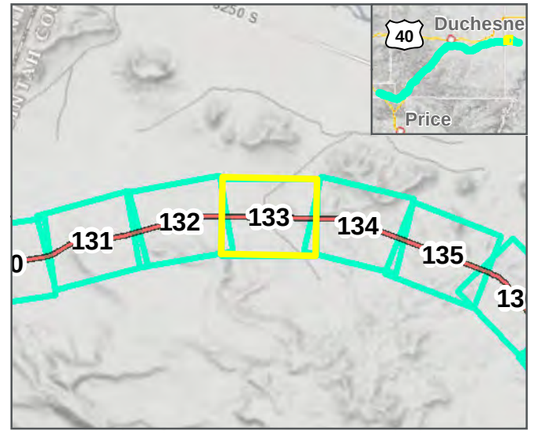

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
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- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
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SEVEN COUNTY INFRASTRUCTURE COALITION

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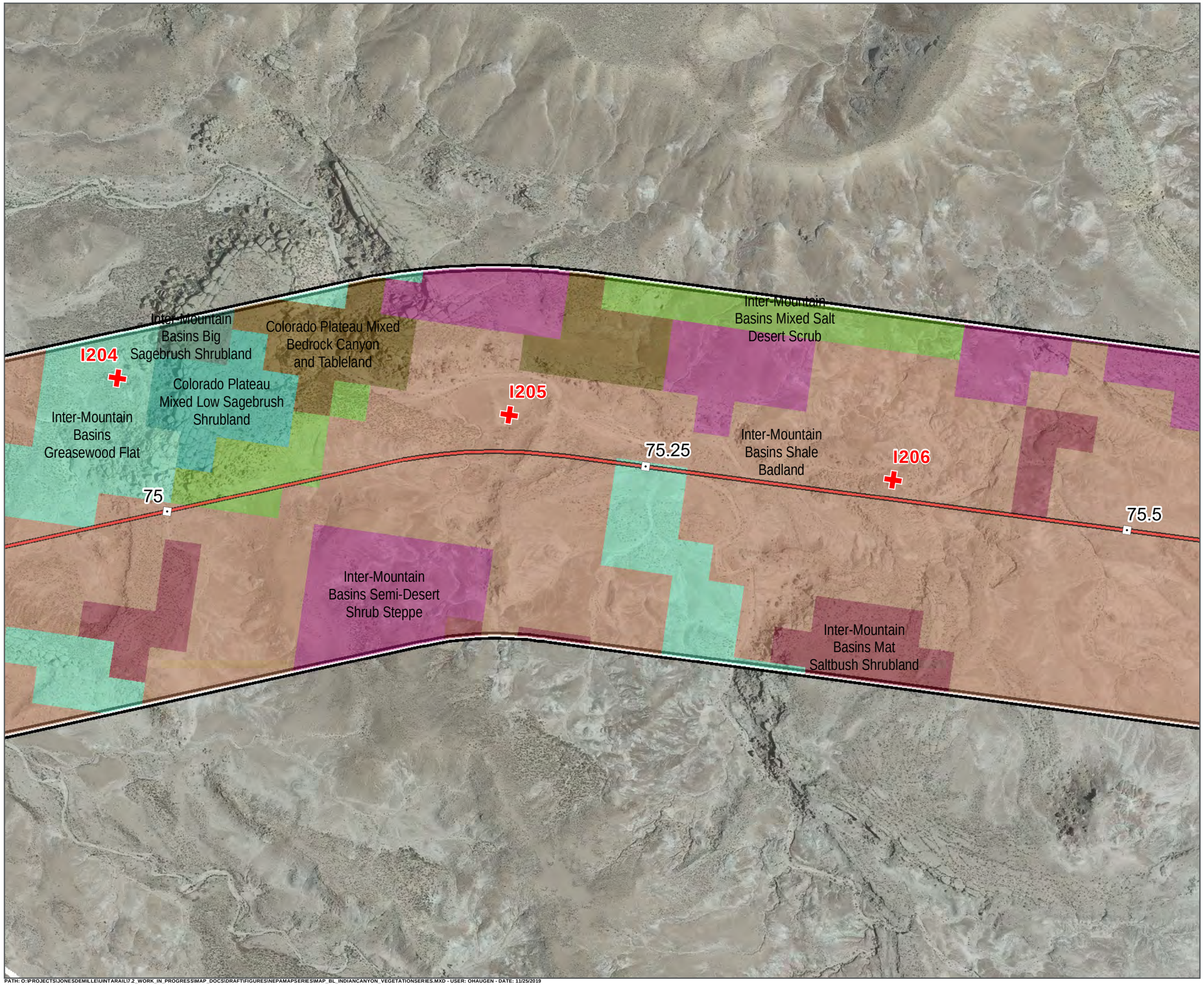

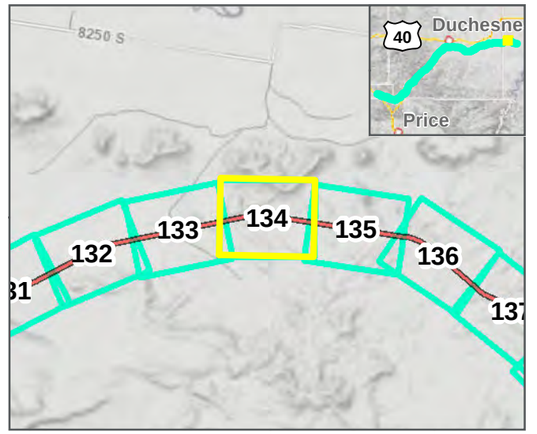

Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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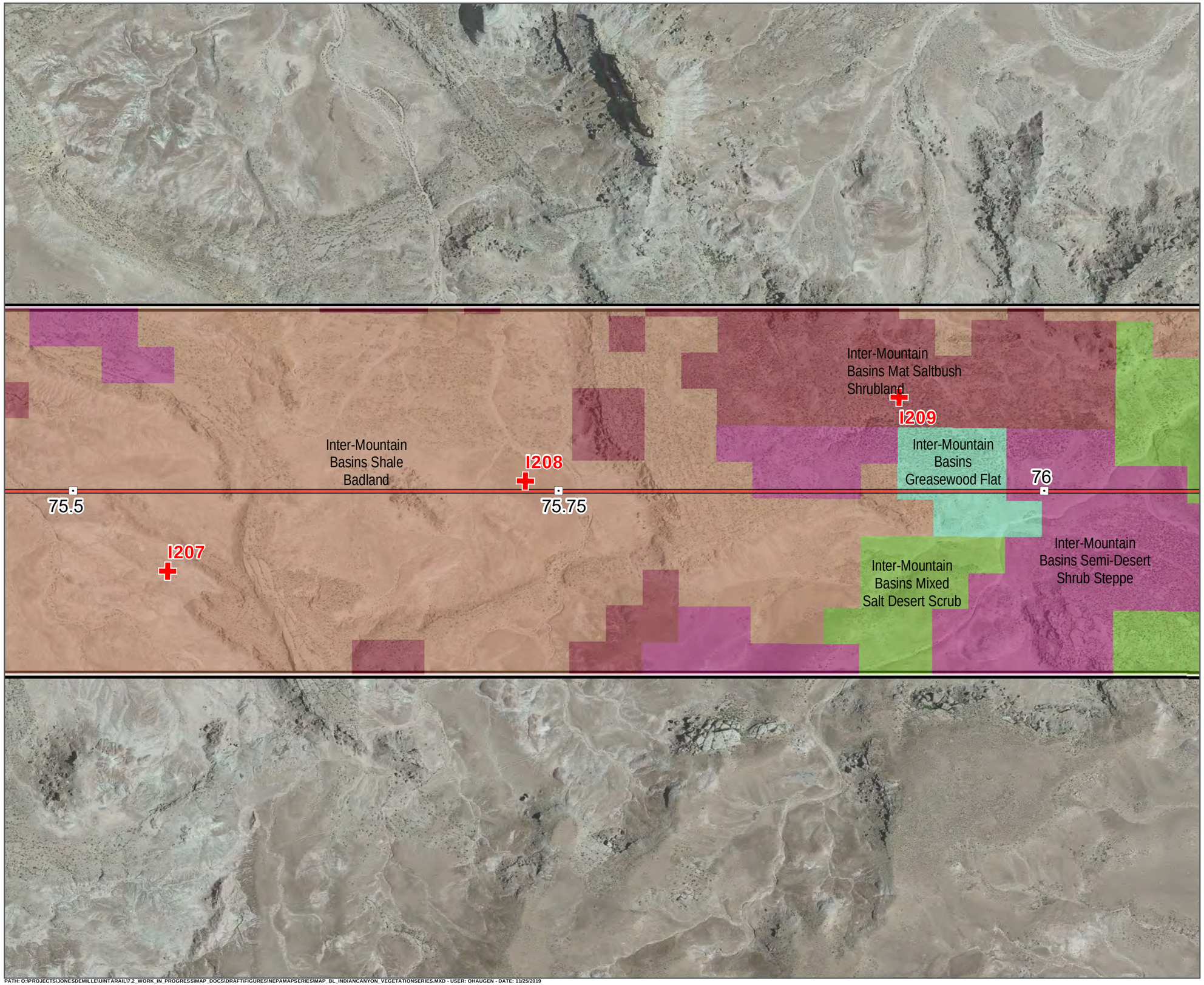

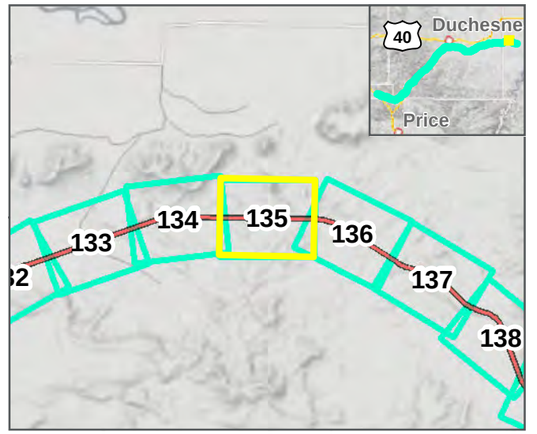

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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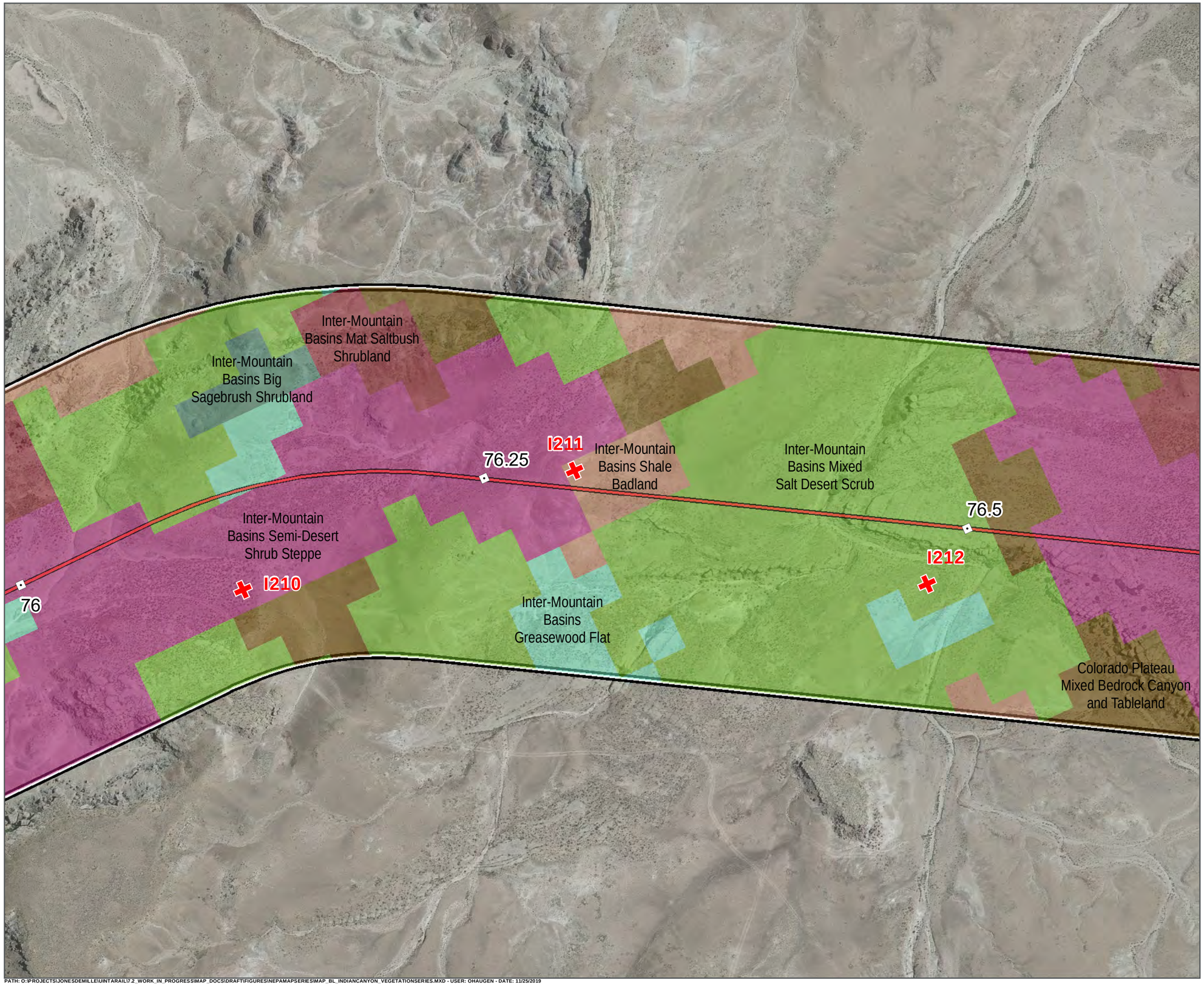

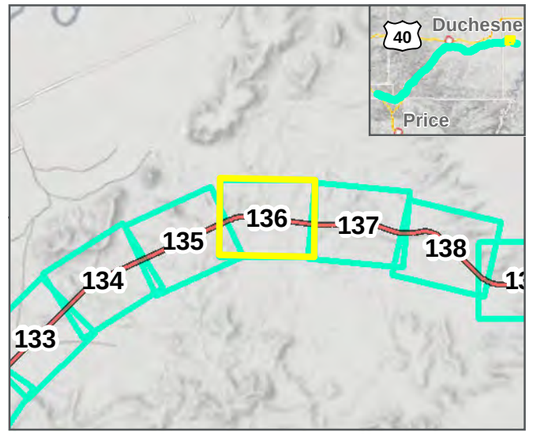

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
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- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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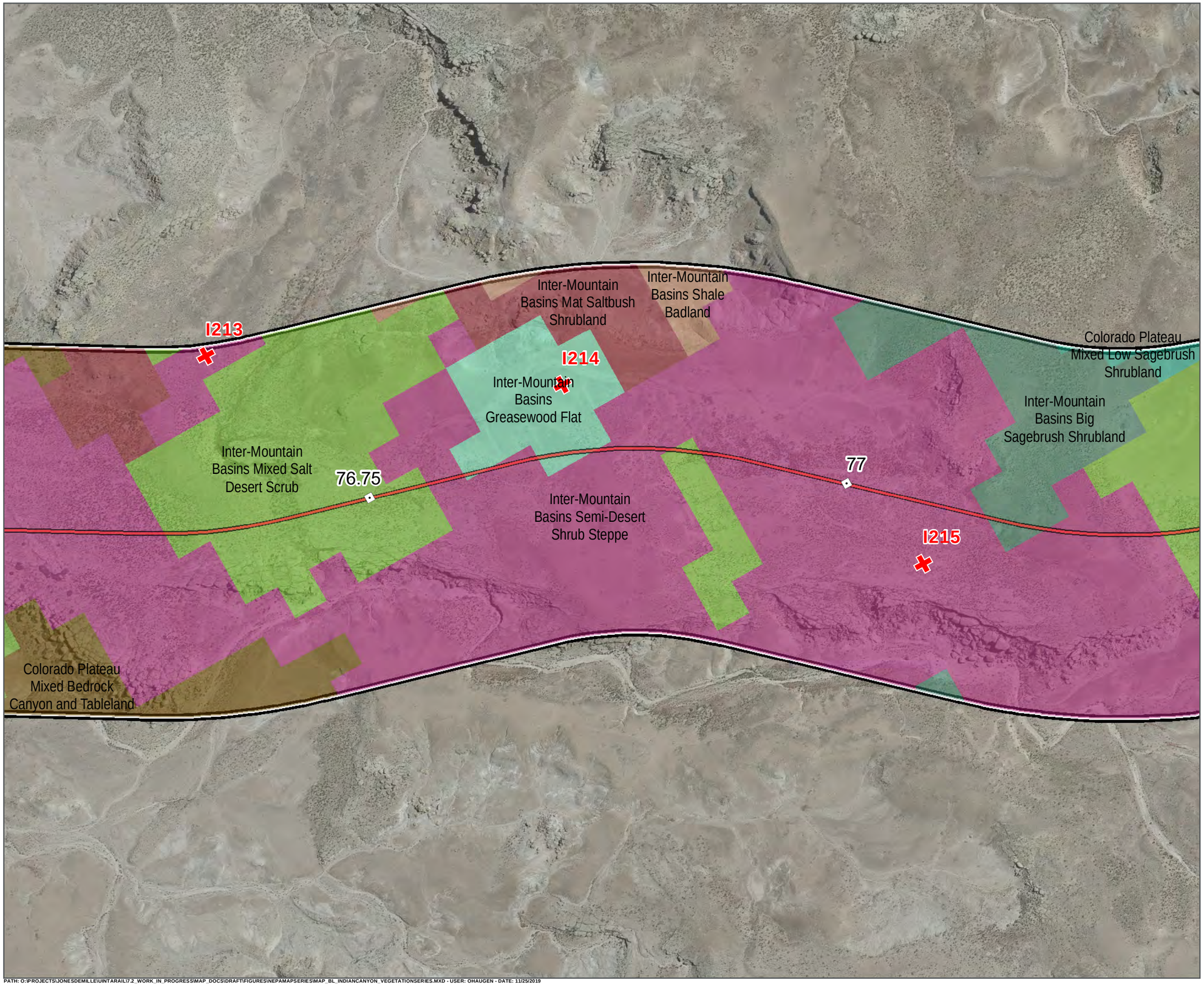


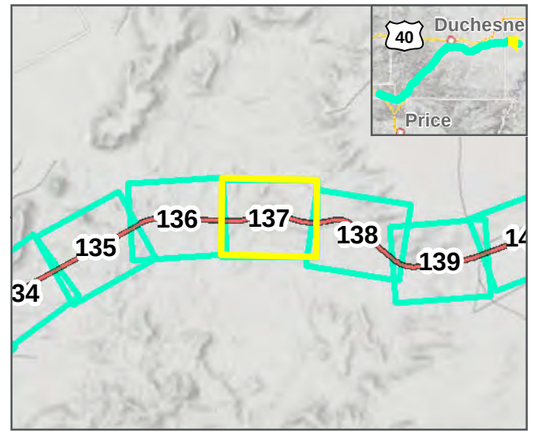


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

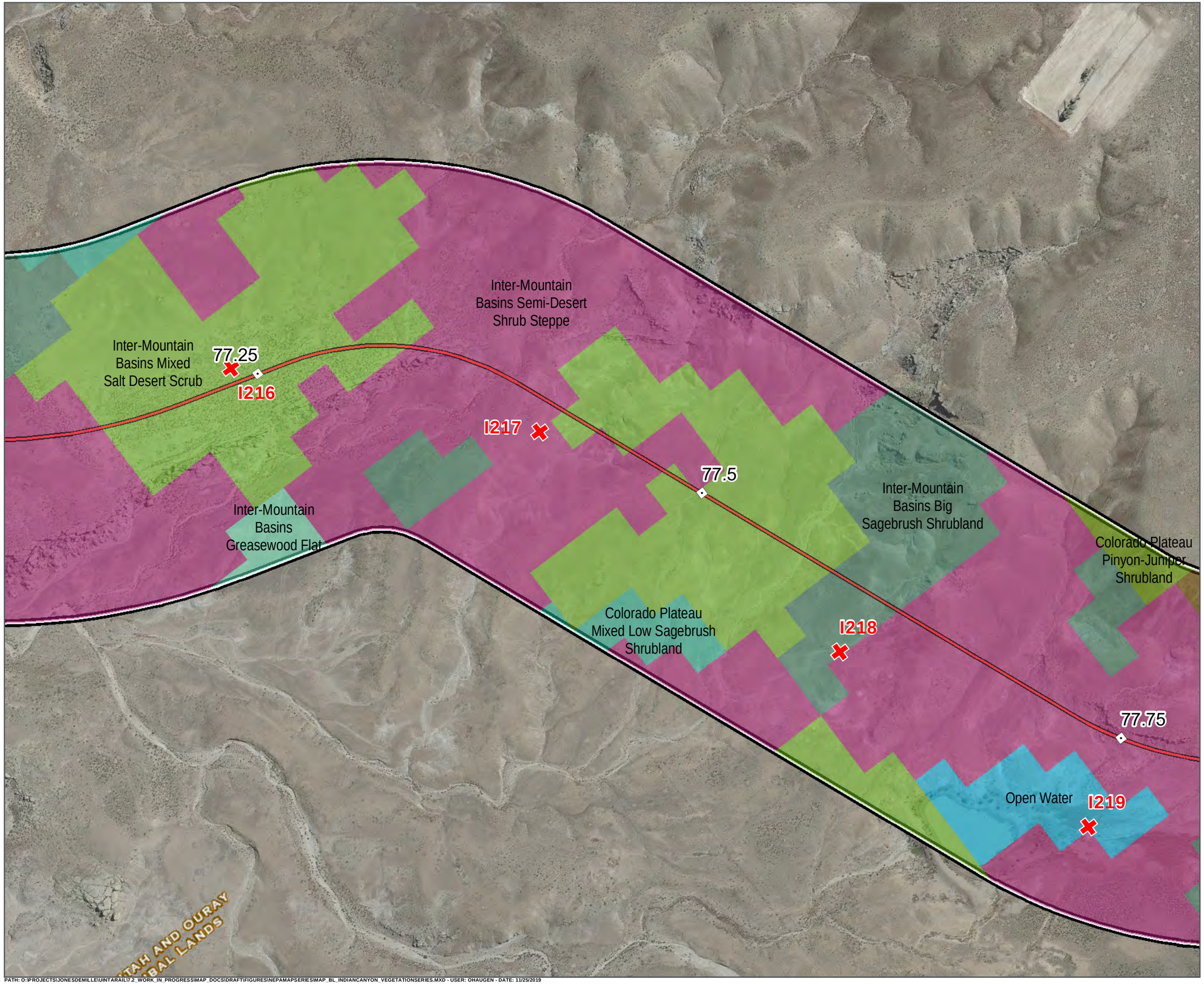
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



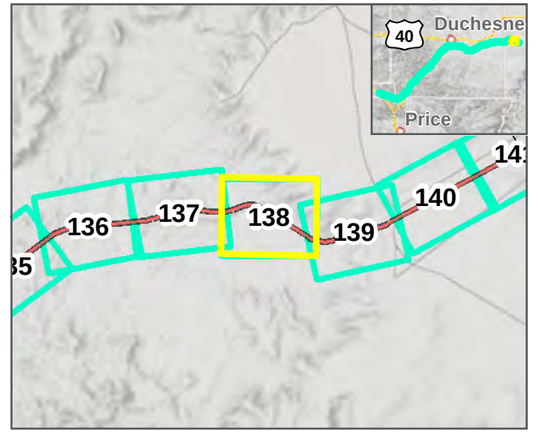


Photo Points

Mileposts

Indian Canyon Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Open Water

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

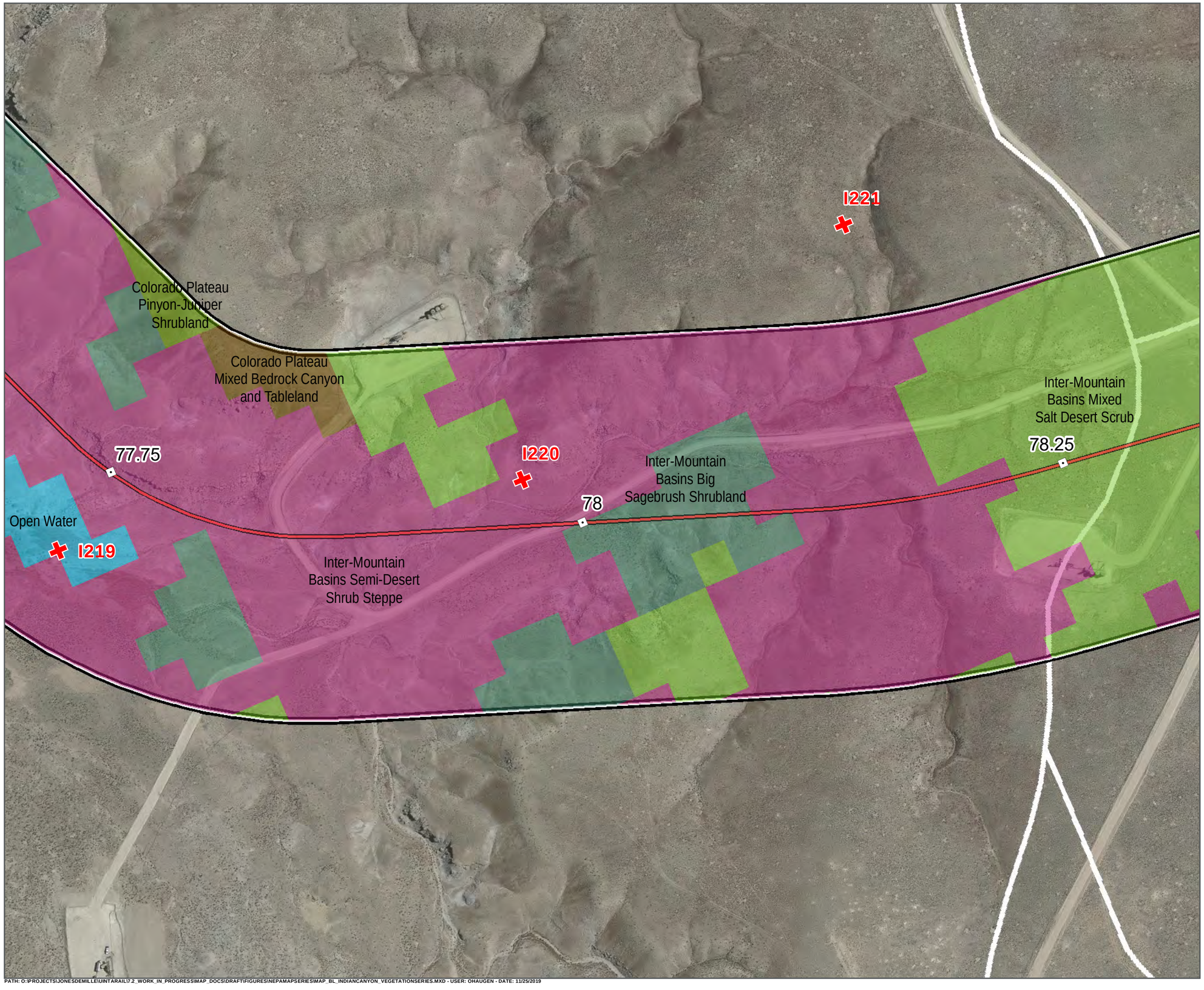
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



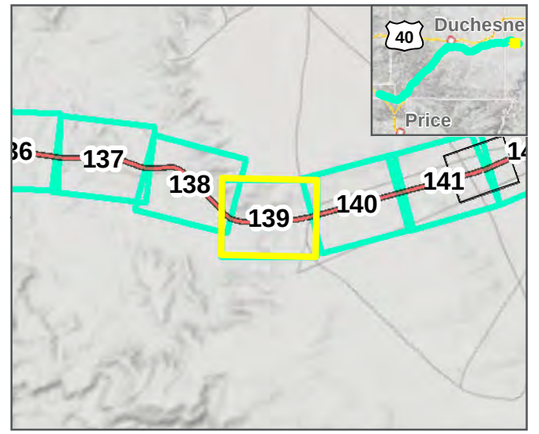


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Open Water

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

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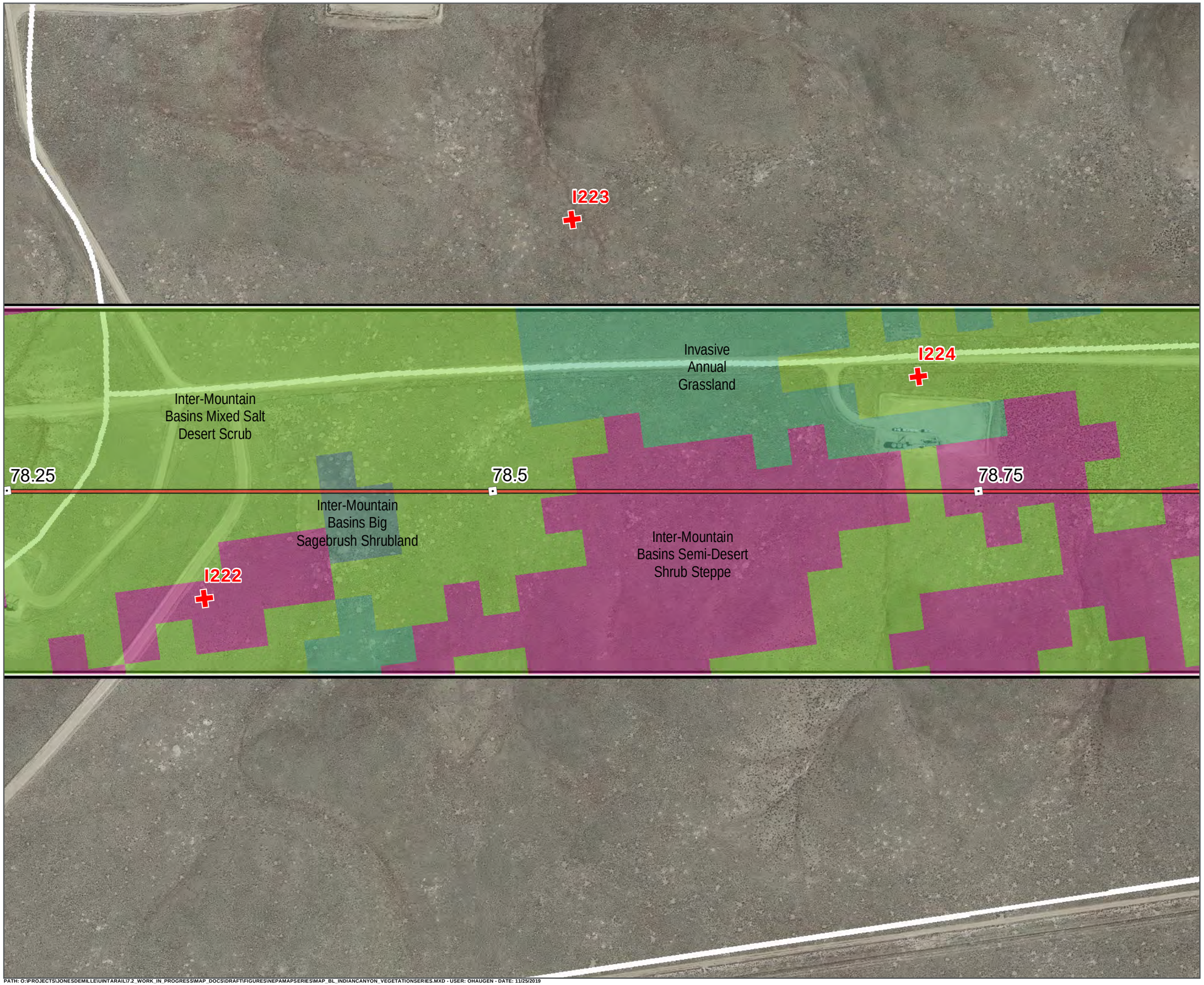

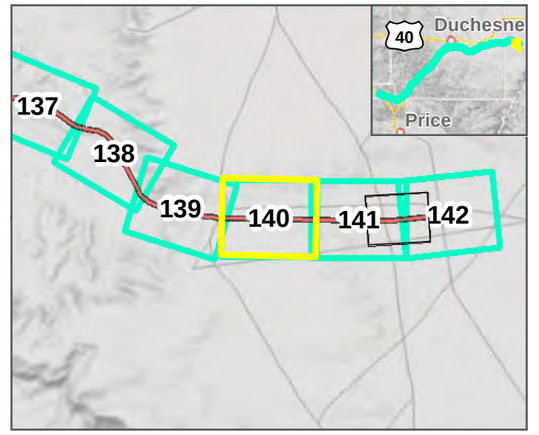

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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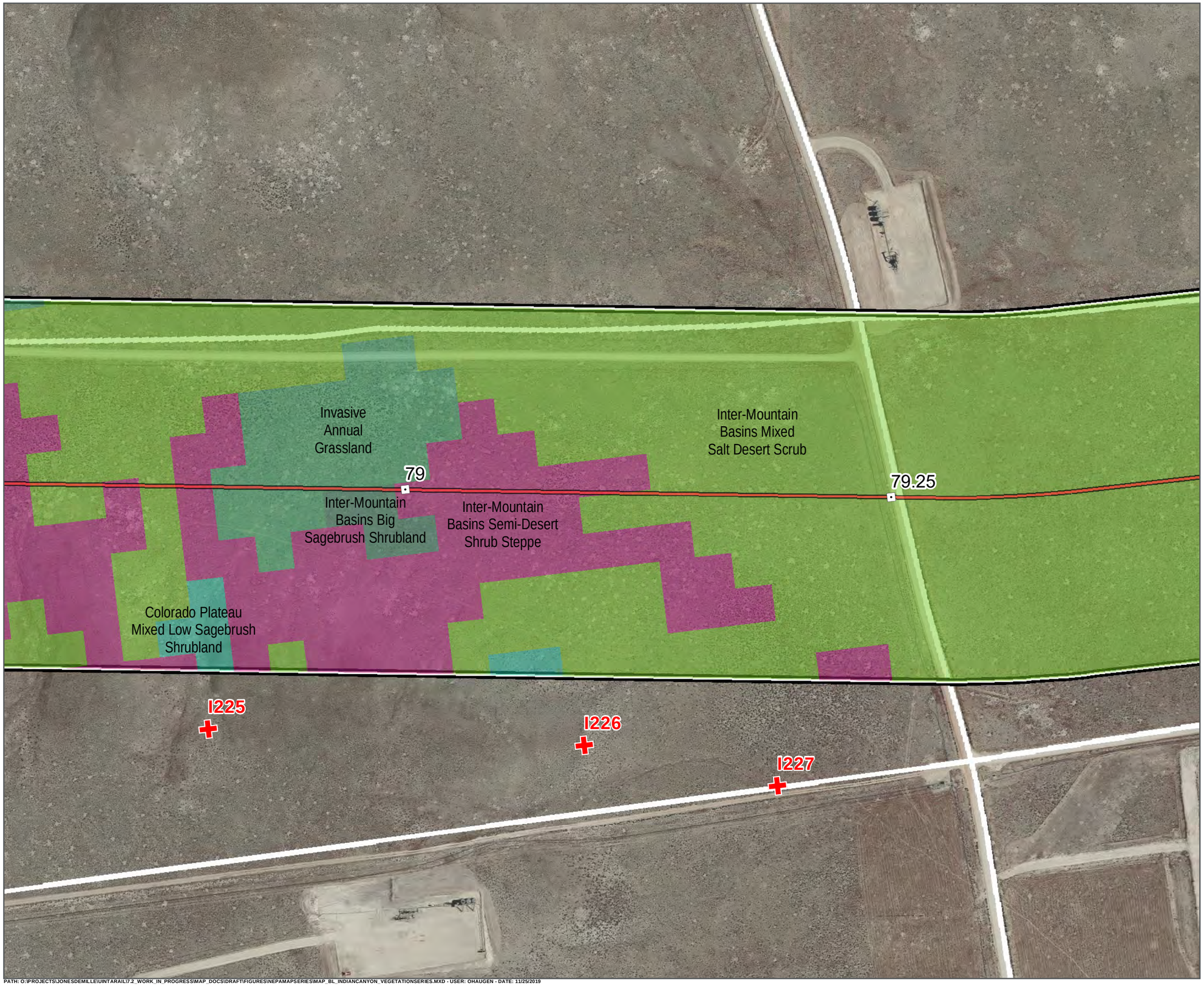

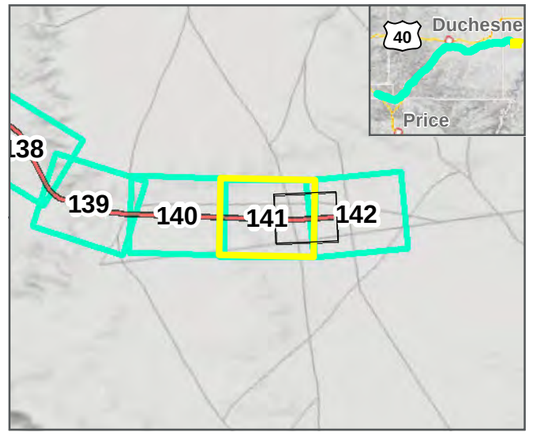

Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual Grassland

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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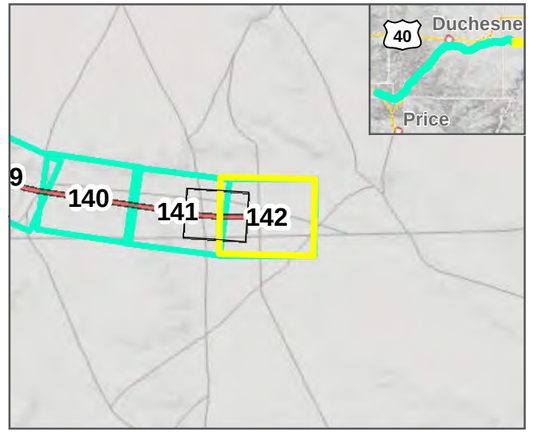


Photo Points
Mileposts
Indian Canyon Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

Inter-Mountain Basins Mixed Salt Desert Scrub
Invasive Annual

INDIAN CANYON ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

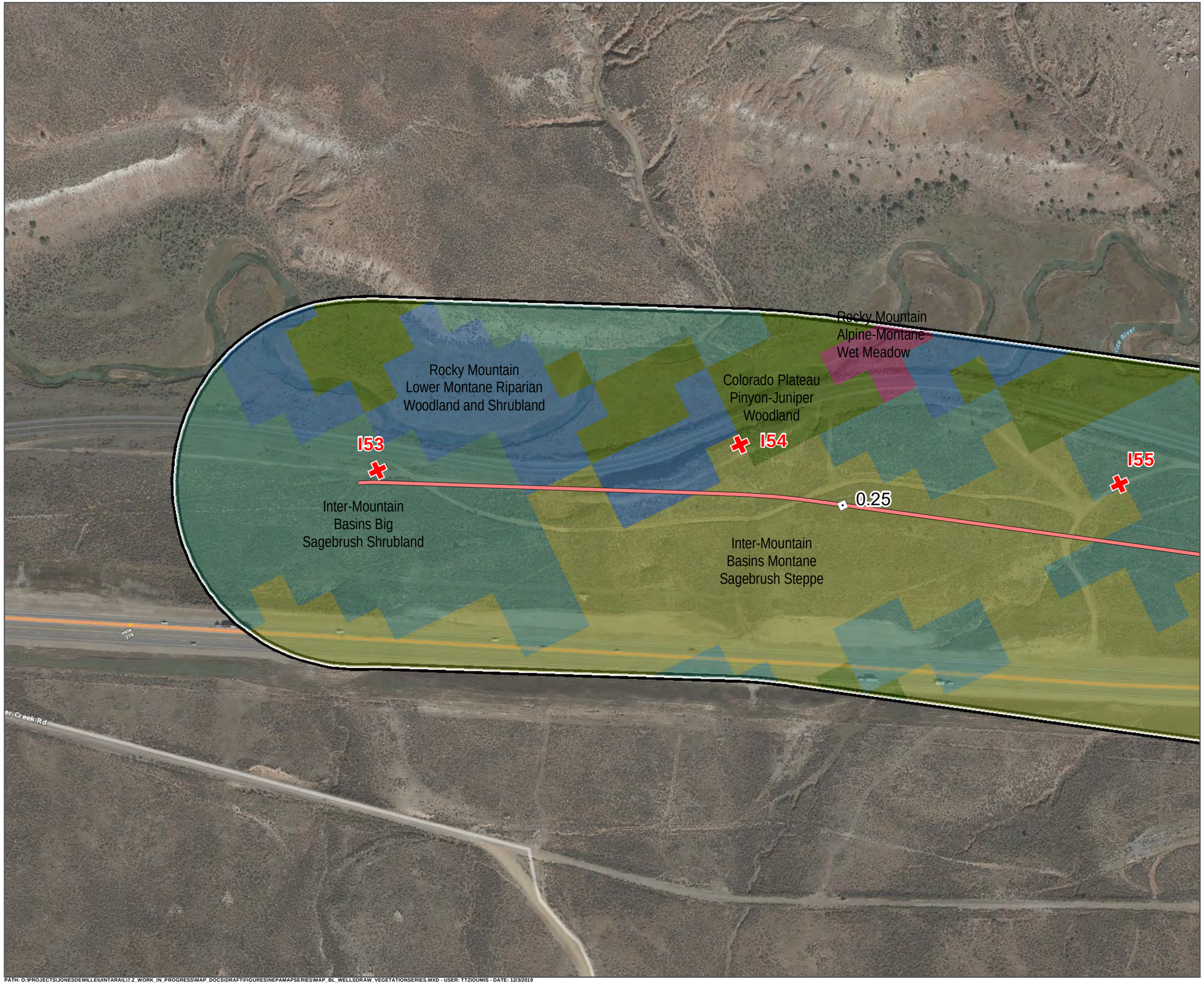
SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_INDIANCANYON_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

APPENDIX C

Vegetation Community Maps for the Wells Draw Study Area



WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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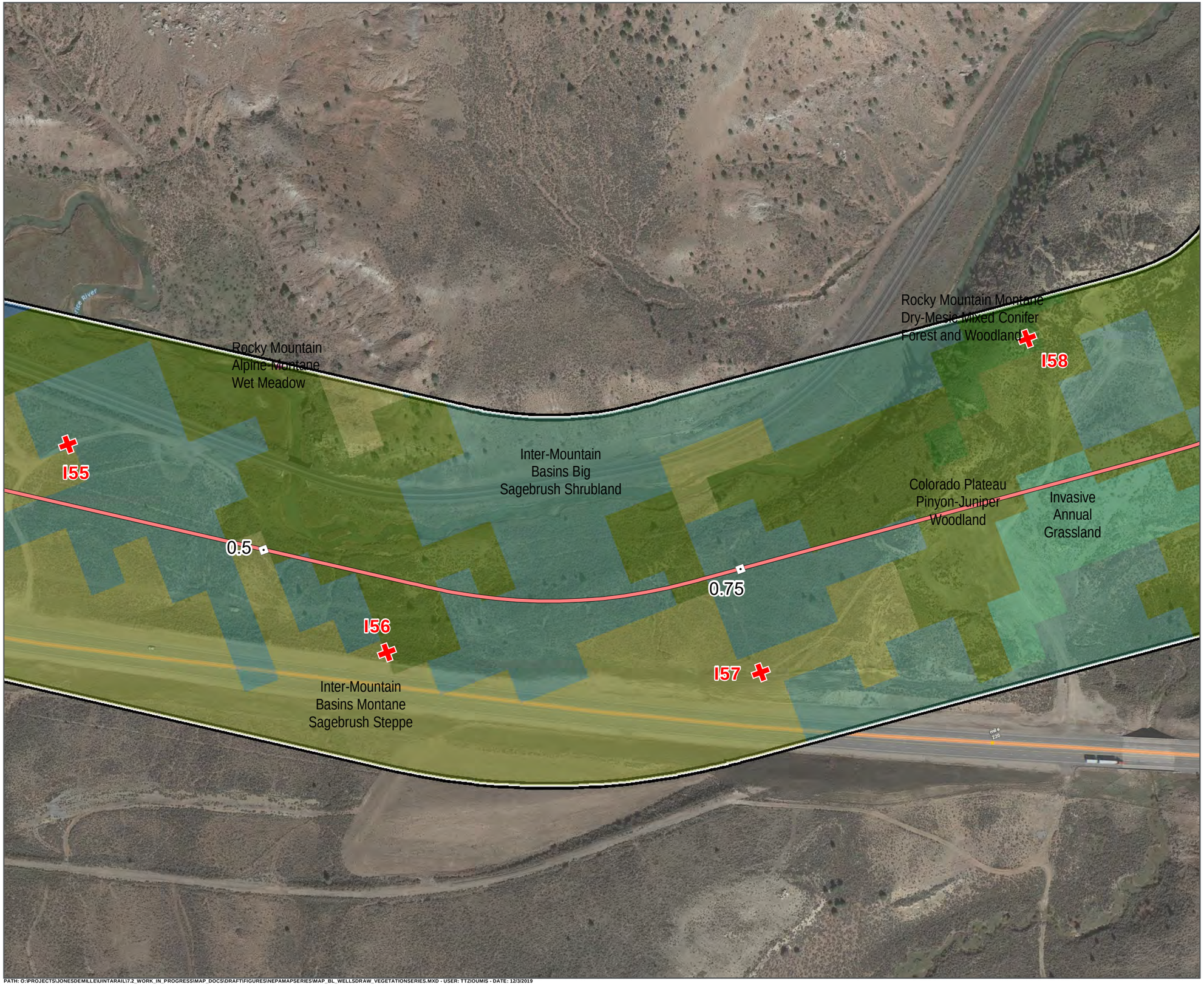

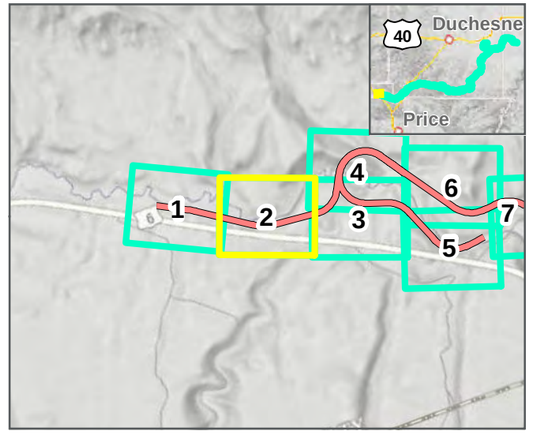

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Invasive Annual Grassland
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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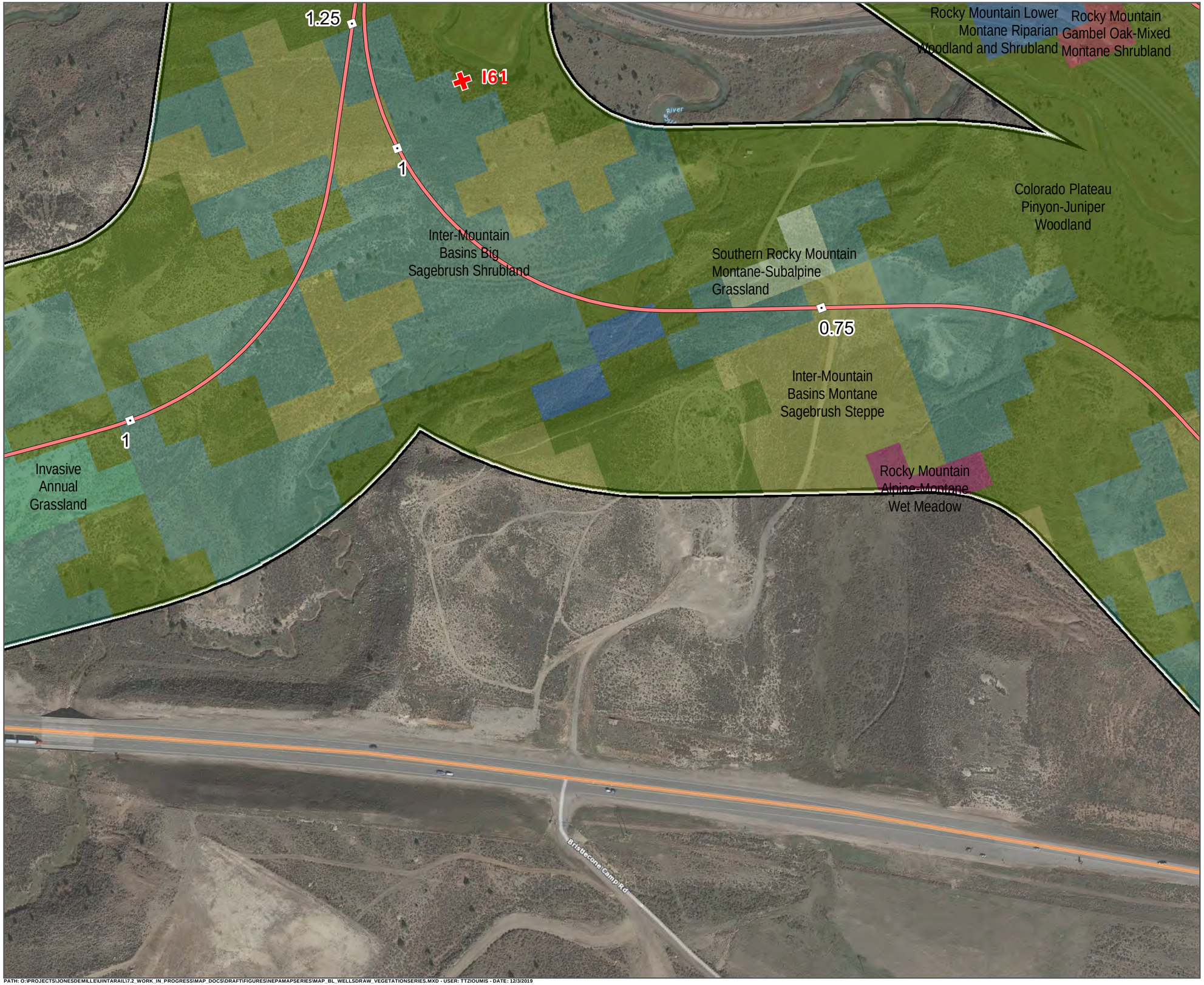

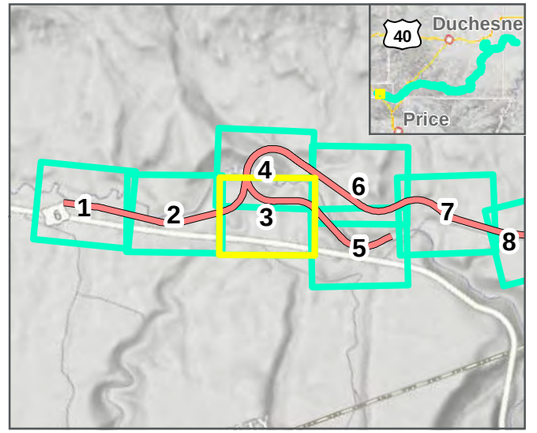

- Photo Points
- Milepost
- Wells Draw Centerline
- Study Area
- Map Extent (current view in yellow)

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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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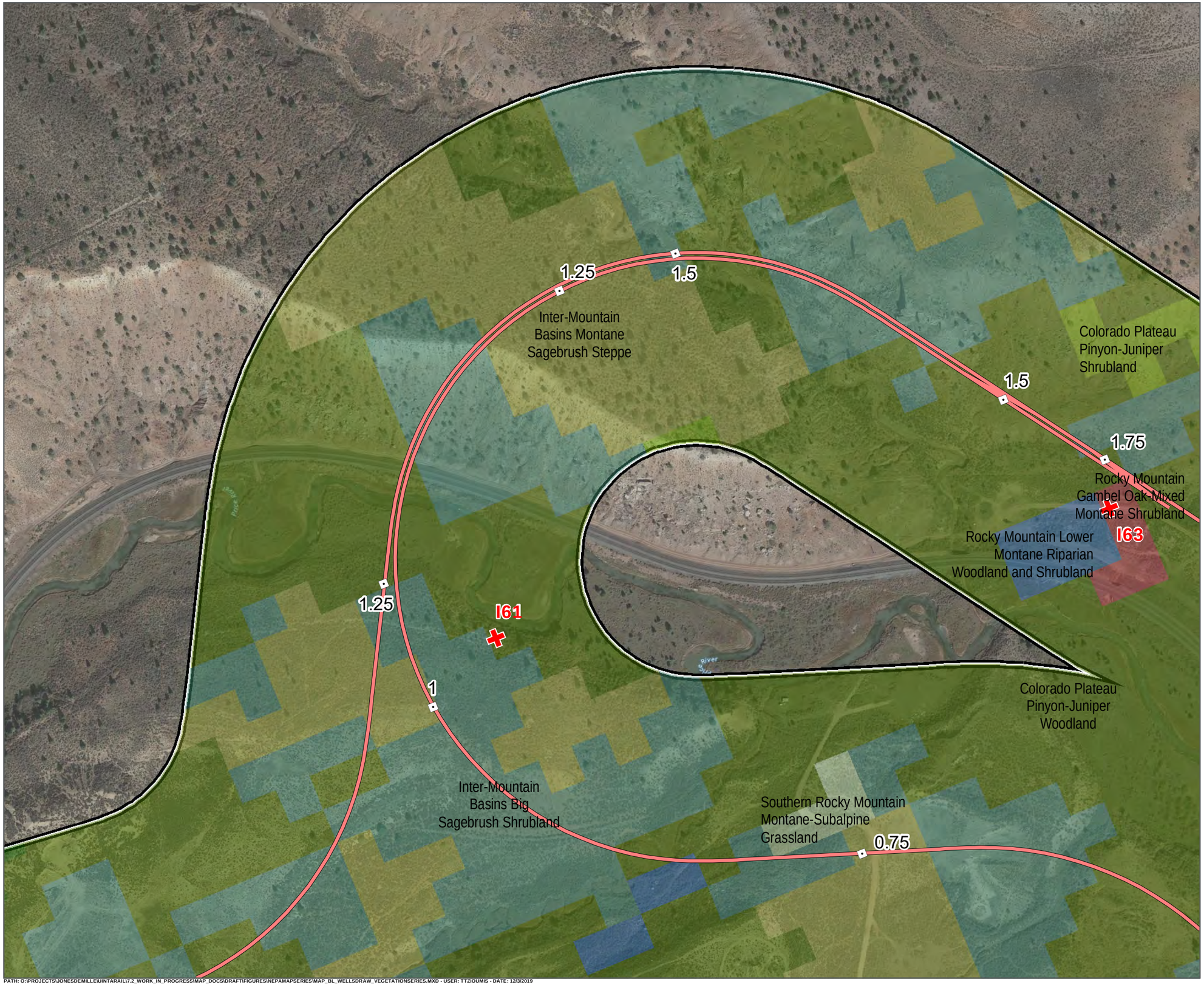

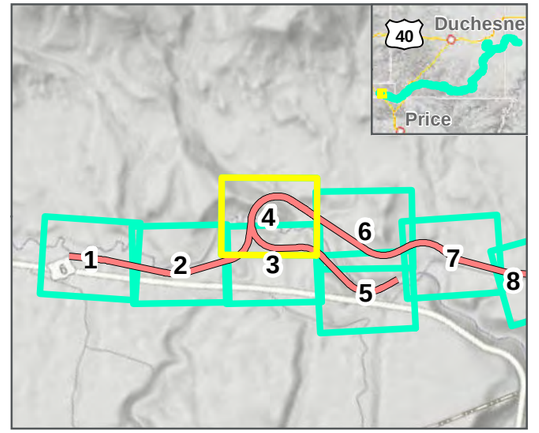

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WELLS DRAW ALTERNATIVE: 5/30/2019

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SEPTEMBER 2019

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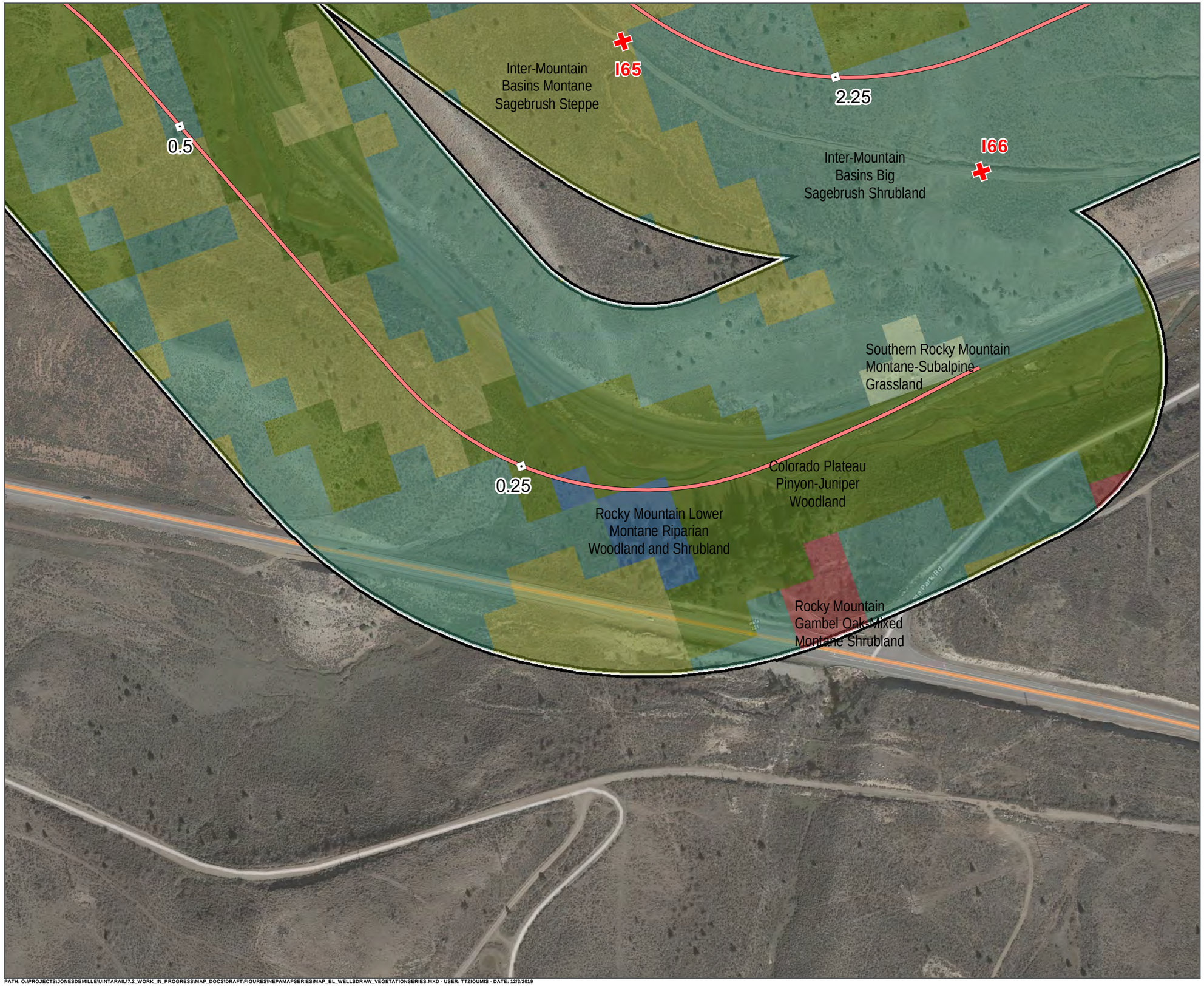

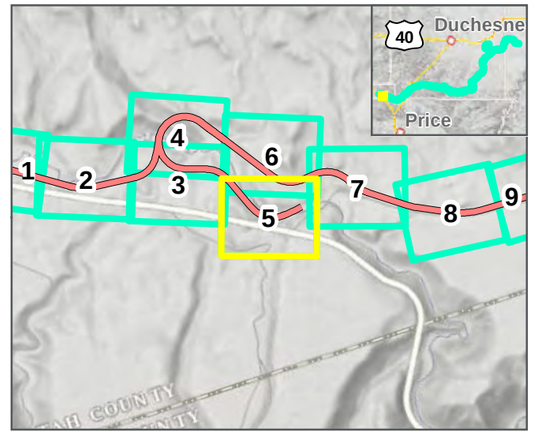

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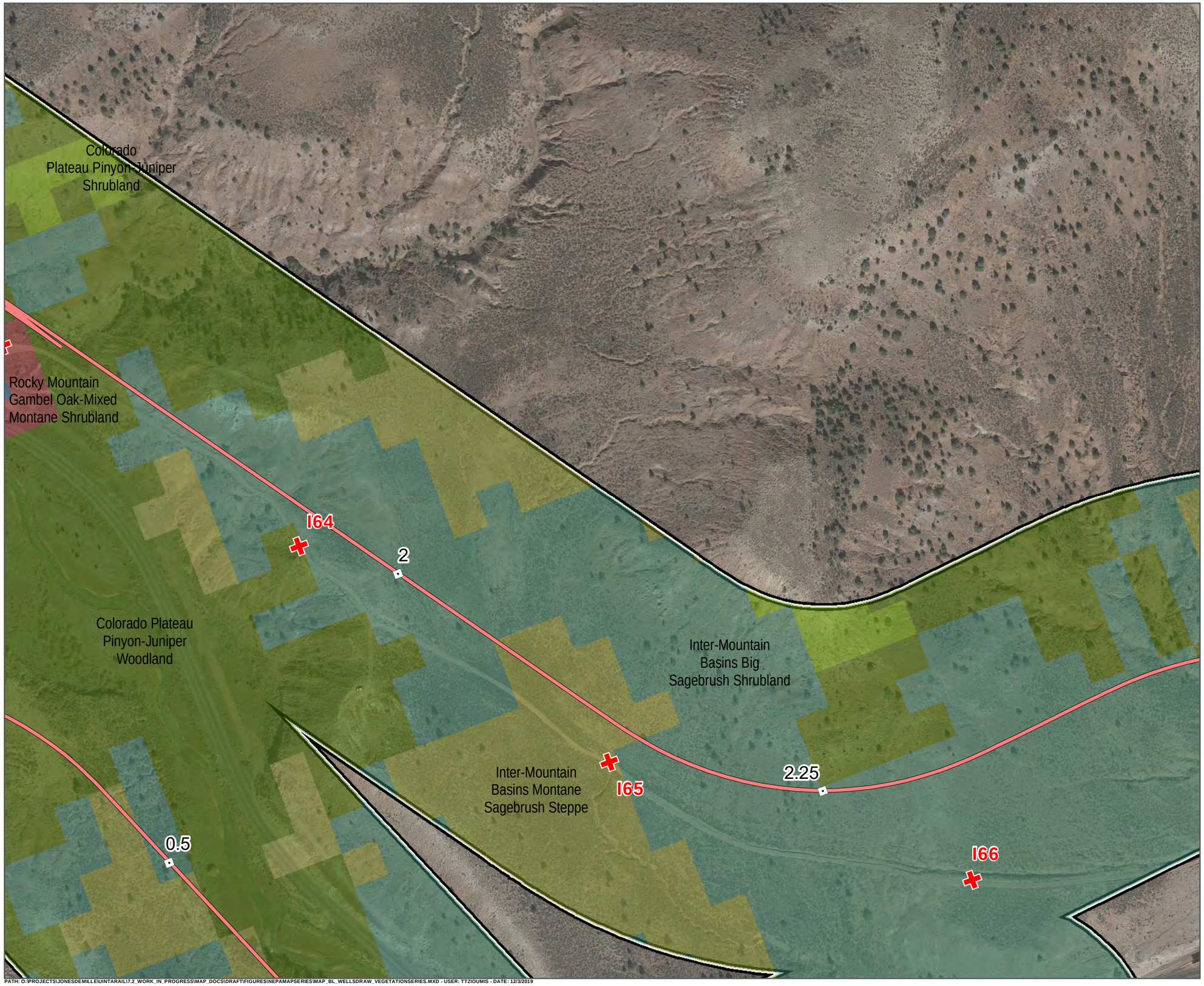

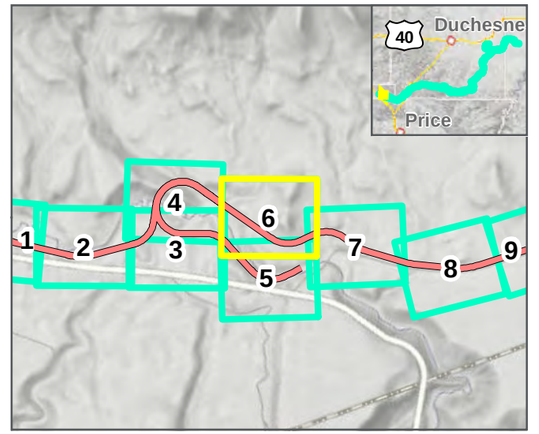

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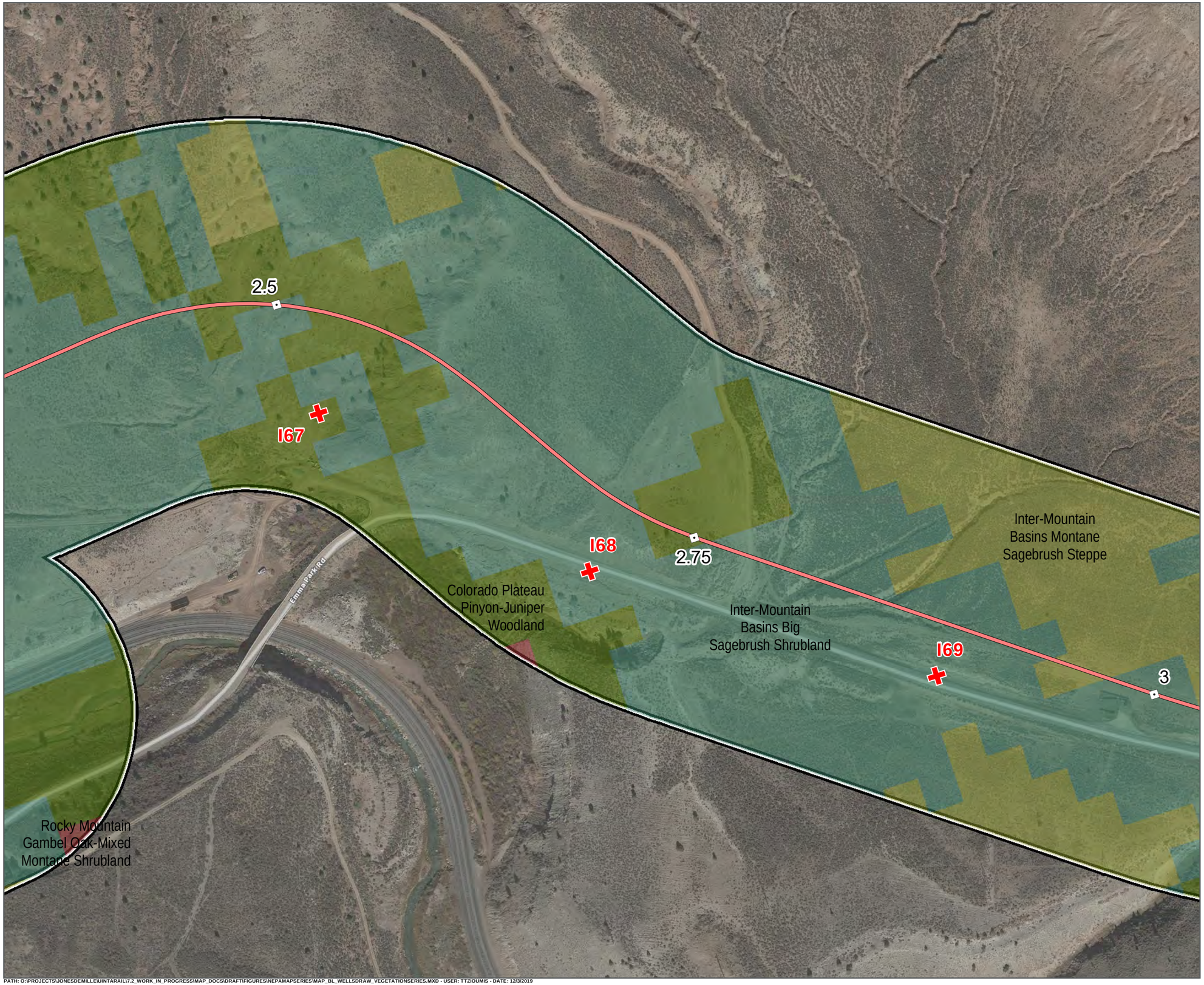

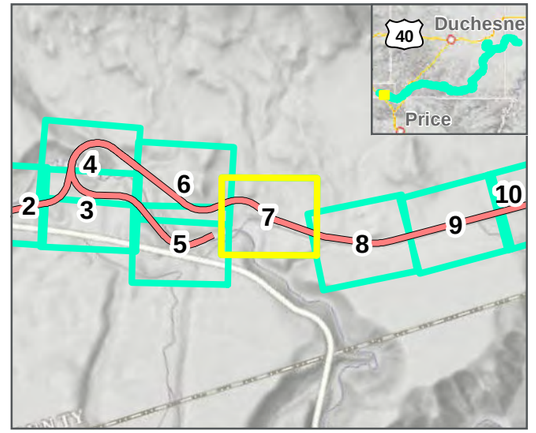

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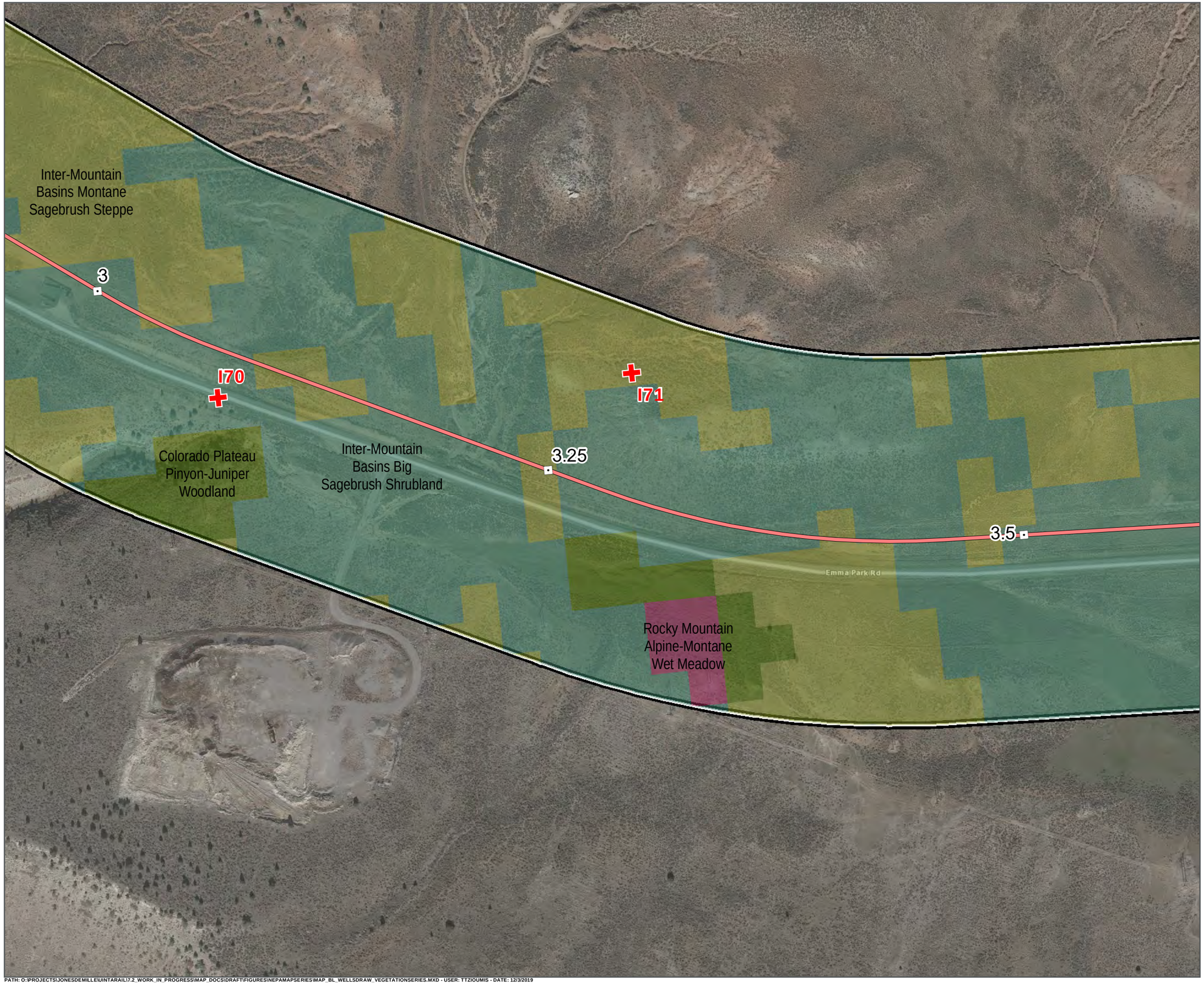

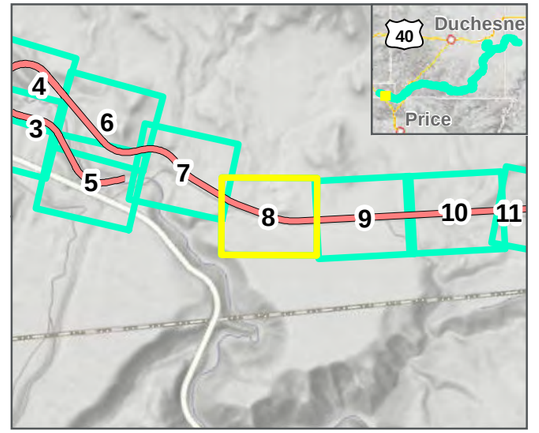

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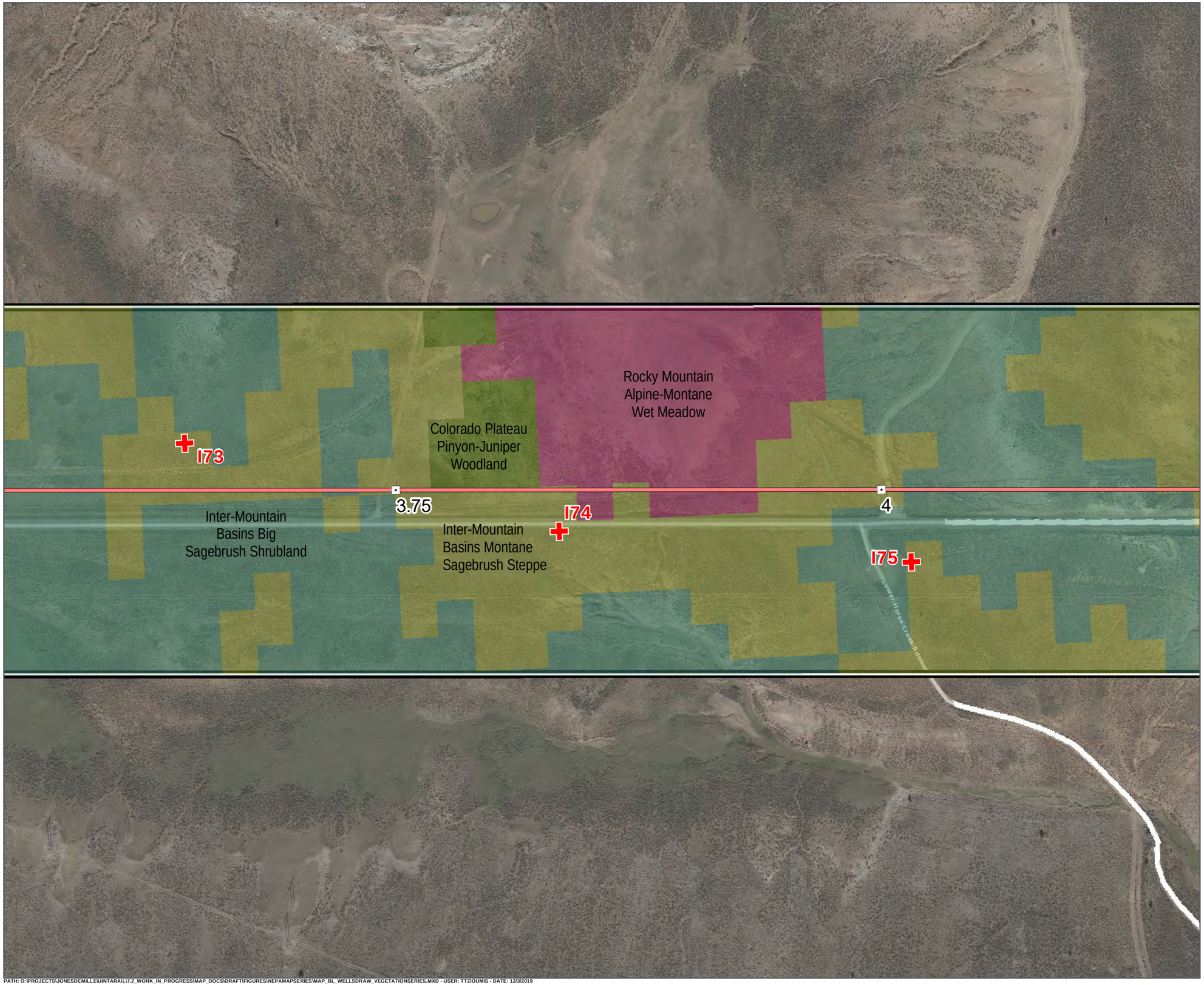

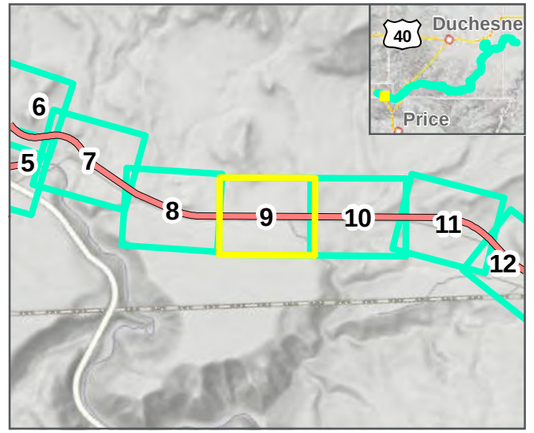

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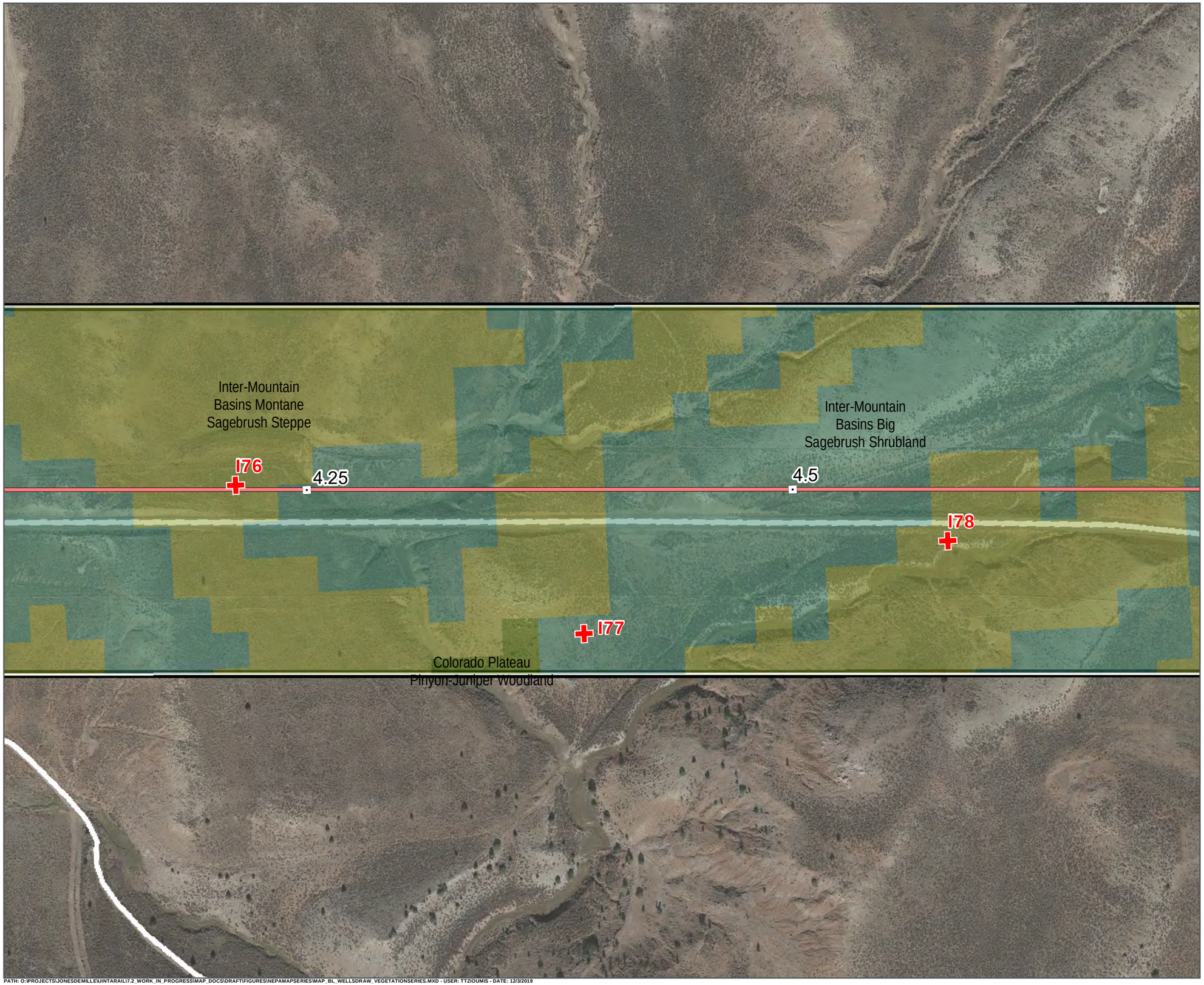

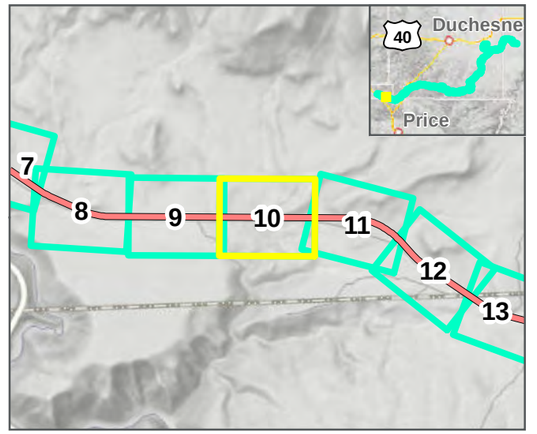

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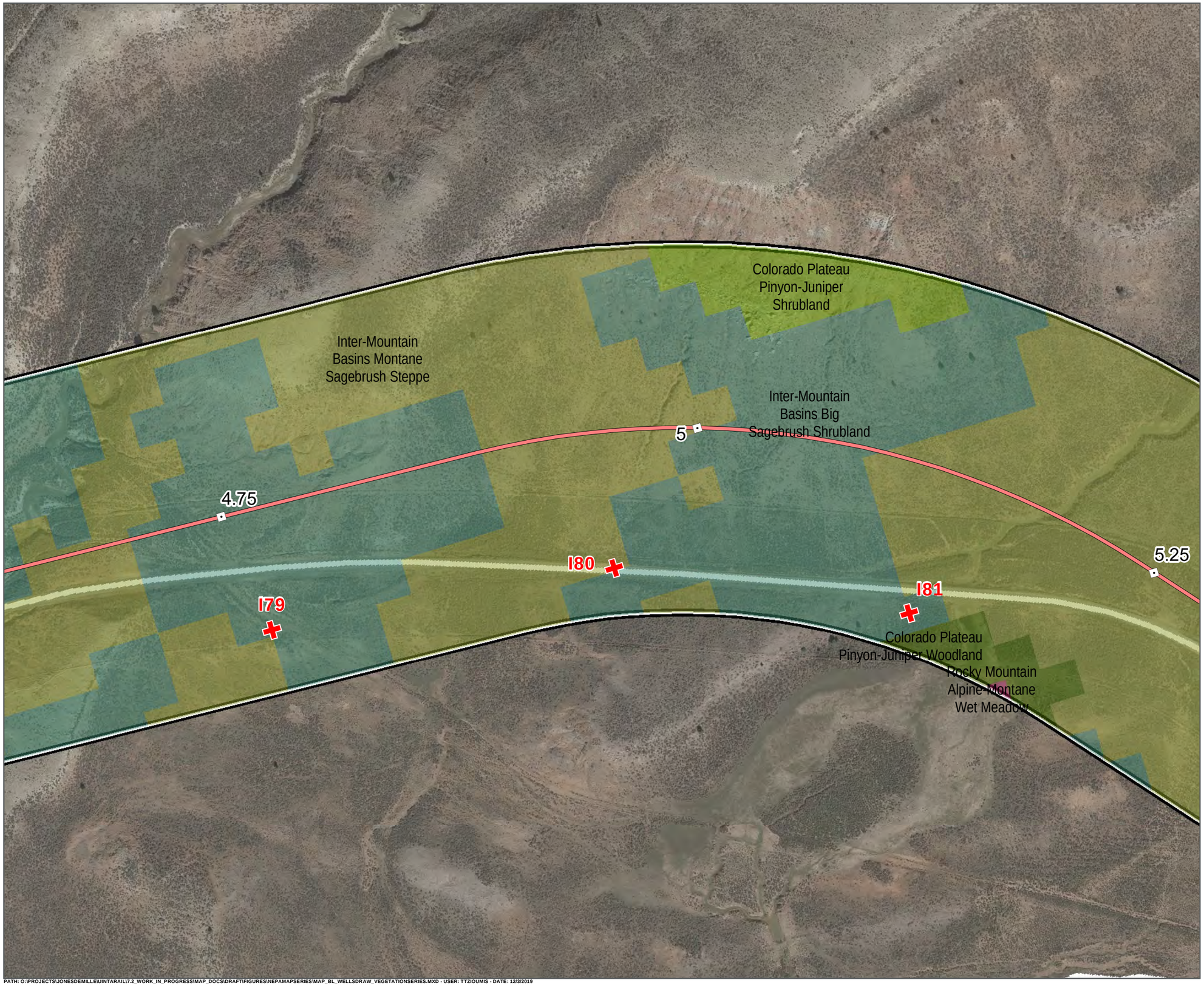

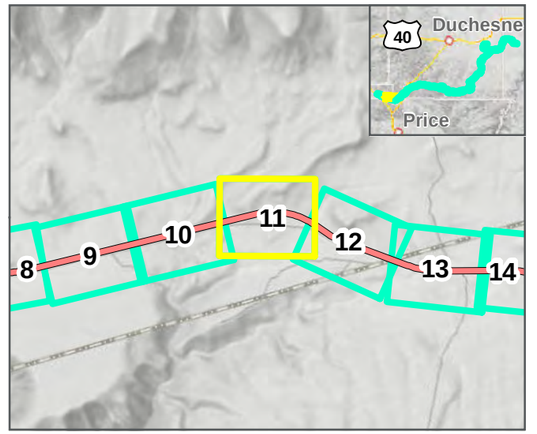

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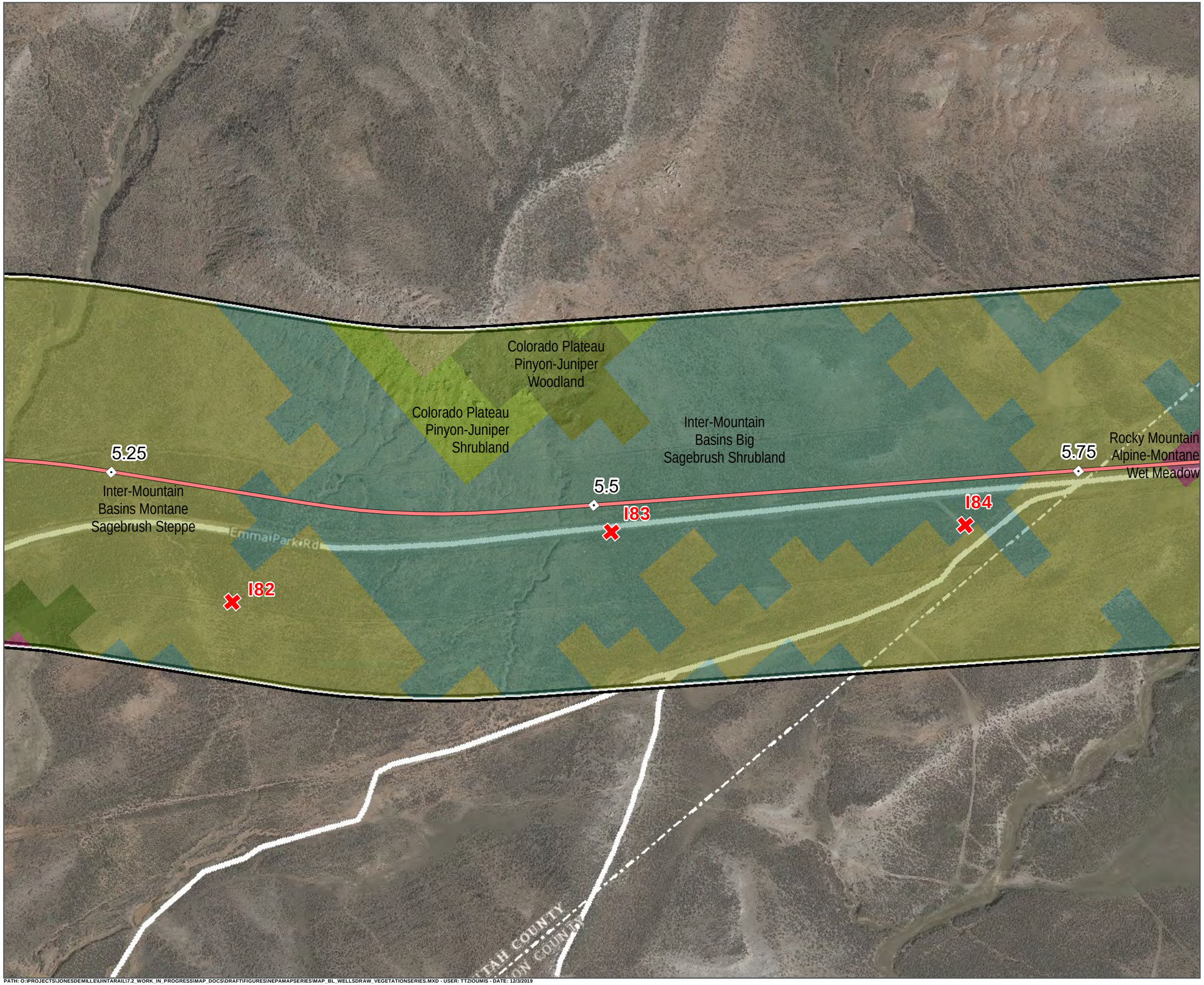

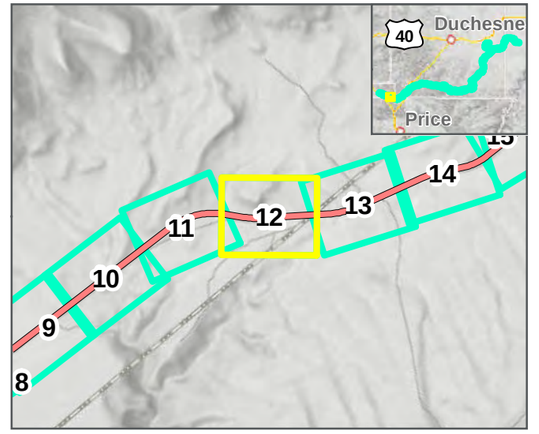

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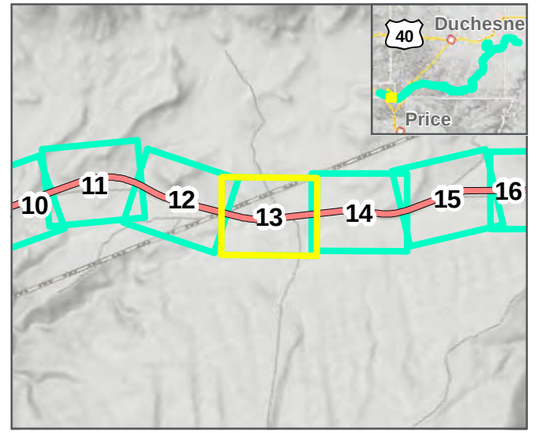

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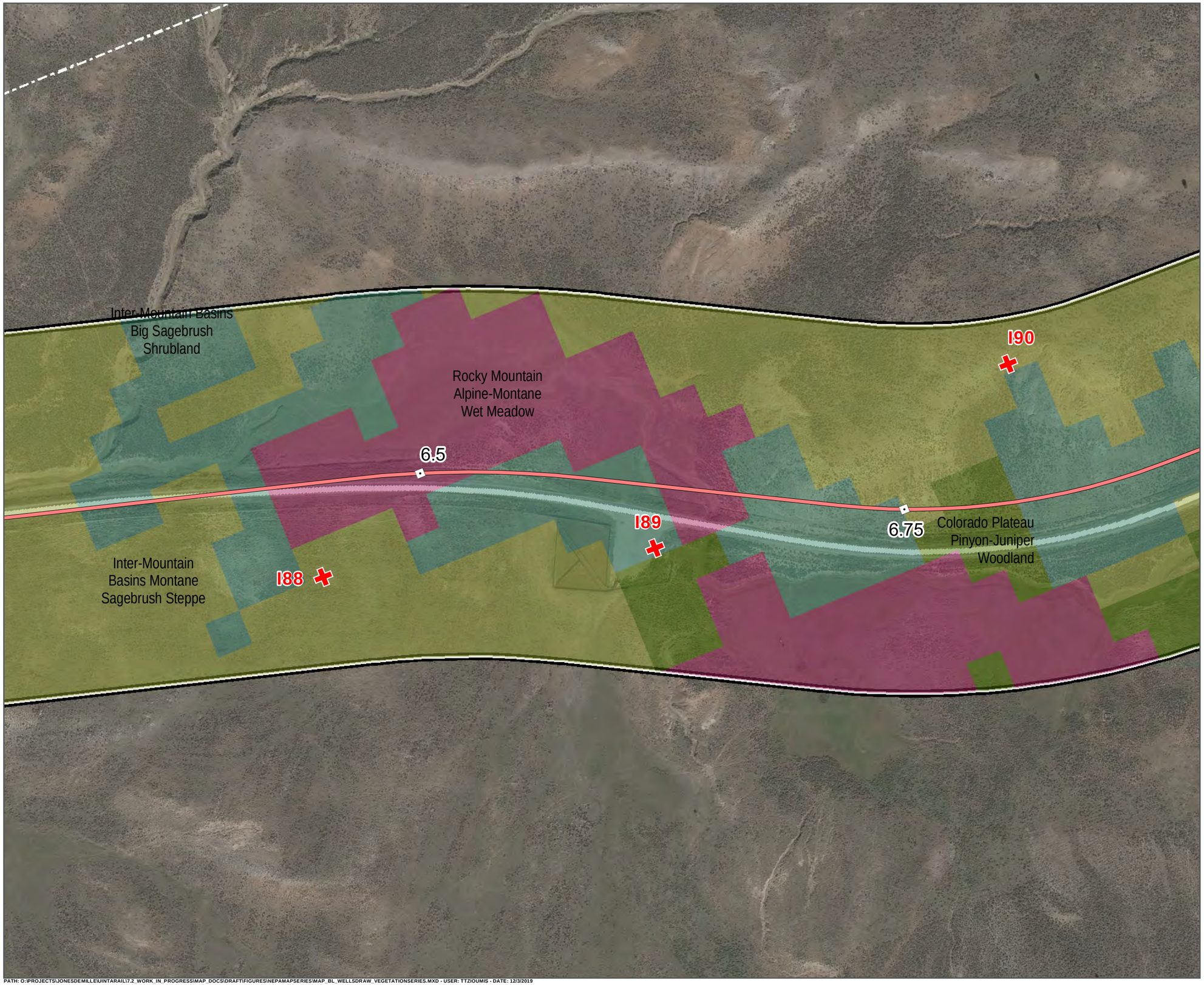

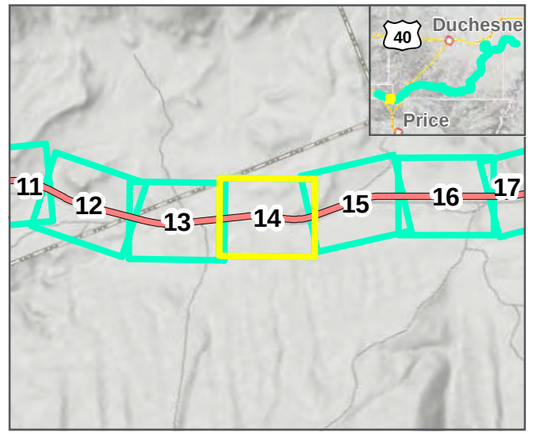

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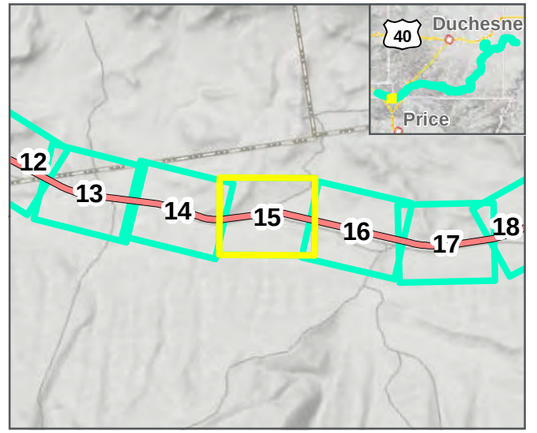

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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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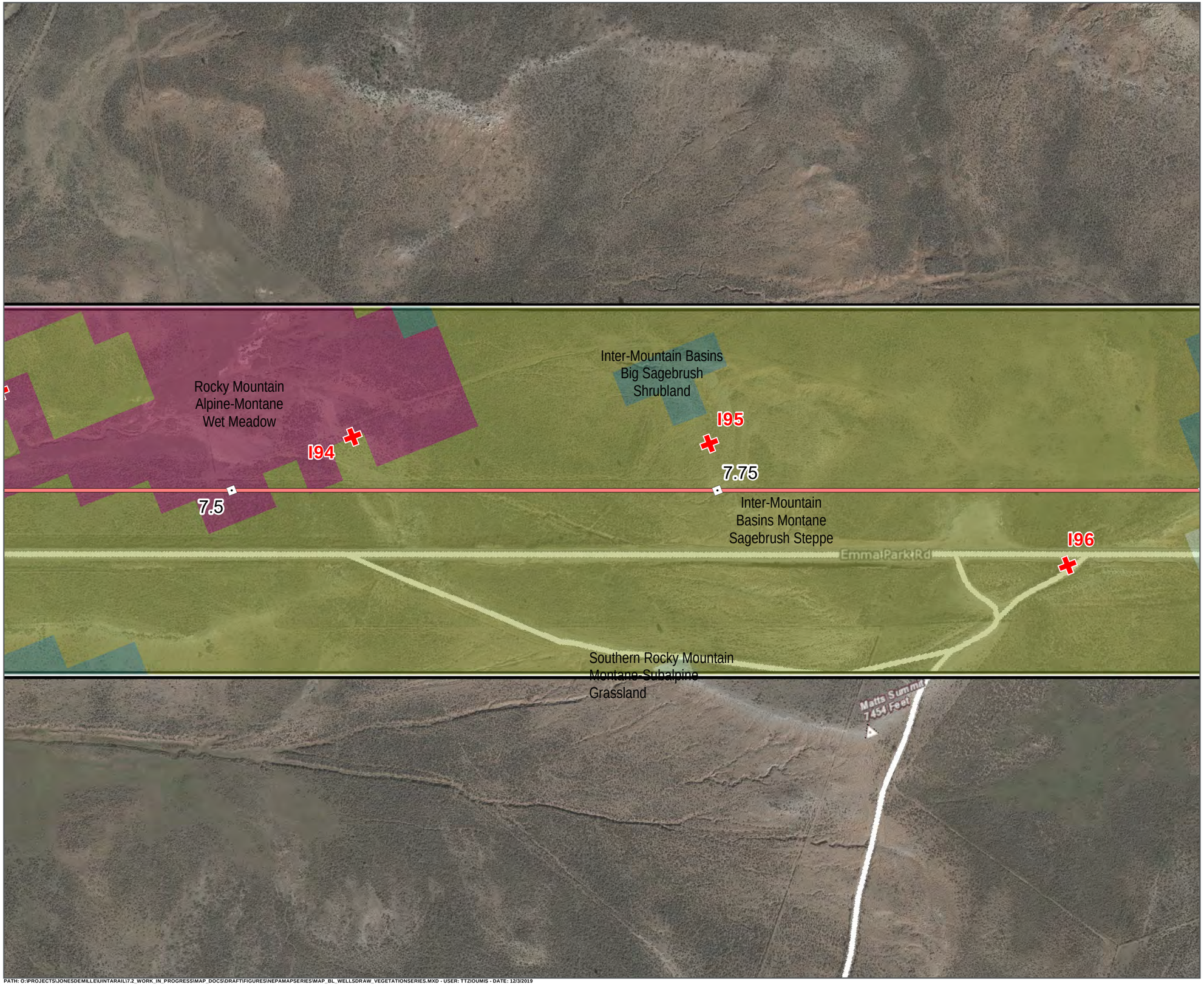

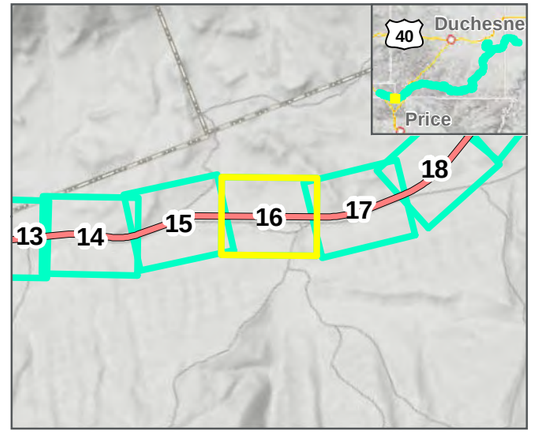

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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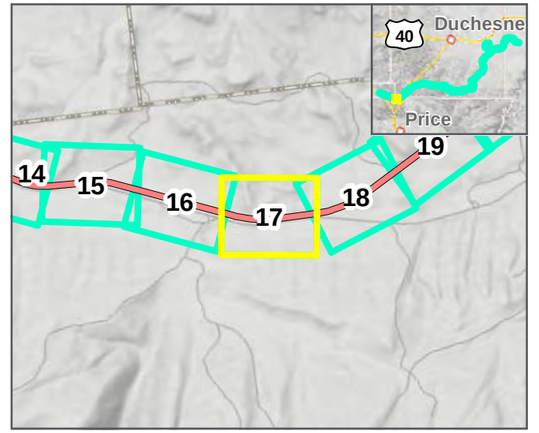

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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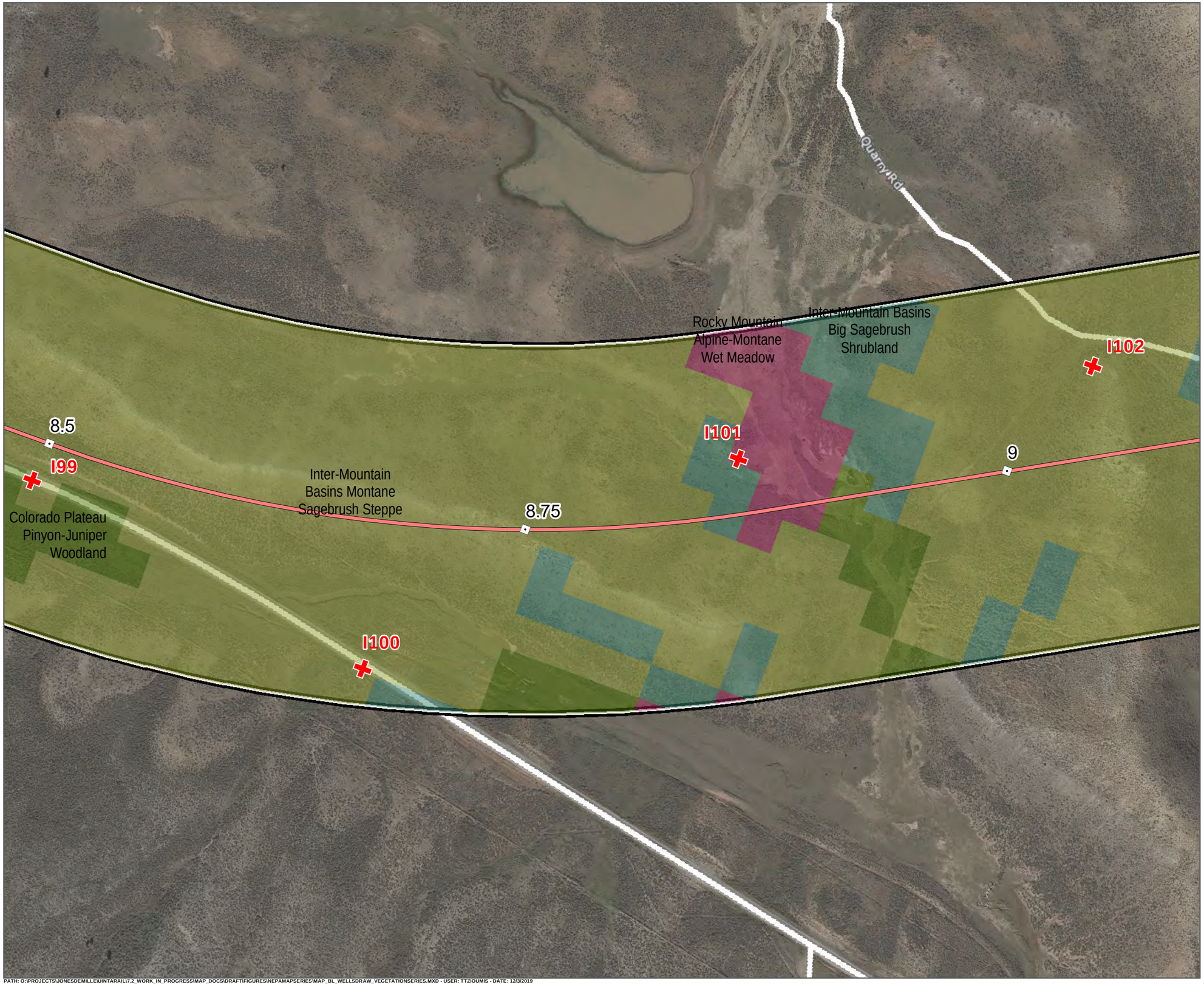

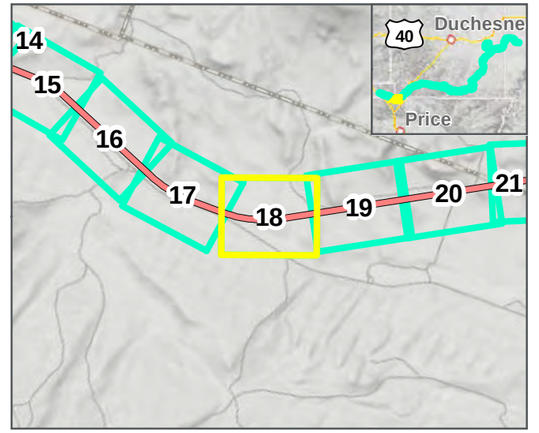

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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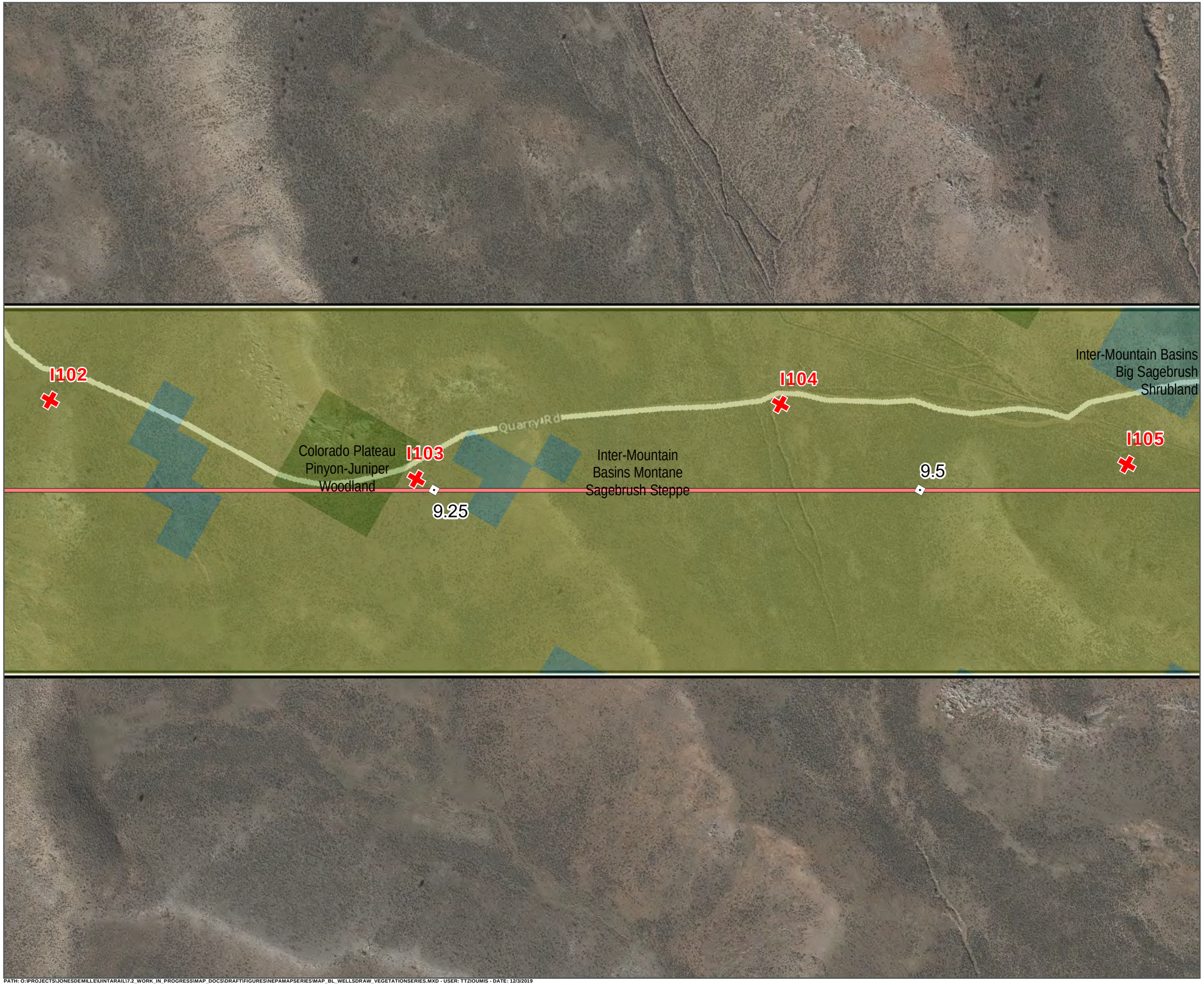

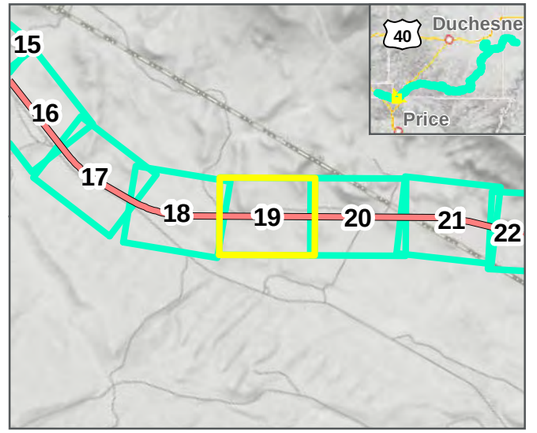

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

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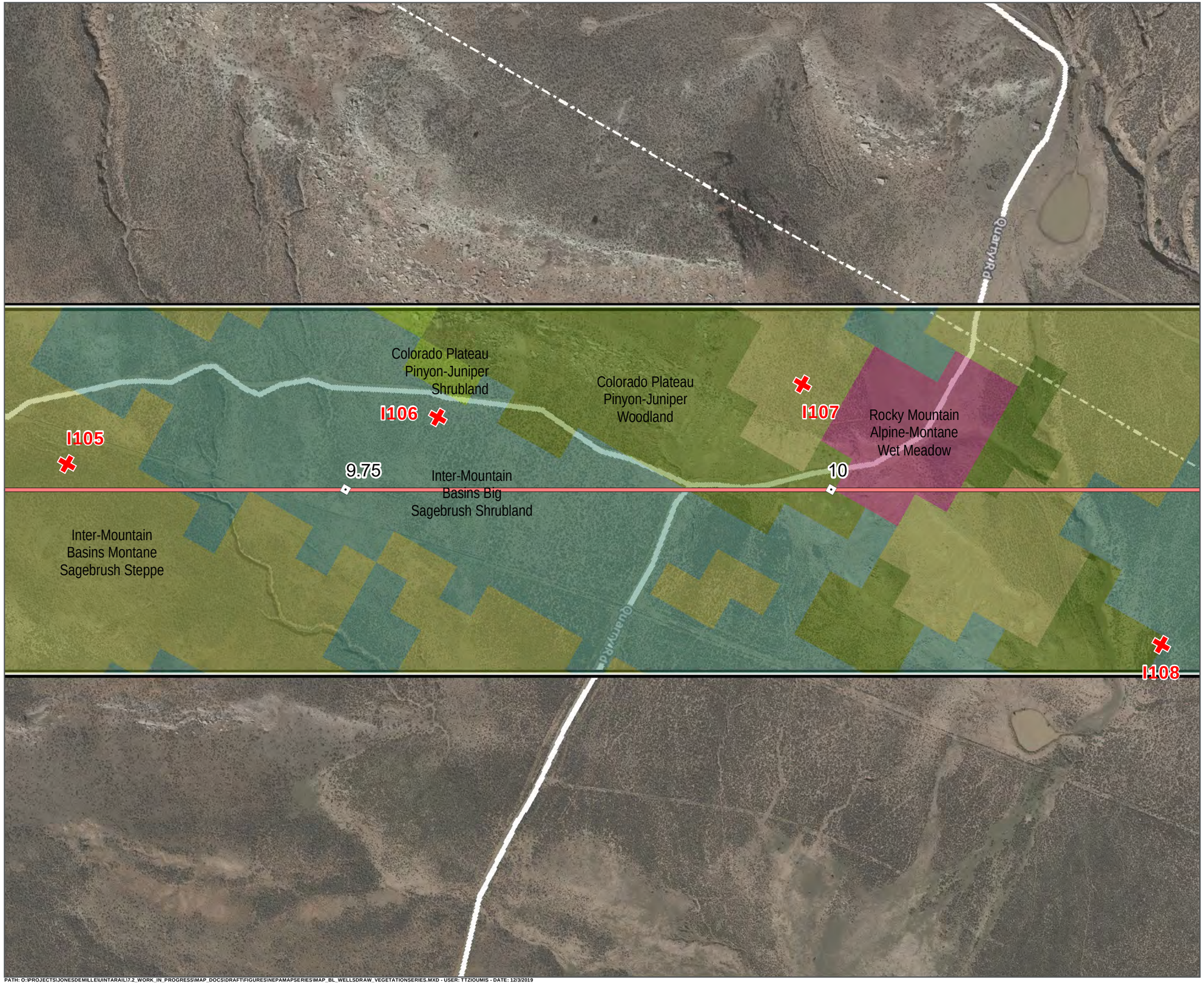

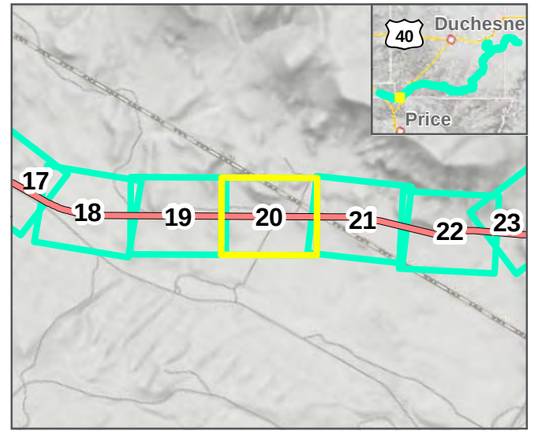

Photo Points

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Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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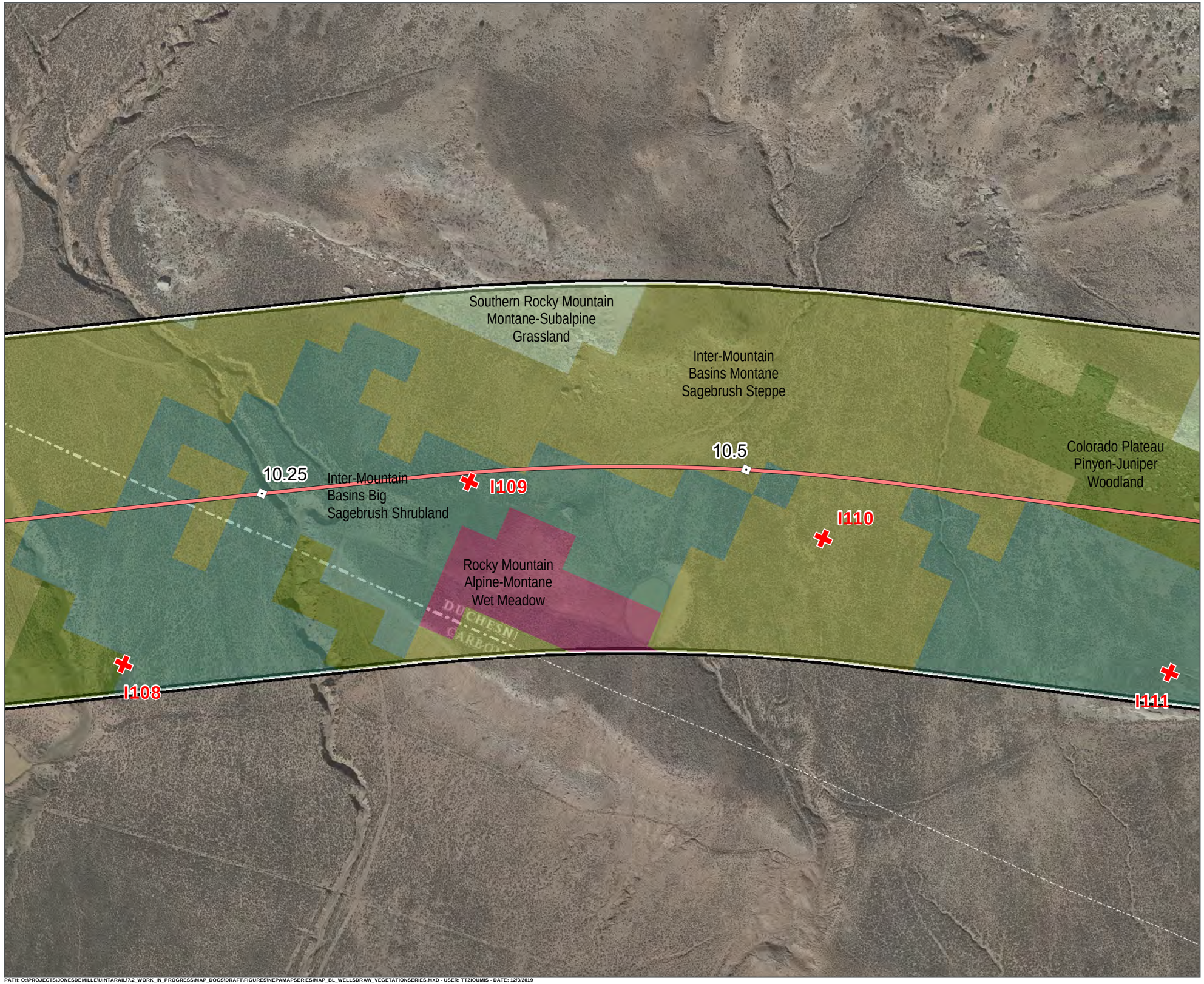

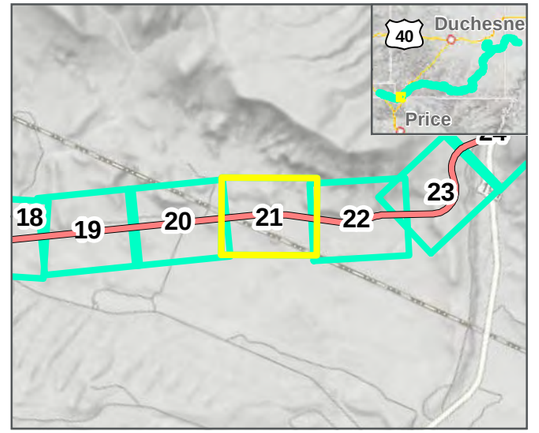

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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SEVEN COUNTY INFRASTRUCTURE COALITION

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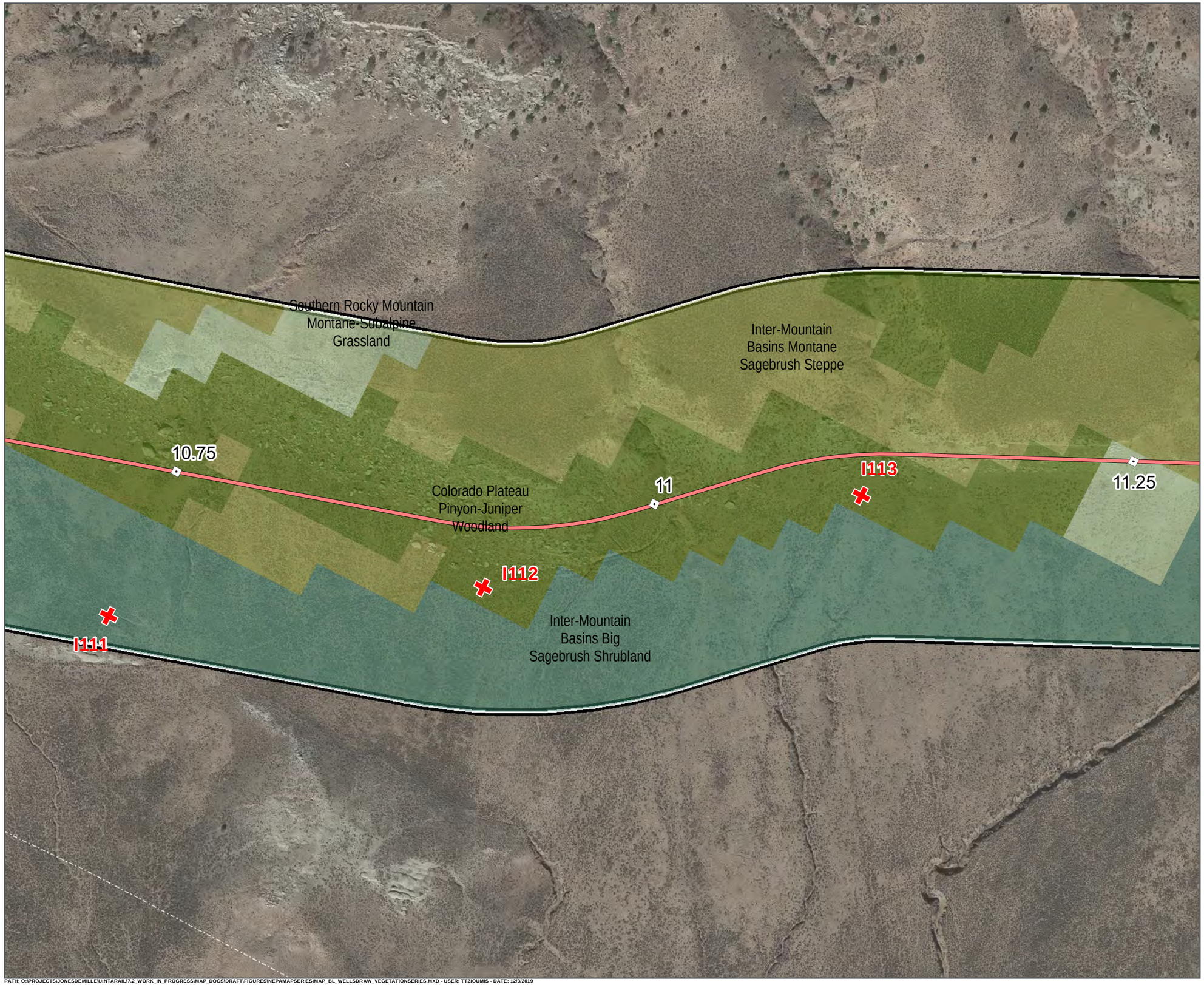

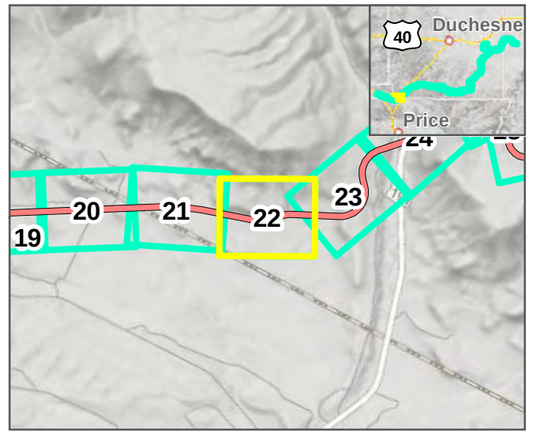

Photo Points

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Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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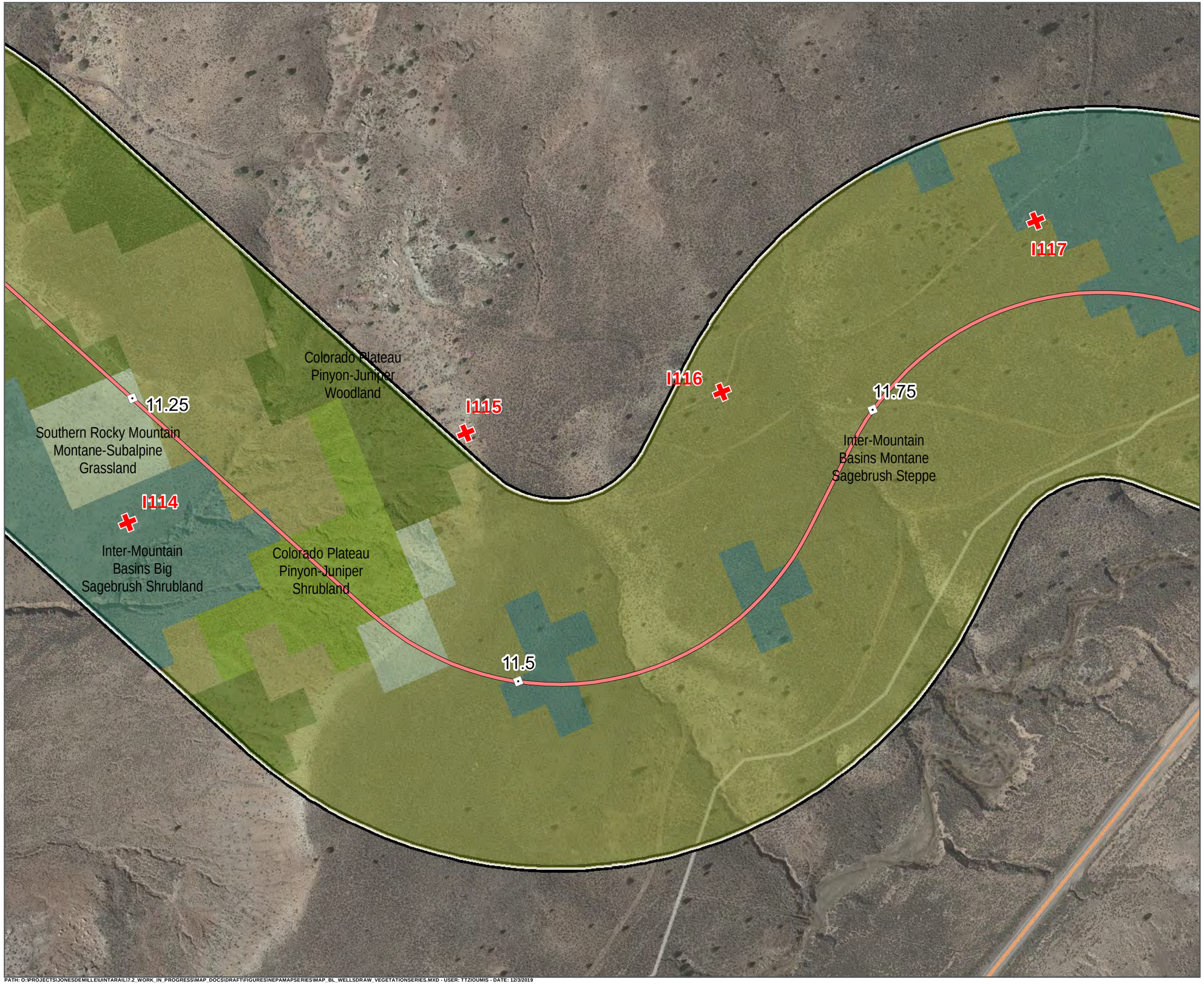

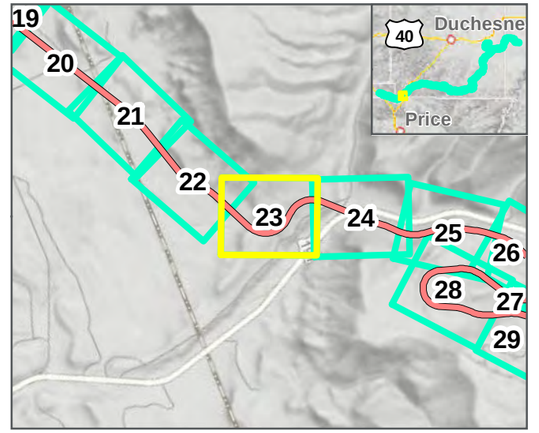

Photo Points

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Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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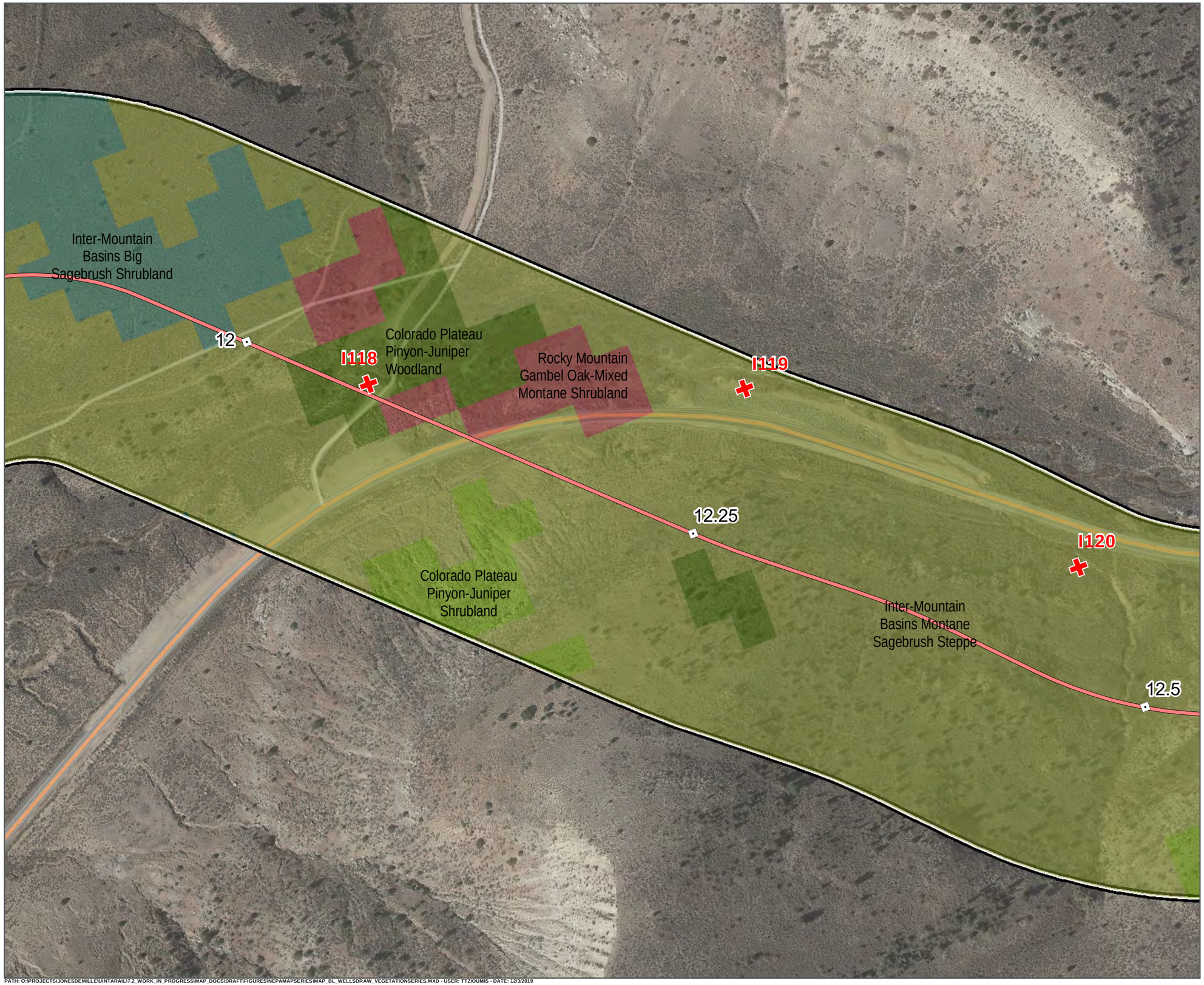

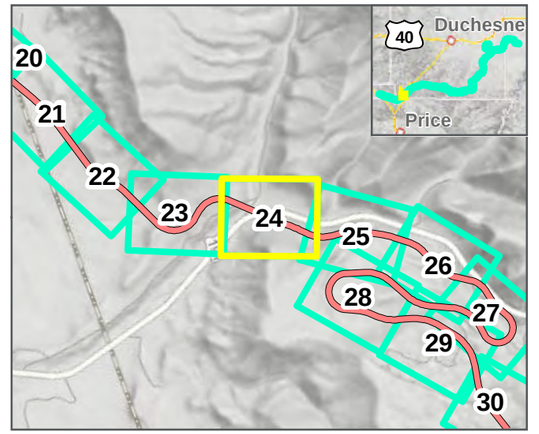

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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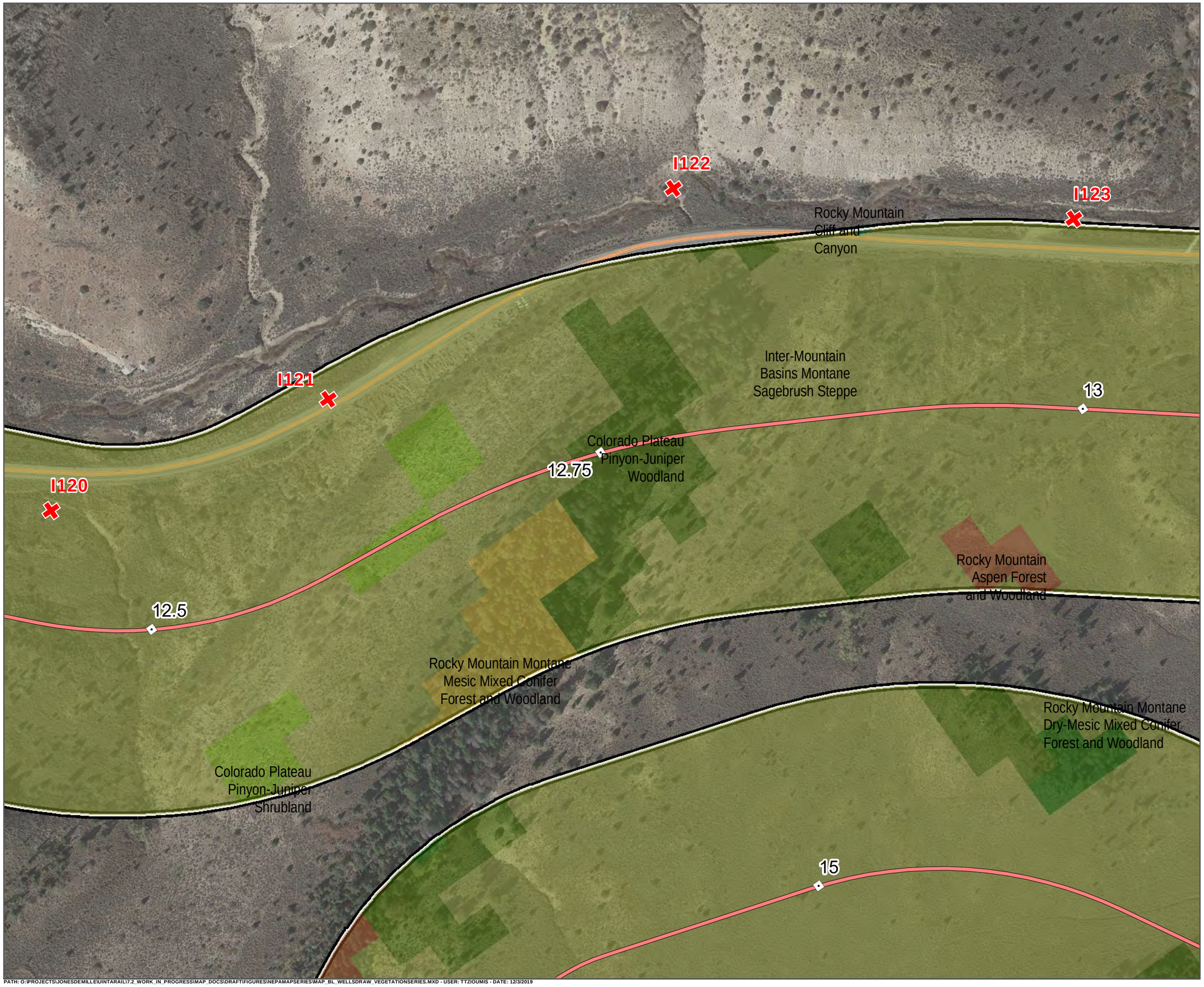

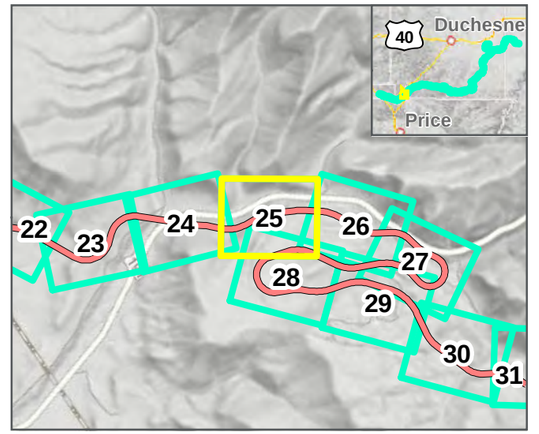

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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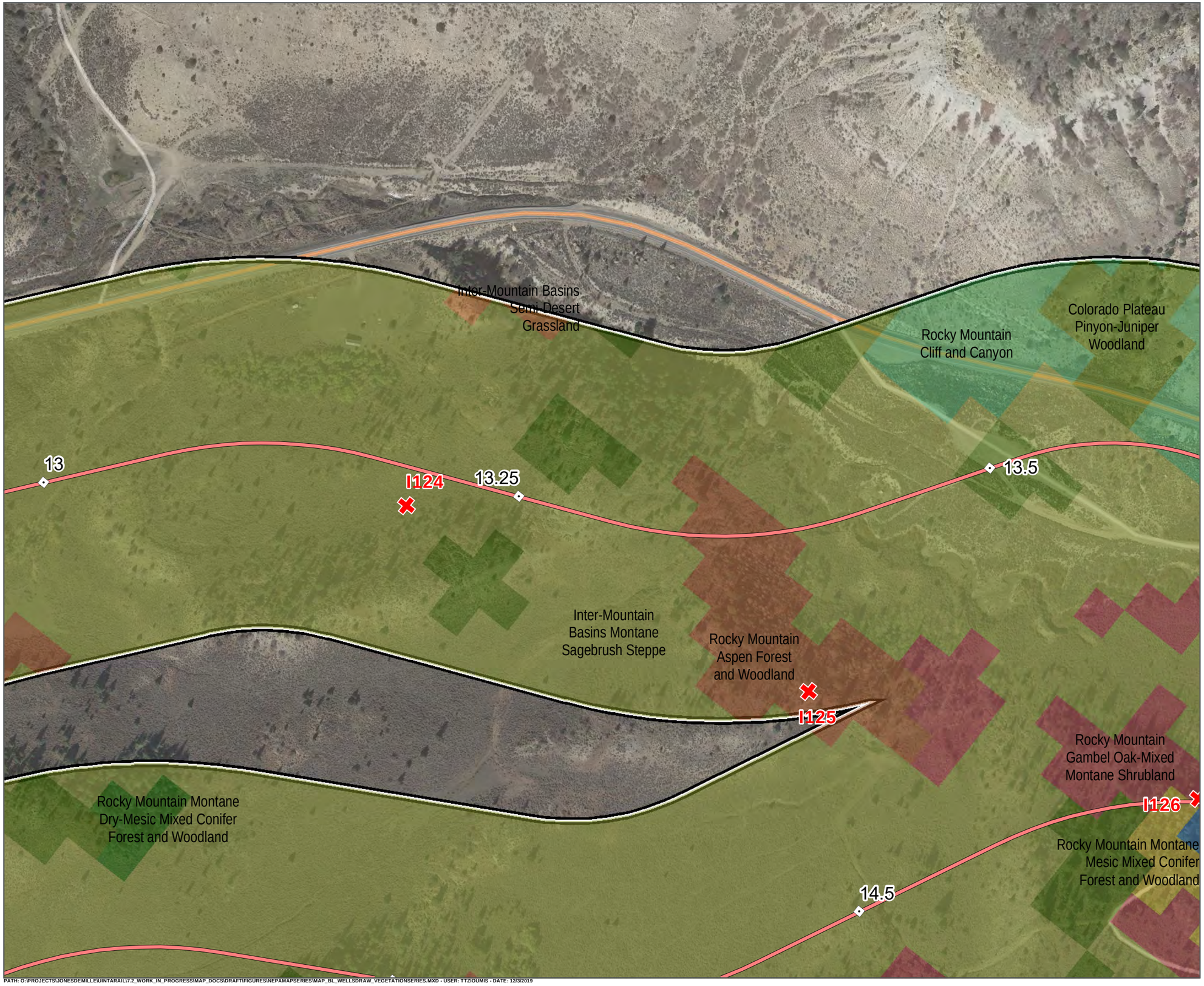

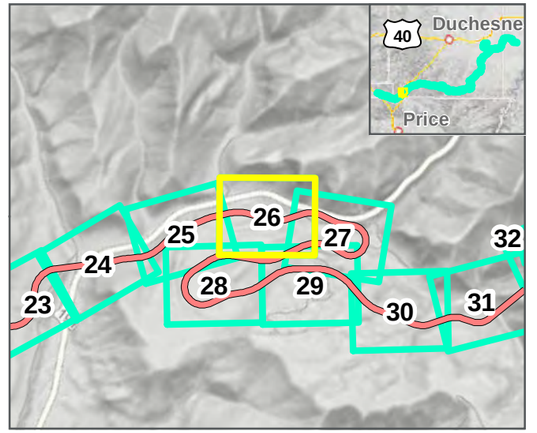

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain Basins Semi-Desert Grassland
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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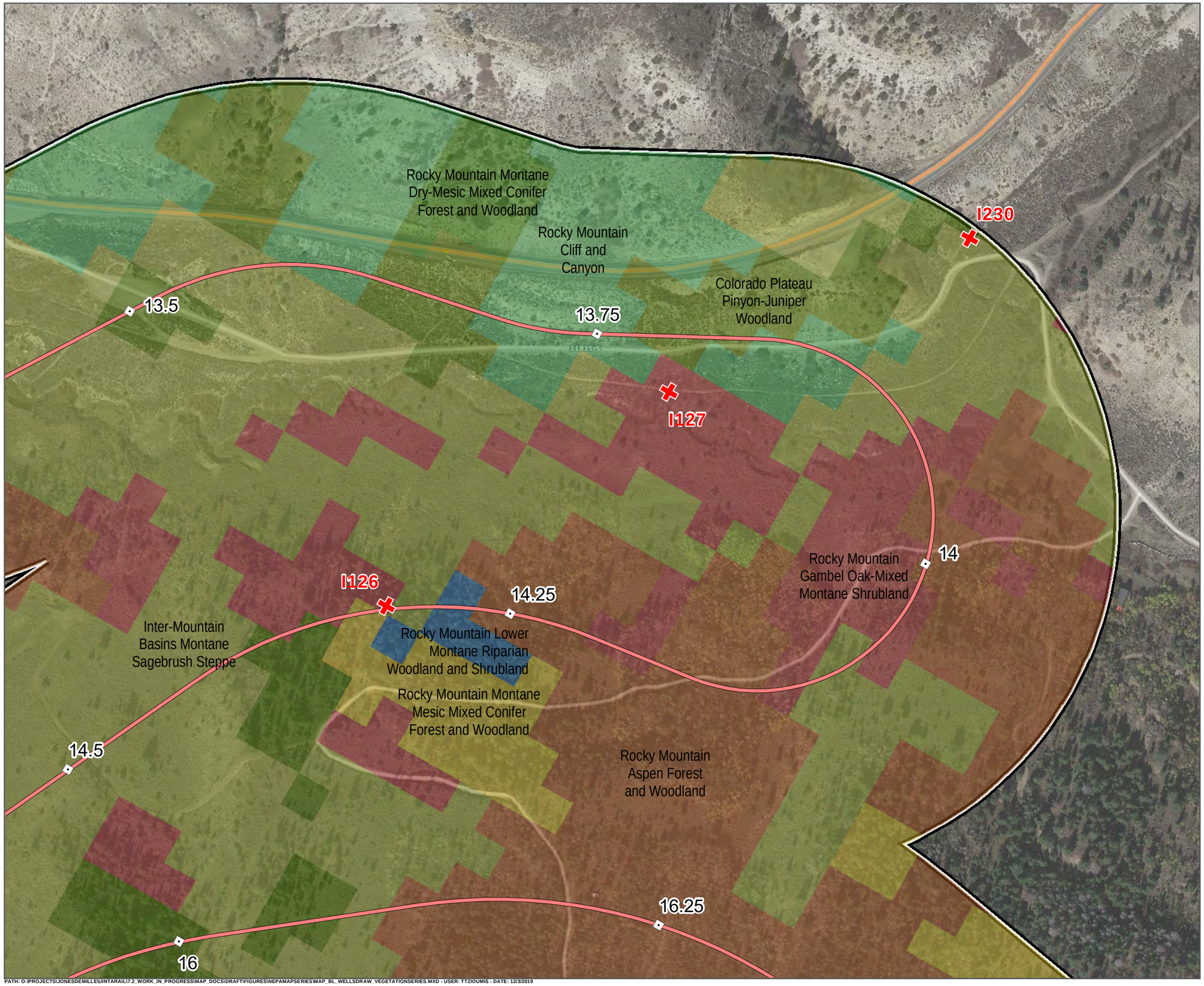

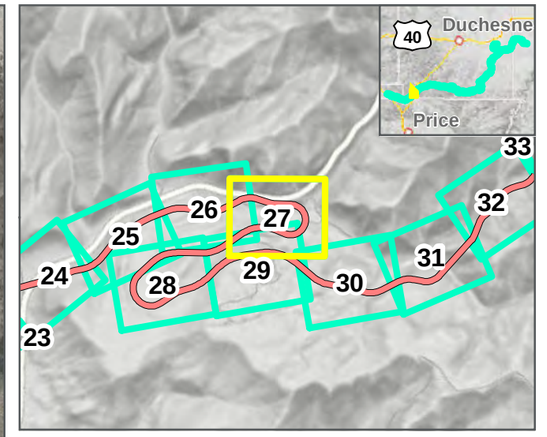

Photo Points
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Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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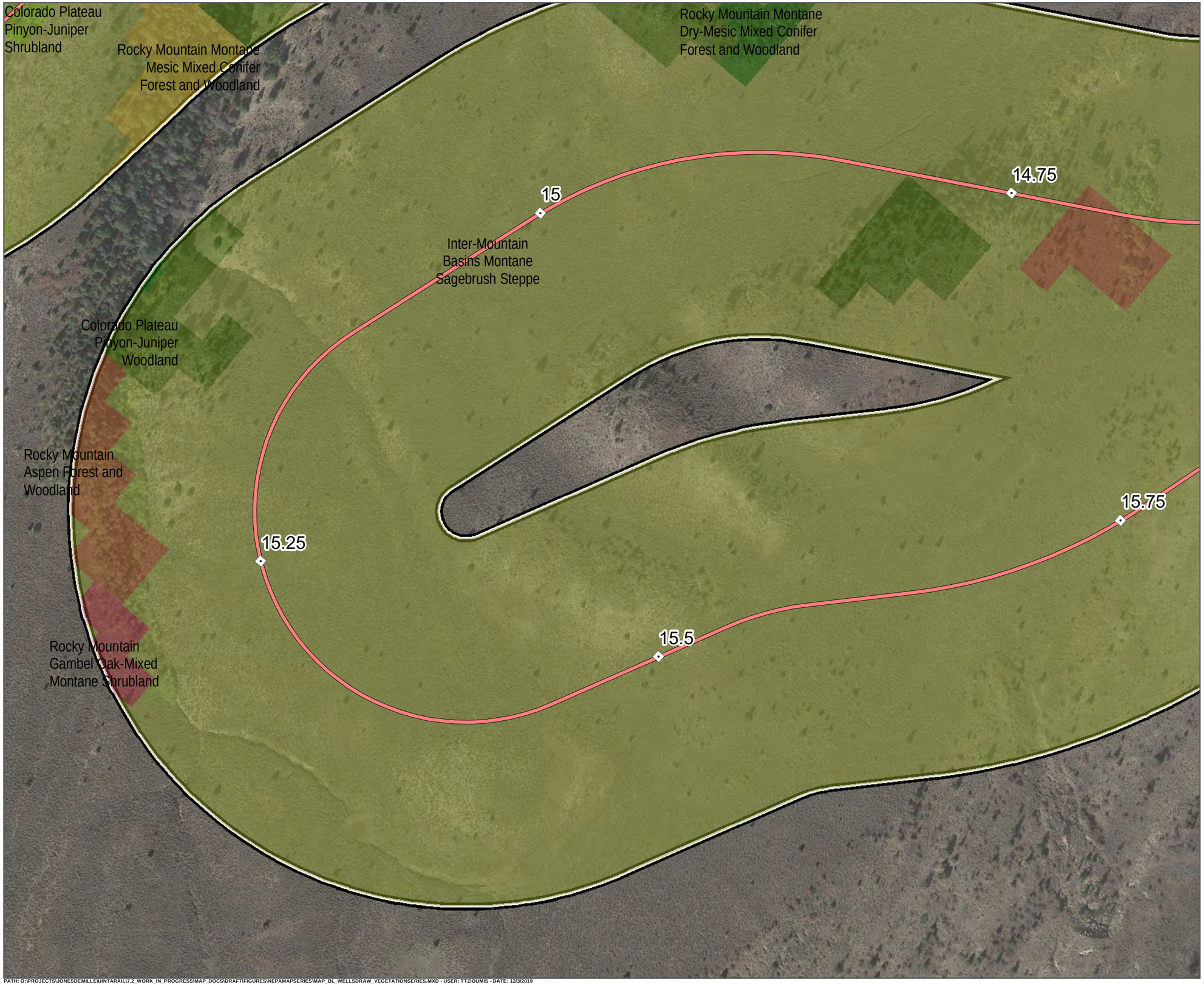

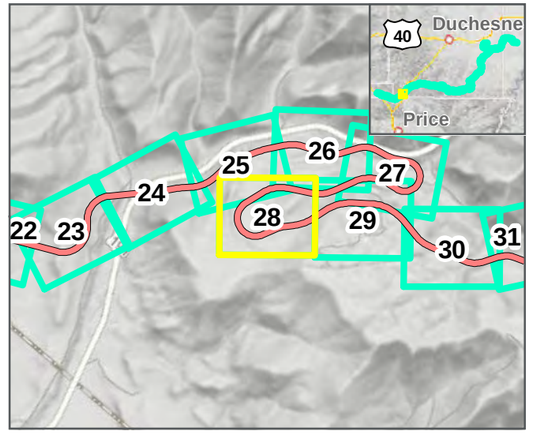

Photo Points
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Wells Draw Centerline
Study Area
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Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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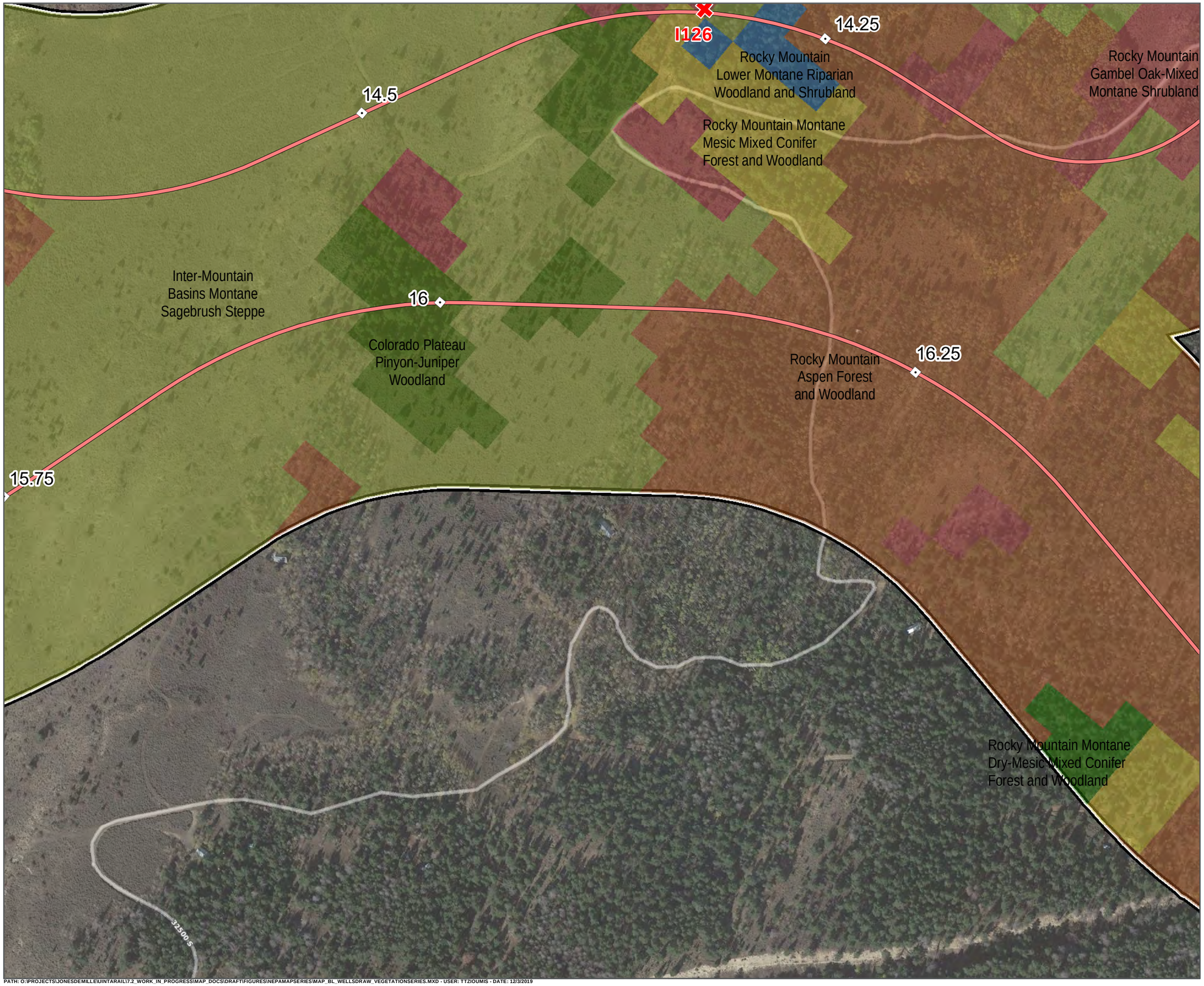

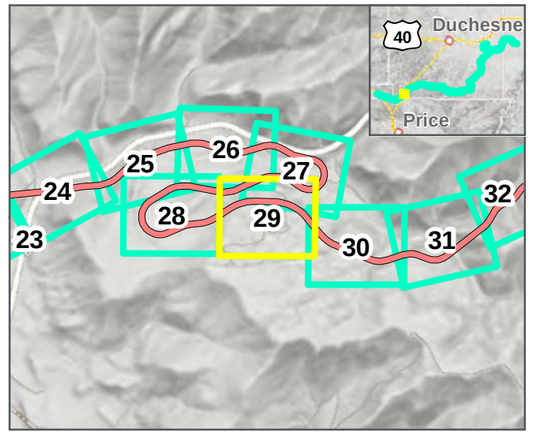

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Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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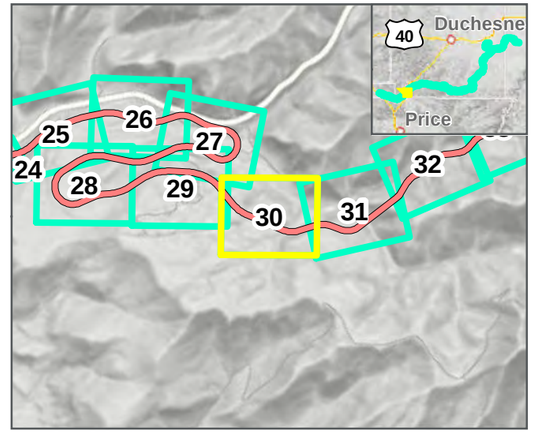

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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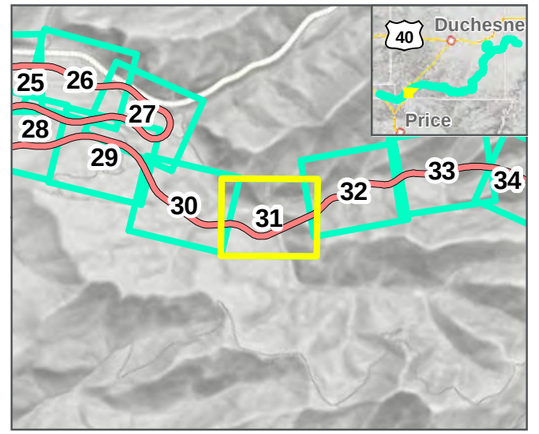

- Photo Points
- Milepost
- Wells Draw Centerline
- Study Area
- Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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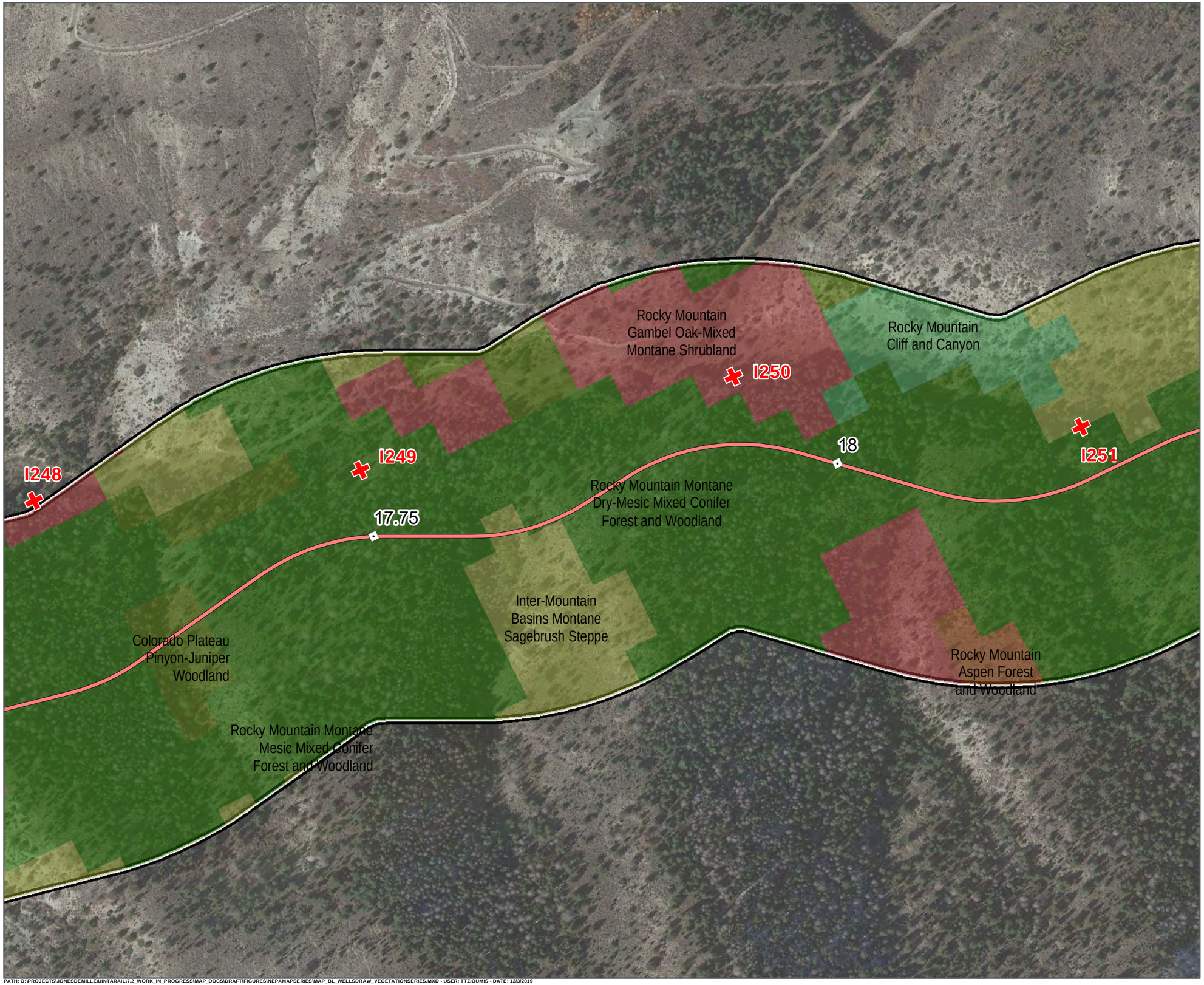

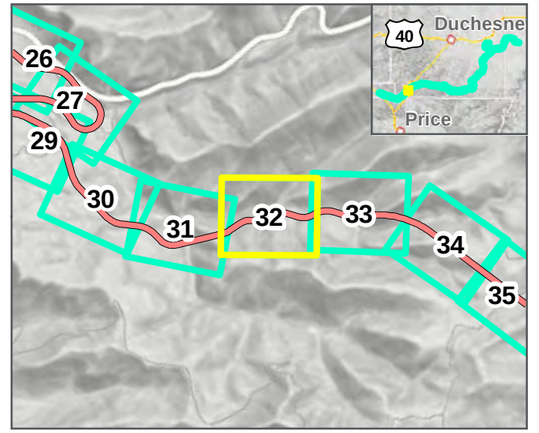

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
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- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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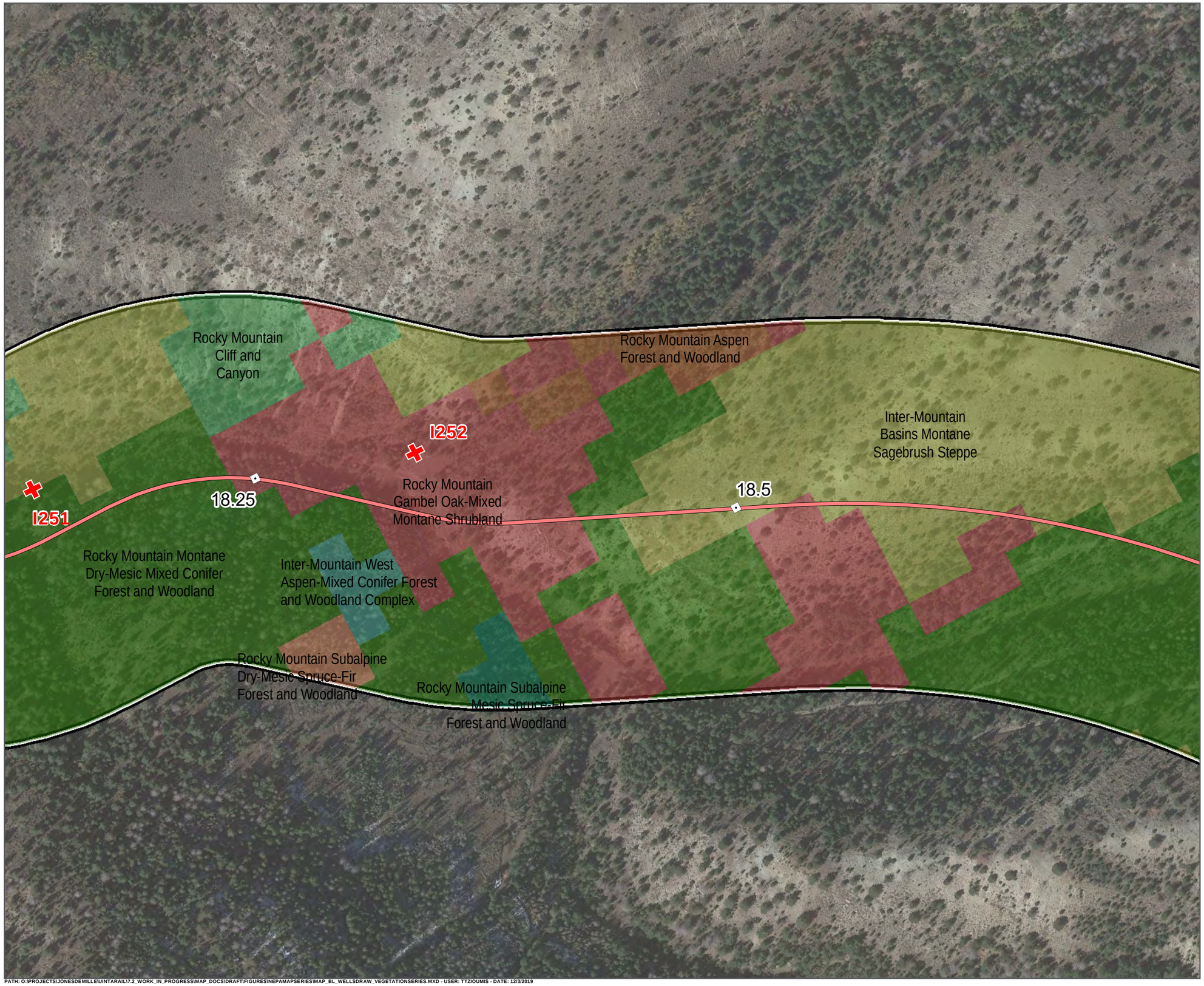

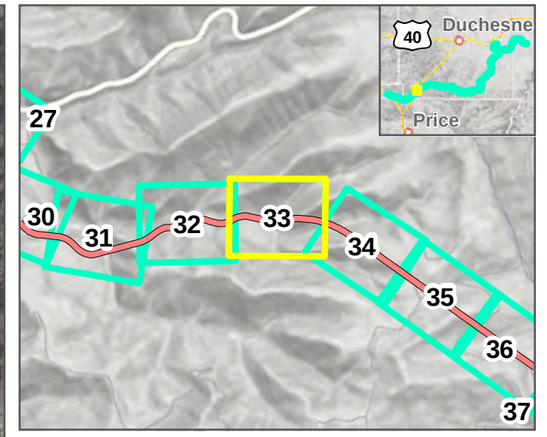

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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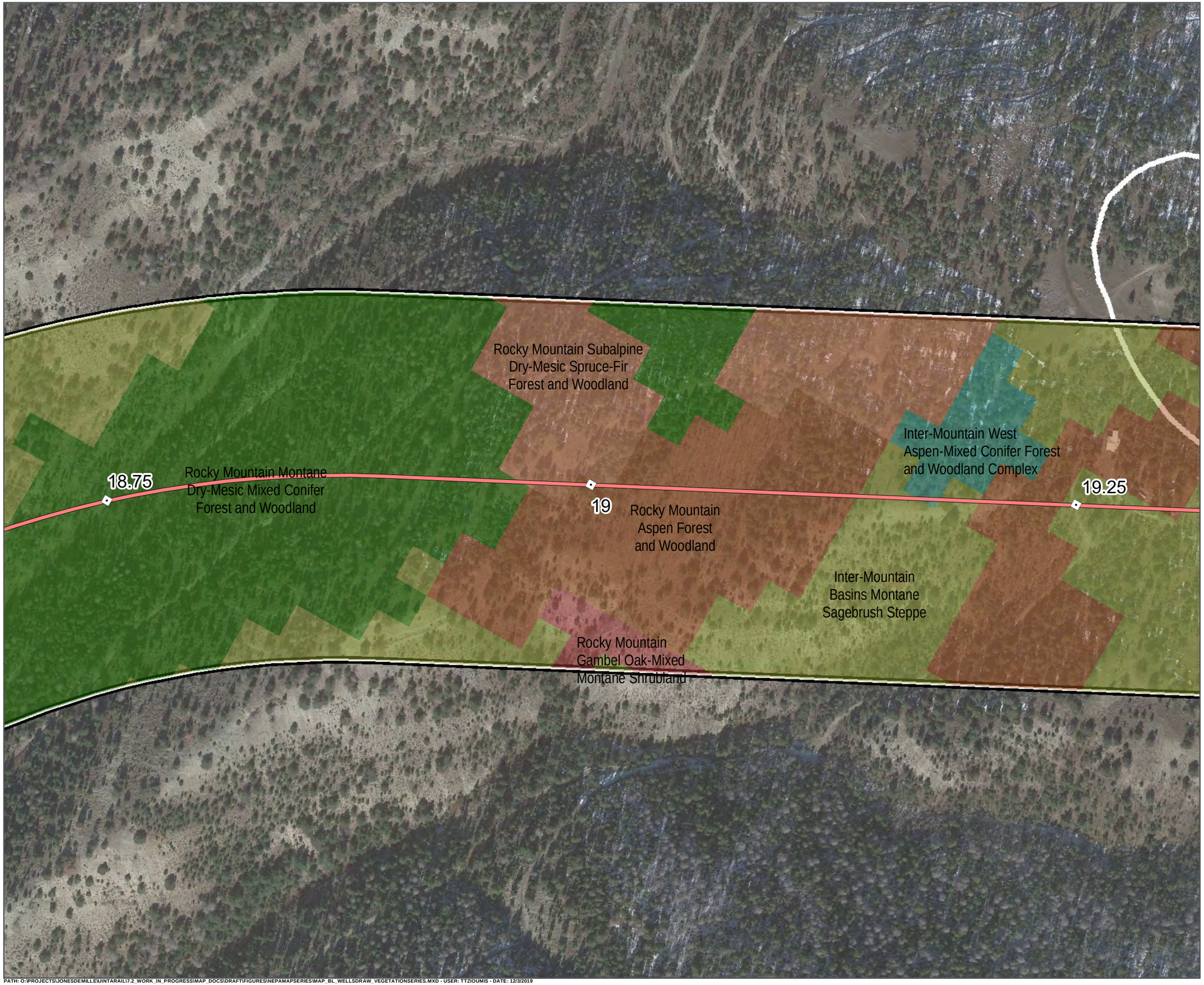

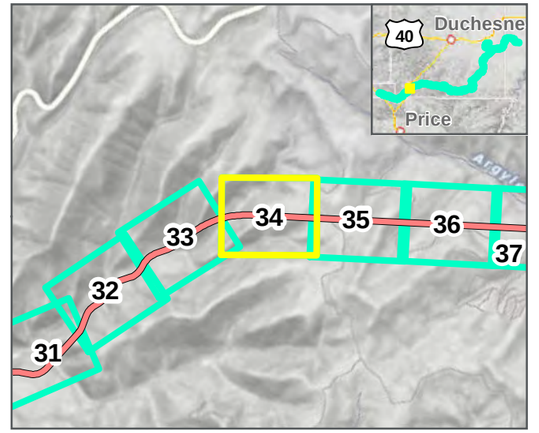

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
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- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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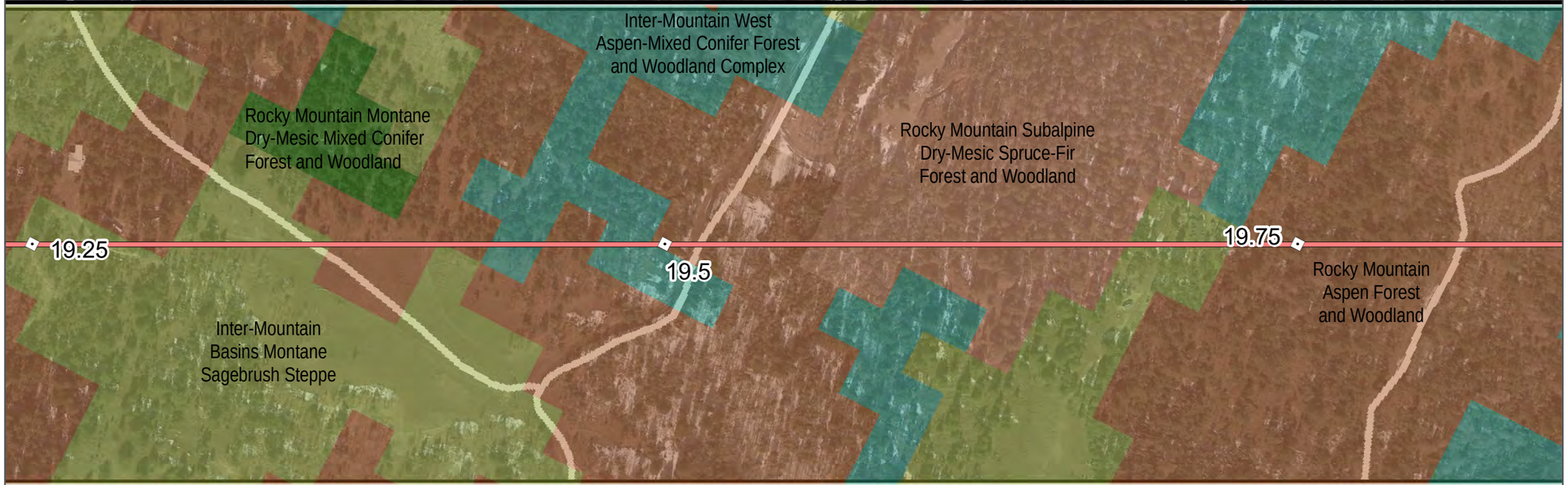

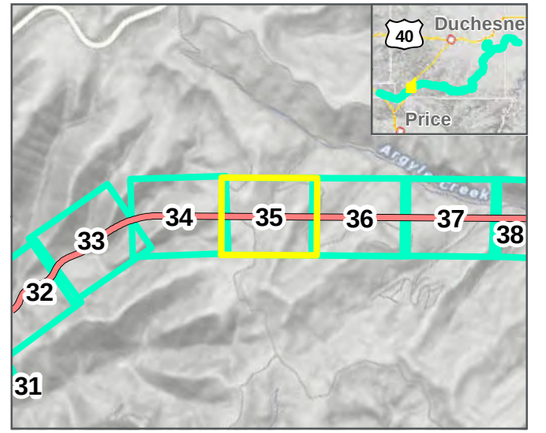

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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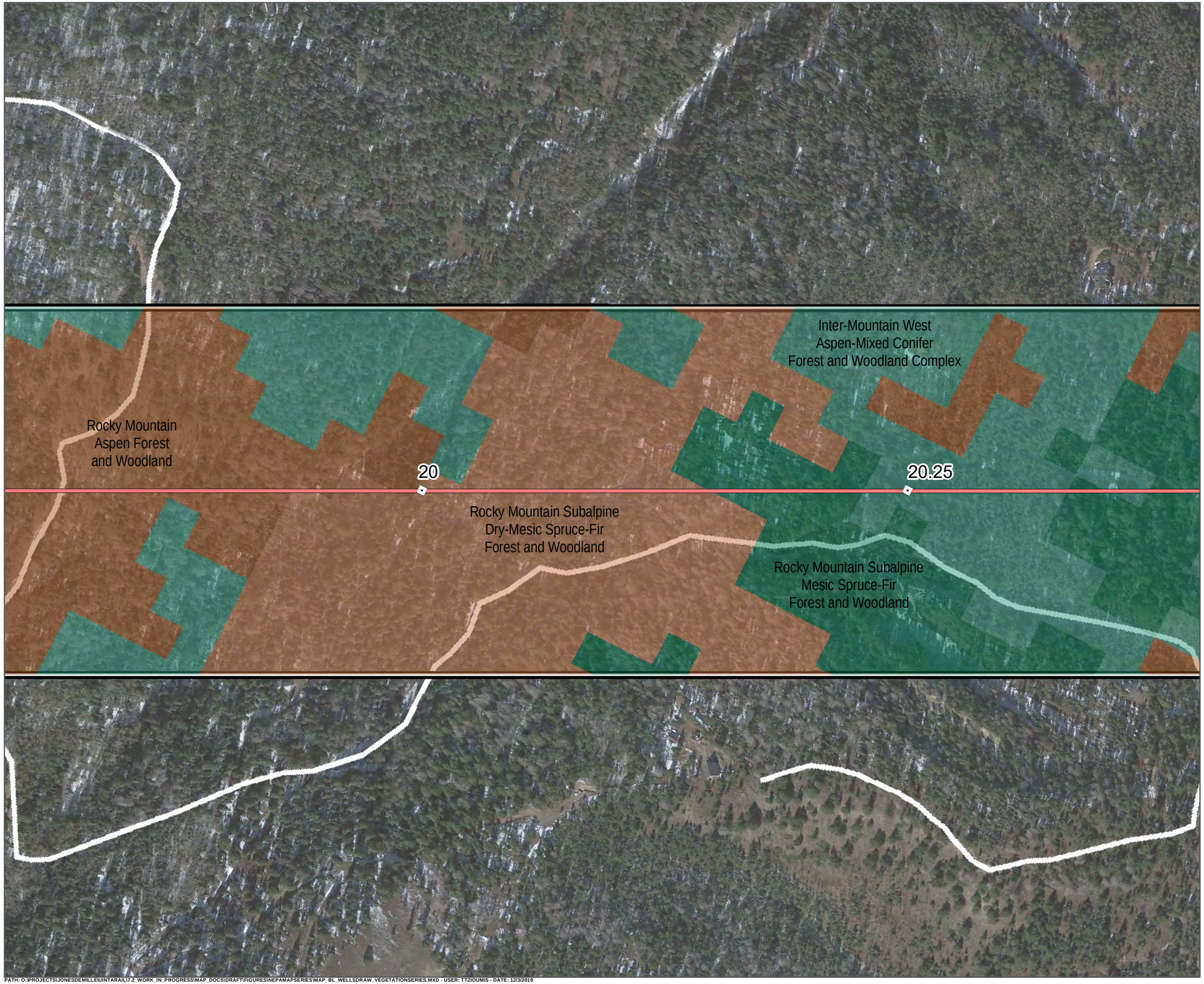

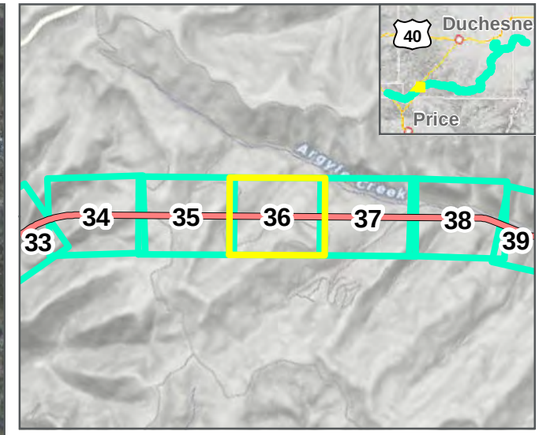

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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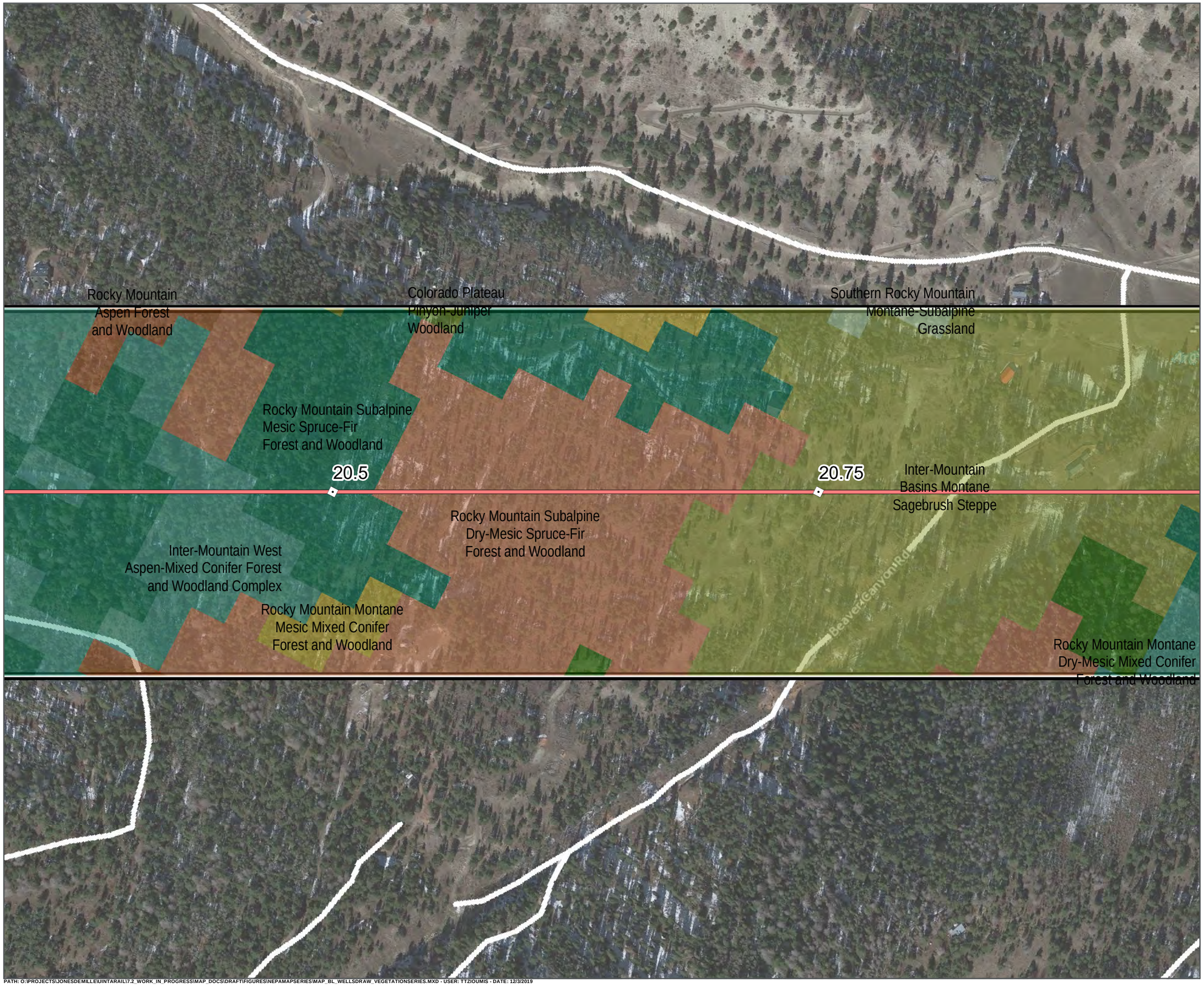

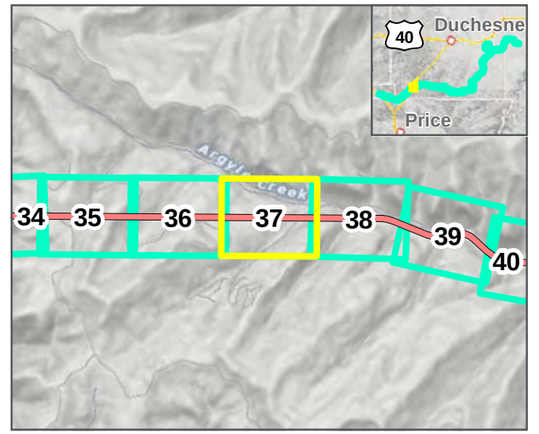

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

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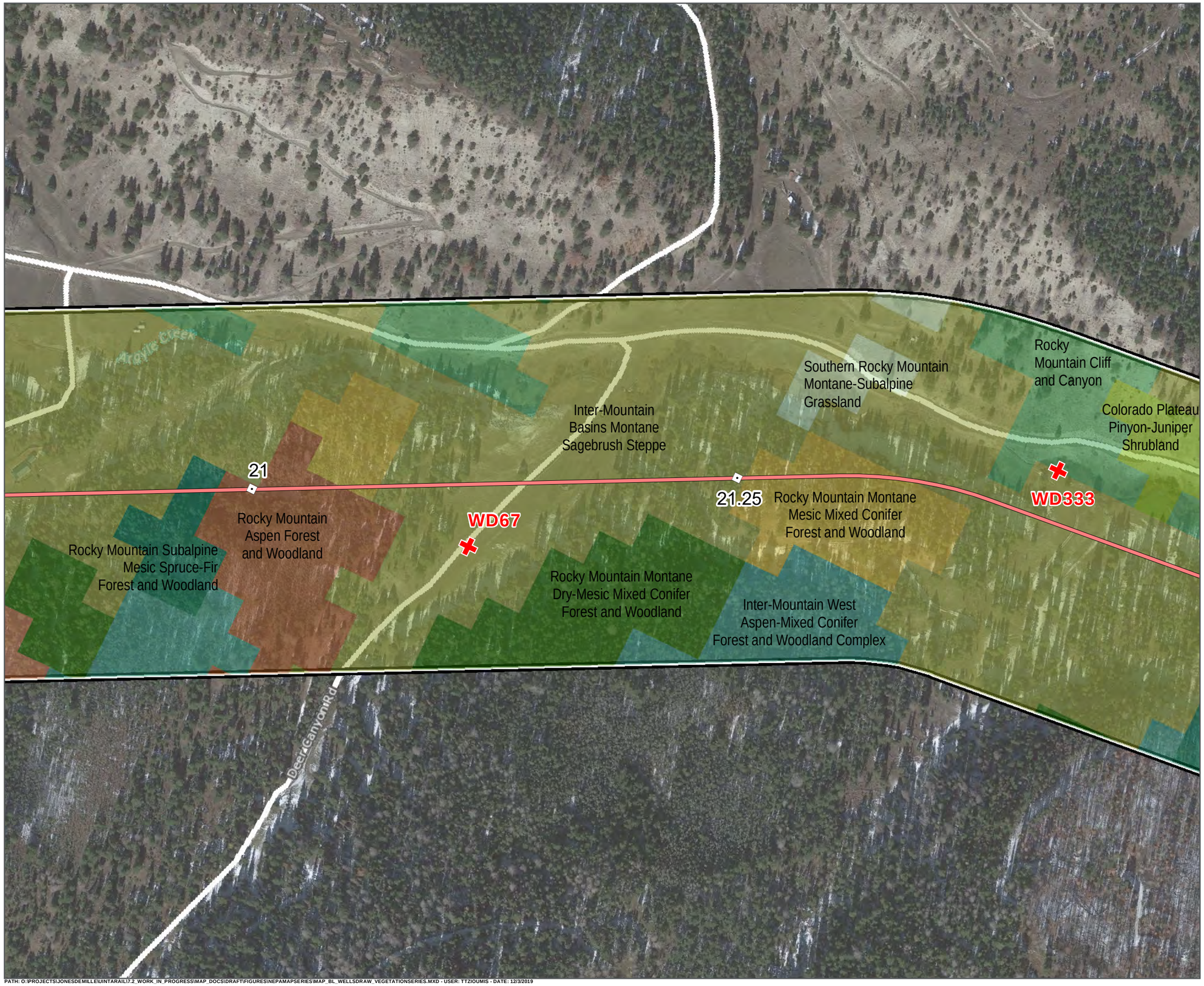

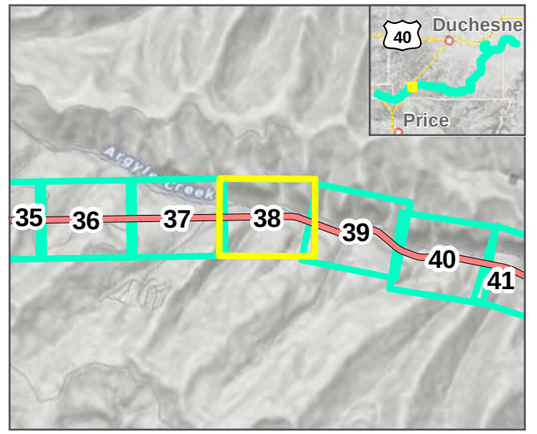

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
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- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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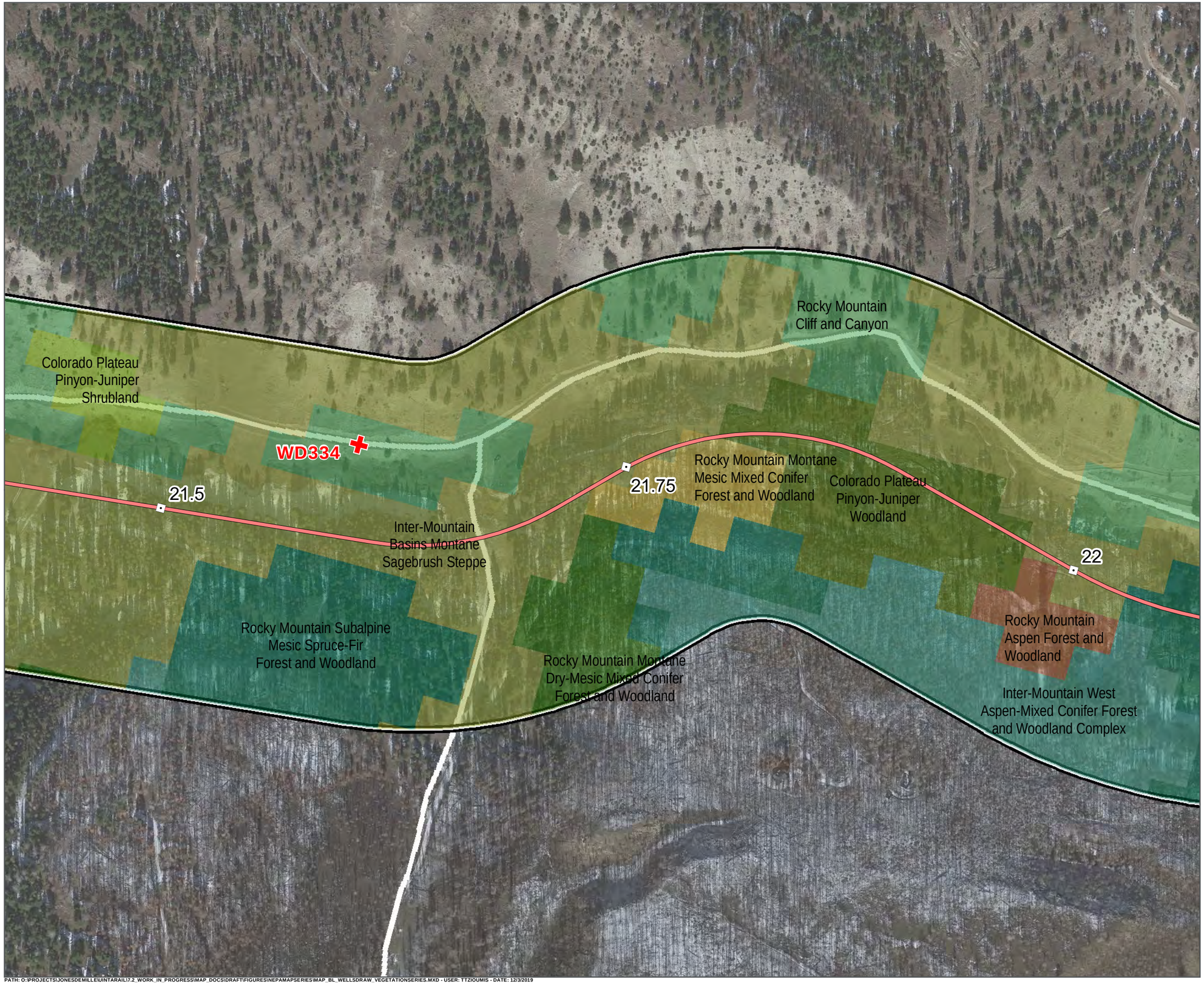

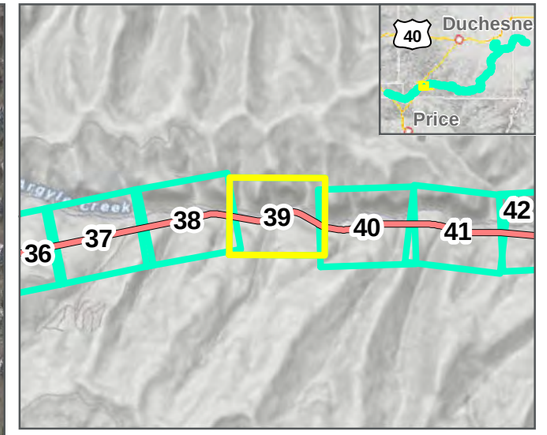

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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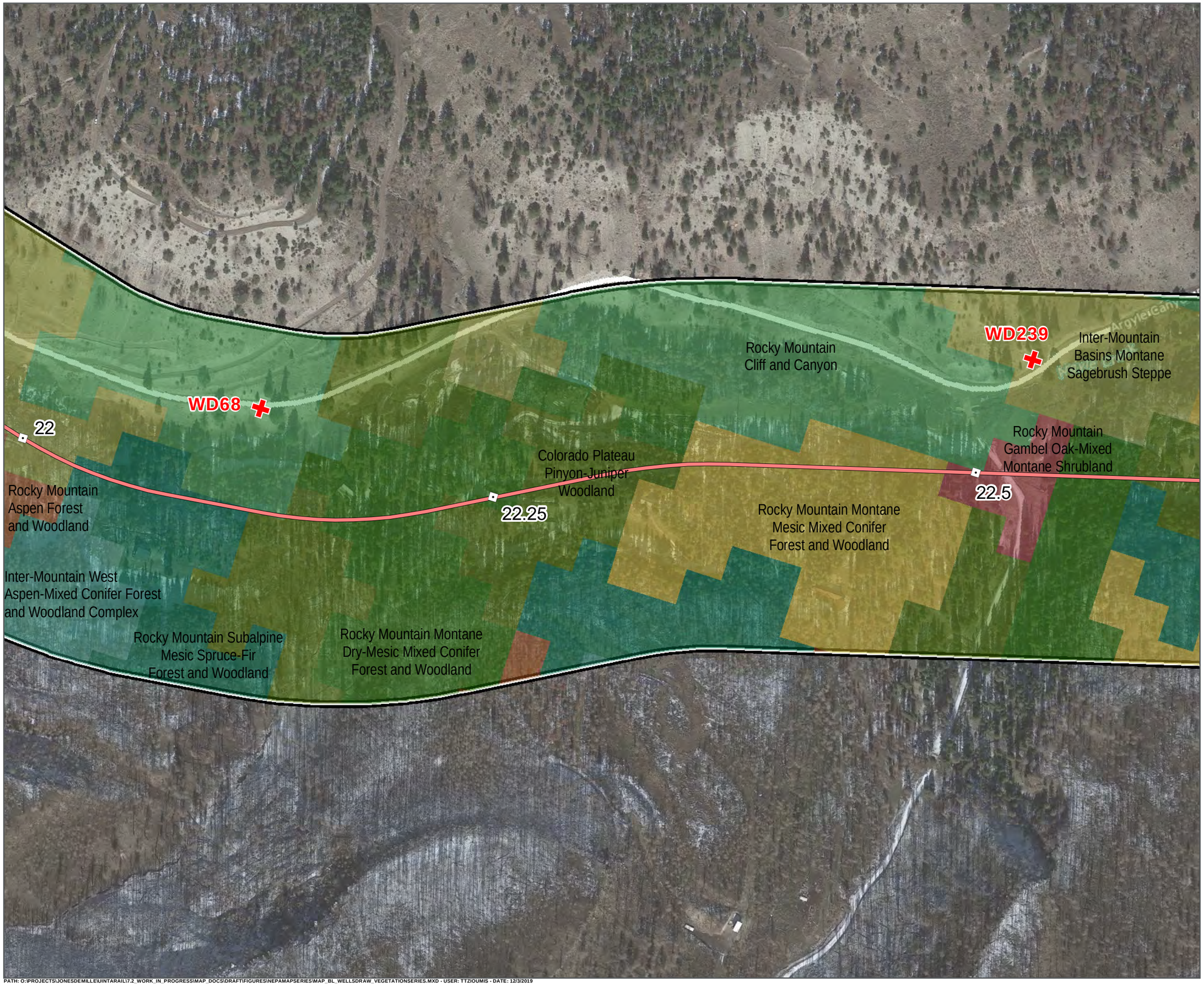

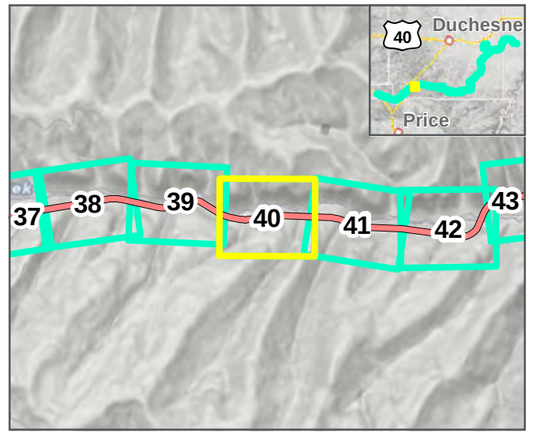

Photo Points
Milepost
Wells Draw Centerline
Study Area
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Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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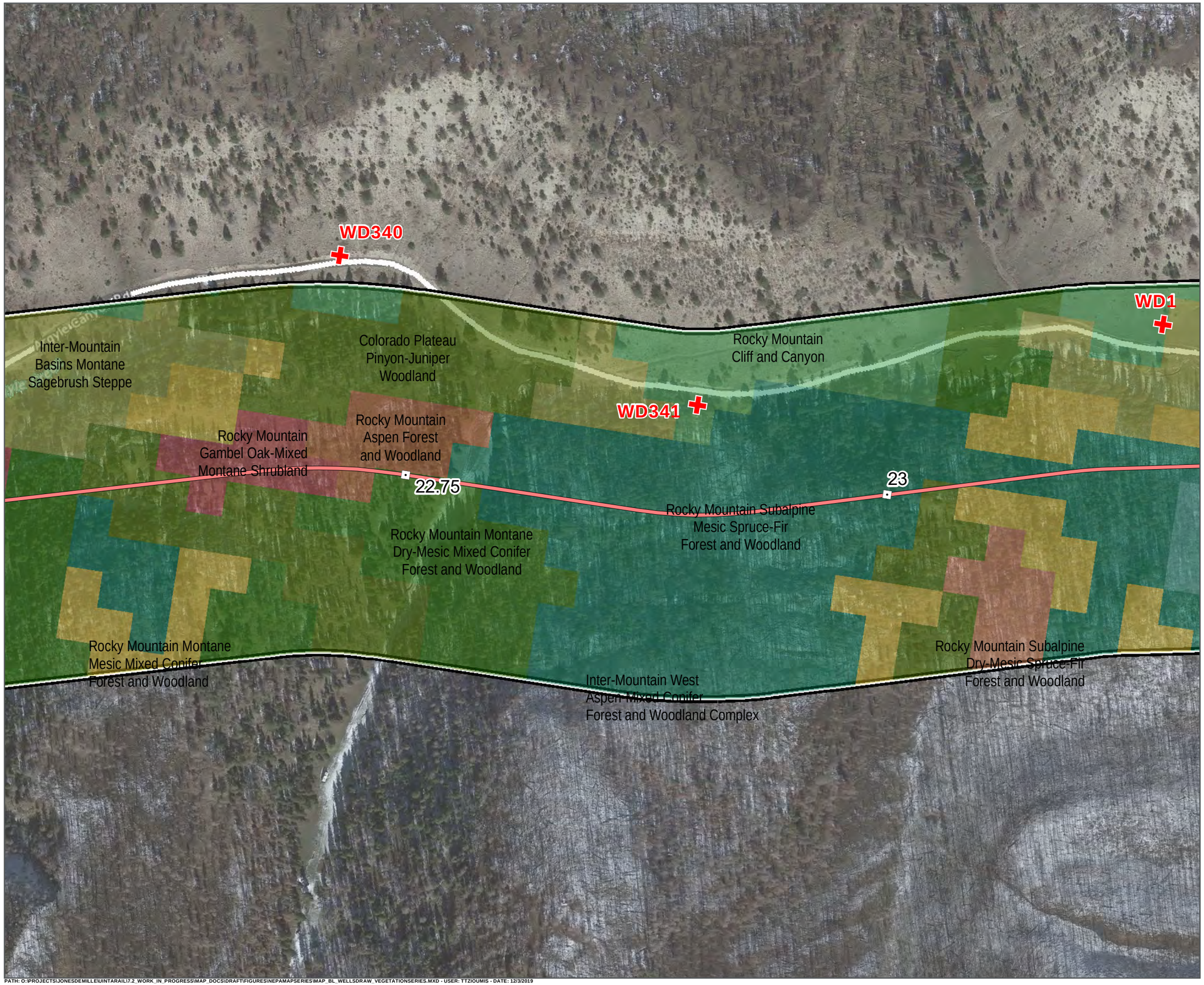

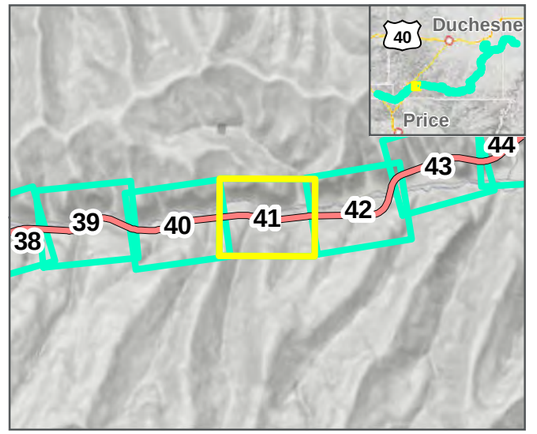

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Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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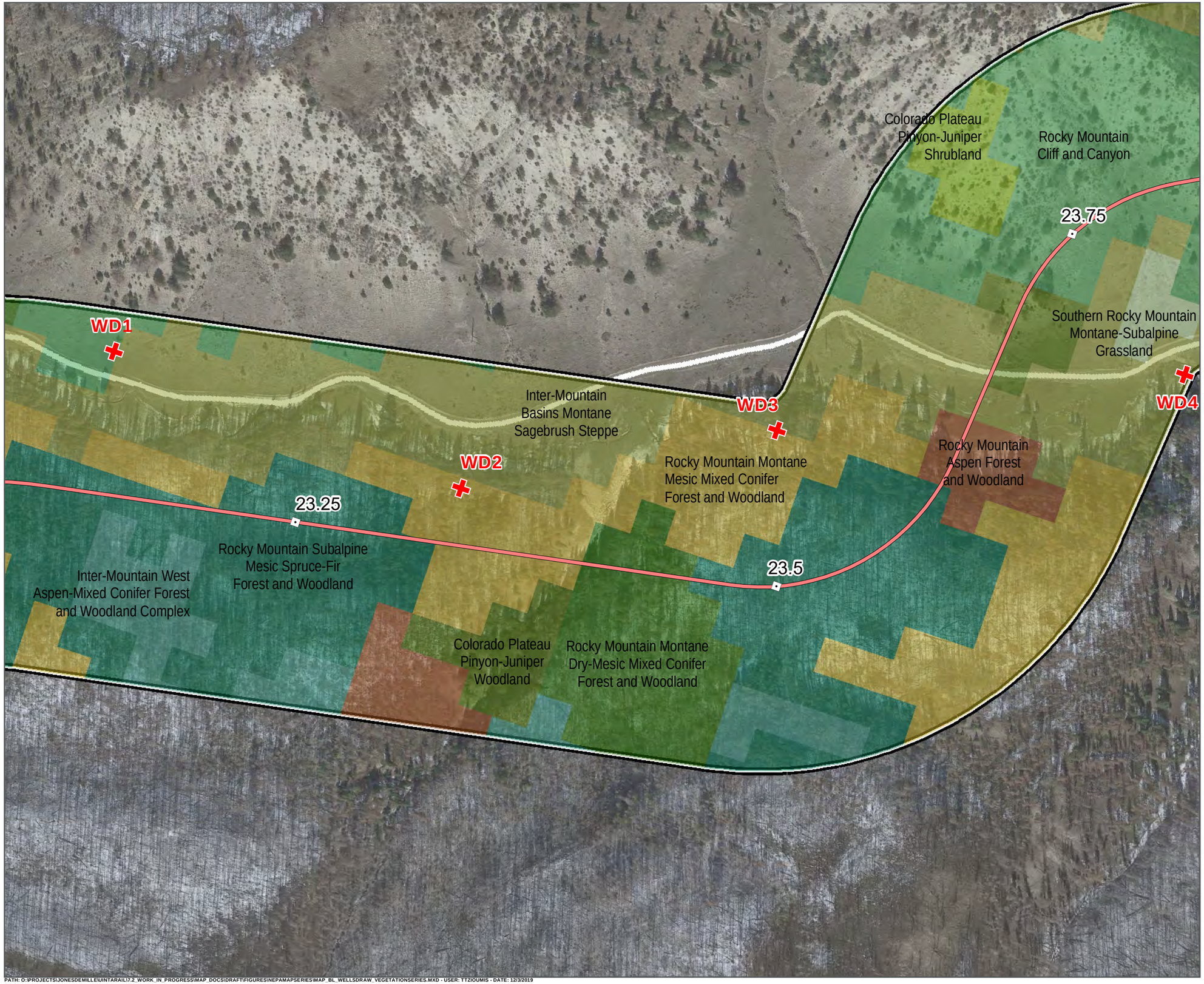

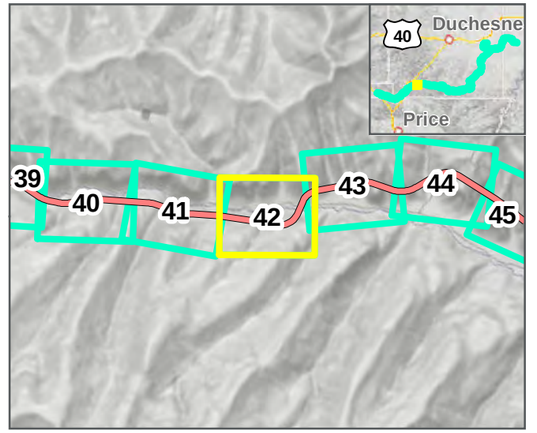

Photo Points
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Wells Draw Centerline
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Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
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- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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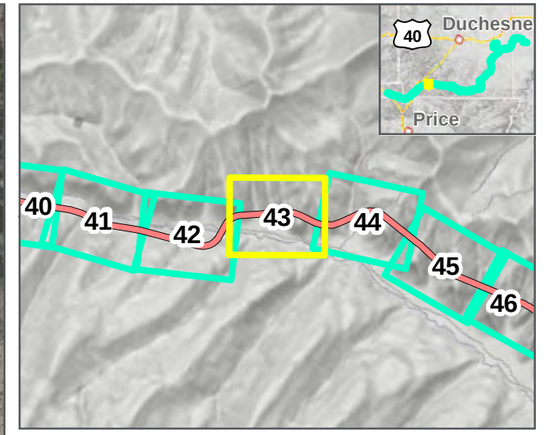

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
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VEGETATION COMMUNITIES
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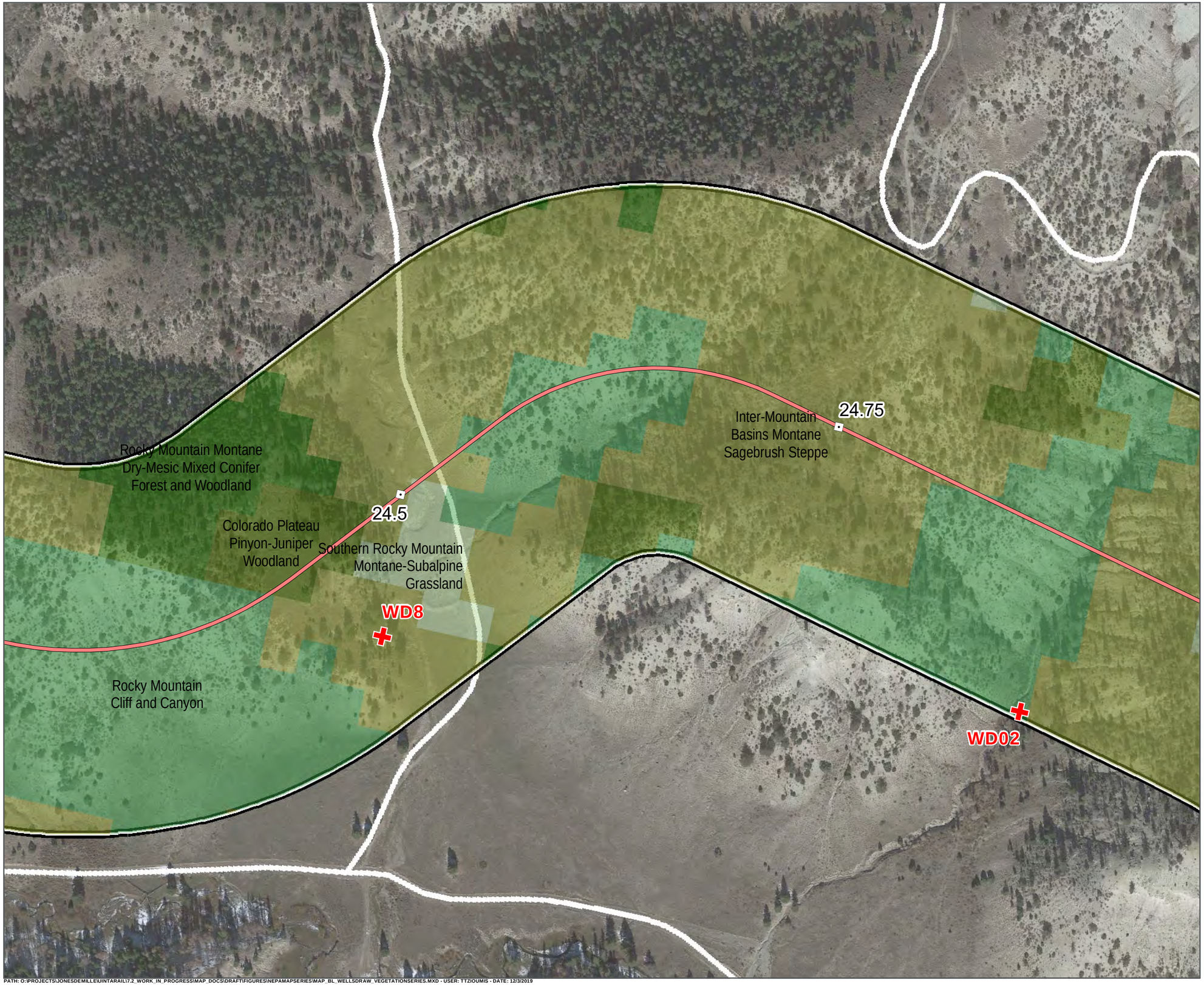

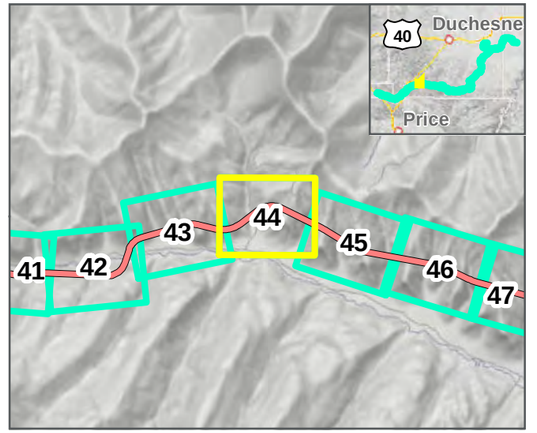

Photo Points

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Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
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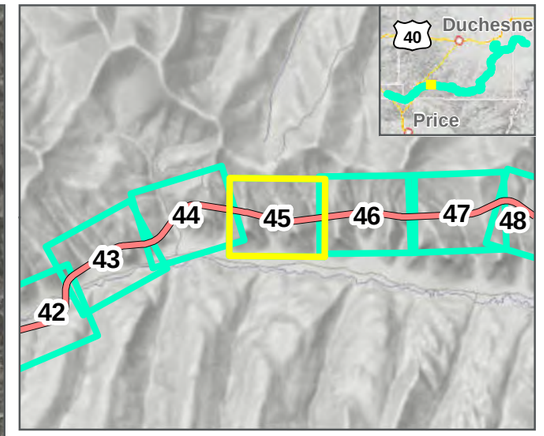

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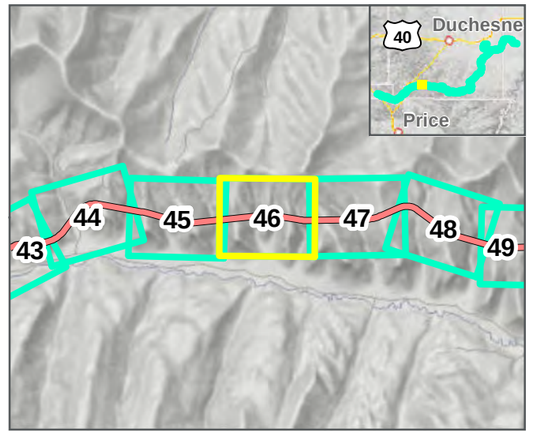

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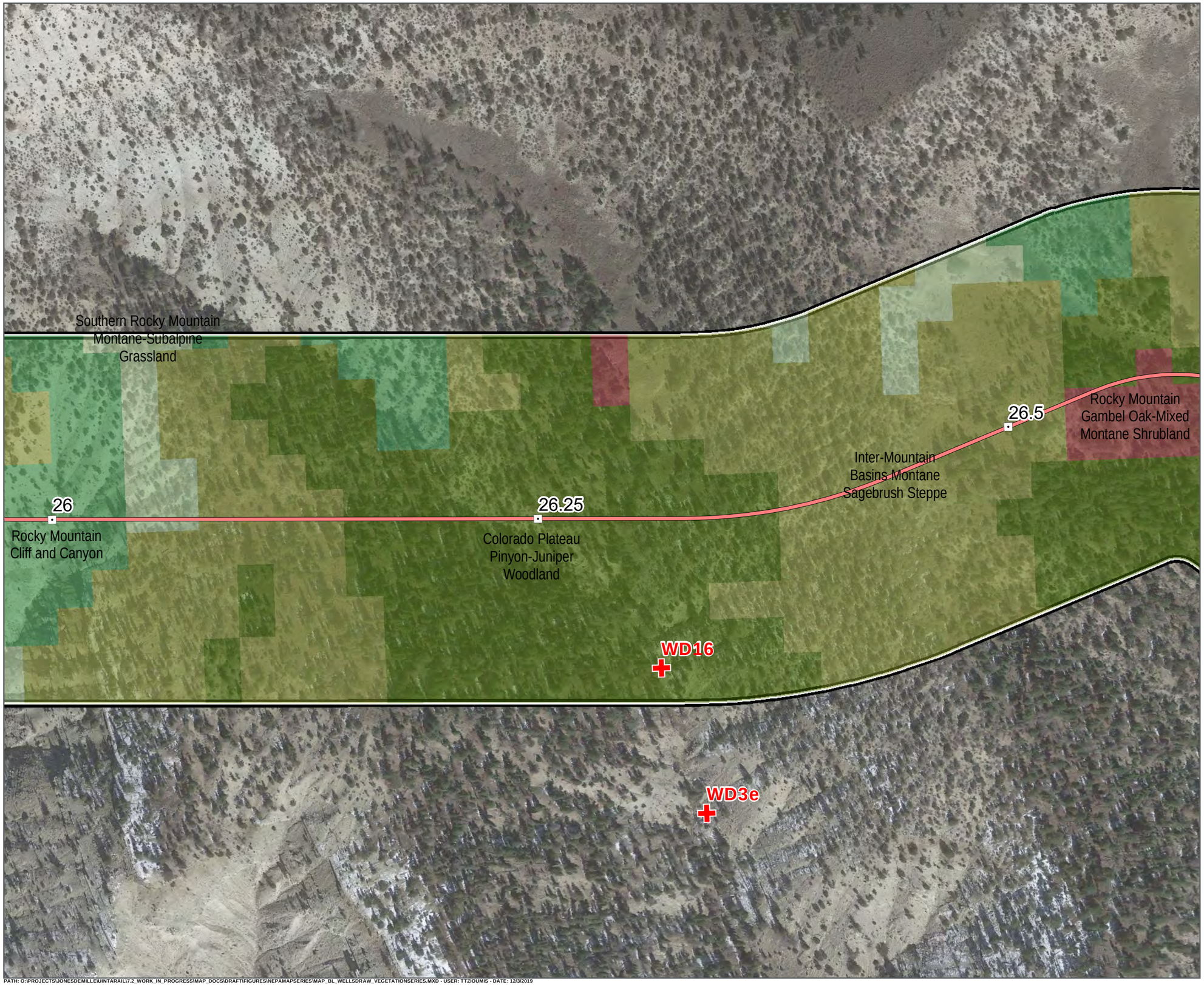

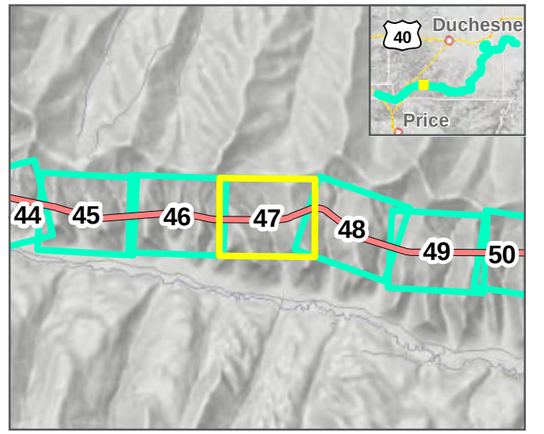

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Vegetation Communities

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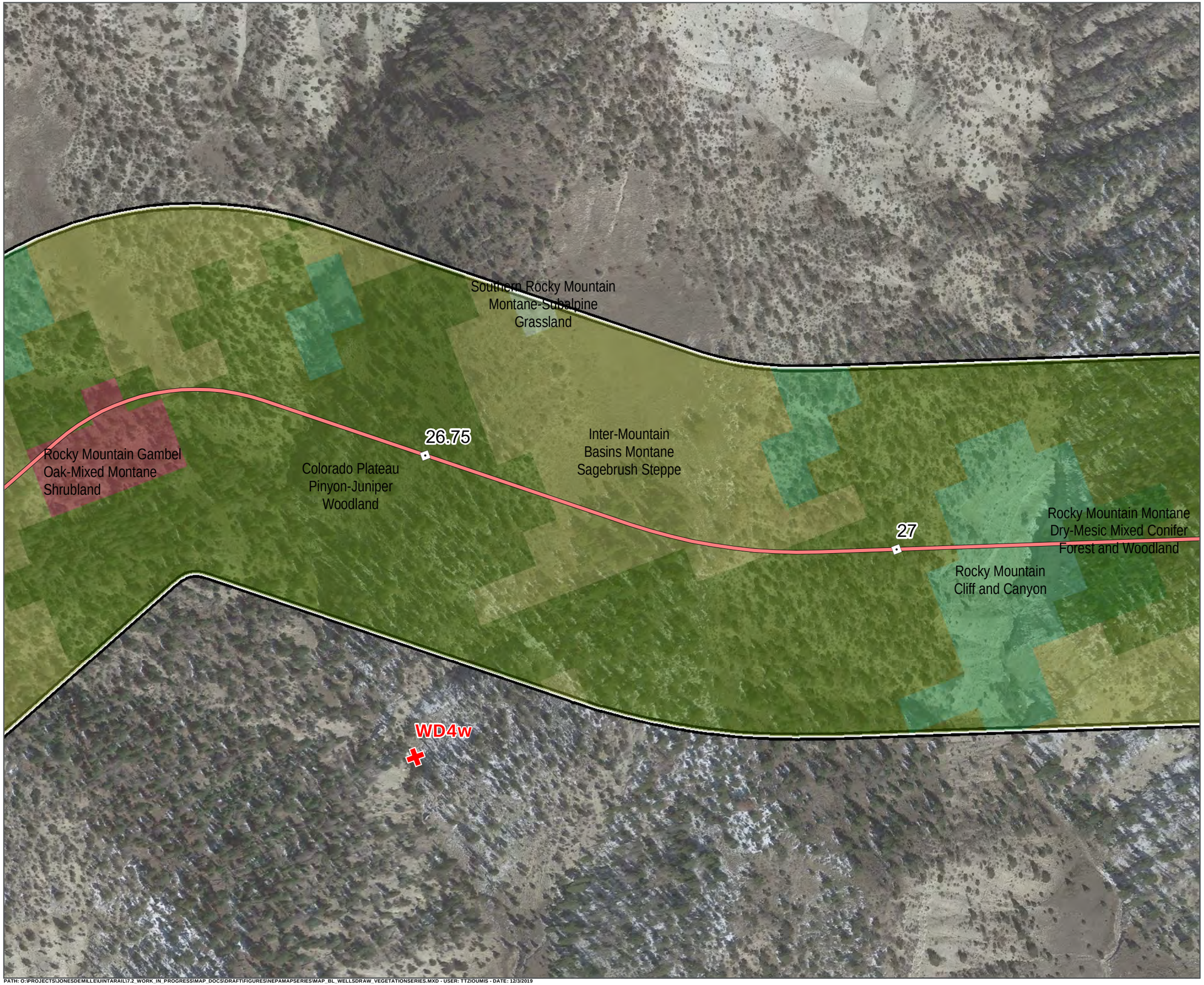

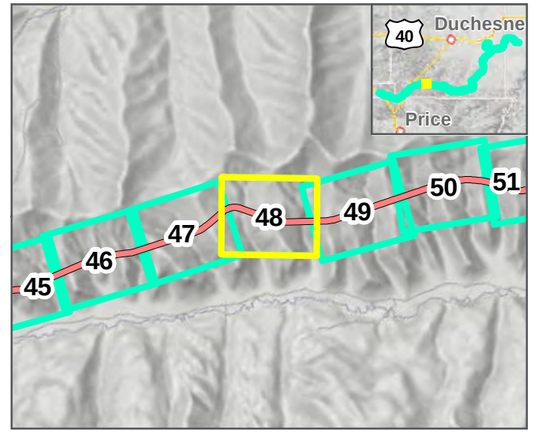

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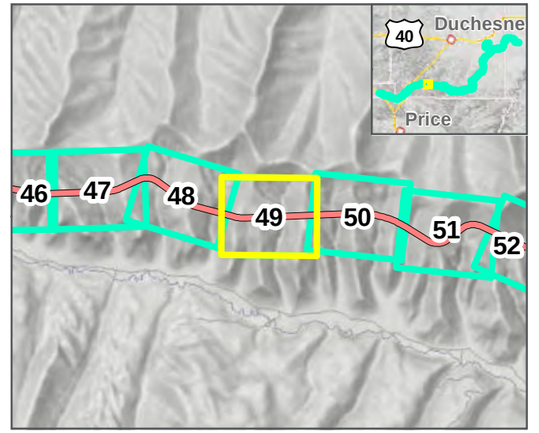

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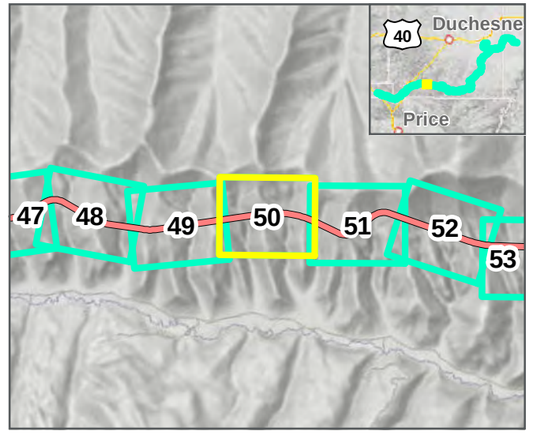

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Vegetation Communities

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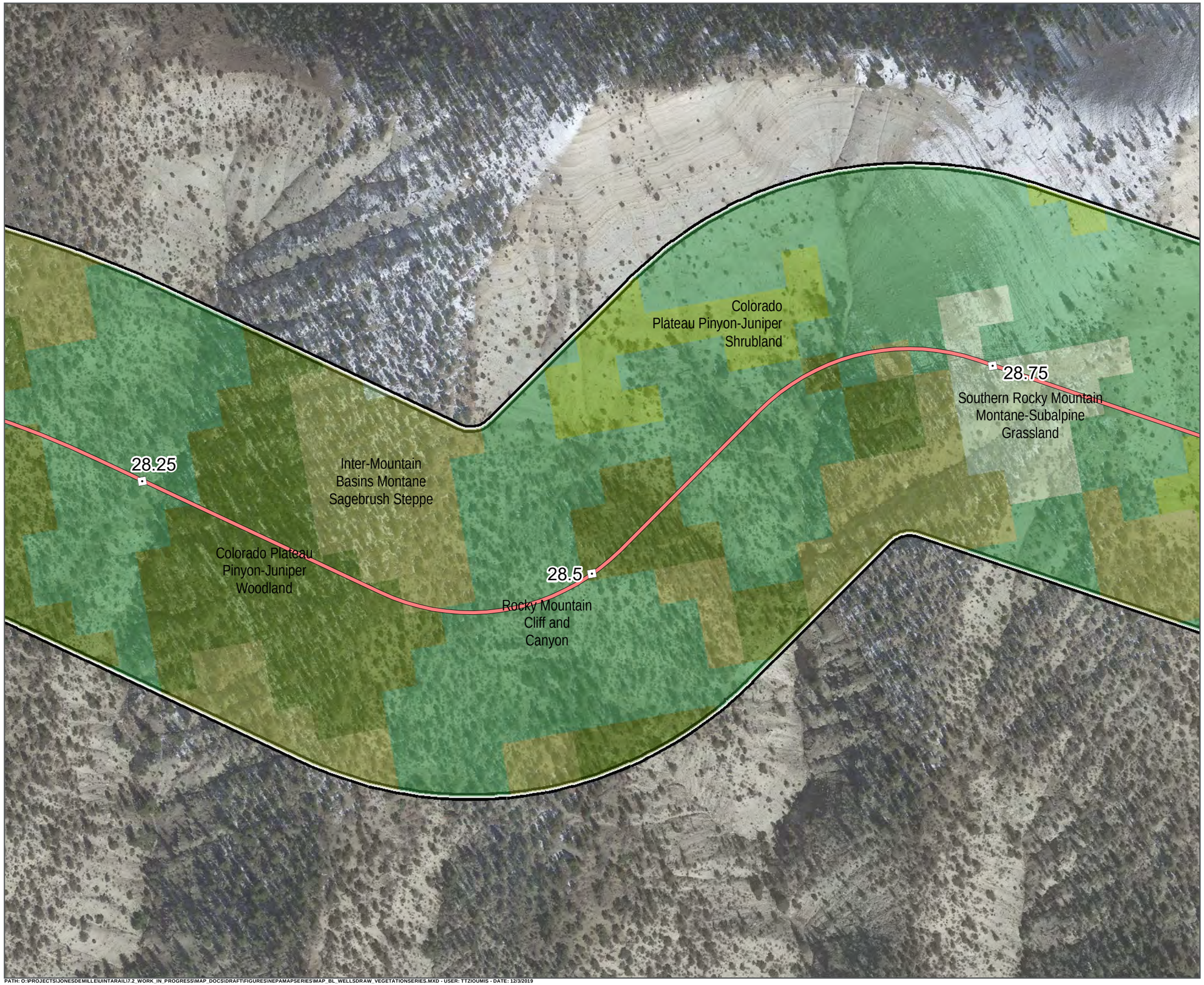

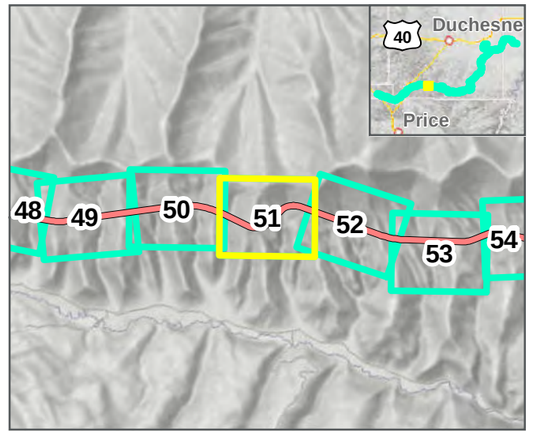

Photo Points

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Map Extent (current view in yellow)

Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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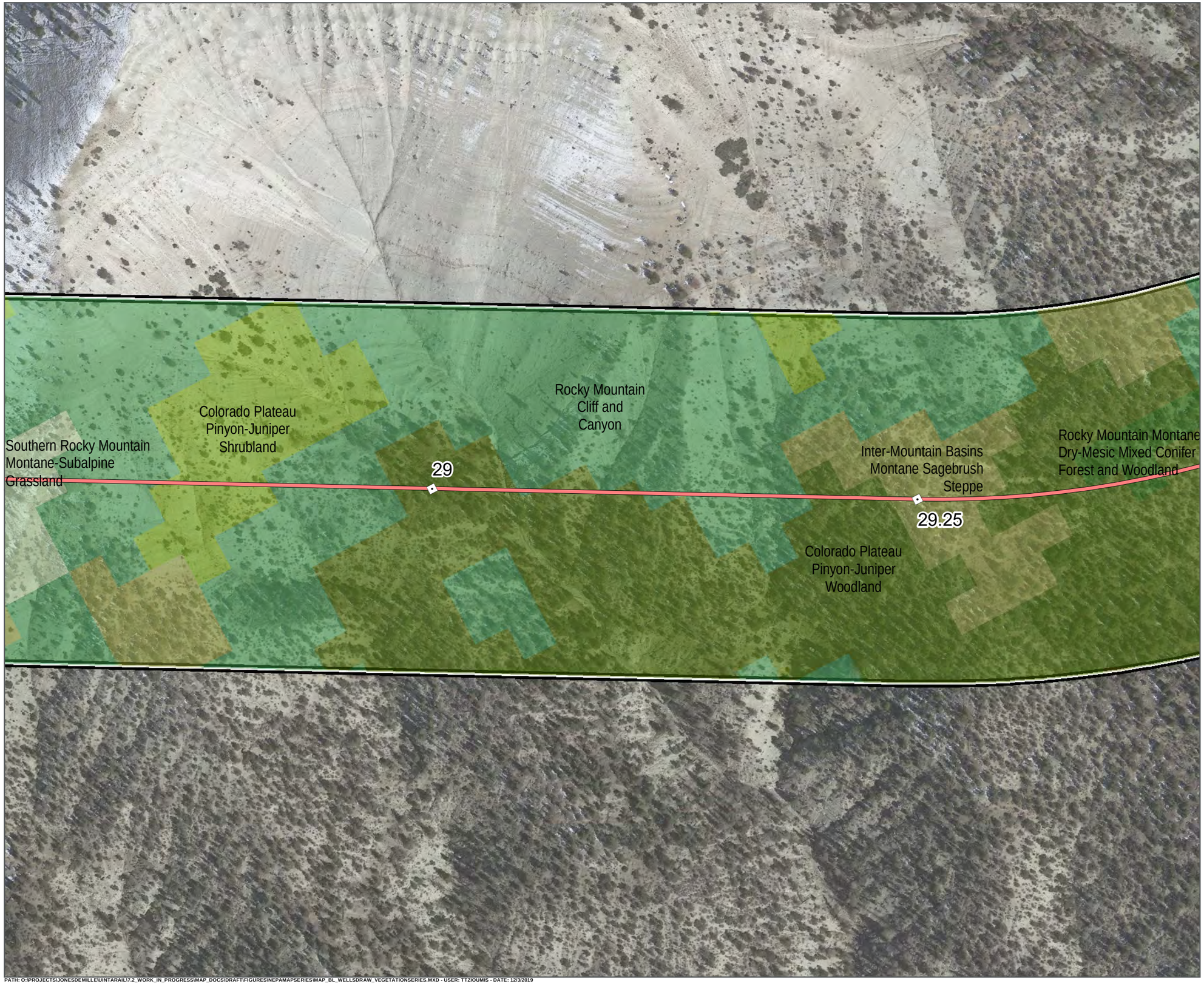

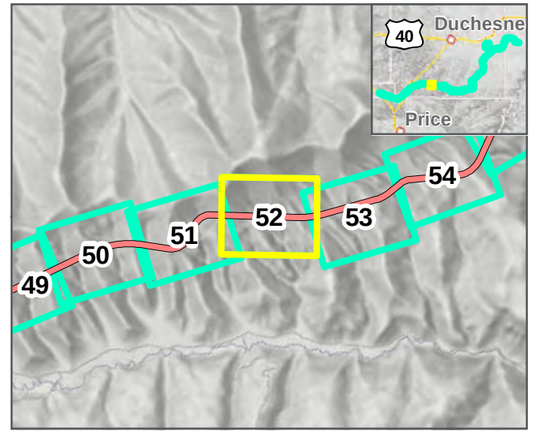

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Wells Draw Centerline
Study Area
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Vegetation Communities

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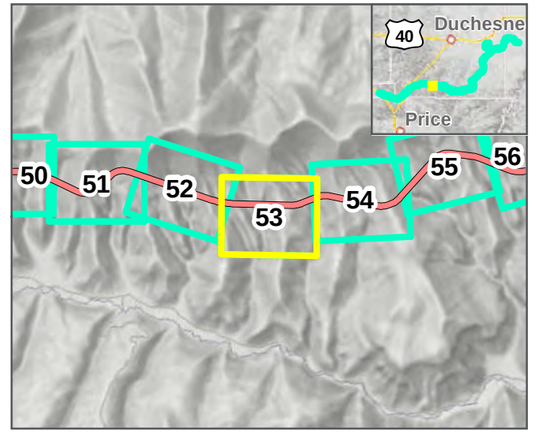

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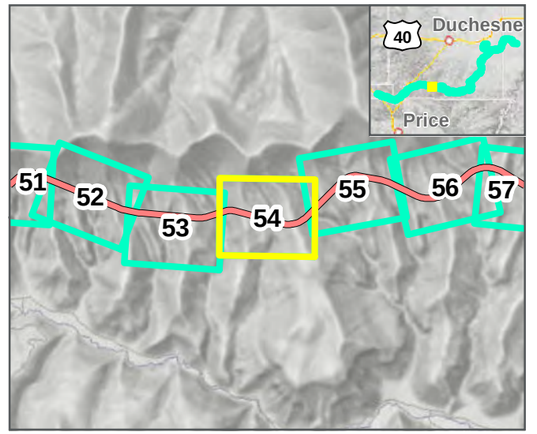

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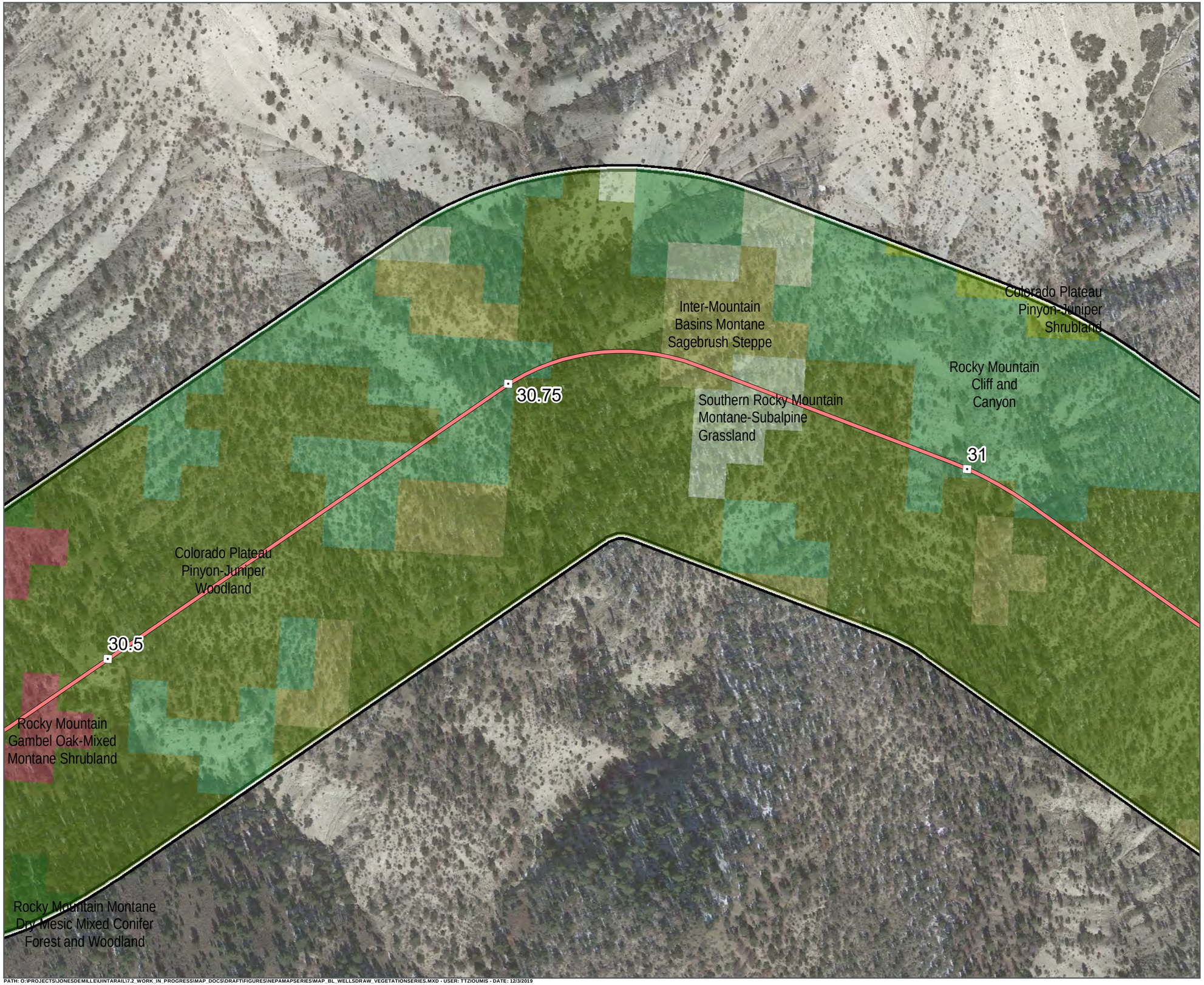

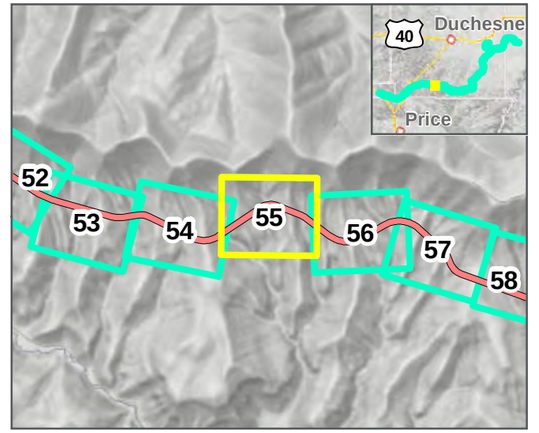

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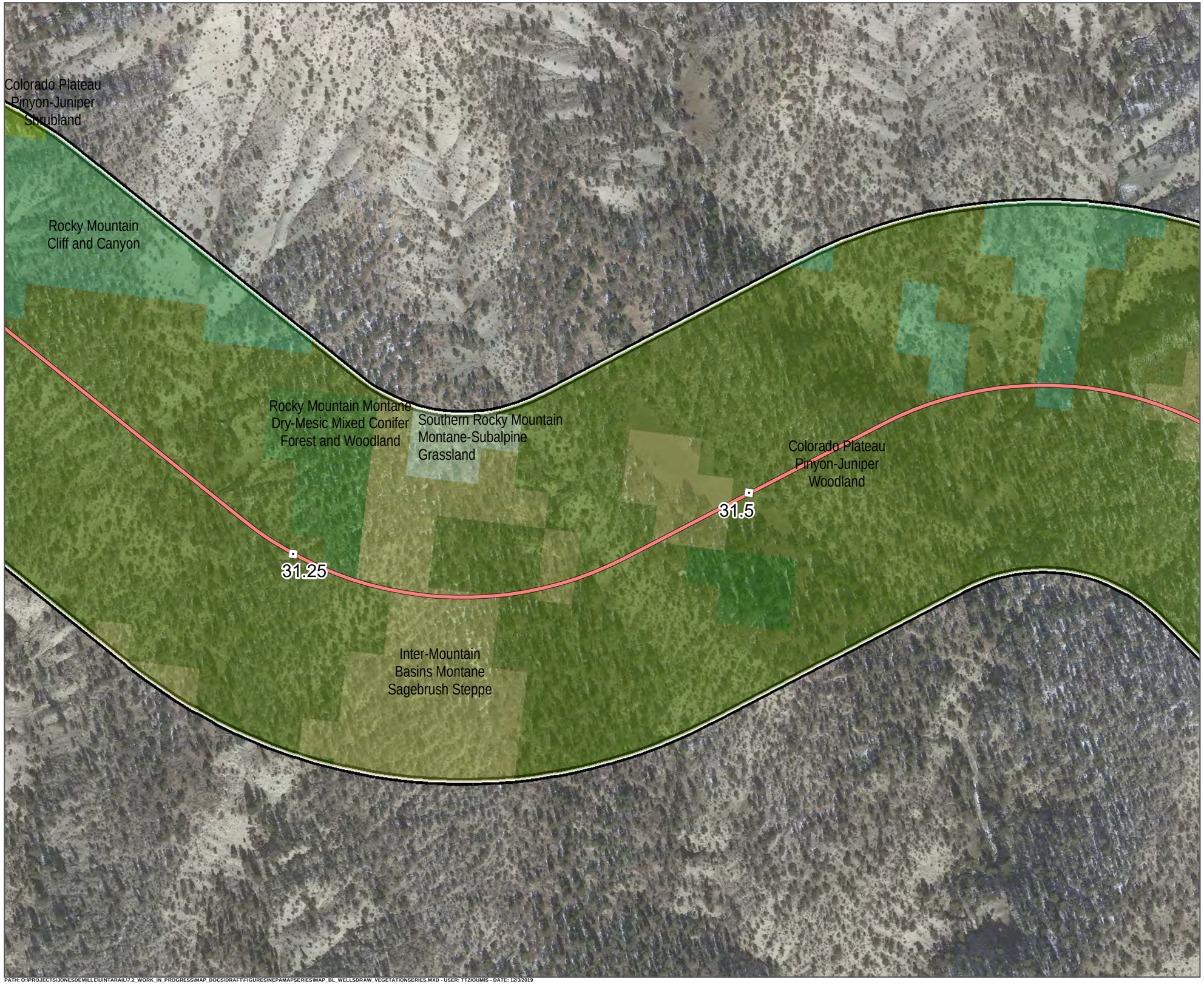

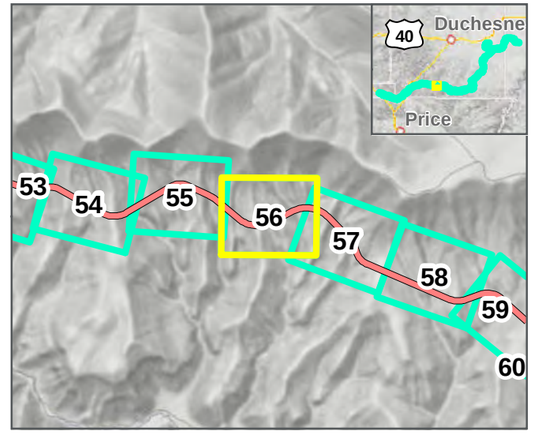

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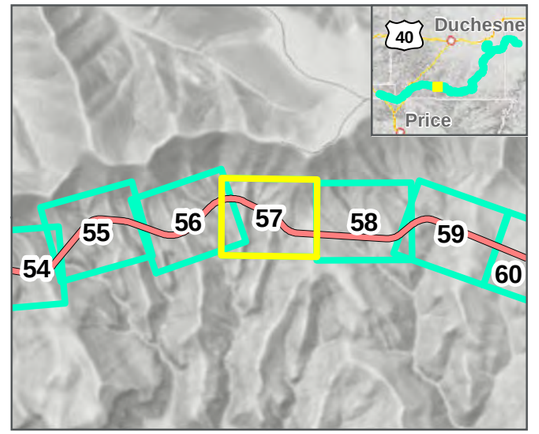

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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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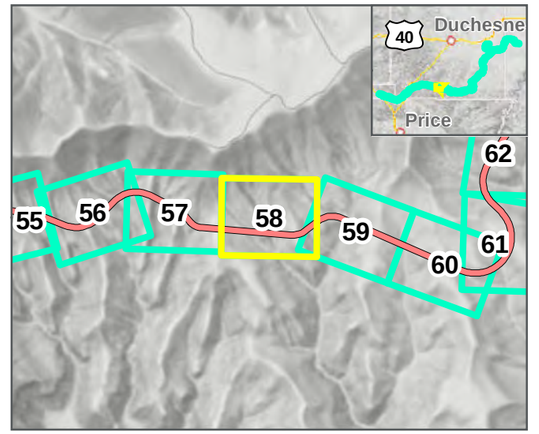

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

Colorado Plateau Pinyon-Juniper Woodland

Inter-Mountain Basins Montane Sagebrush Steppe

Rocky Mountain Cliff and Canyon

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
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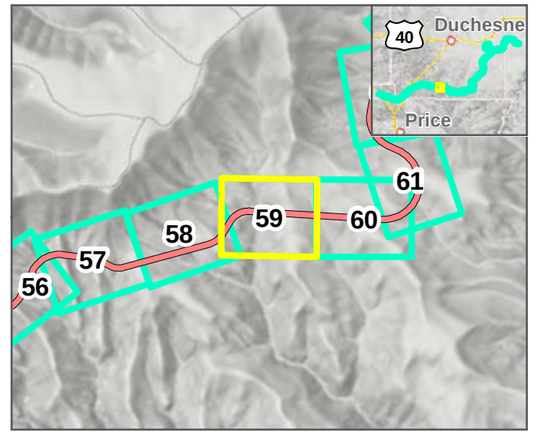

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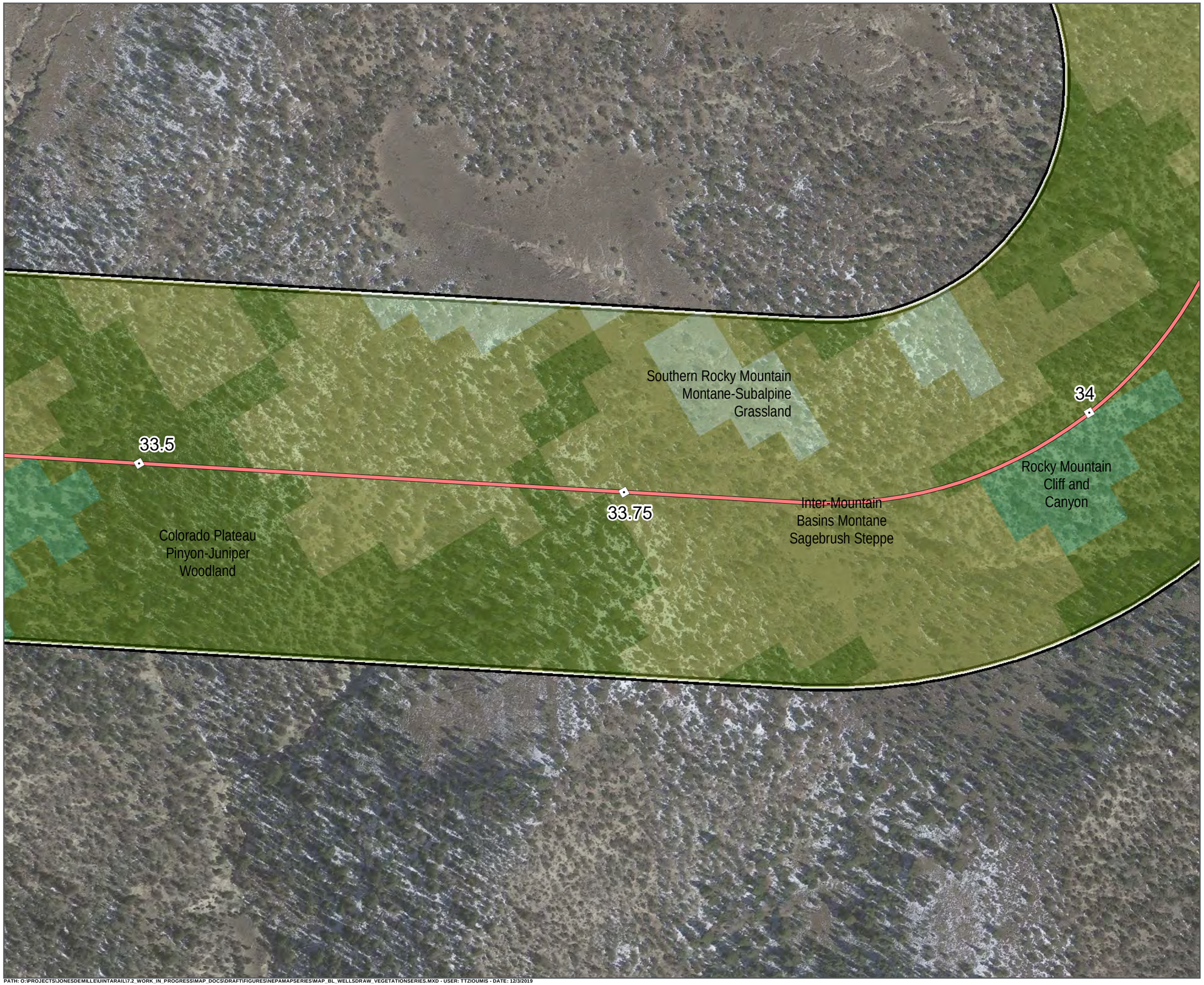

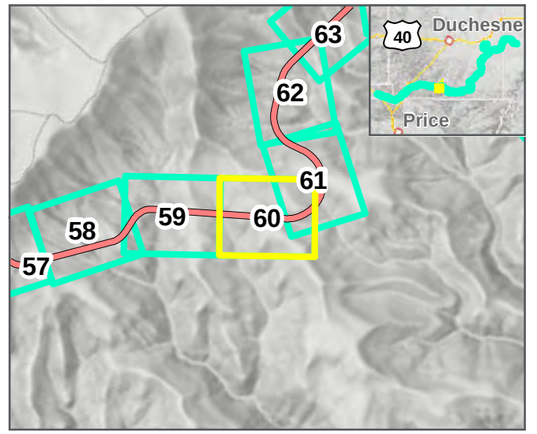

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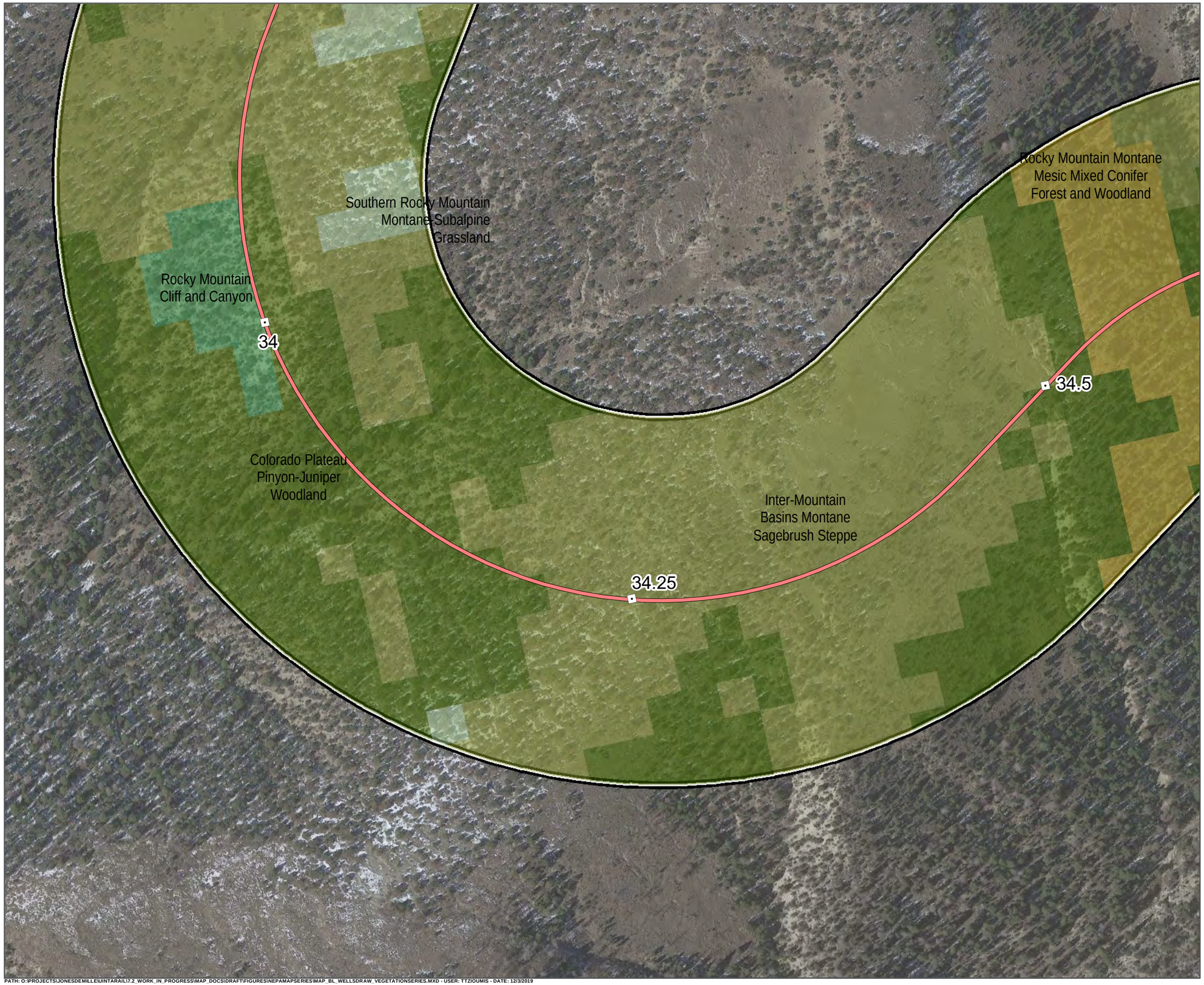

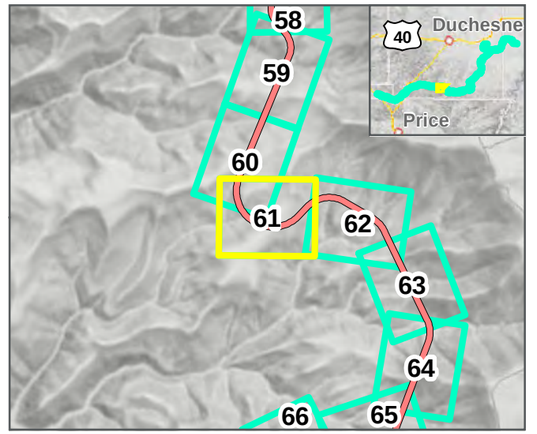

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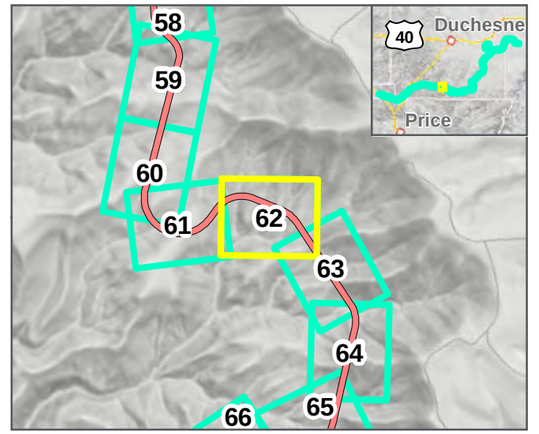

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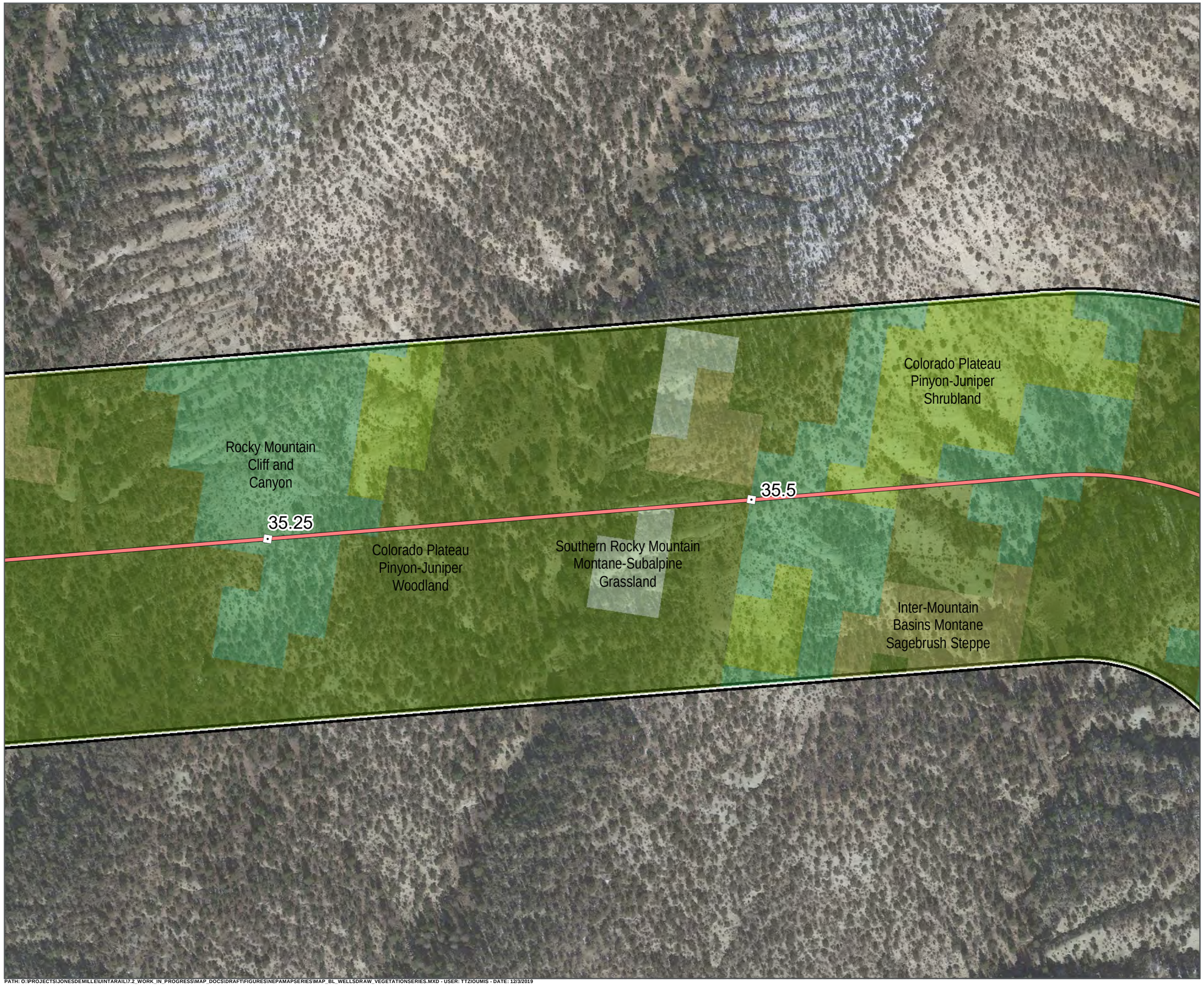

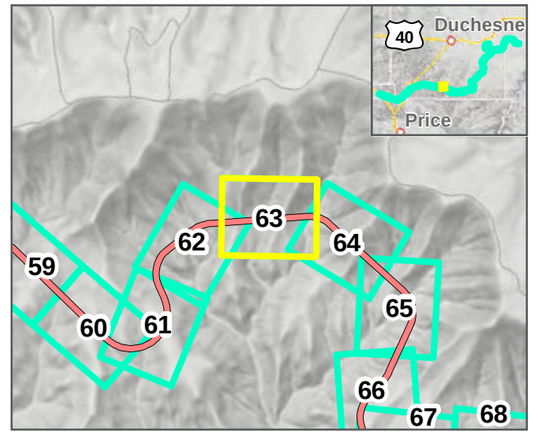

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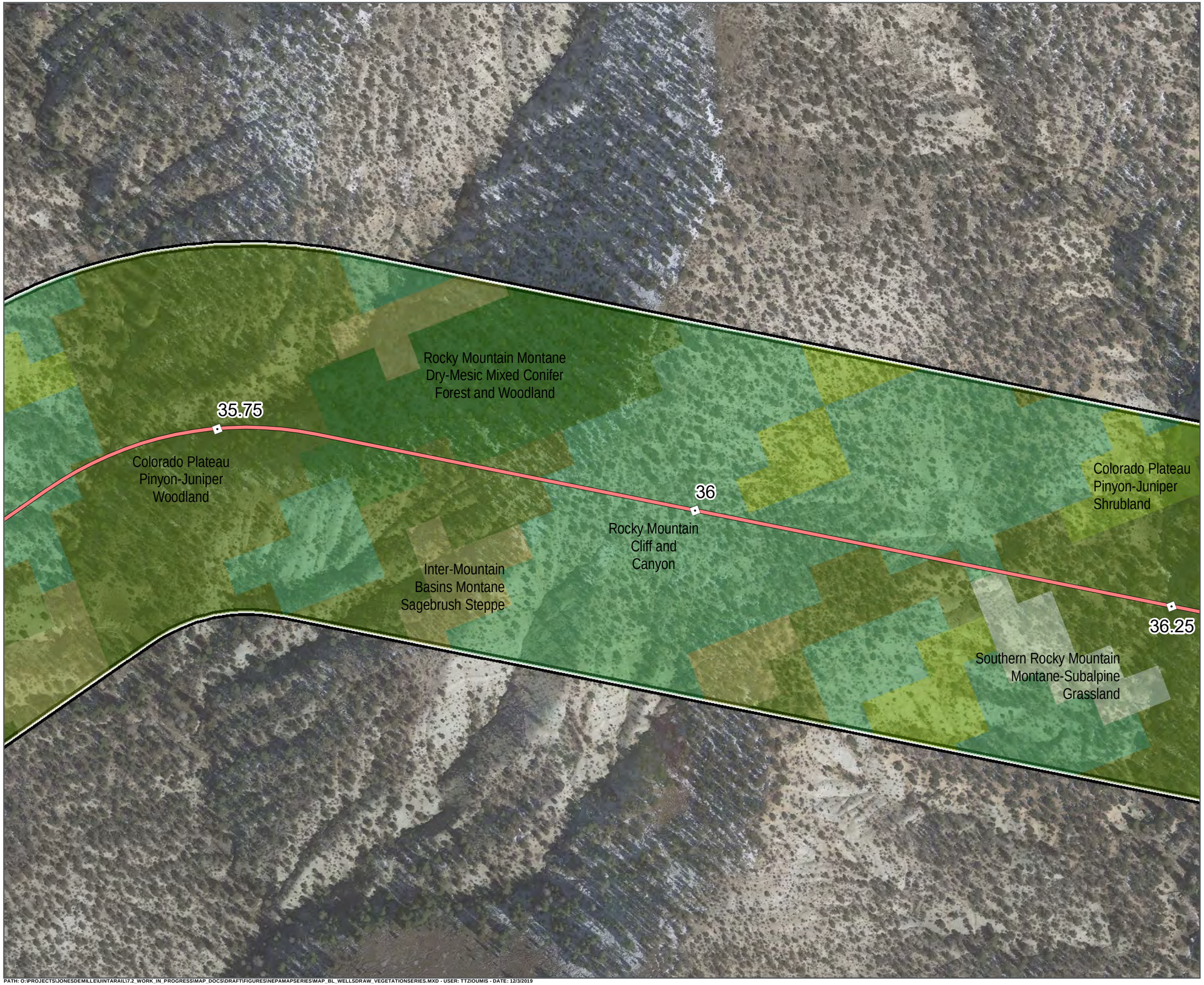

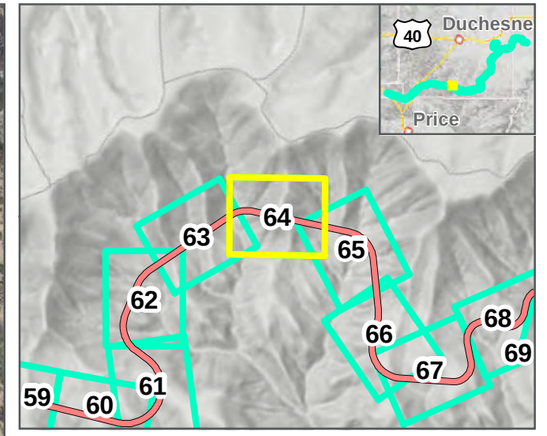

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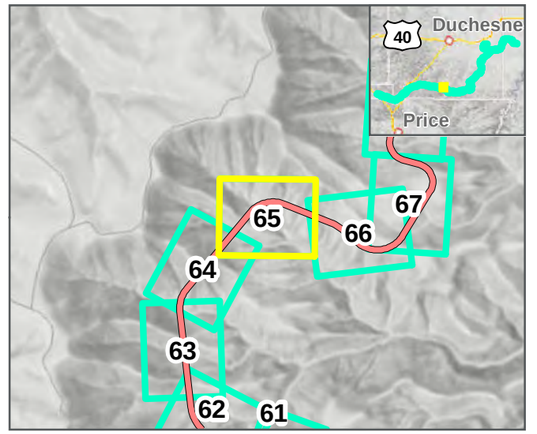

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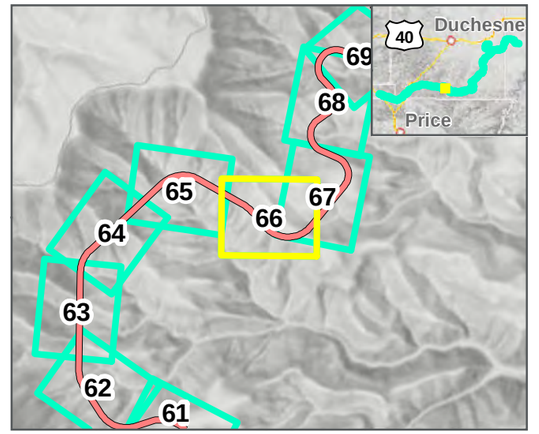

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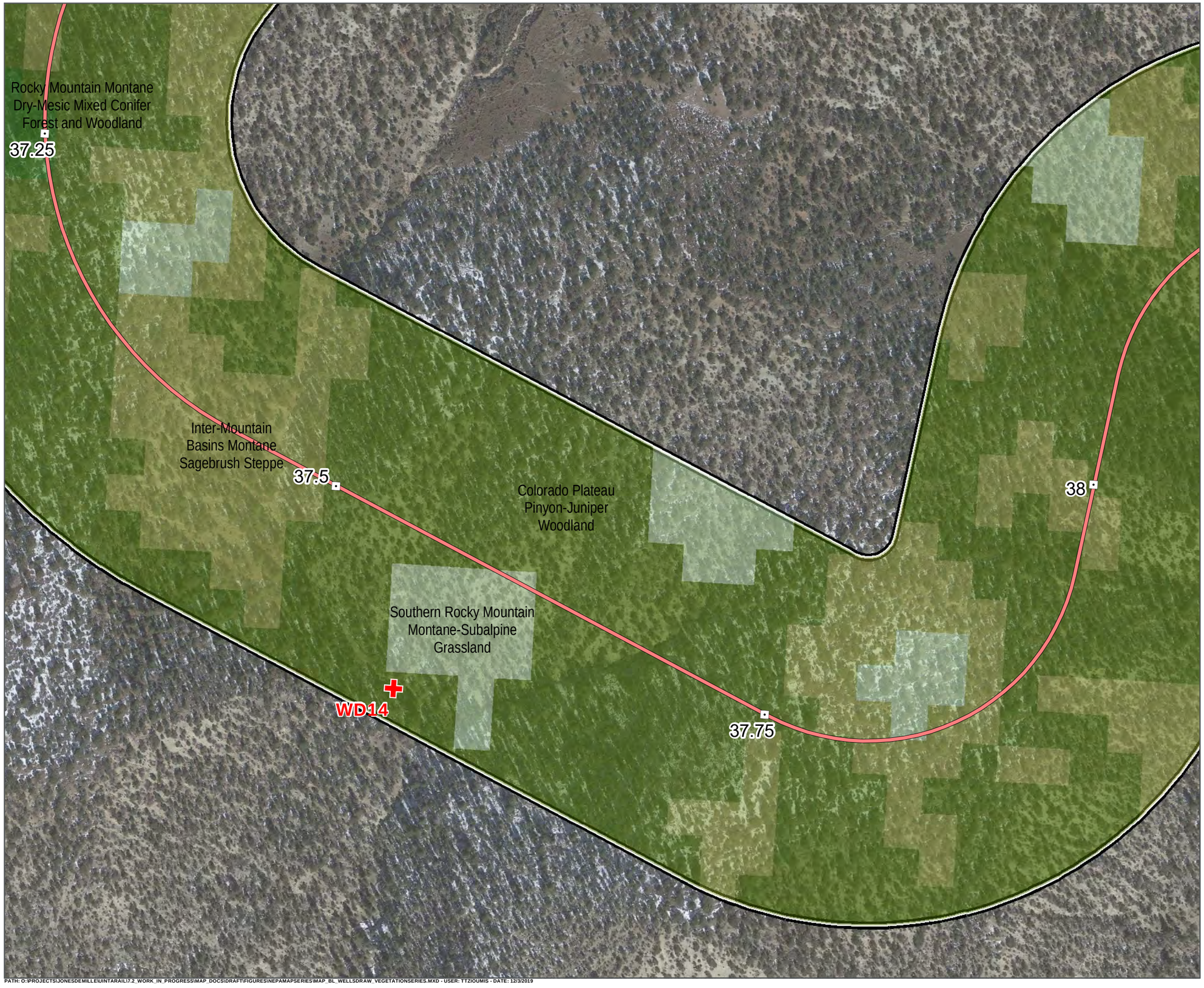

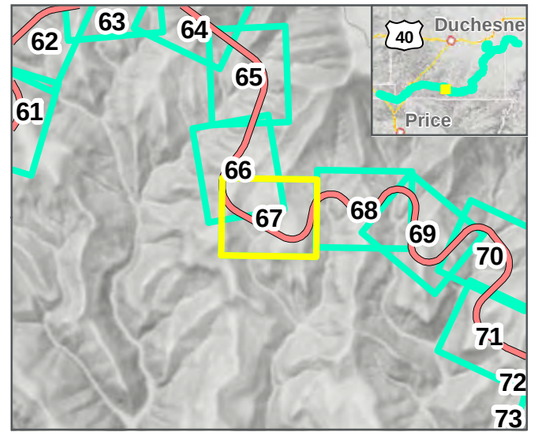

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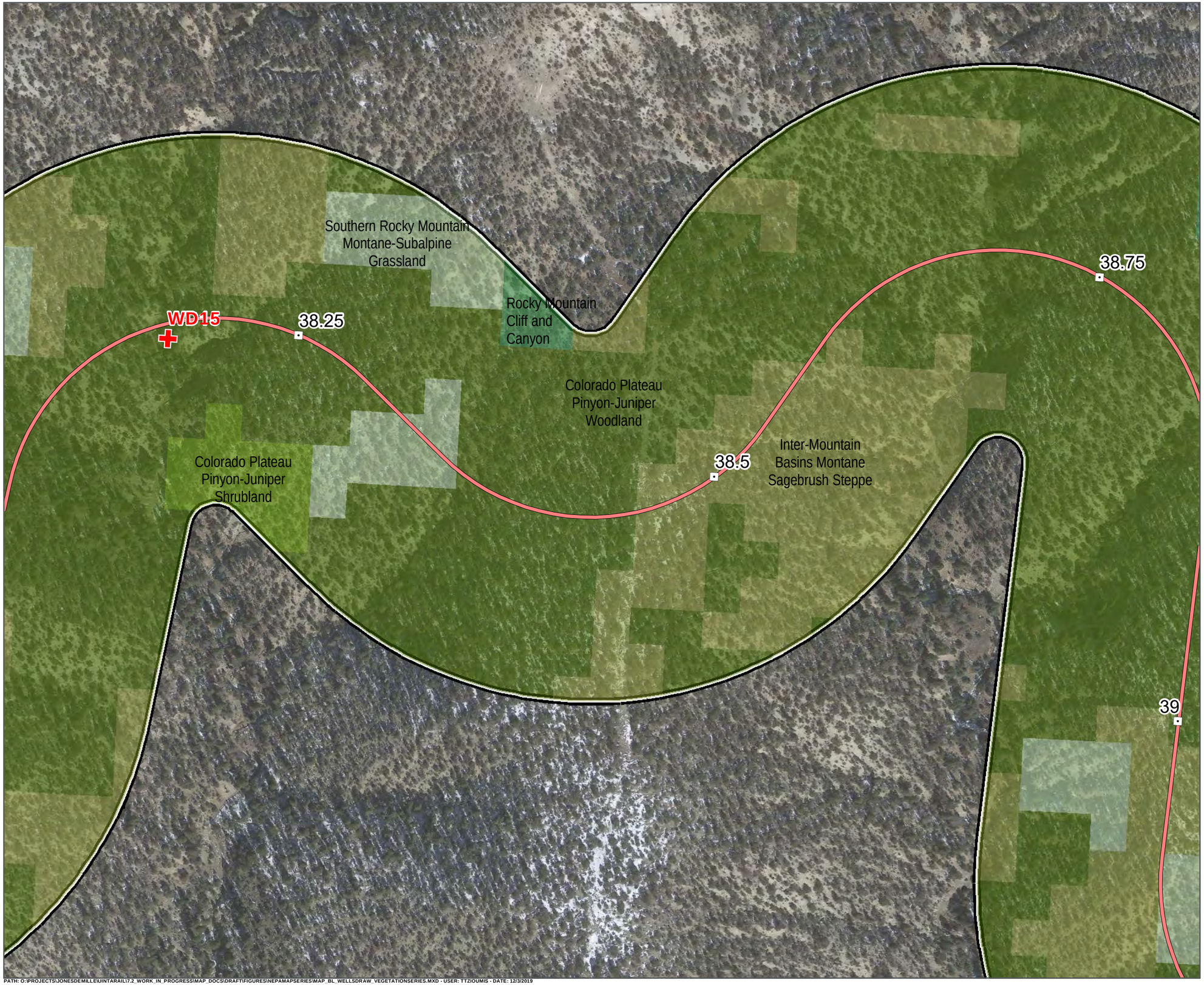

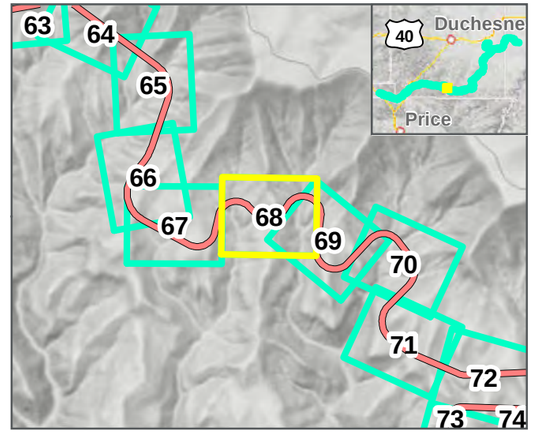

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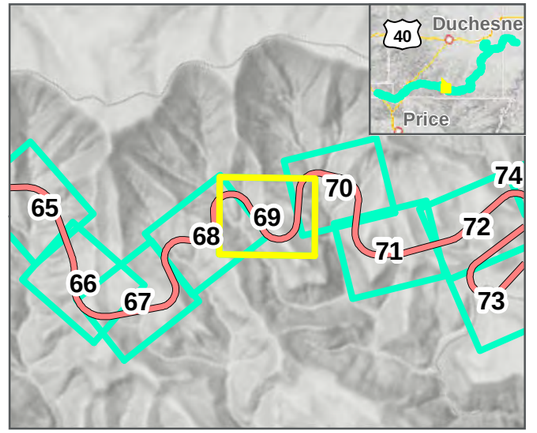

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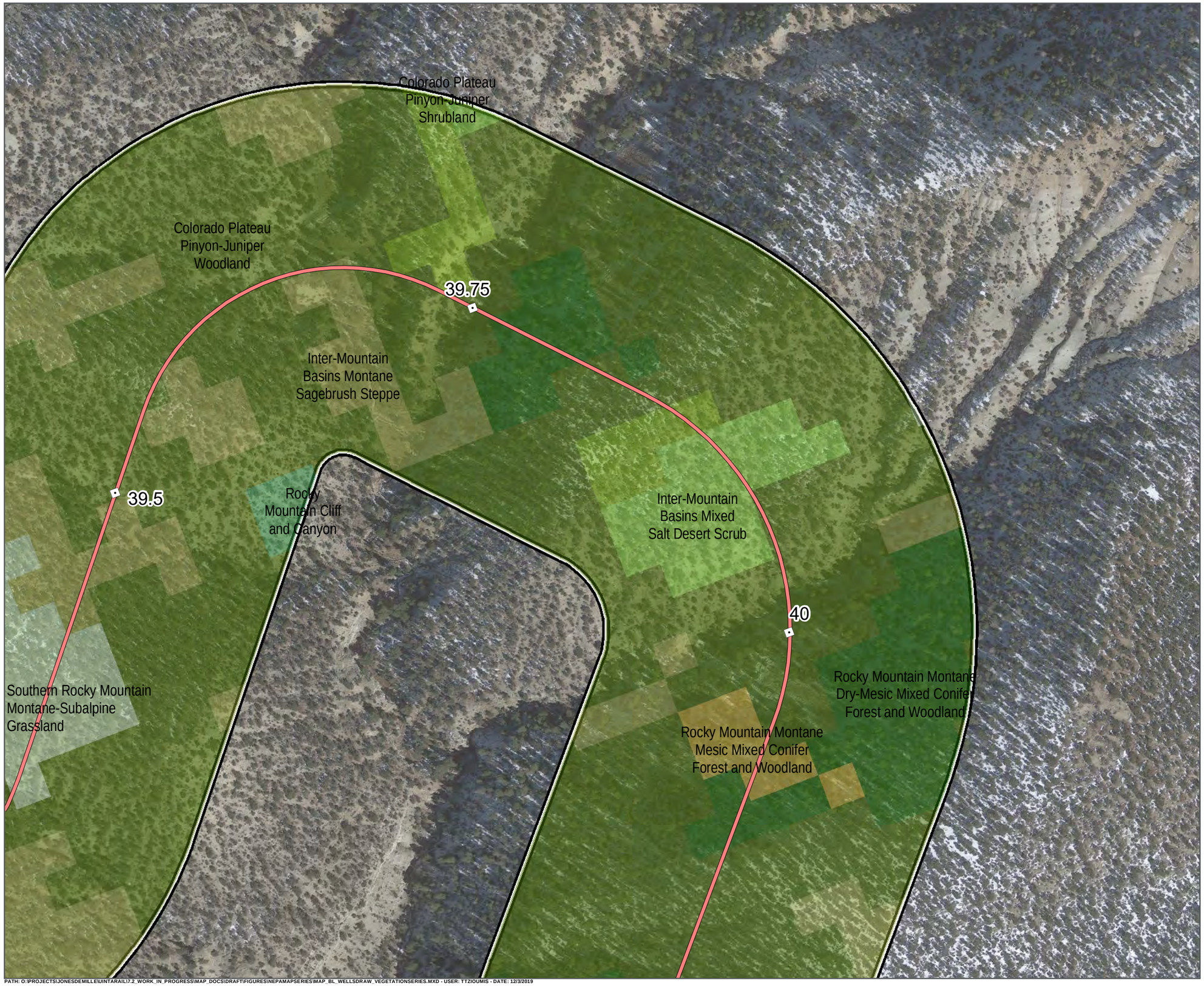

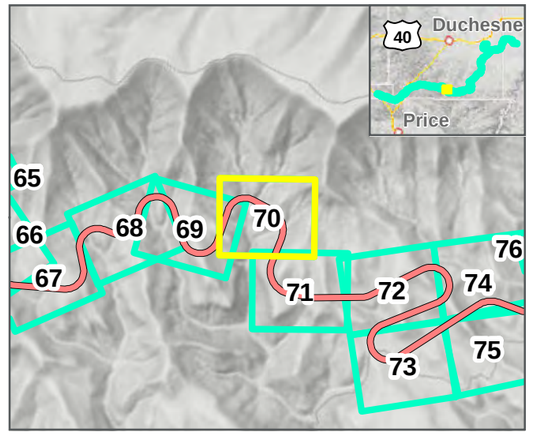

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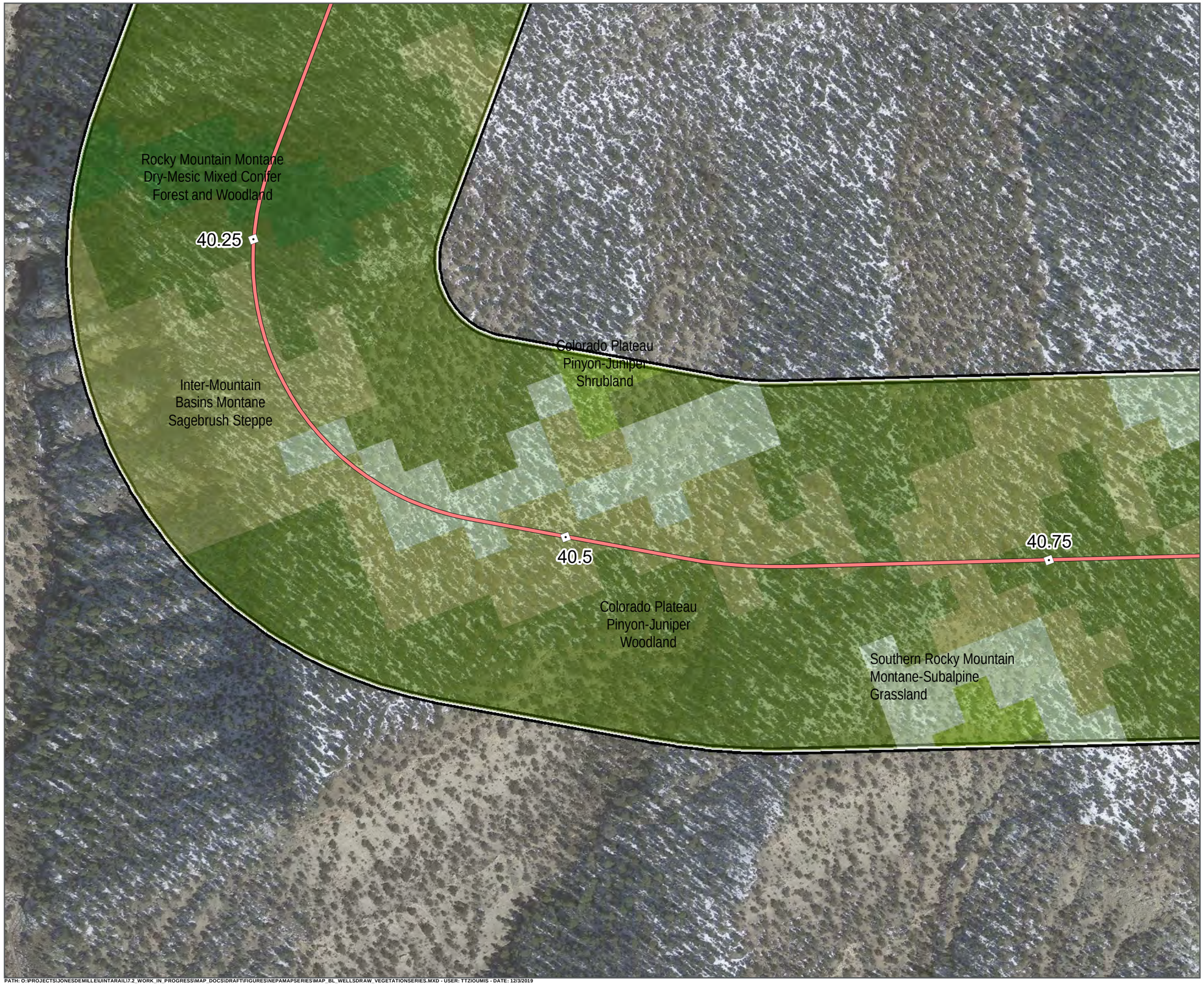

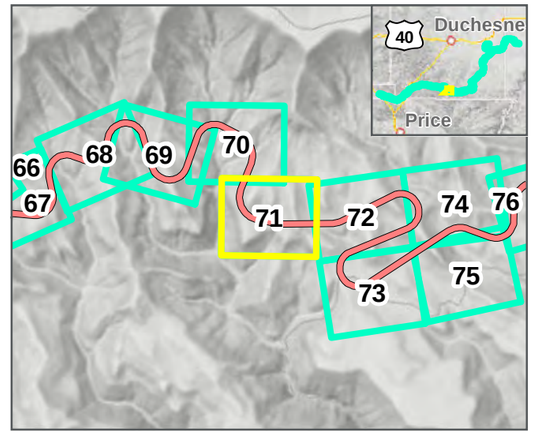

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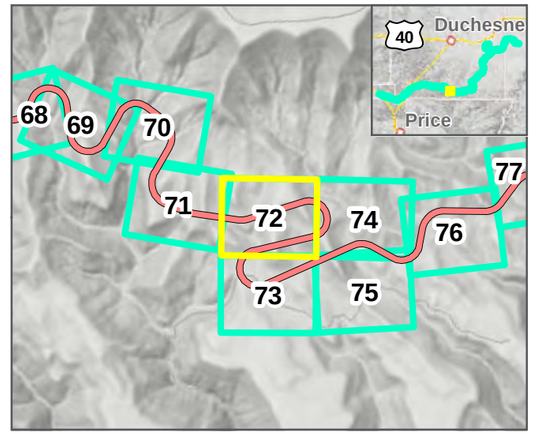

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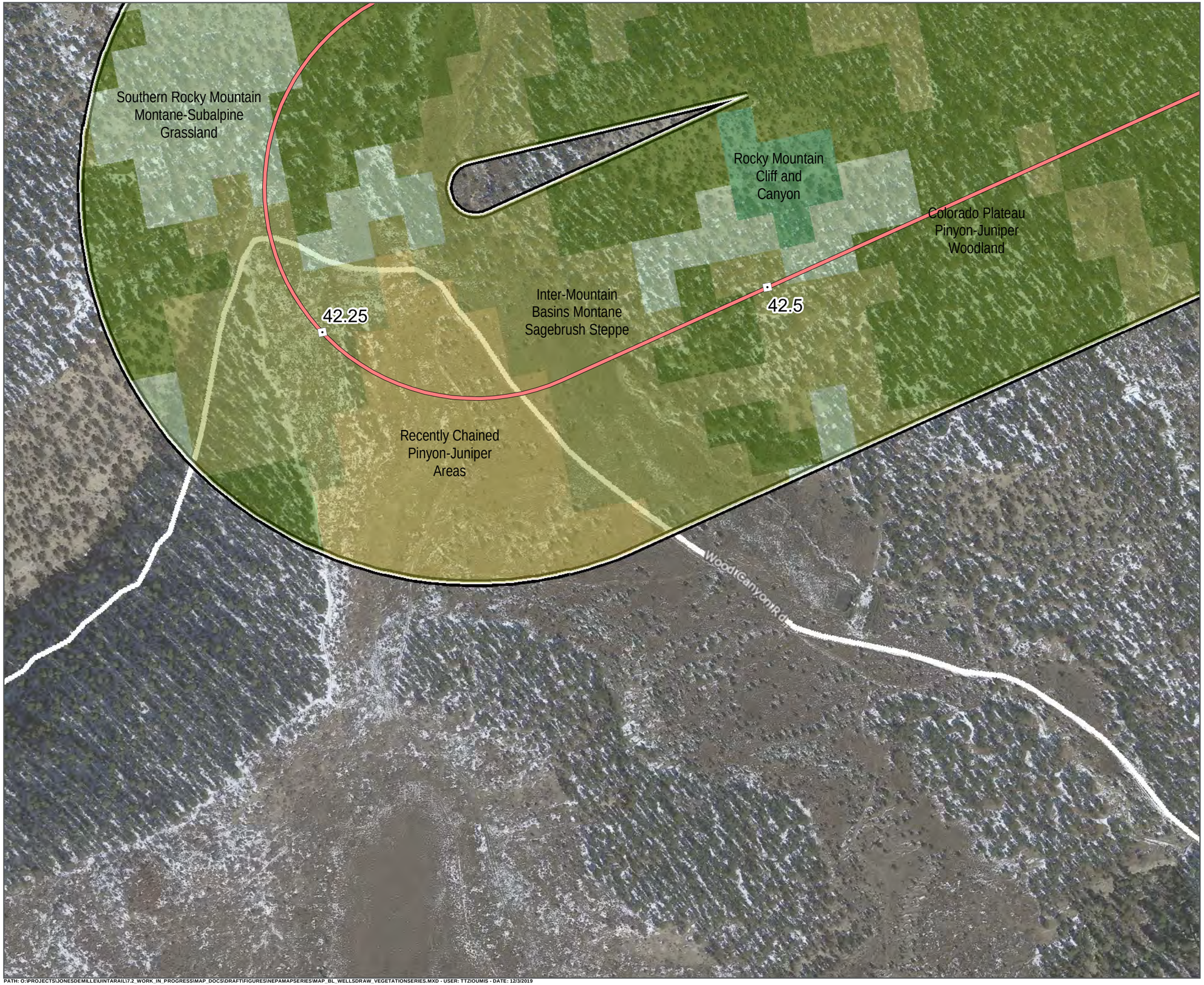

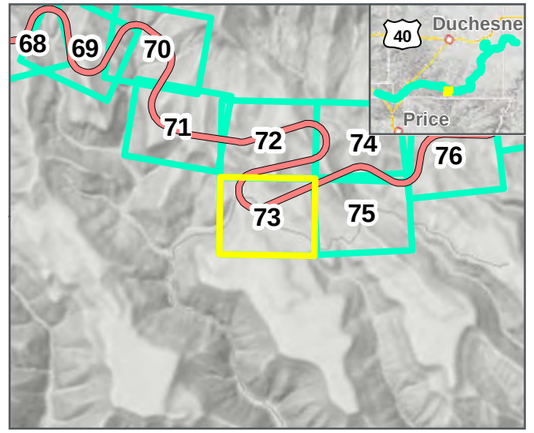

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Recently Chained Pinyon-Juniper Areas
- Rocky Mountain Cliff and Canyon
- Southern Rocky Mountain Montane-Subalpine Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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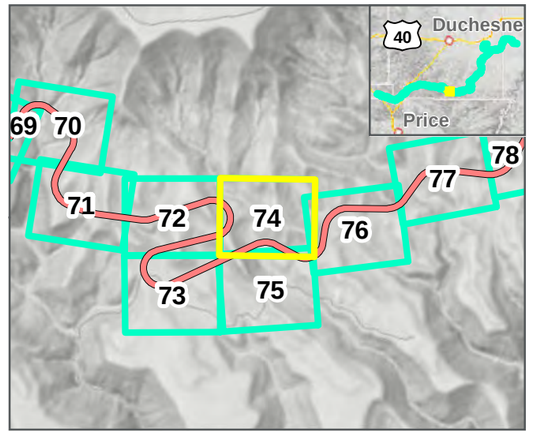

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
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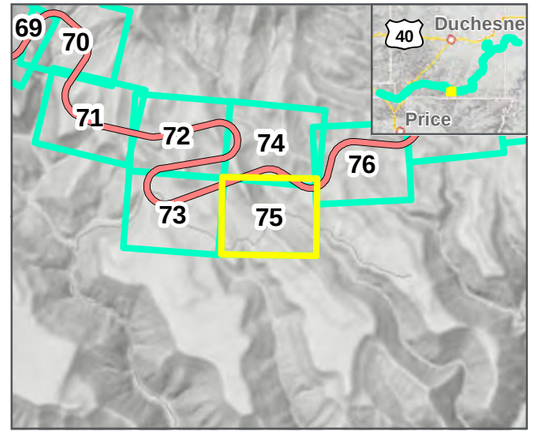

Photo Points

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Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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VEGETATION COMMUNITIES
SEPTEMBER 2019

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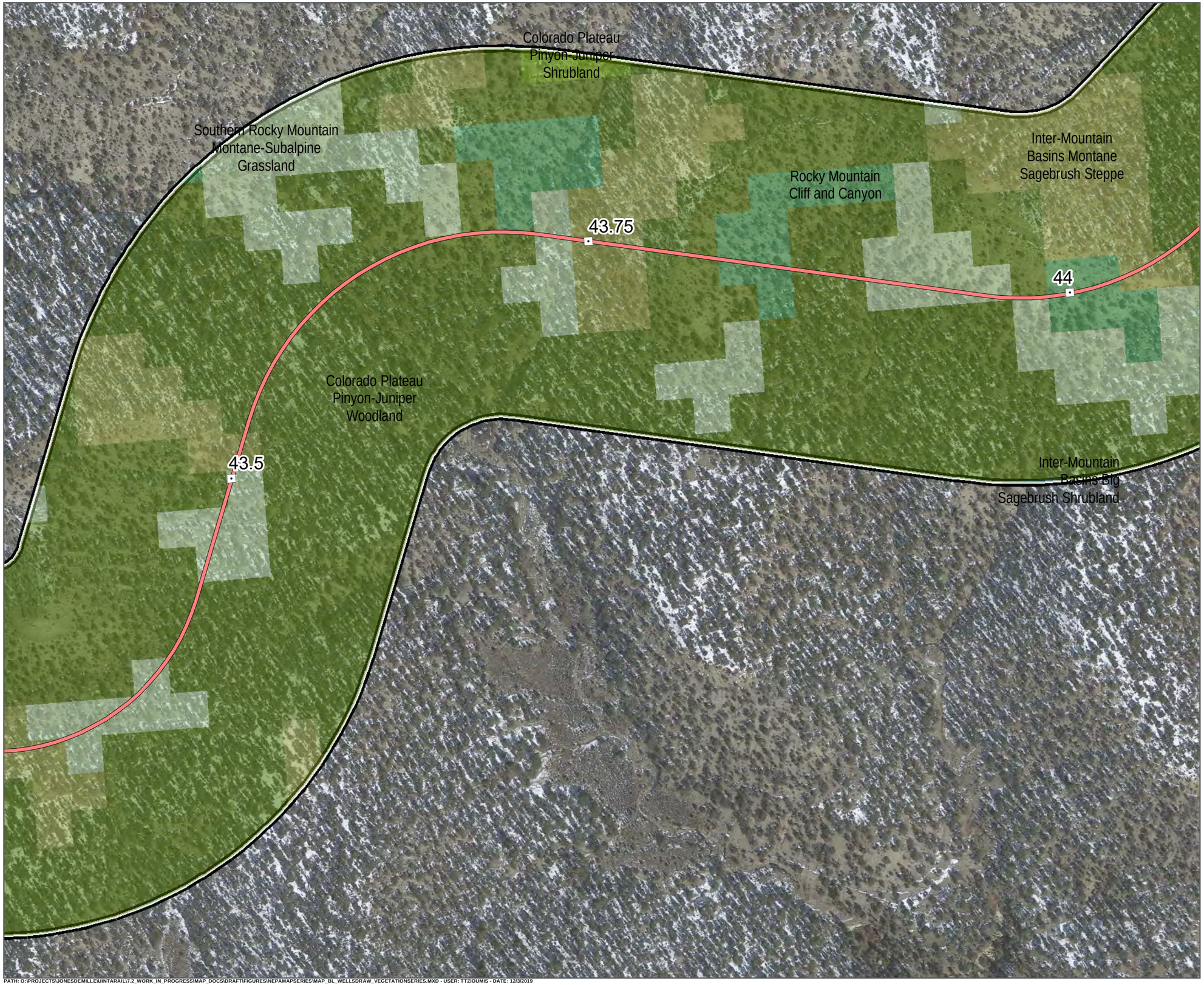

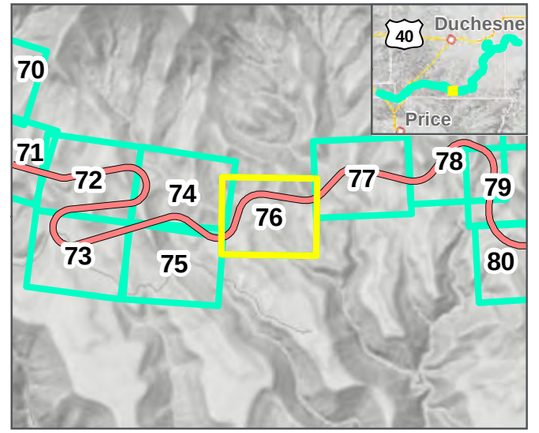

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Study Area

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Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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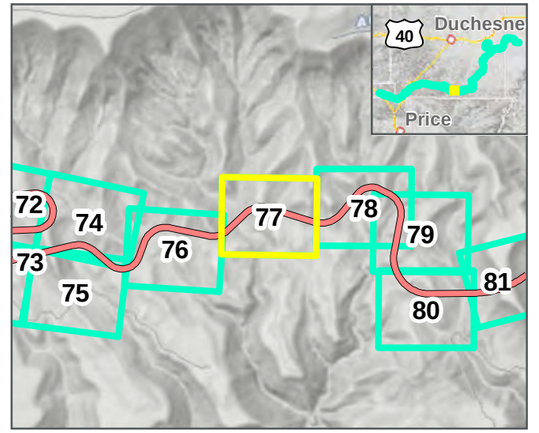

- Photo Points
- Milepost
- Wells Draw Centerline
- Study Area
- Map Extent (current view in yellow)

Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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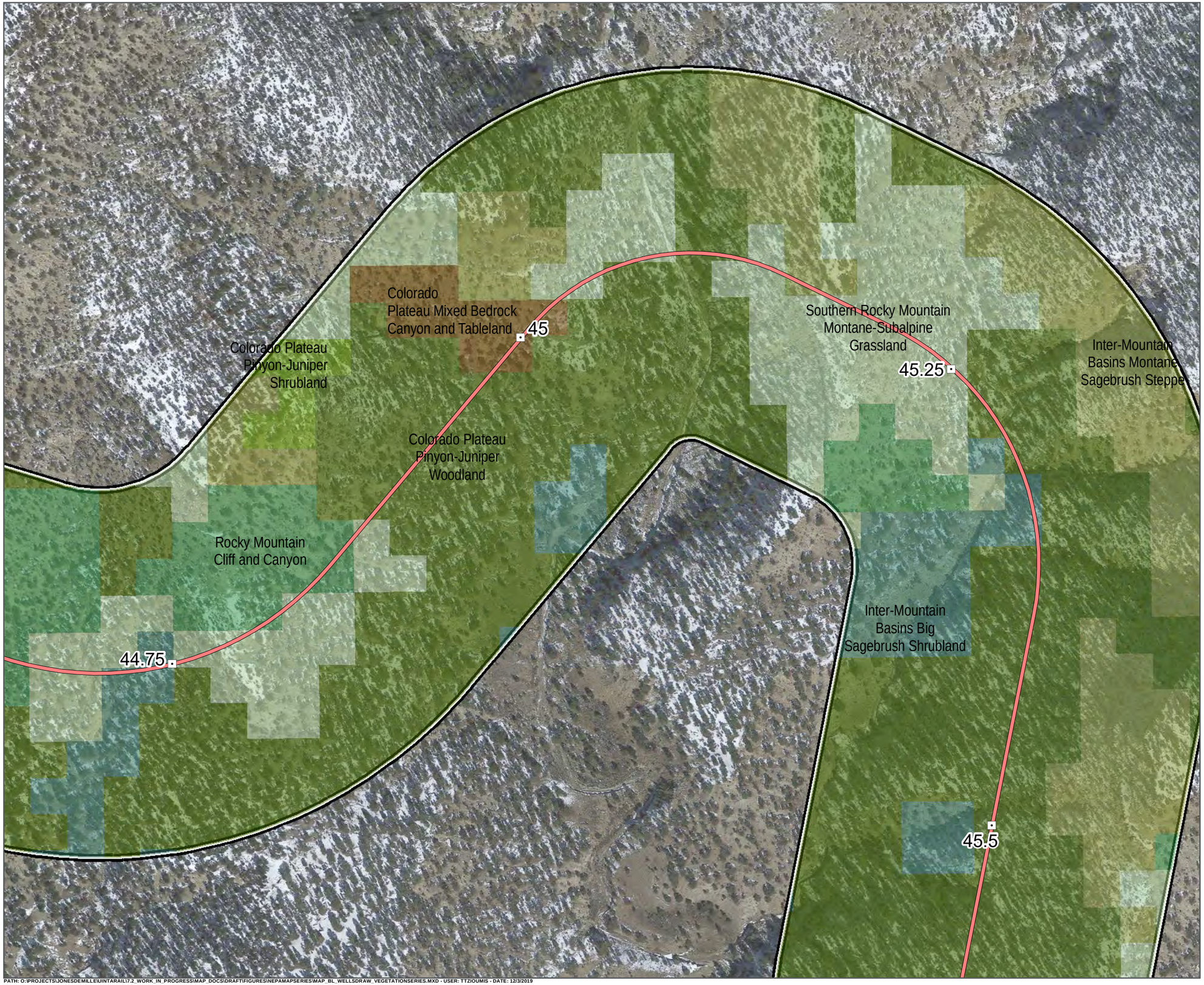

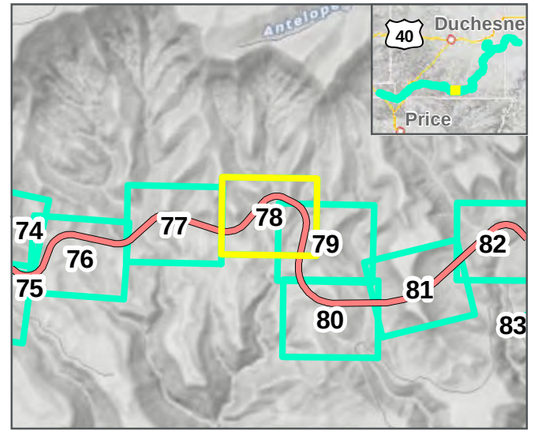

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Wells Draw Centerline
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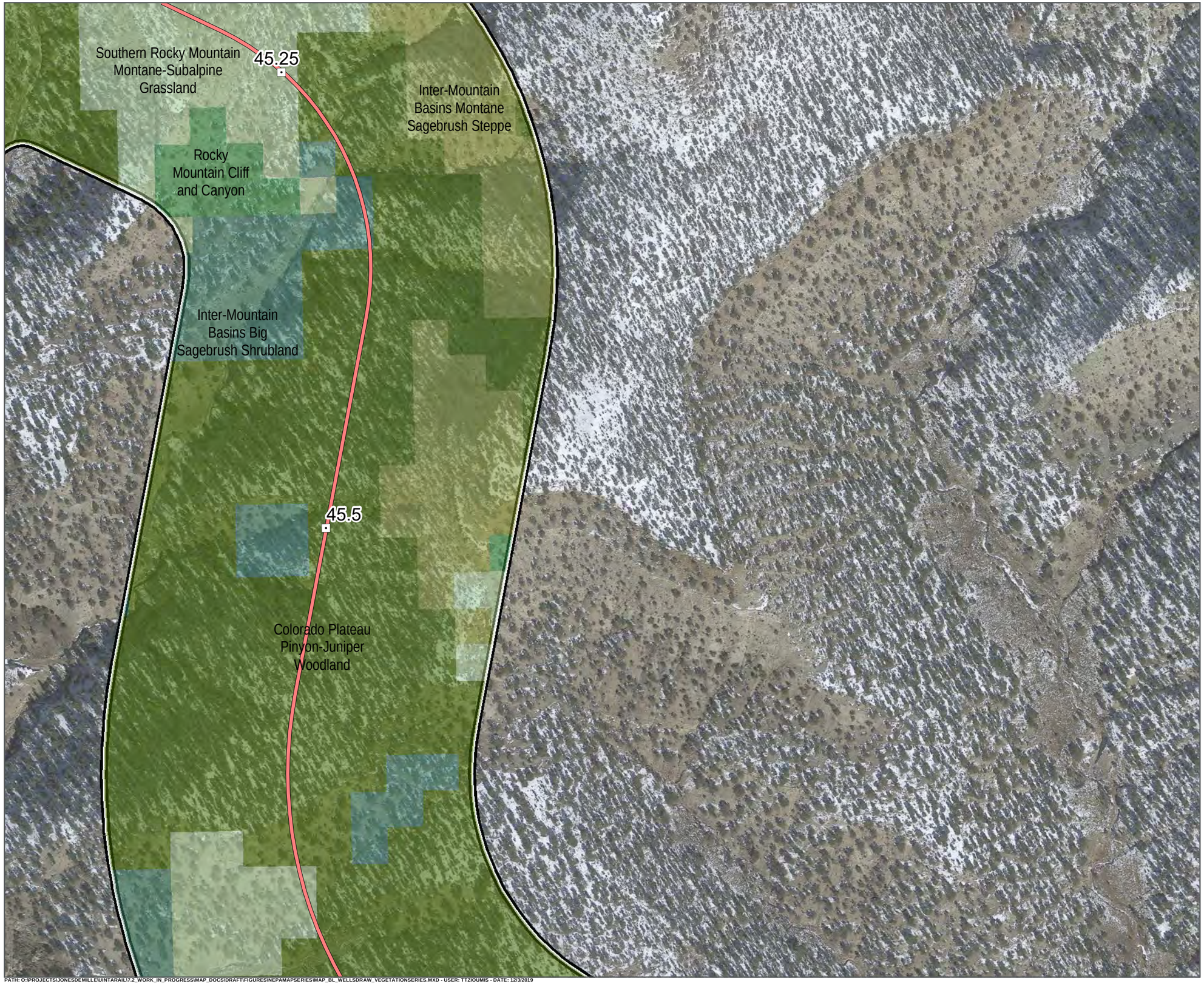

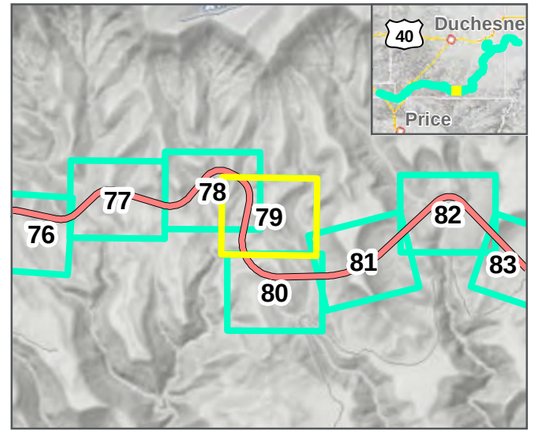

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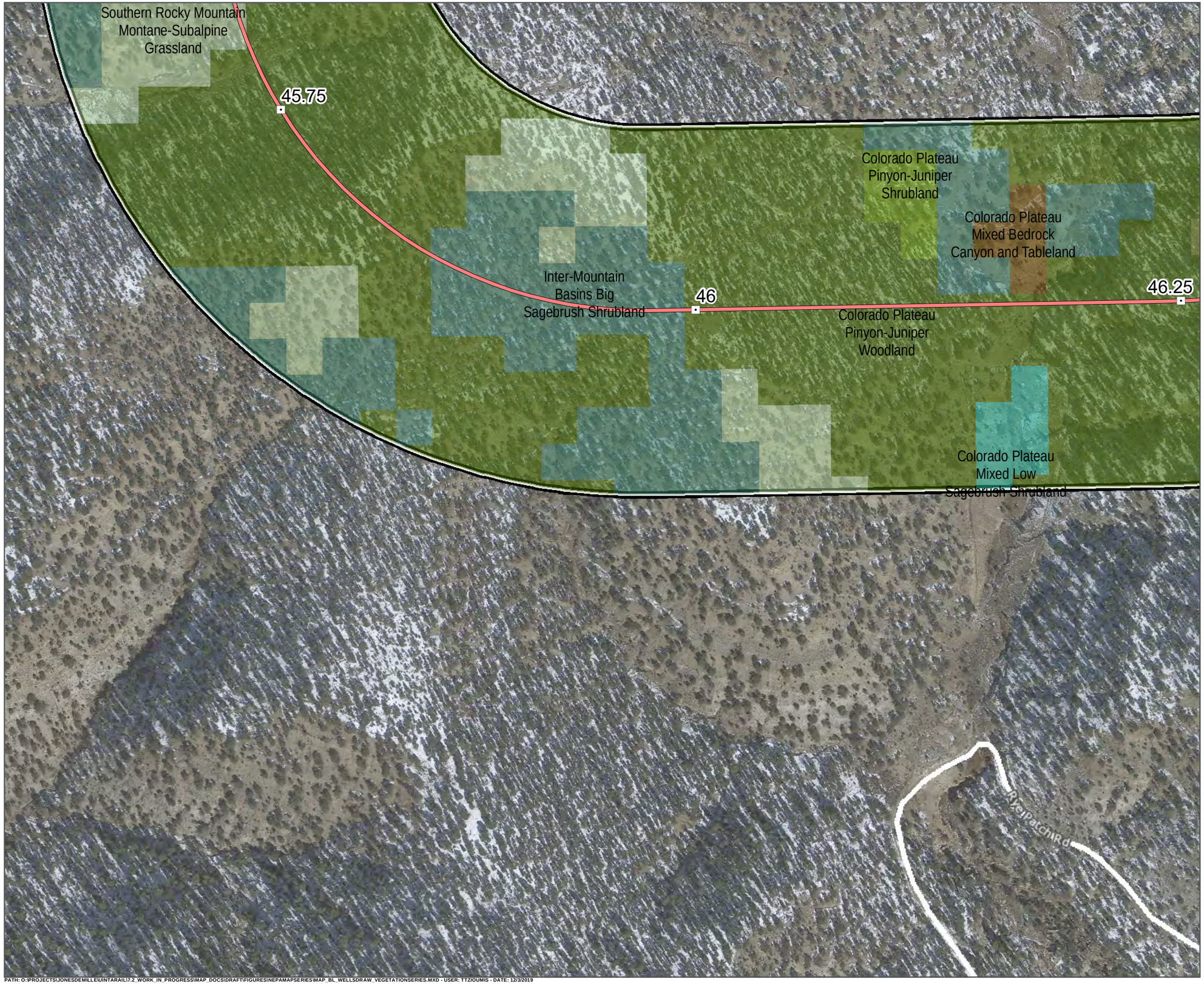

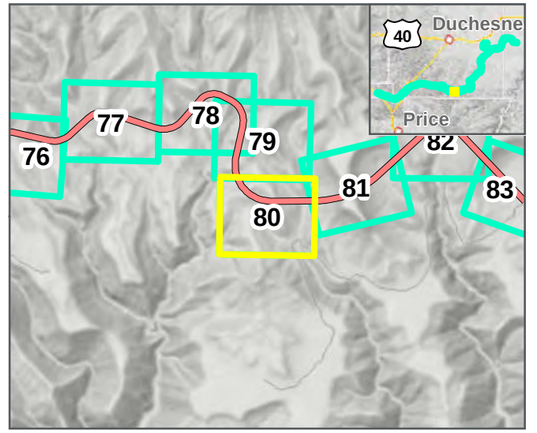

Photo Points
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Wells Draw Centerline
Study Area
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Vegetation Communities

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SEPTEMBER 2019

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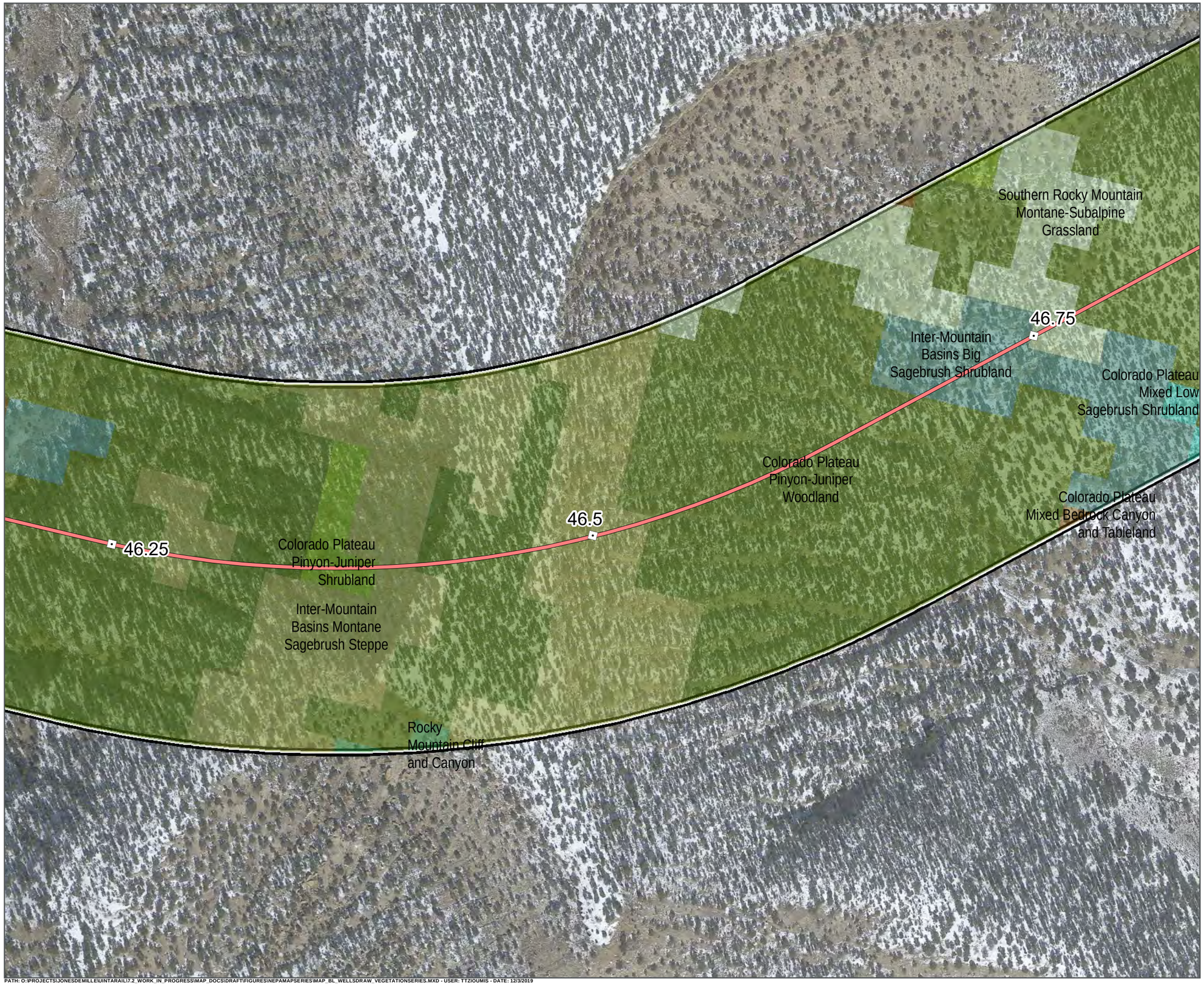

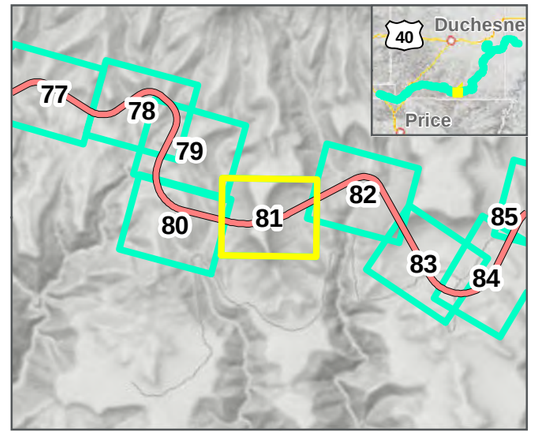

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Vegetation Communities

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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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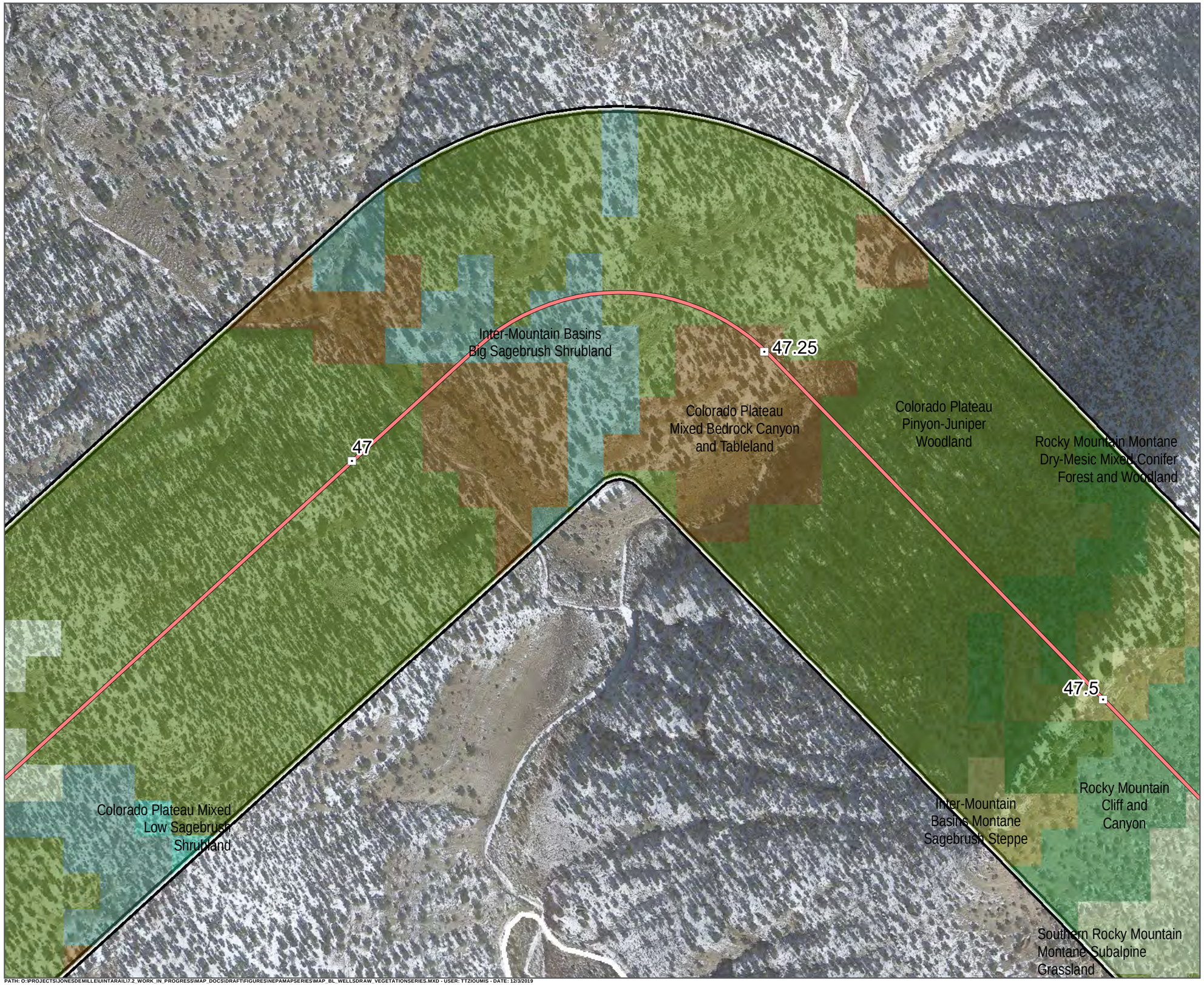

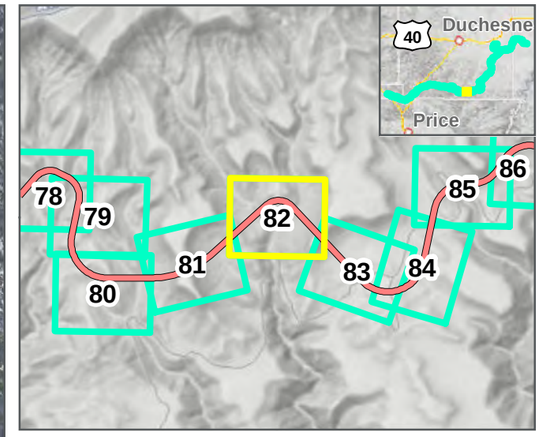

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Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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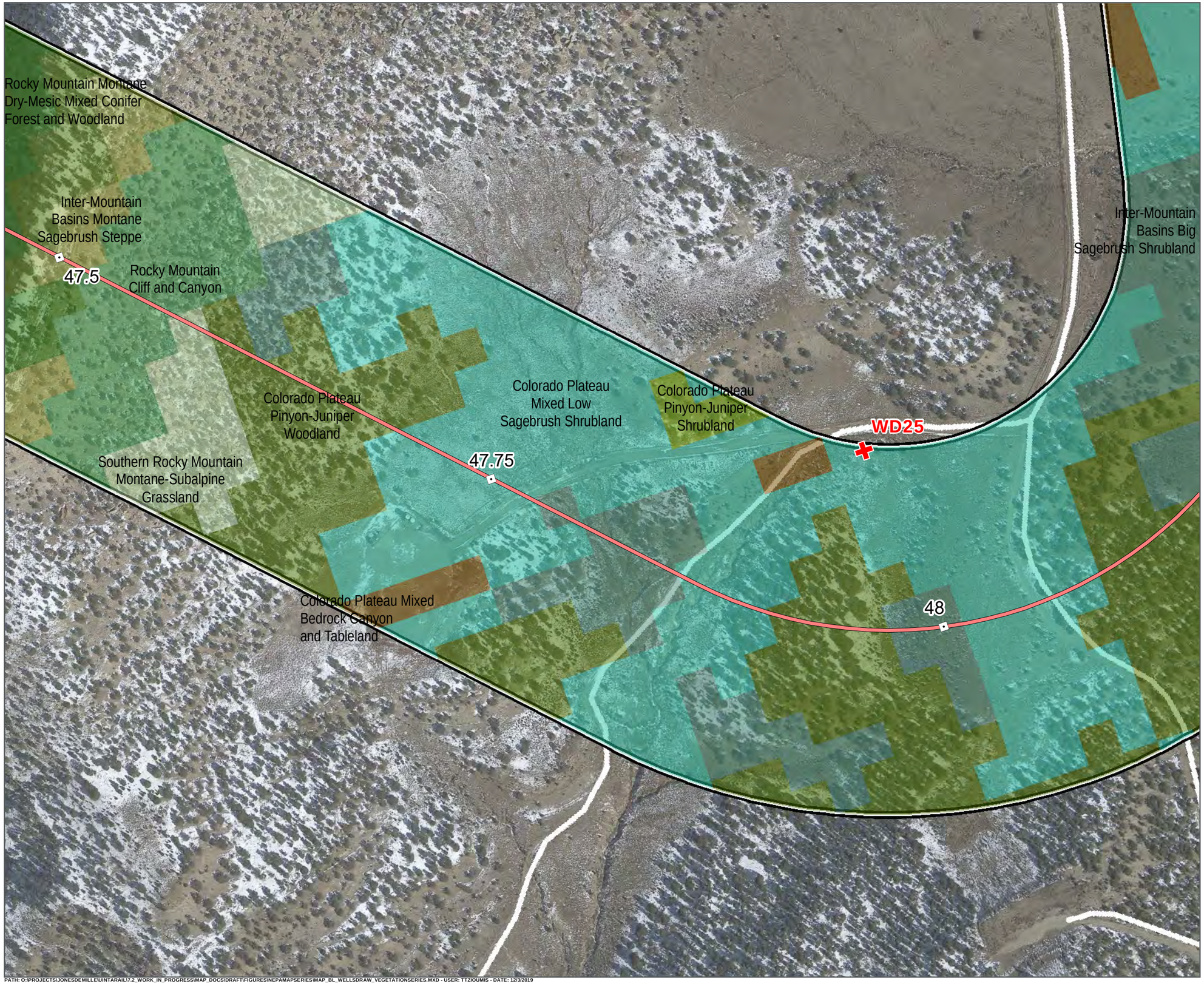

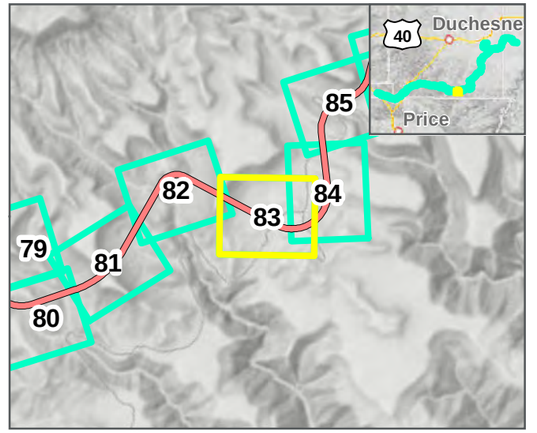

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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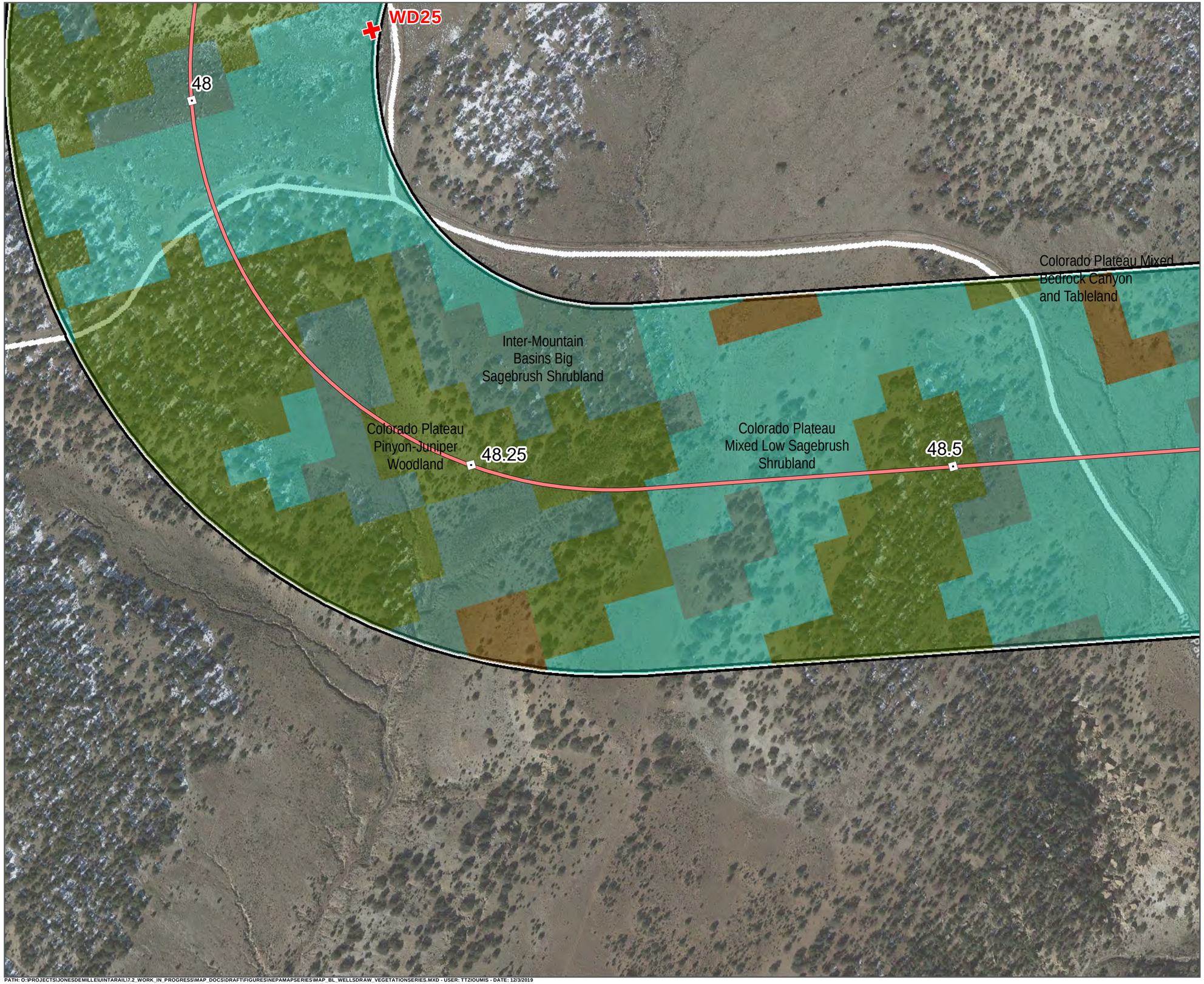

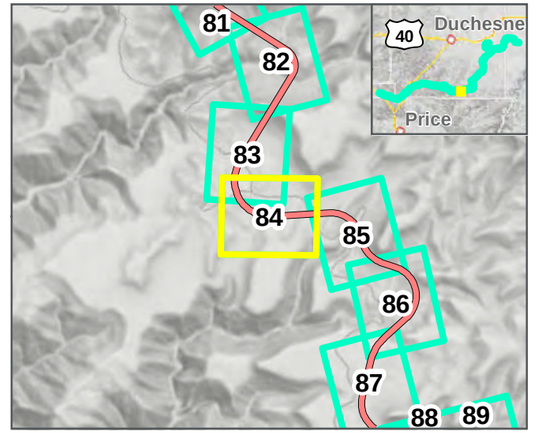

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Vegetation Communities

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SEPTEMBER 2019

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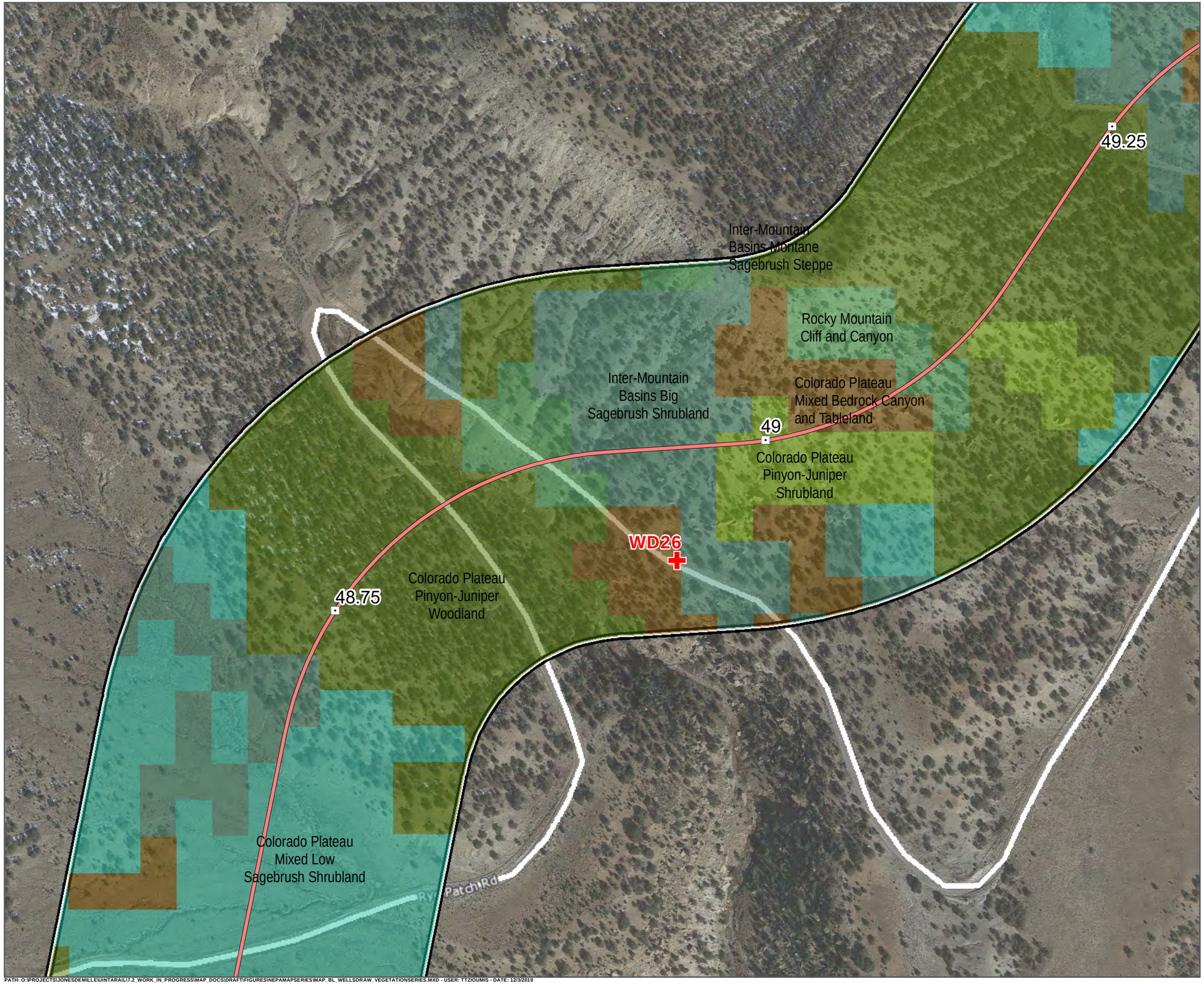

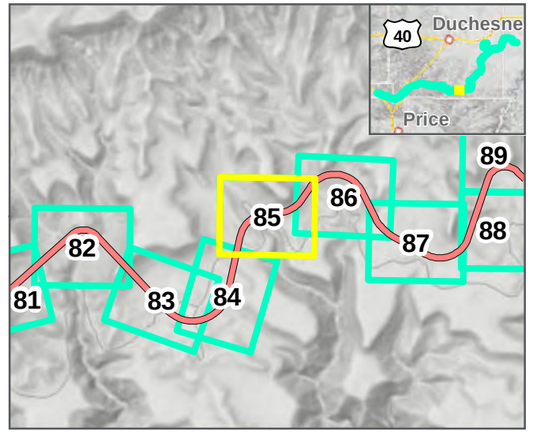

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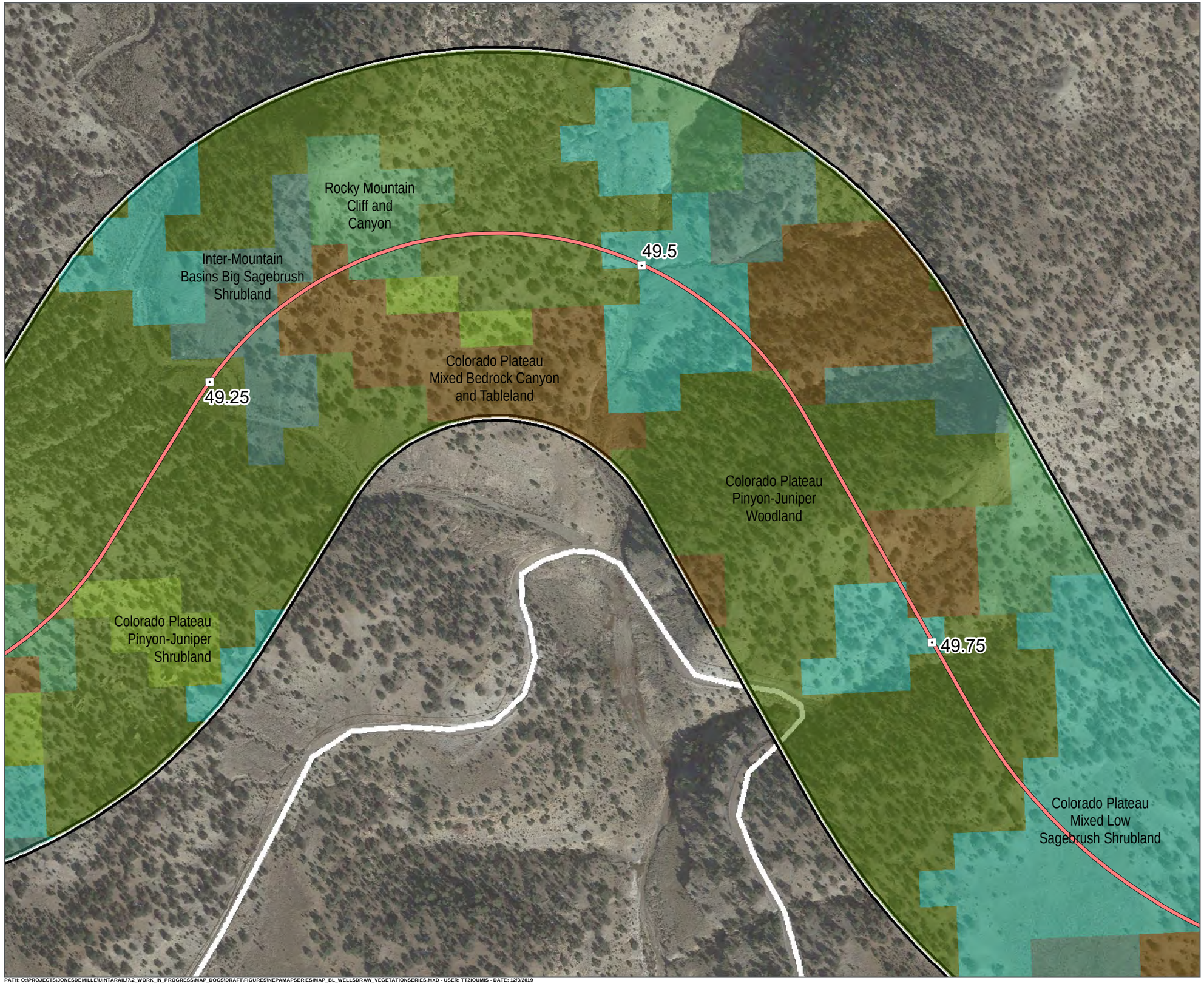

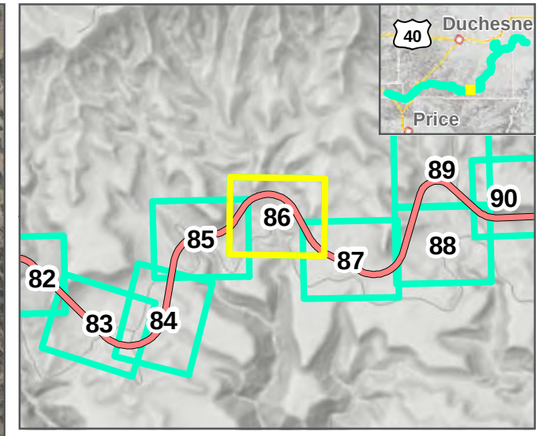

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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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Colorado Plateau
Mixed Bedrock
Canyon and Tableland

49.75

Colorado Plateau
Mixed Low Sagebrush
Shrubland

50

Inter-Mountain
Basins Big
Sagebrush Shrubland

WD27

50.25

Colorado Plateau
Pinyon-Juniper
Shrubland

Colorado Plateau
Pinyon-Juniper
Woodland

Rocky
Mountain Cliff
and Canyon

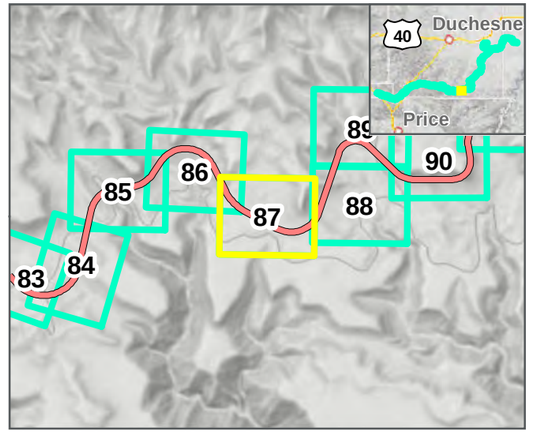

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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- Rocky Mountain Cliff and Canyon

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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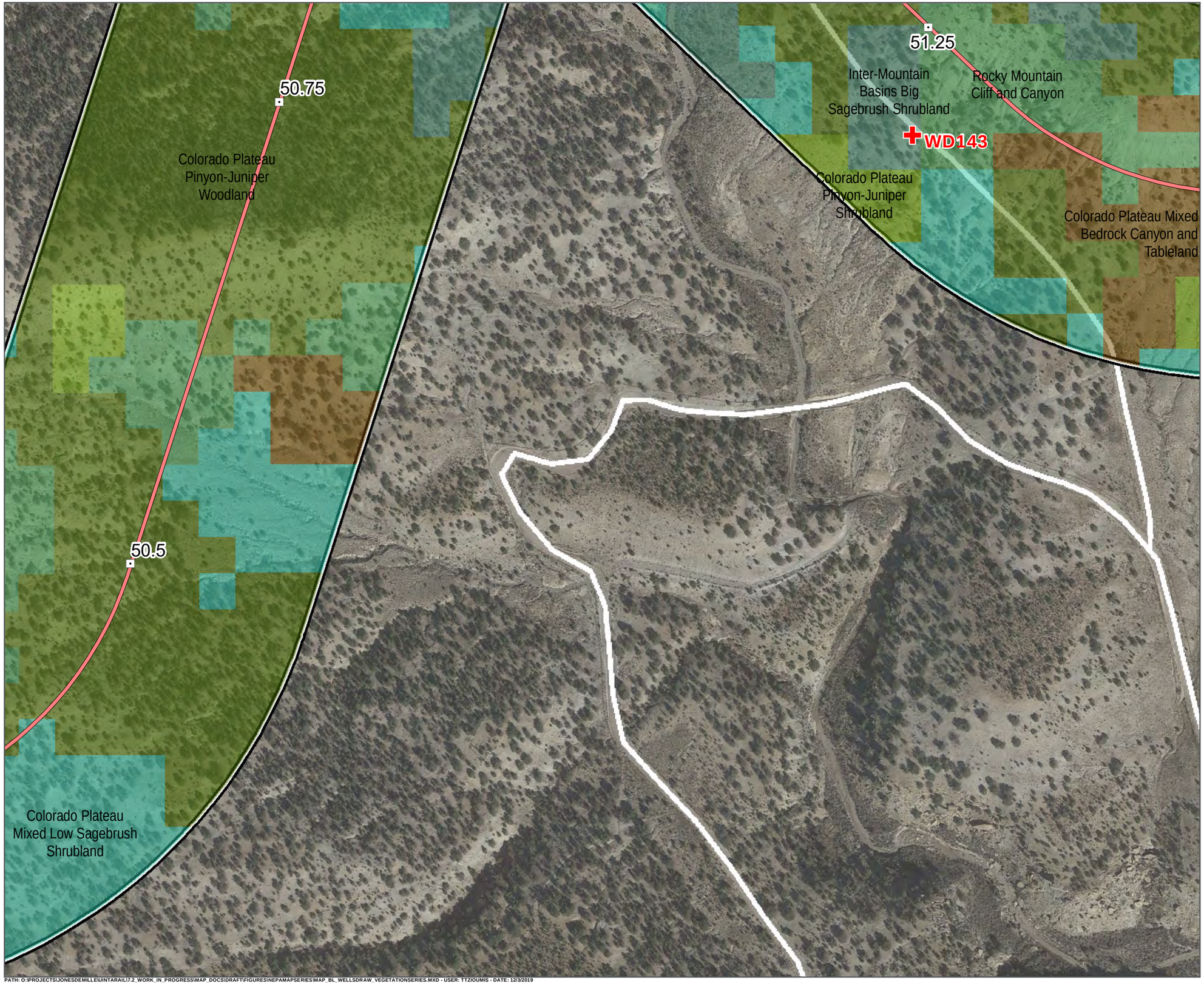

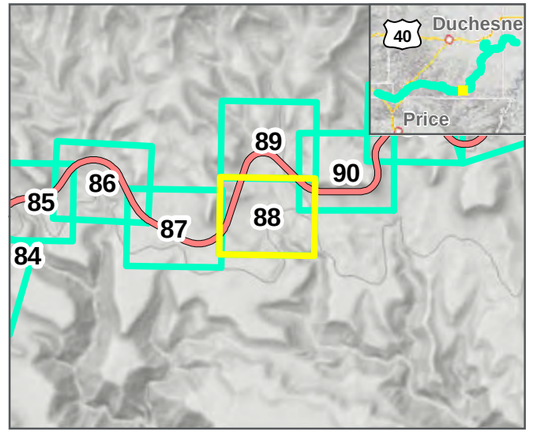

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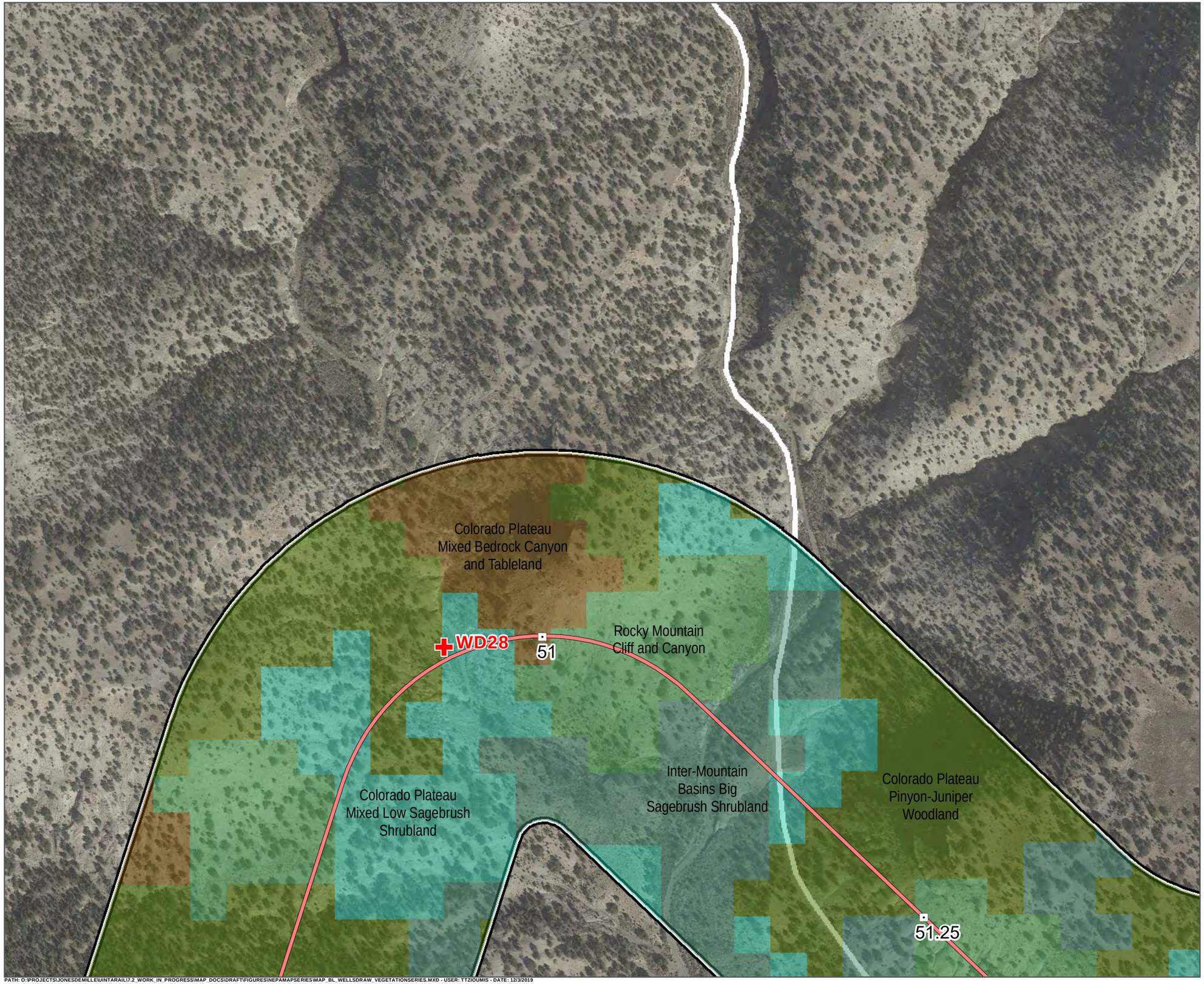

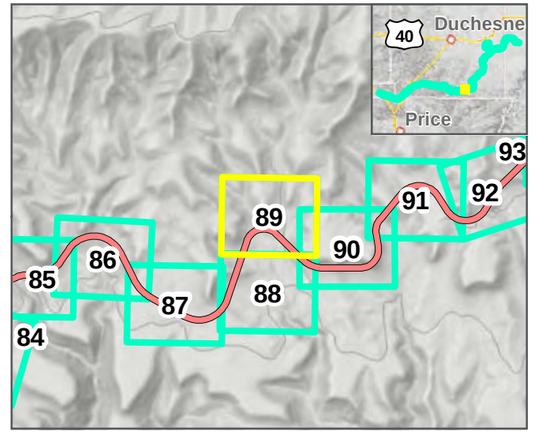

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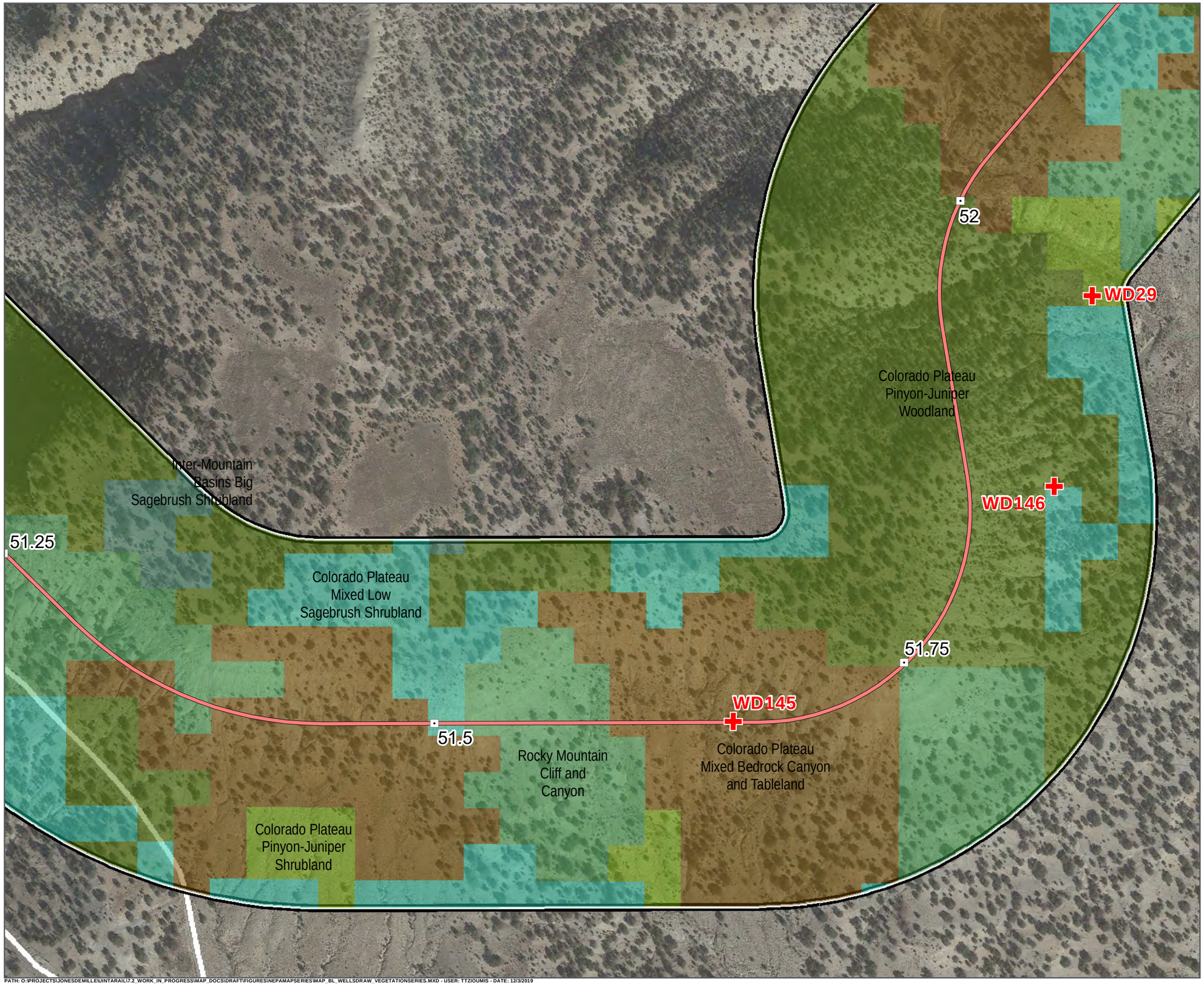

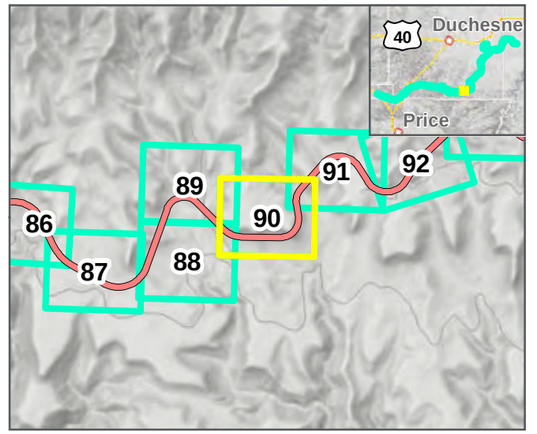

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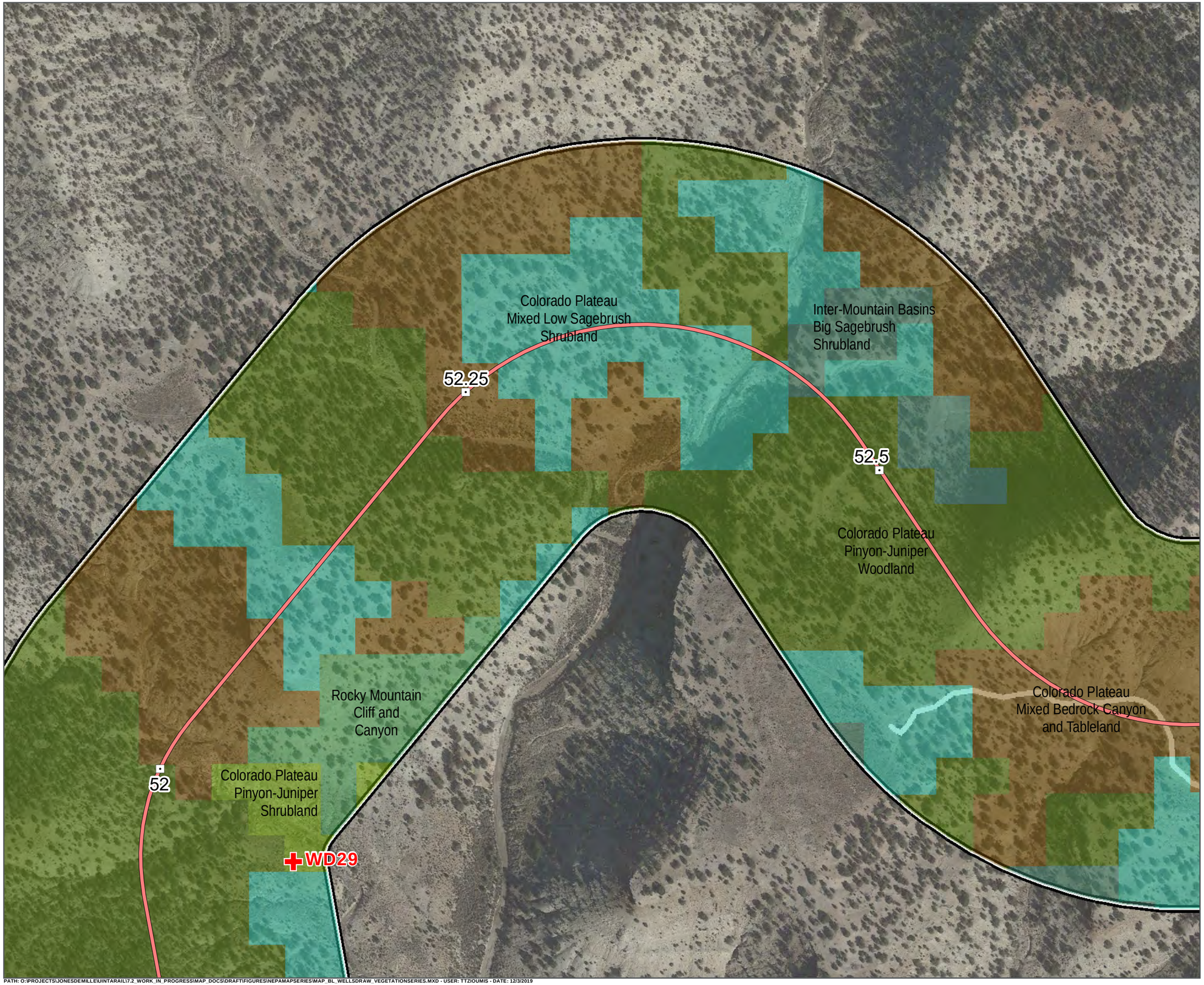

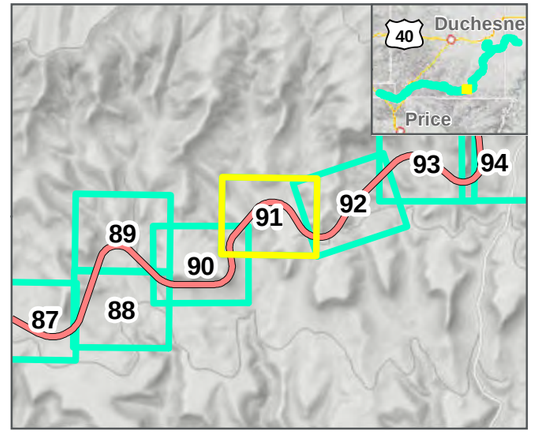

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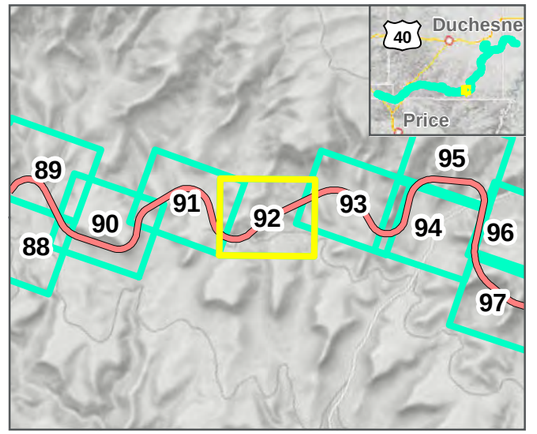

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VEGETATION COMMUNITIES
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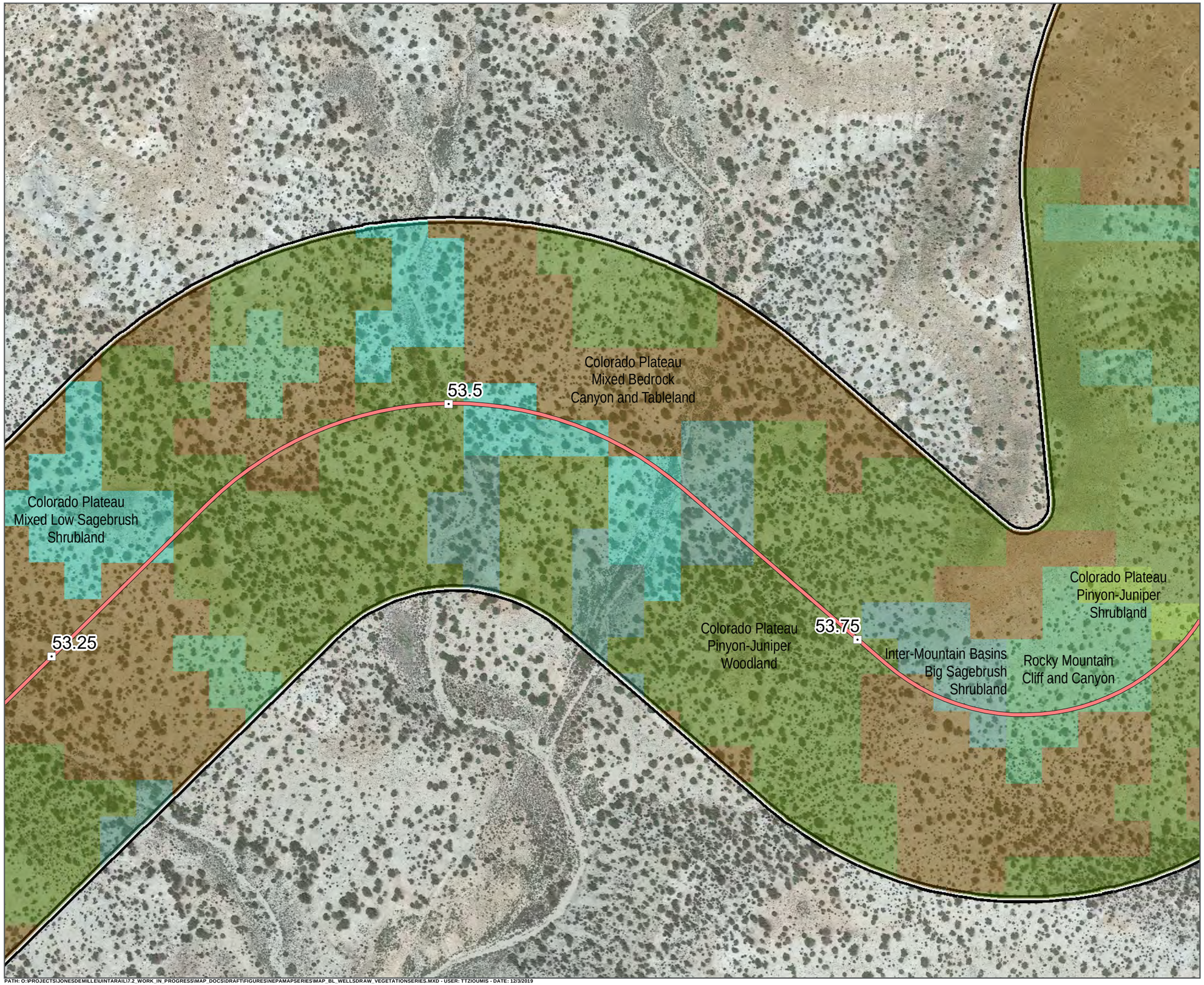

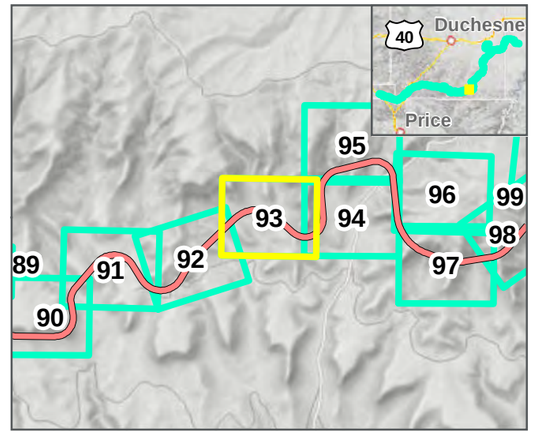

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SEPTEMBER 2019

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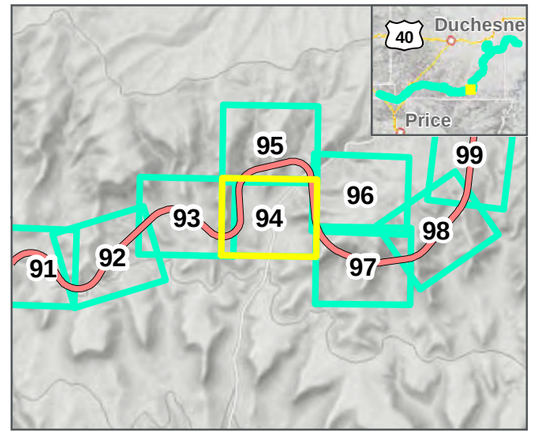

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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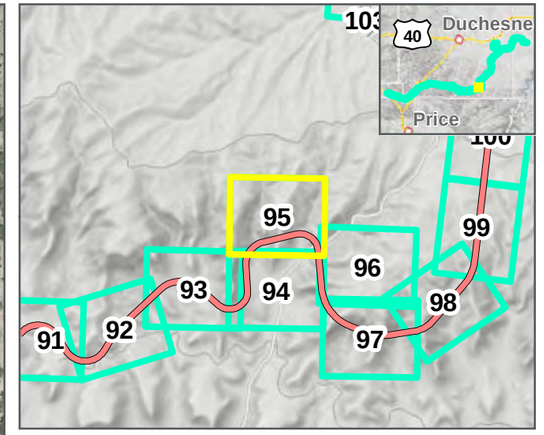

Photo Points

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Study Area

Map Extent (current view in yellow)

Vegetation Communities

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- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Rocky Mountain Cliff and Canyon

WD161

Colorado Plateau Mixed Bedrock Canyon and Tableland

WD160

54.5

54.75

Colorado Plateau Pinyon-Juniper Woodland

54.25

WD159

Rocky Mountain Cliff and Canyon

Colorado Plateau Mixed Low Sagebrush Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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Basemap (2013-2015)
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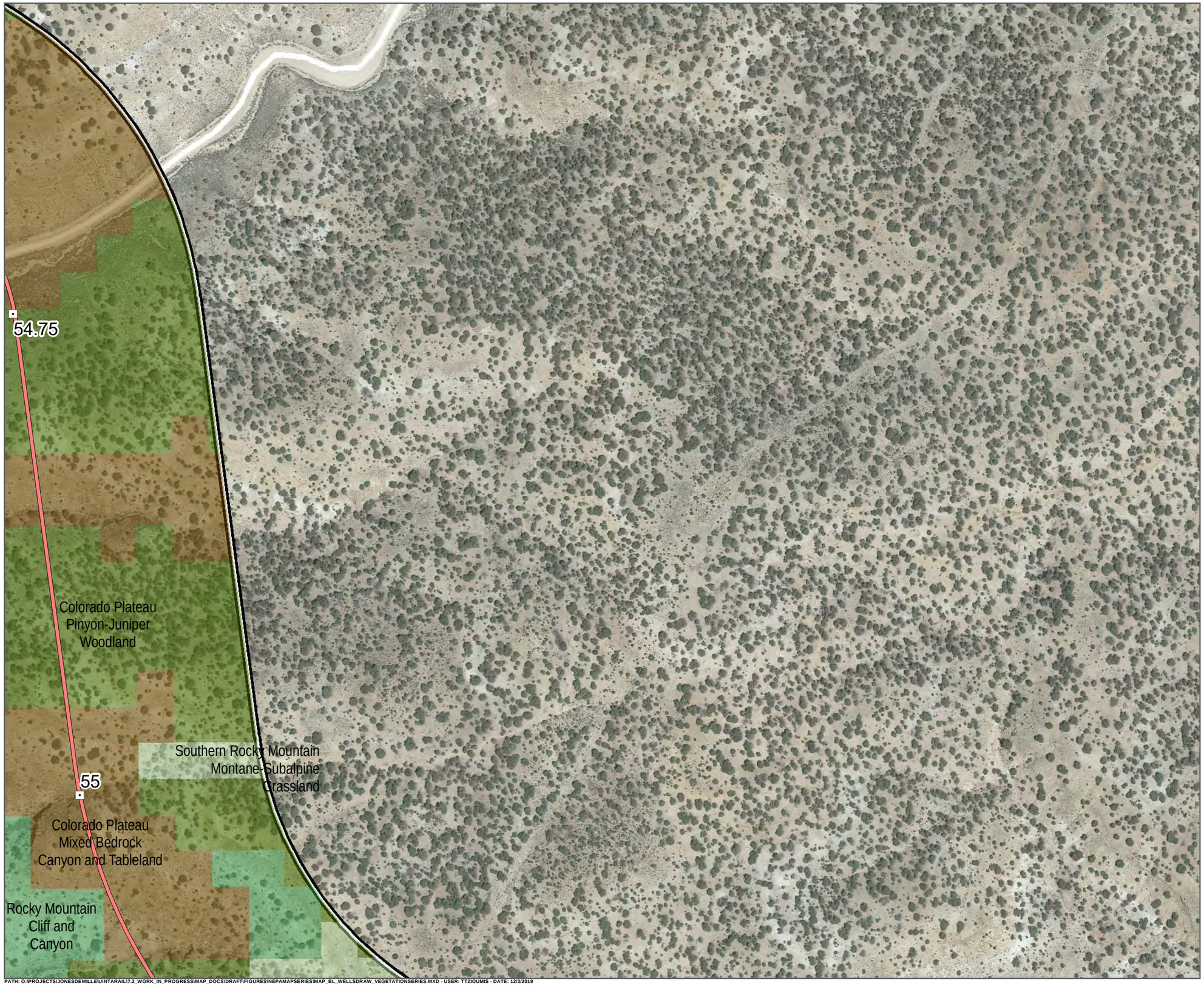

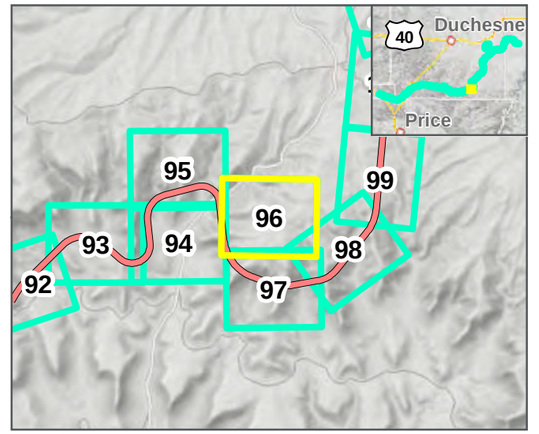

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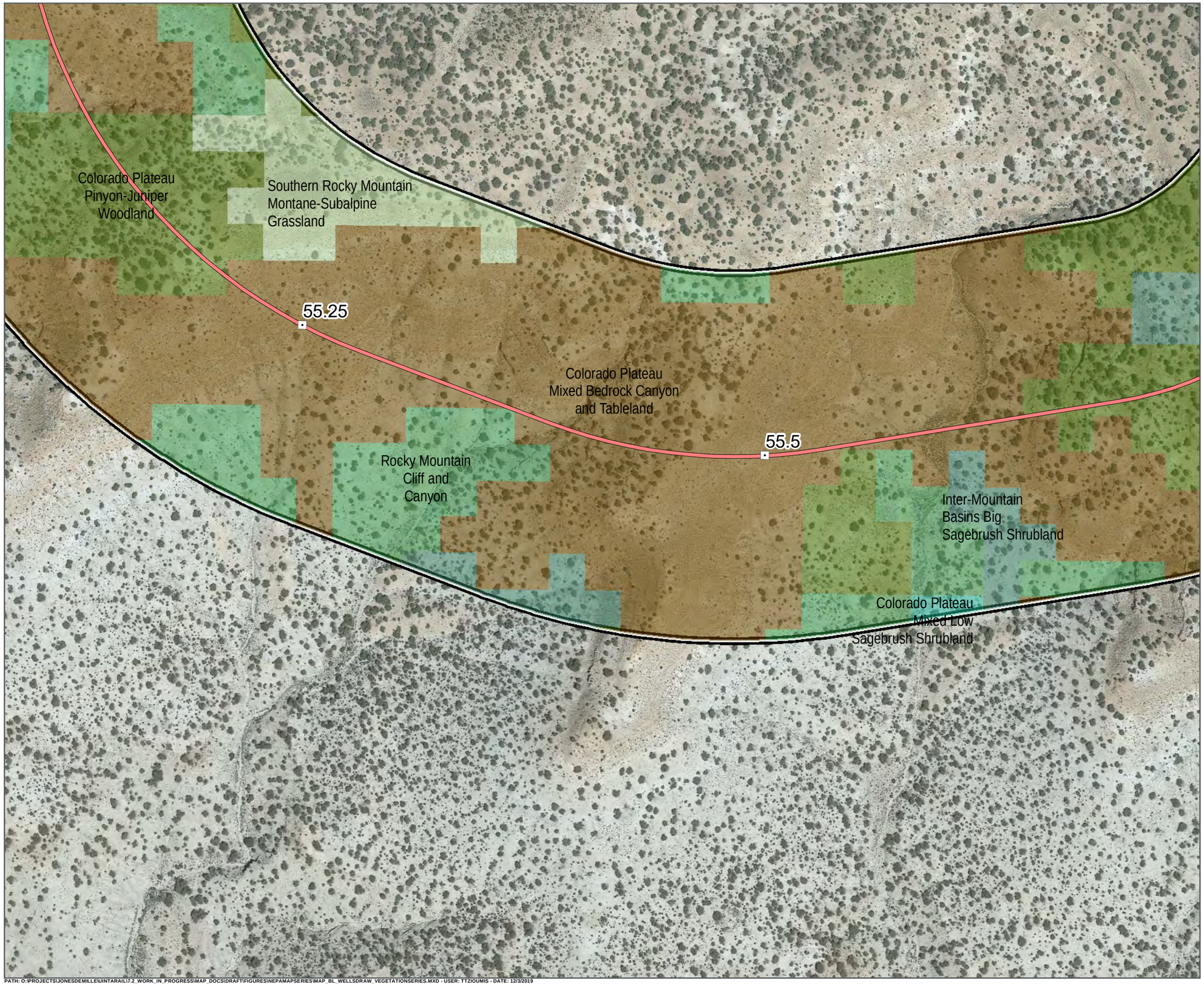

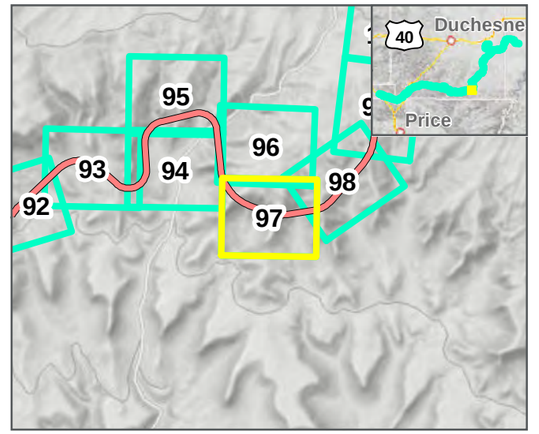

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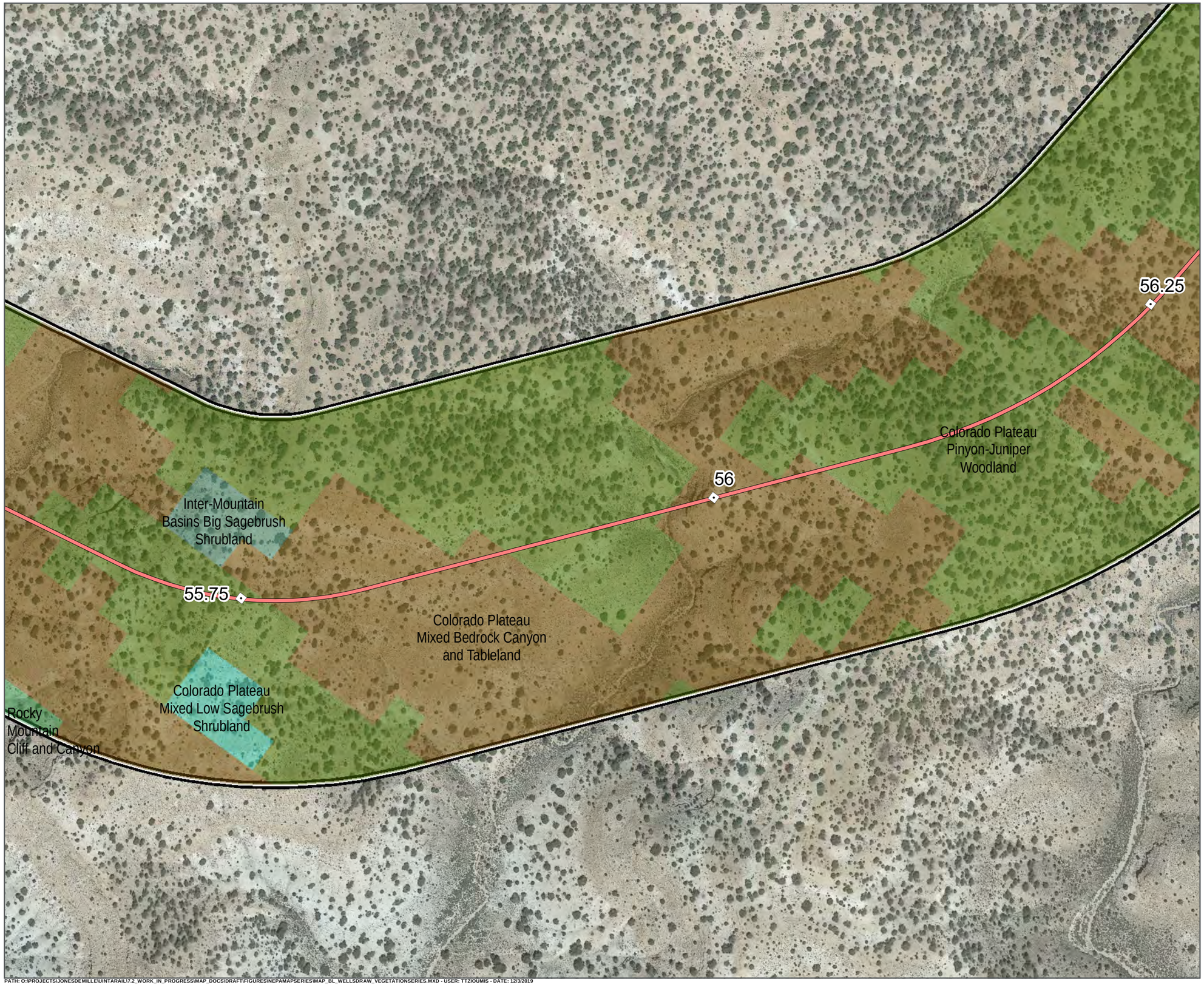

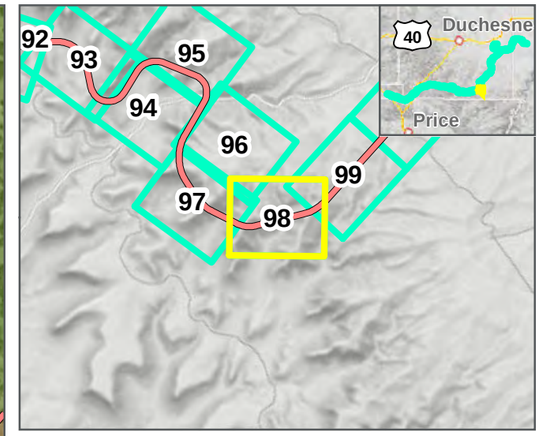

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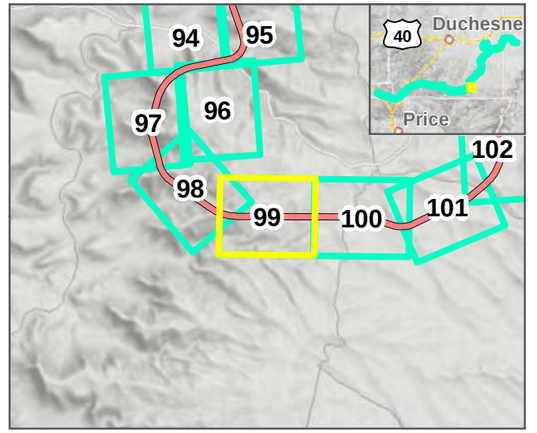

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Vegetation Communities

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- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

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SEPTEMBER 2019

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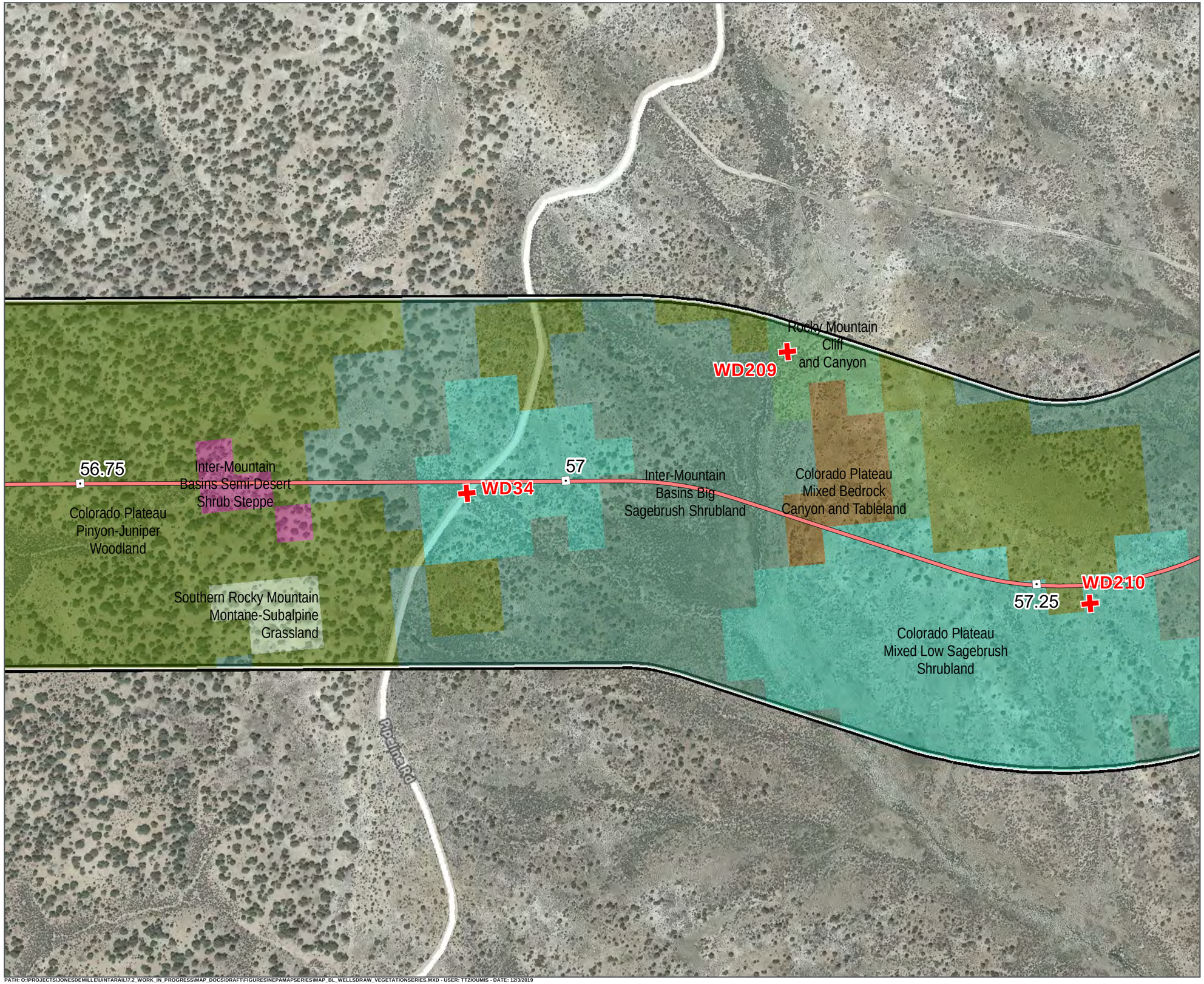

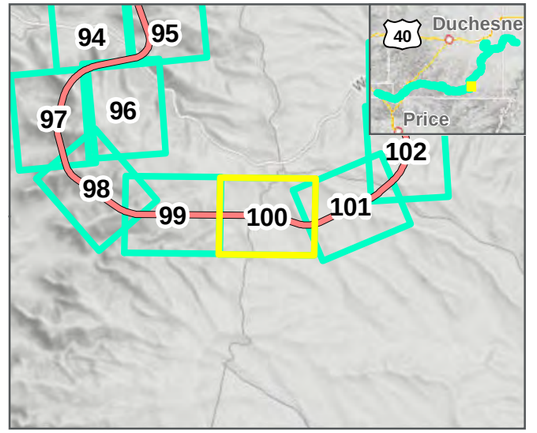

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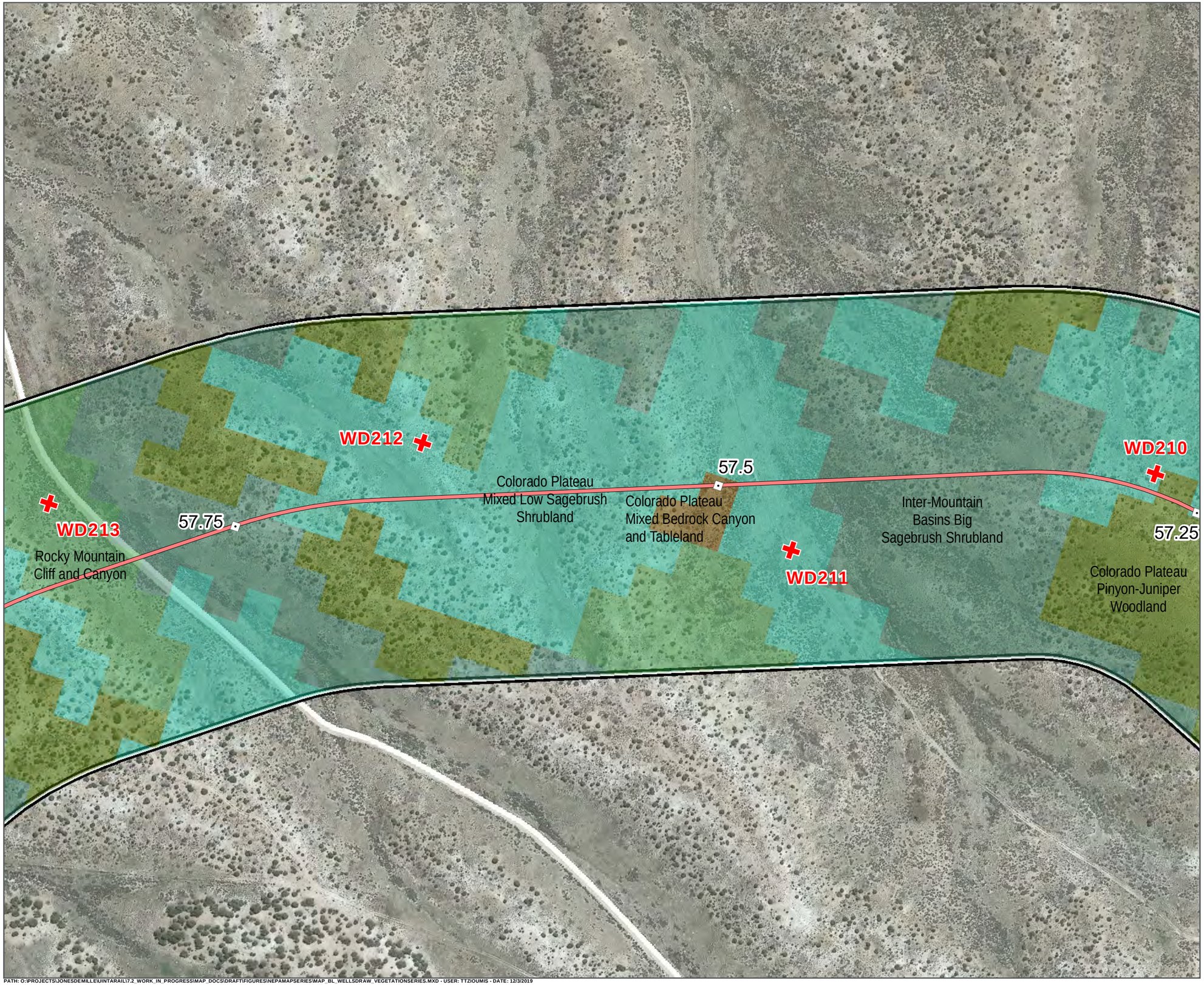

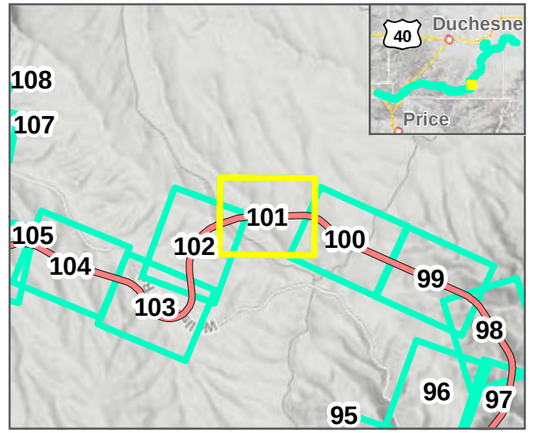

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Rocky Mountain Cliff and Canyon

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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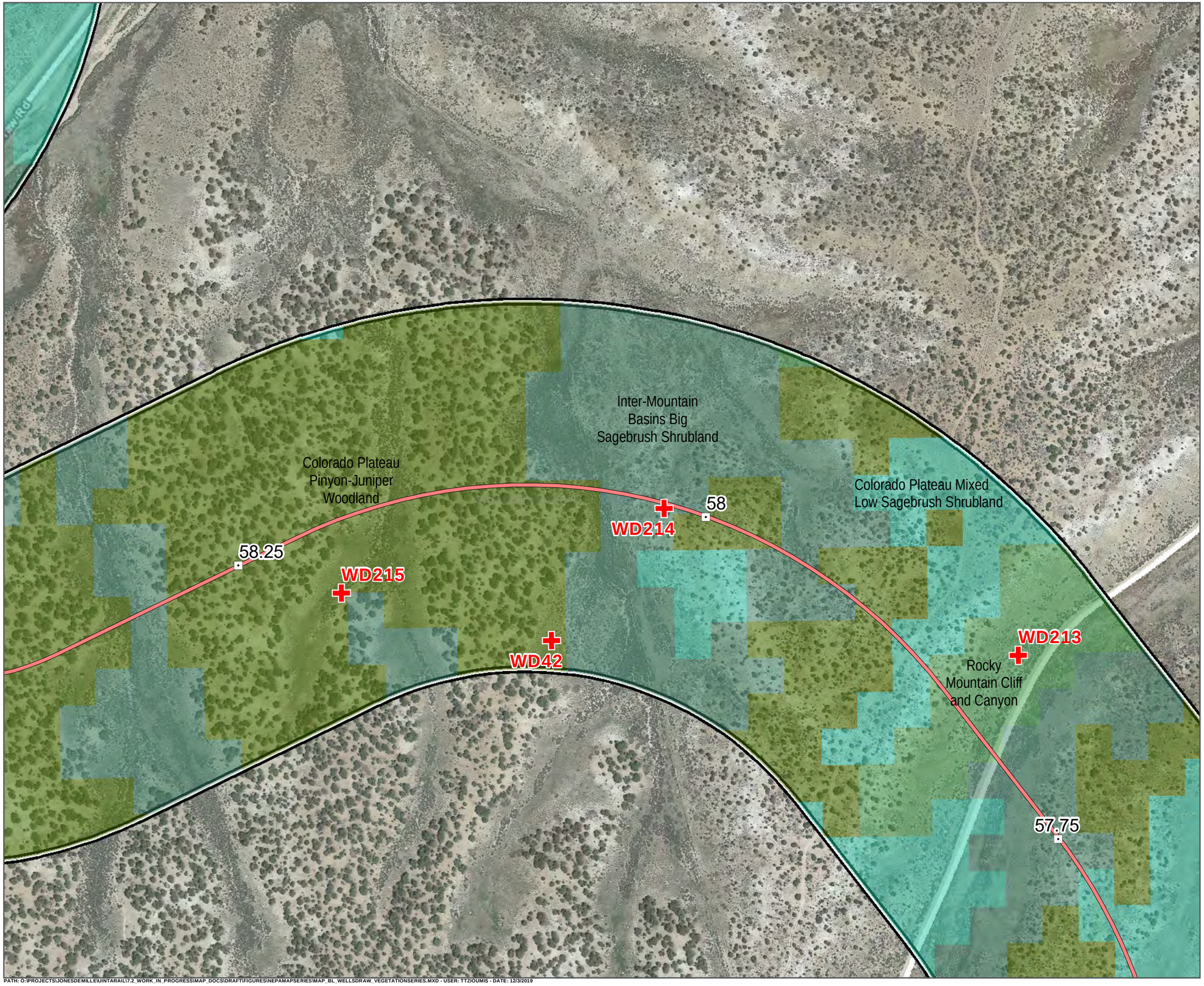

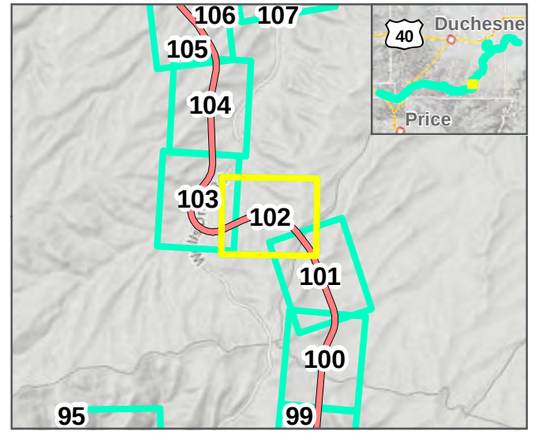

Photo Points

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Study Area

Map Extent (current view in yellow)

Vegetation Communities

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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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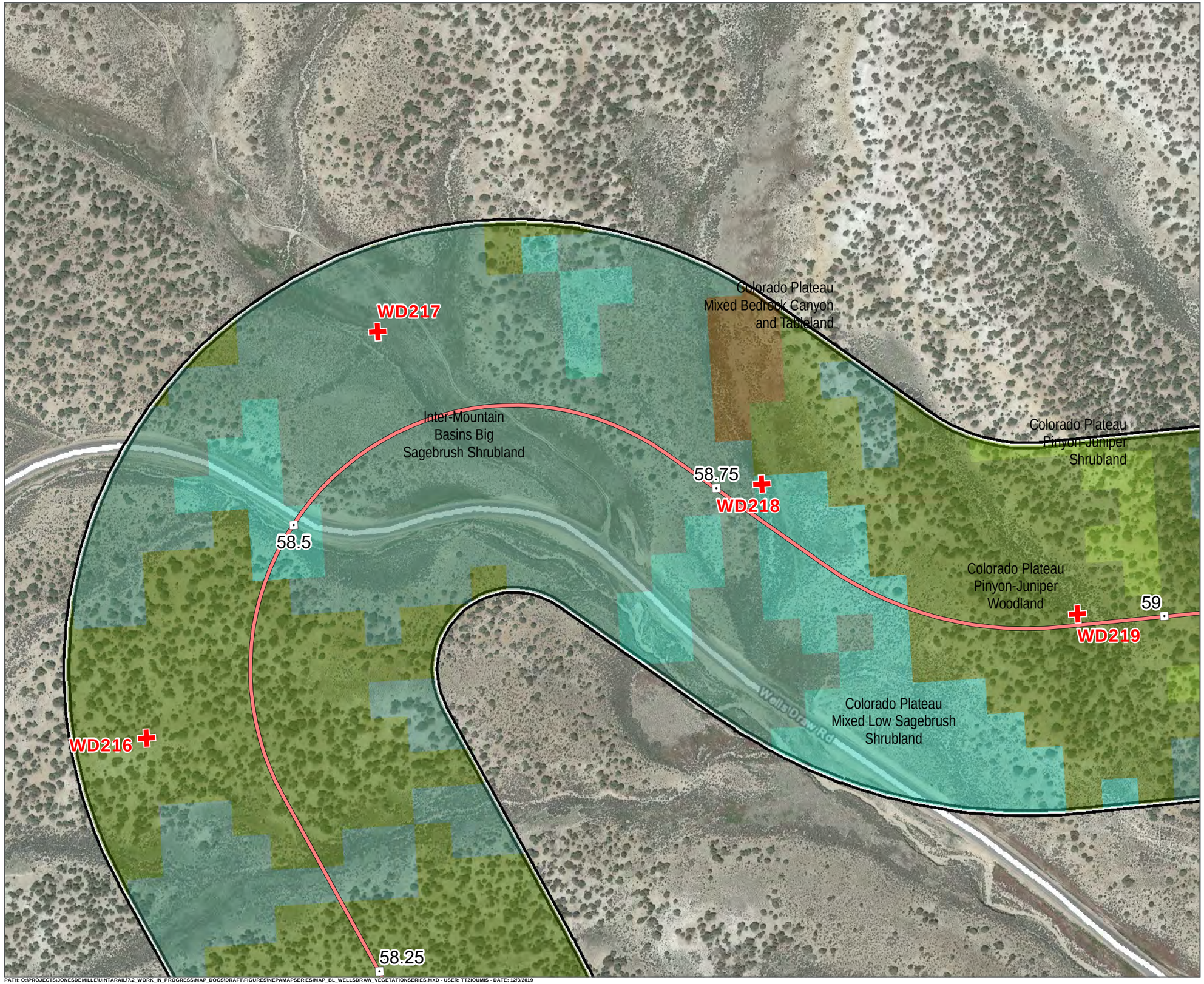

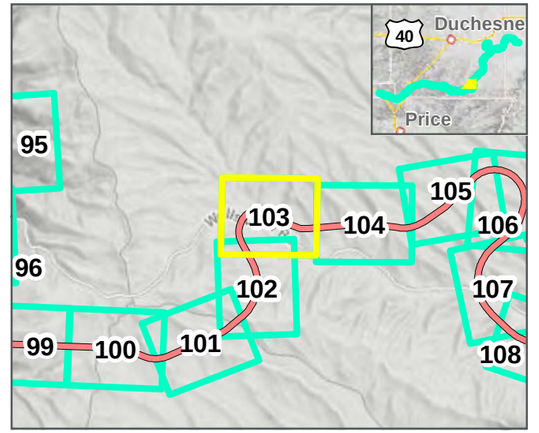

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Vegetation Communities

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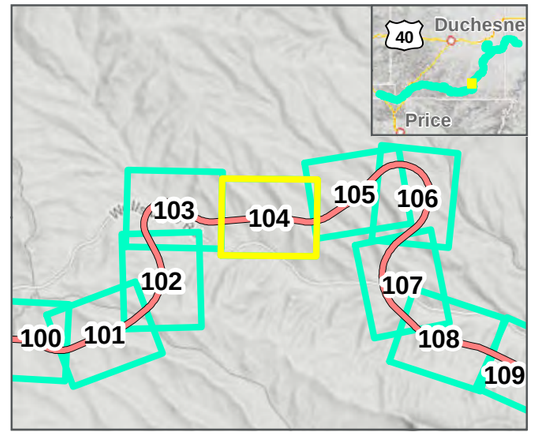

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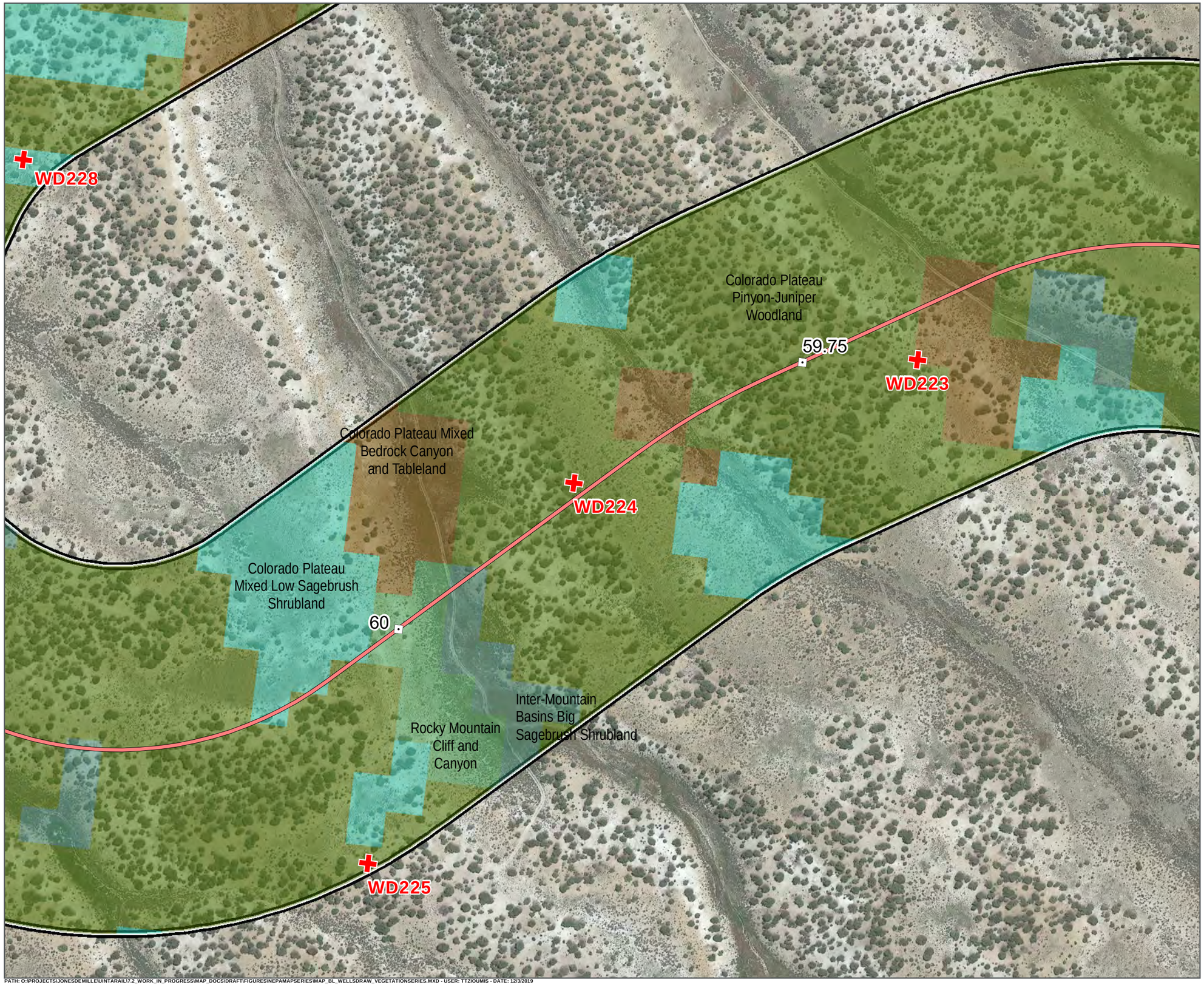

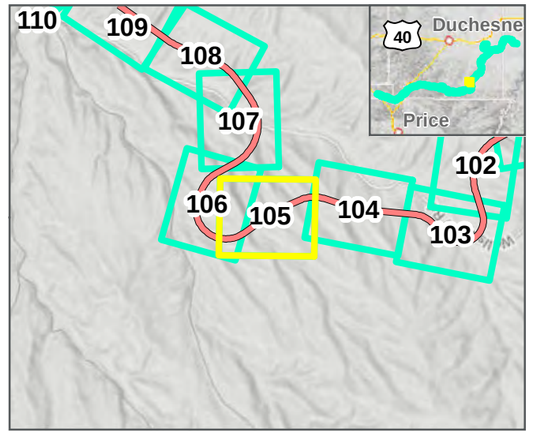

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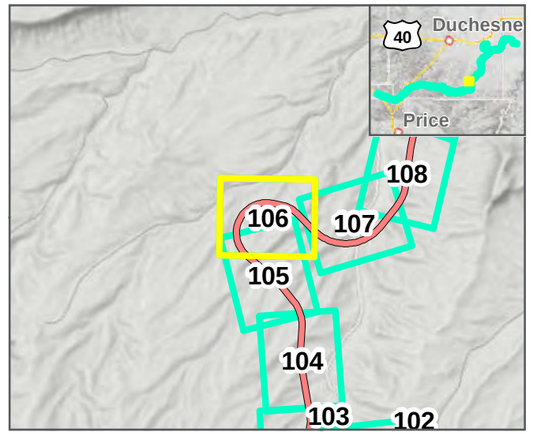

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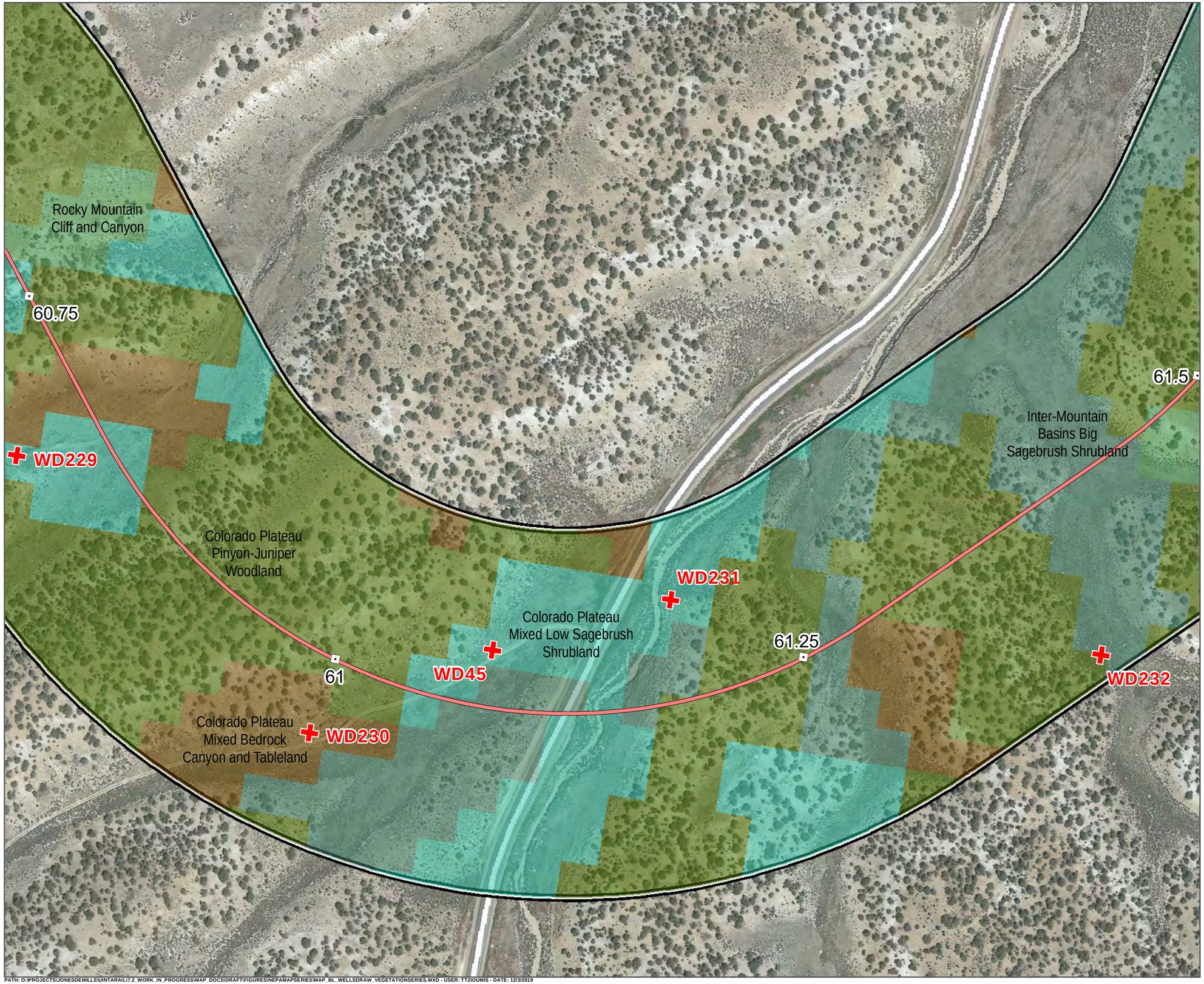

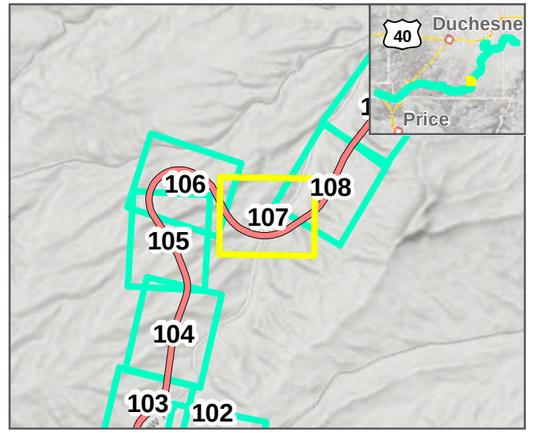

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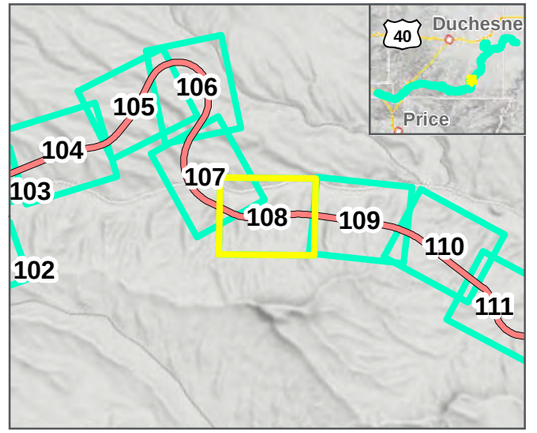

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Vegetation Communities

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SEVEN COUNTY INFRASTRUCTURE COALITION

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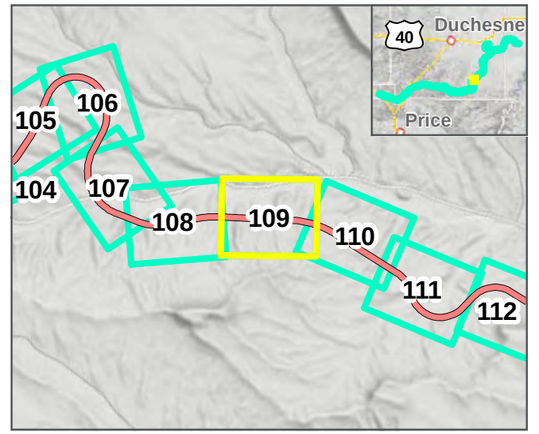

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Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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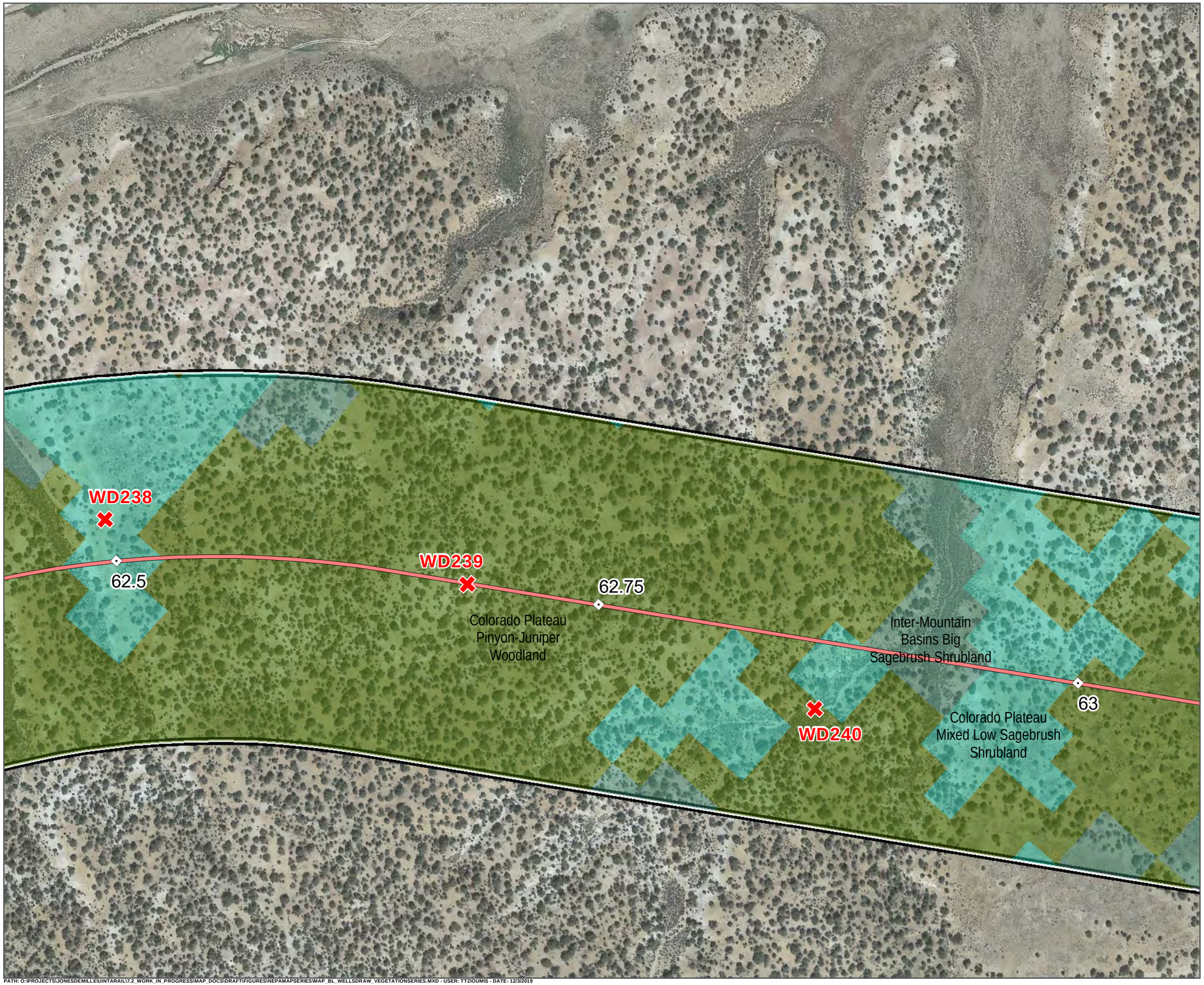

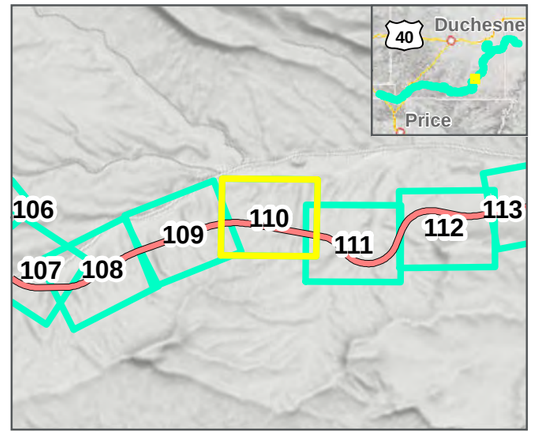

Photo Points

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Study Area

Map Extent (current view in yellow)

Vegetation Communities

Colorado Plateau Mixed Low Sagebrush Shrubland

Colorado Plateau Pinyon-Juniper Woodland

Inter-Mountain Basins Big Sagebrush Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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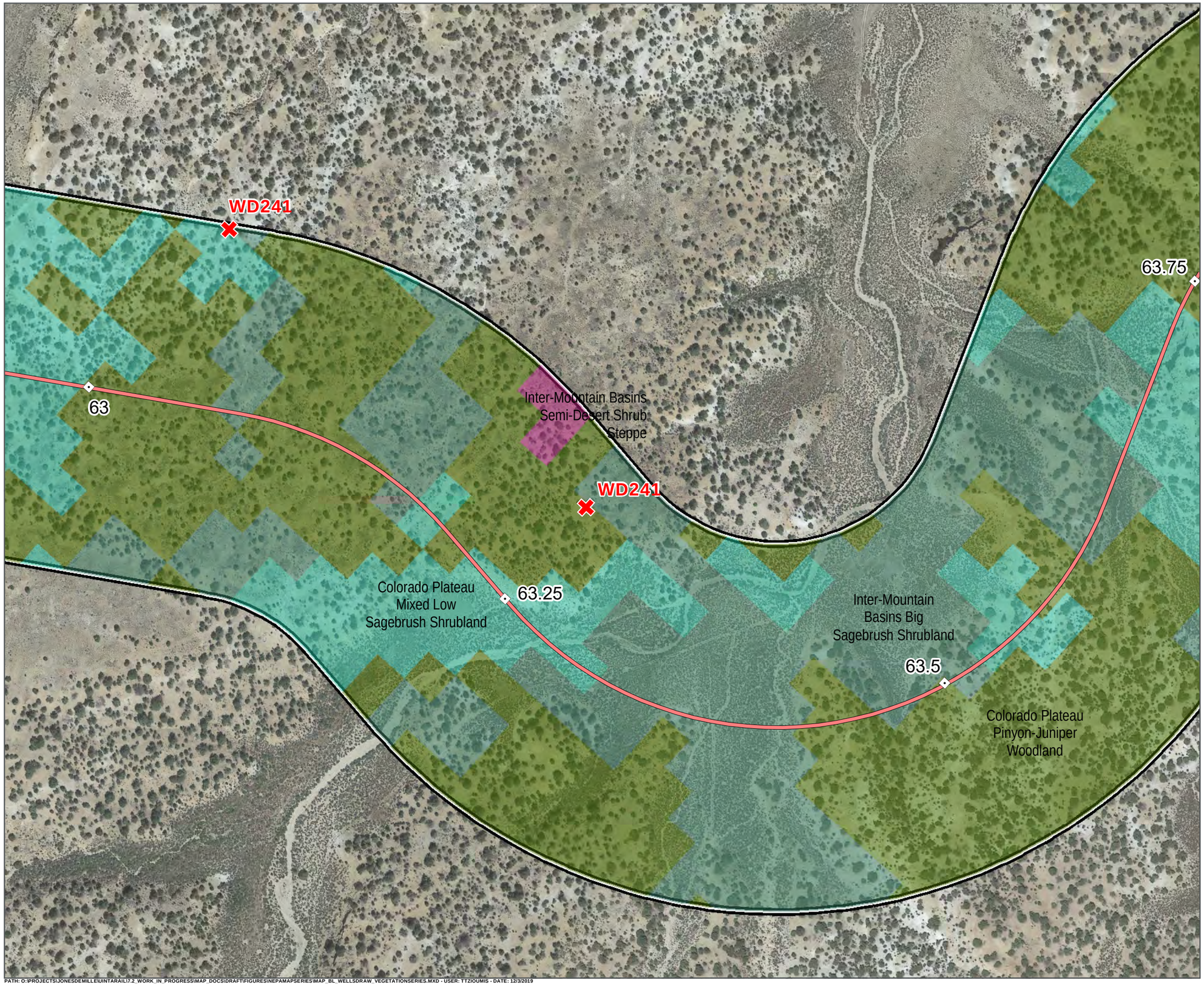

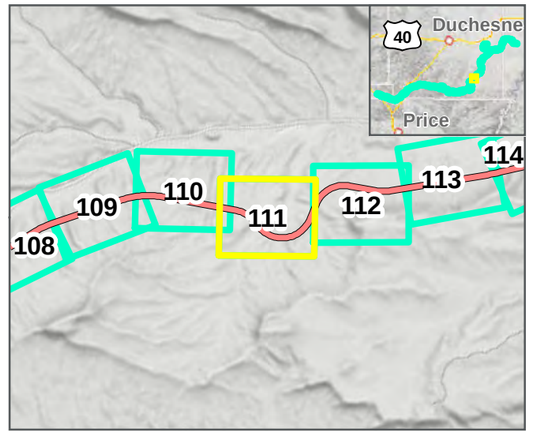

Photo Points
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Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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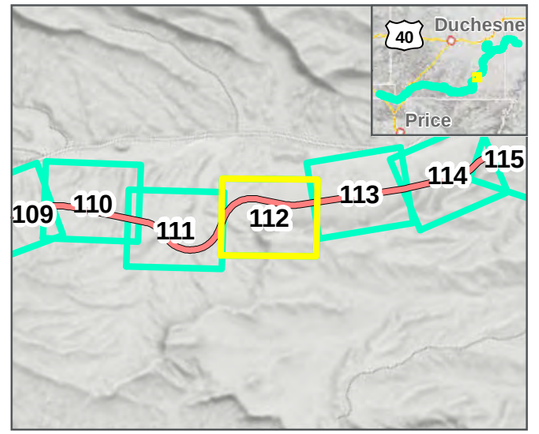

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Vegetation Communities

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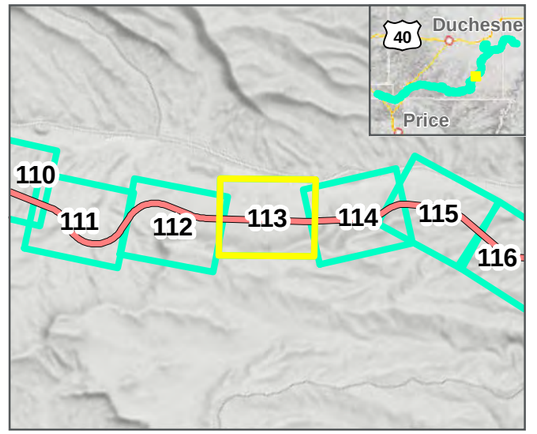

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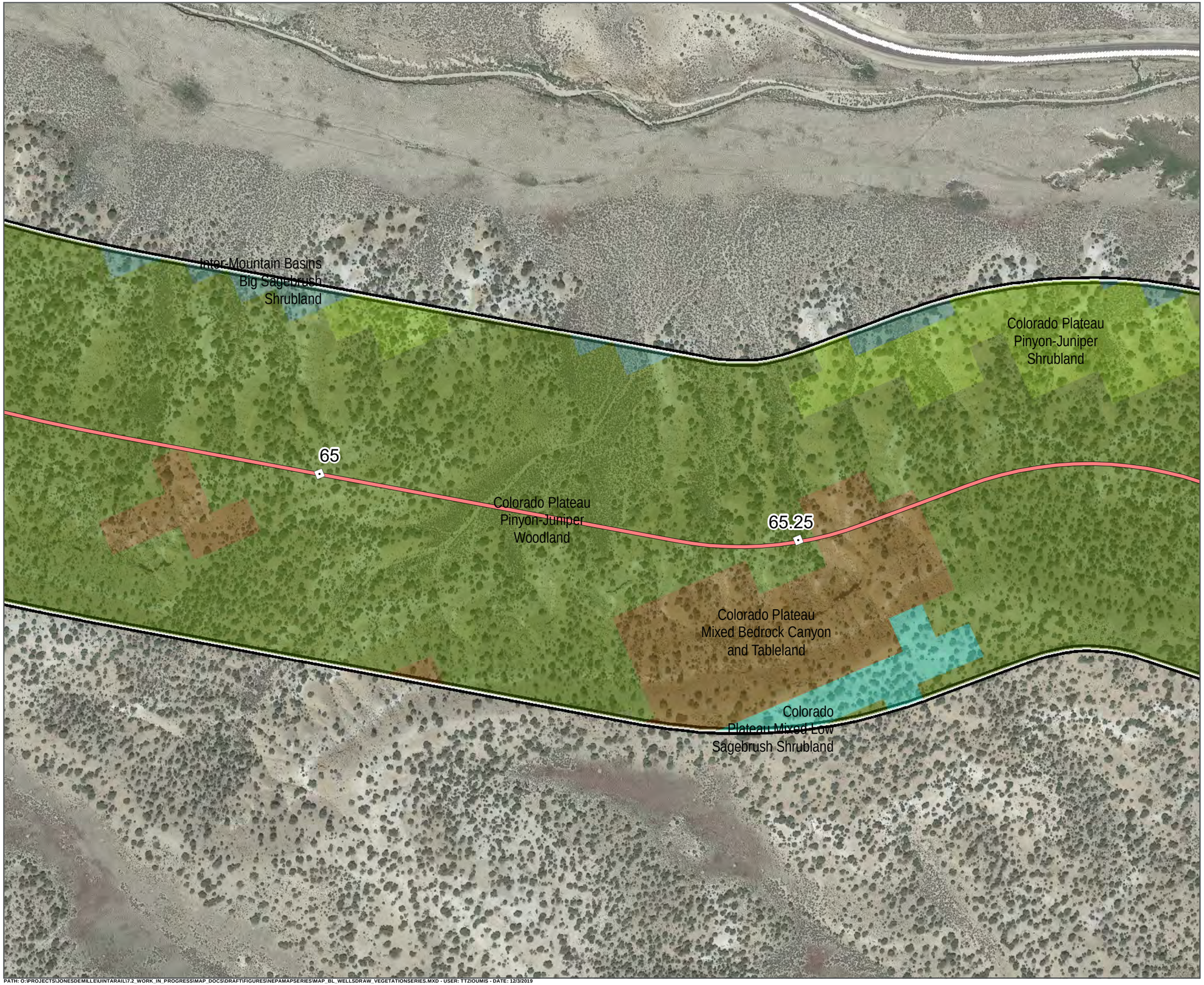

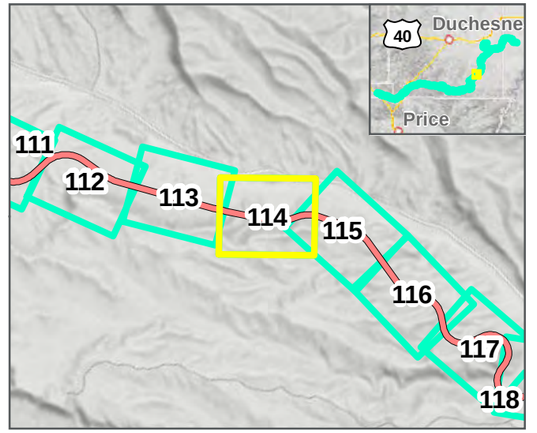

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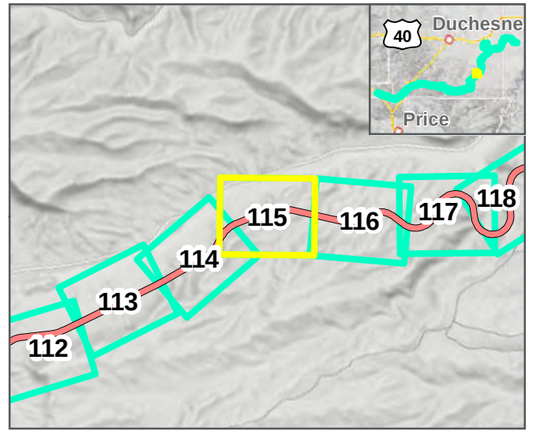

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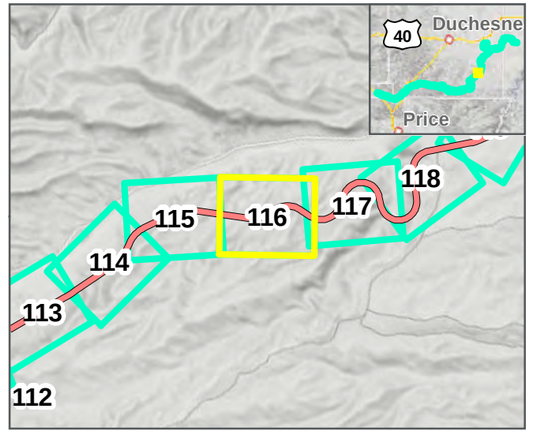

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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

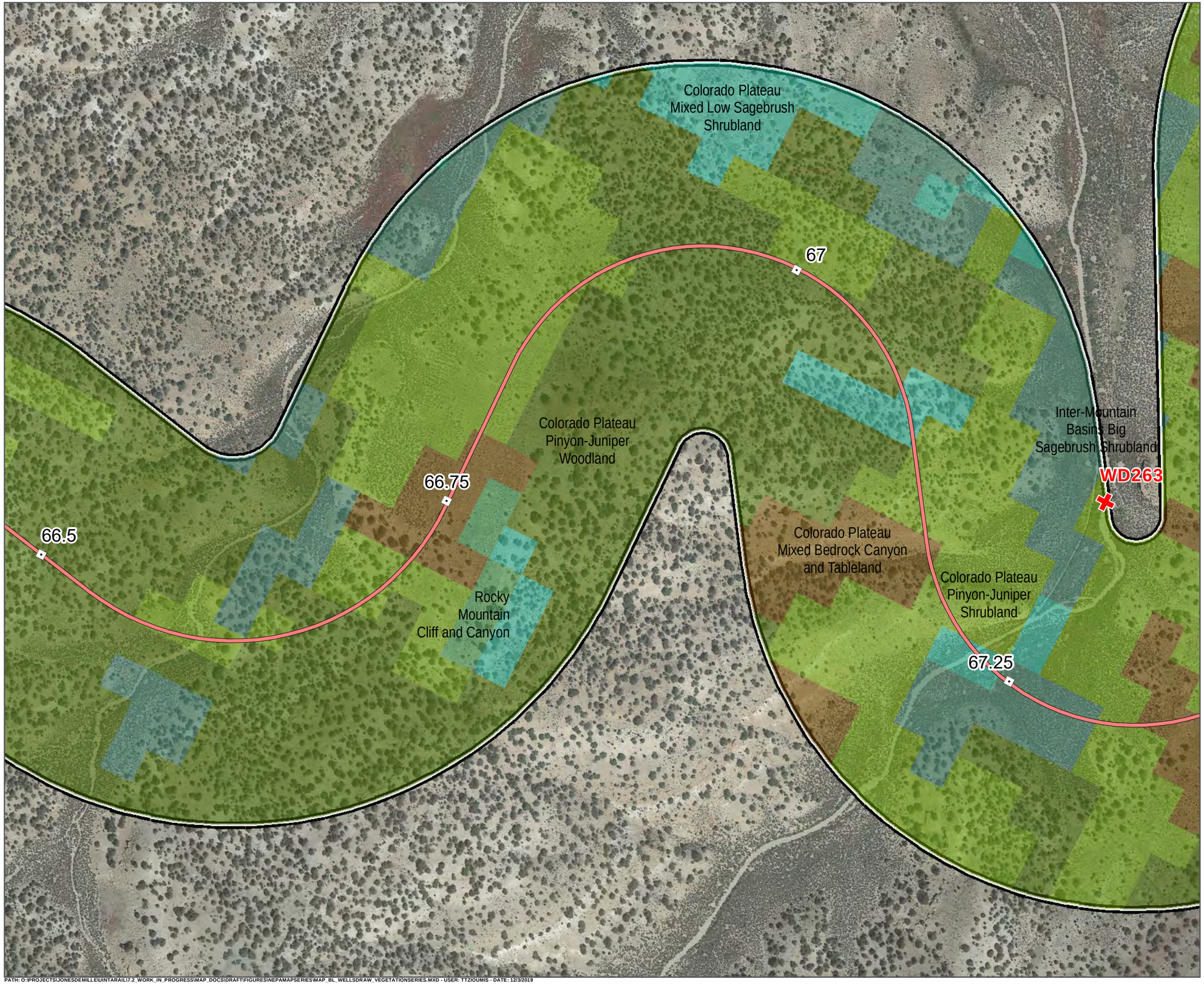
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019



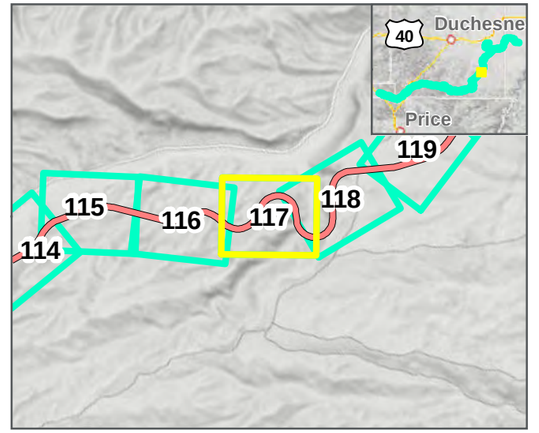


Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Rocky Mountain Cliff and Canyon

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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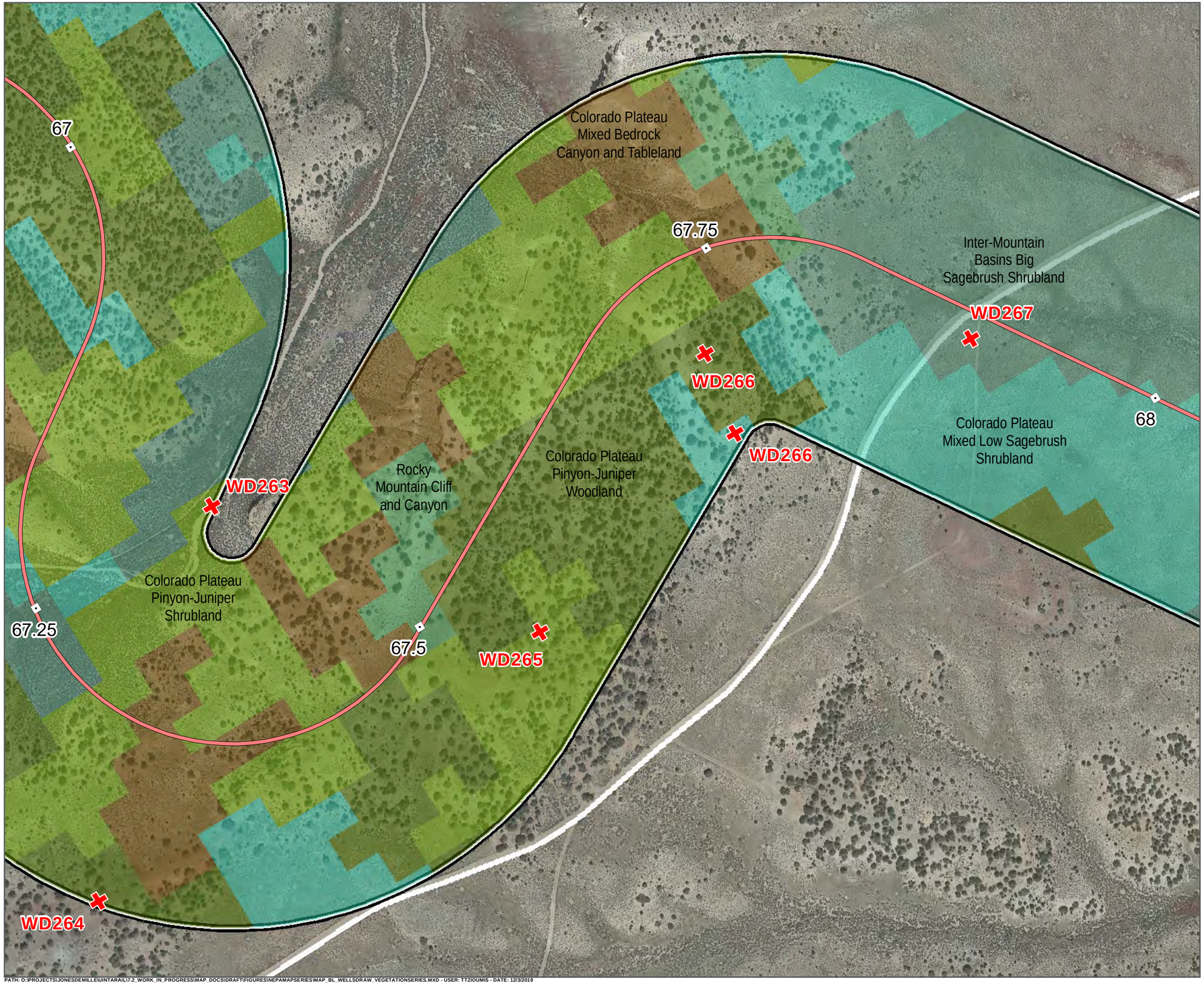

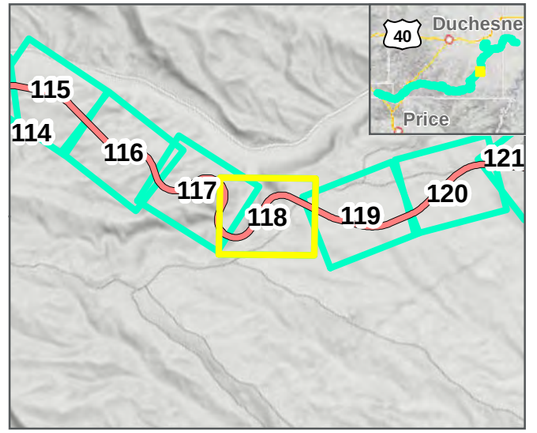

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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COODINATE SYSTEM:
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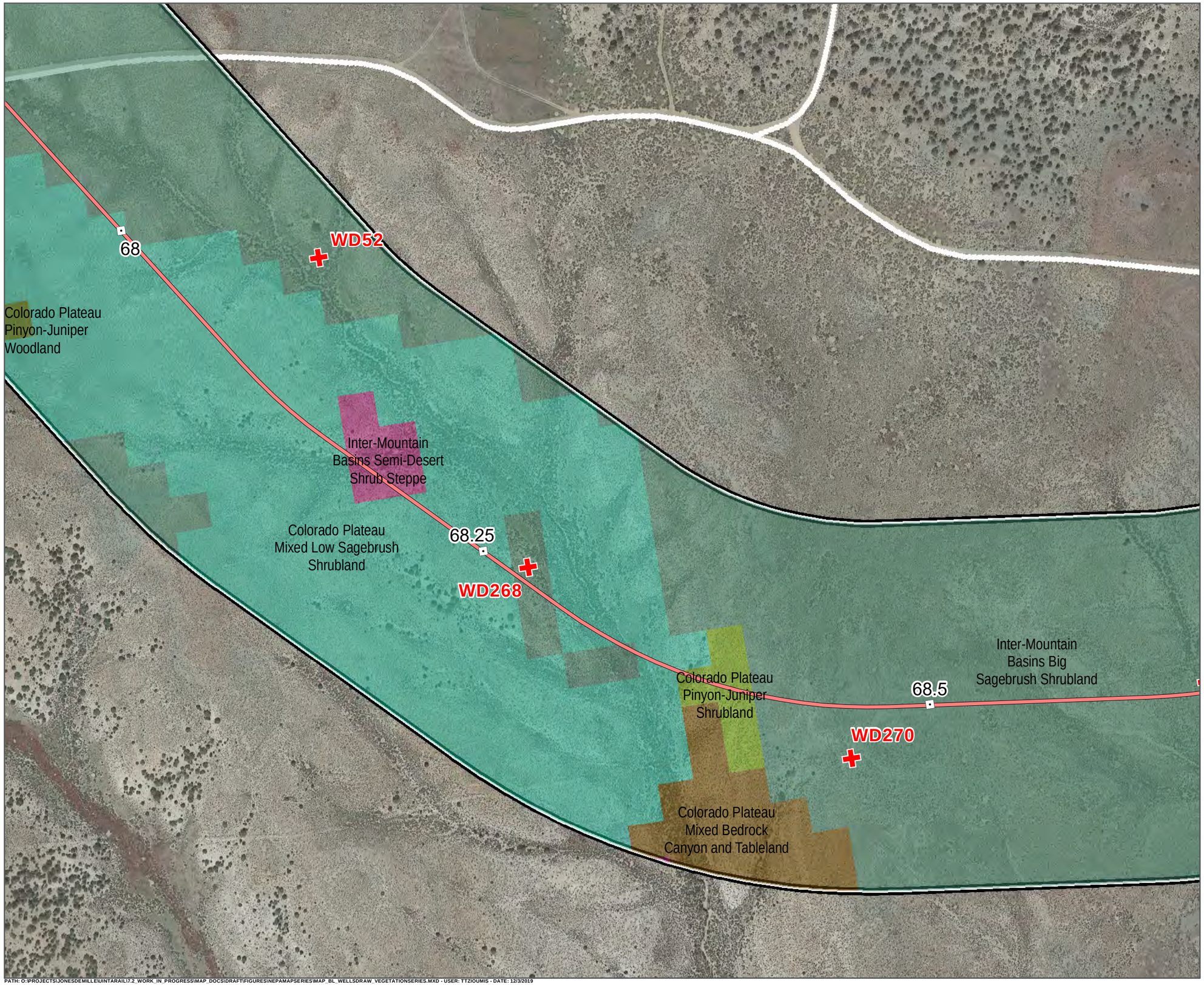

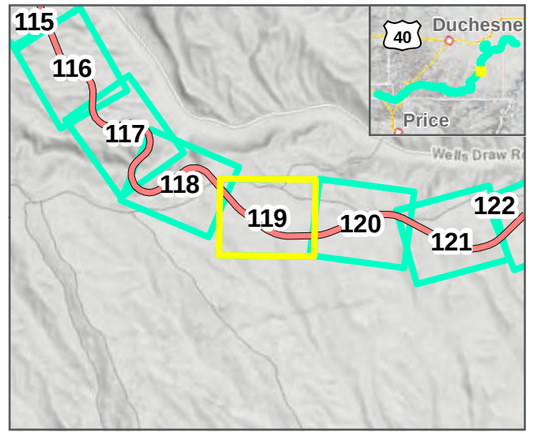

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Study Area
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Vegetation Communities

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- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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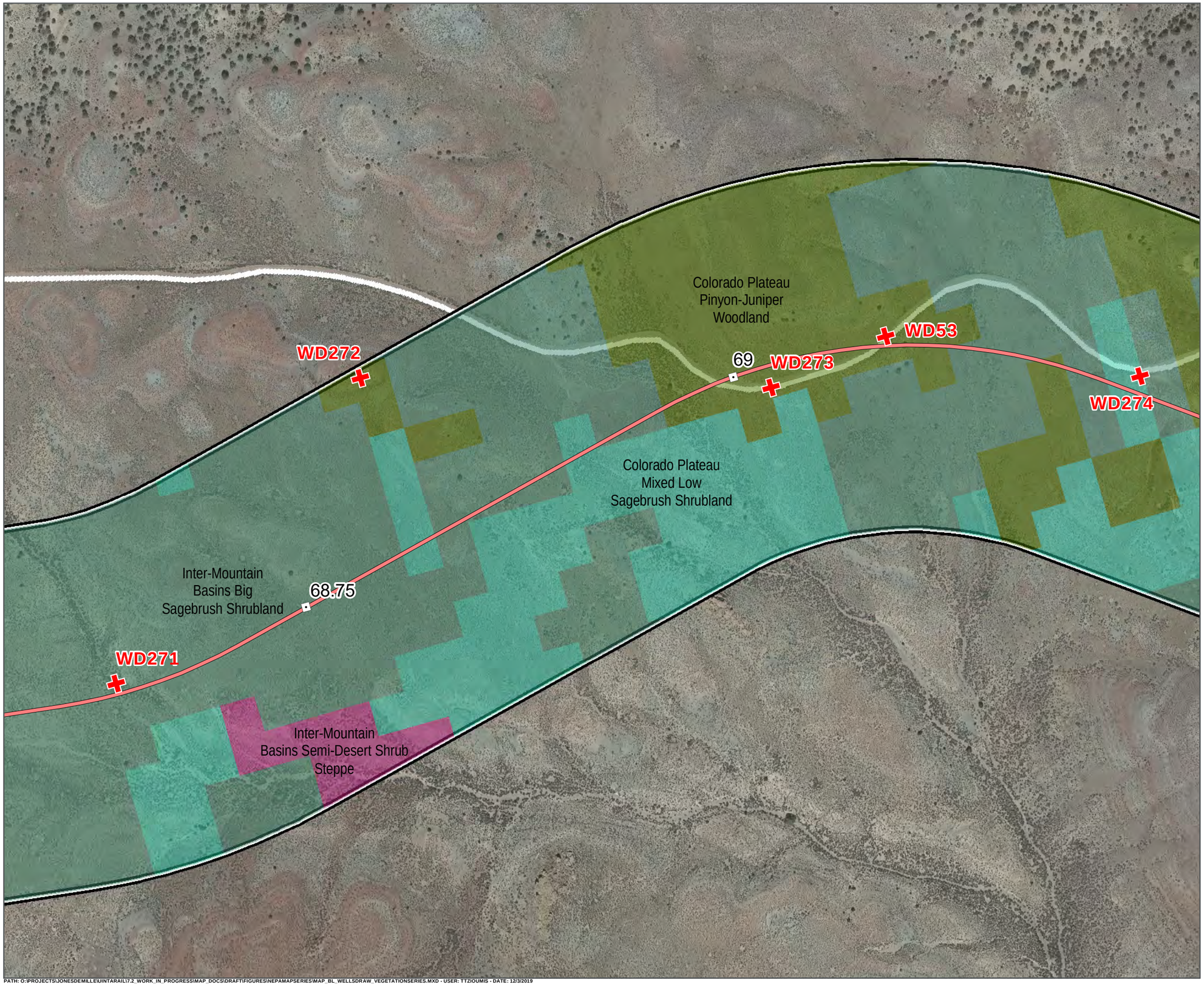

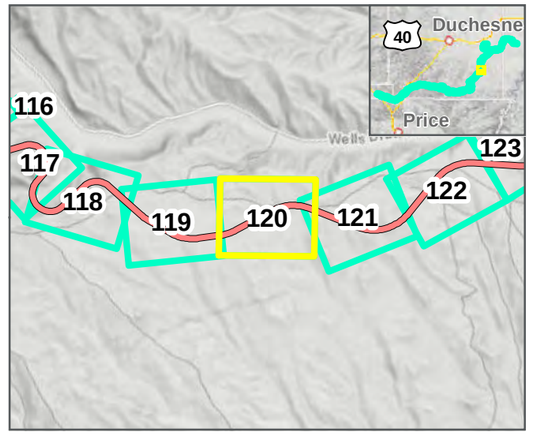

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Vegetation Communities

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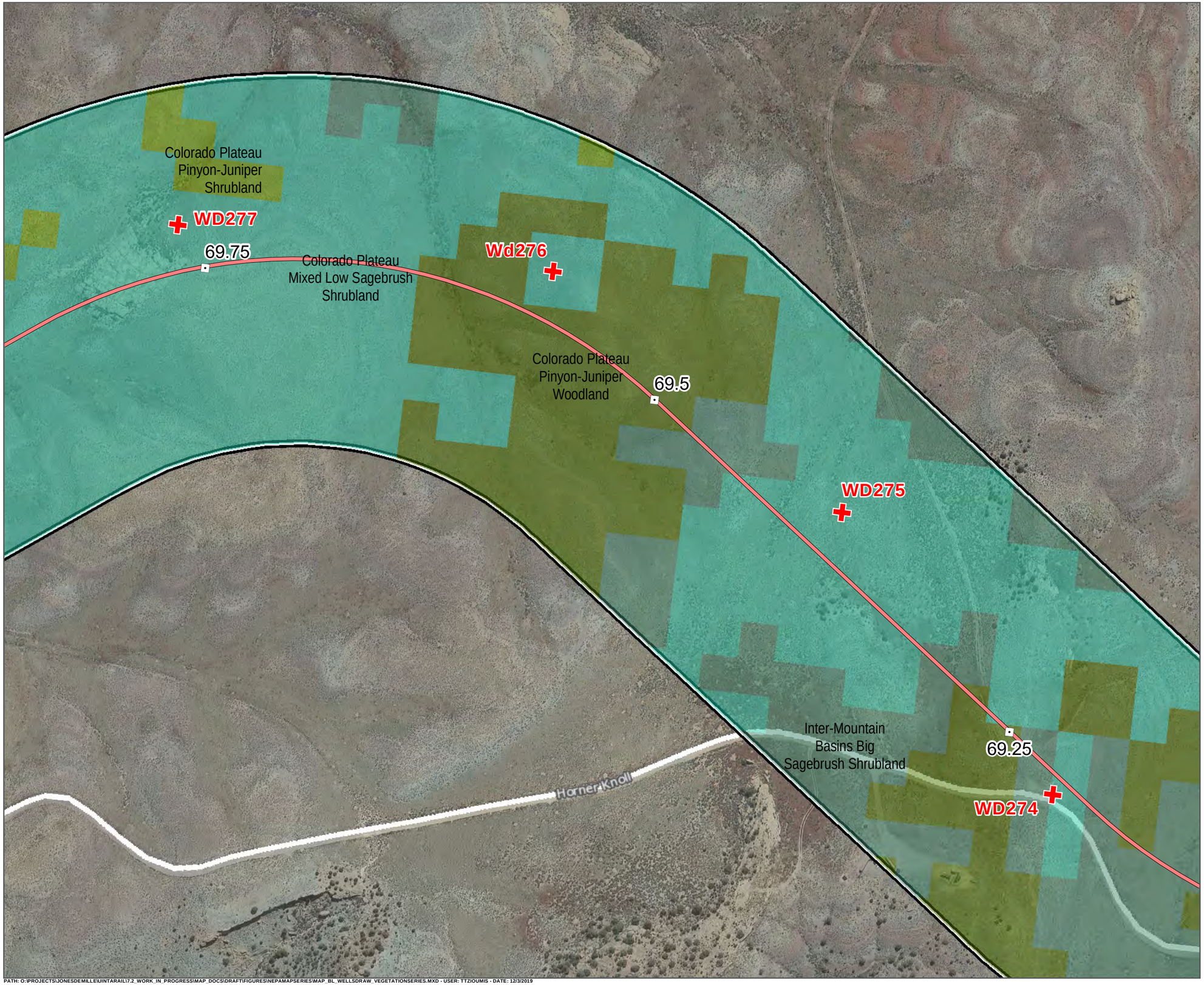

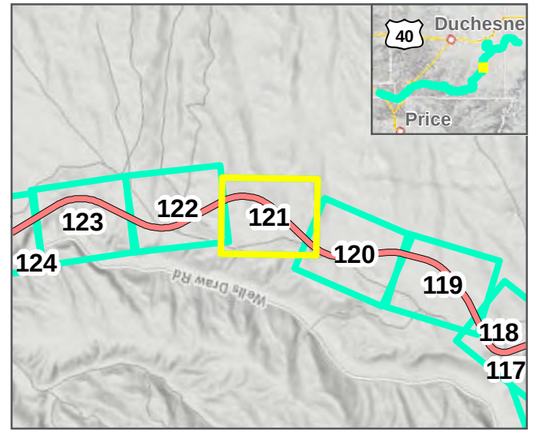

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Vegetation Communities

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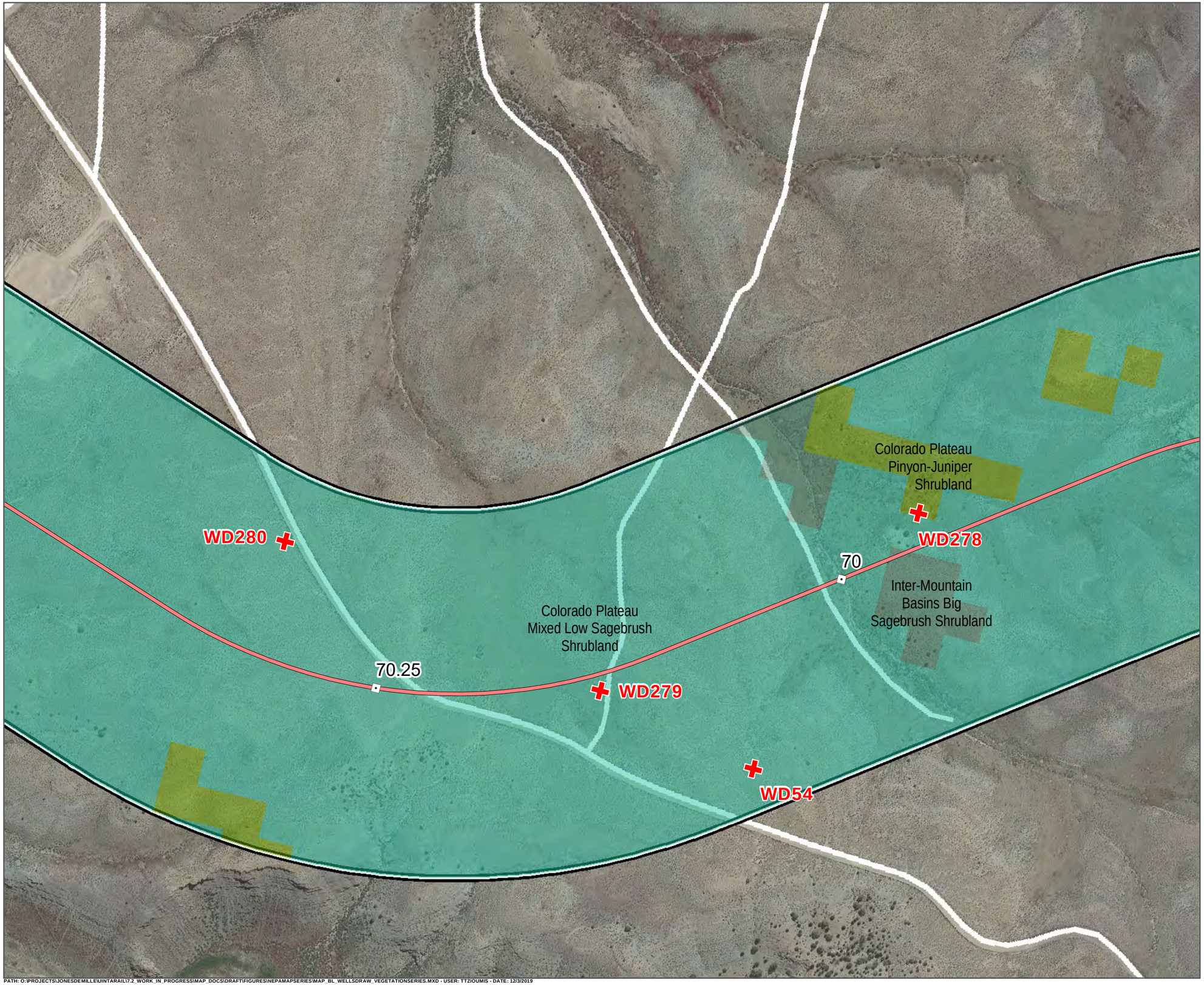

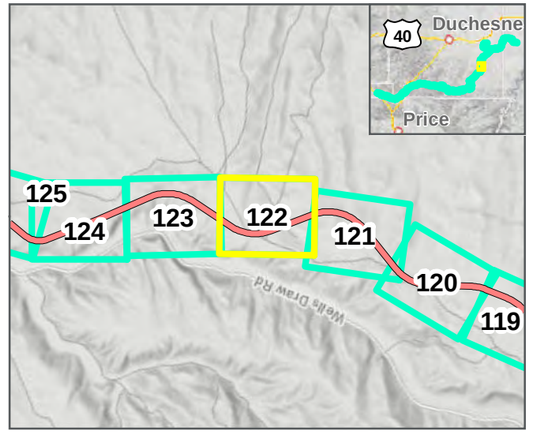

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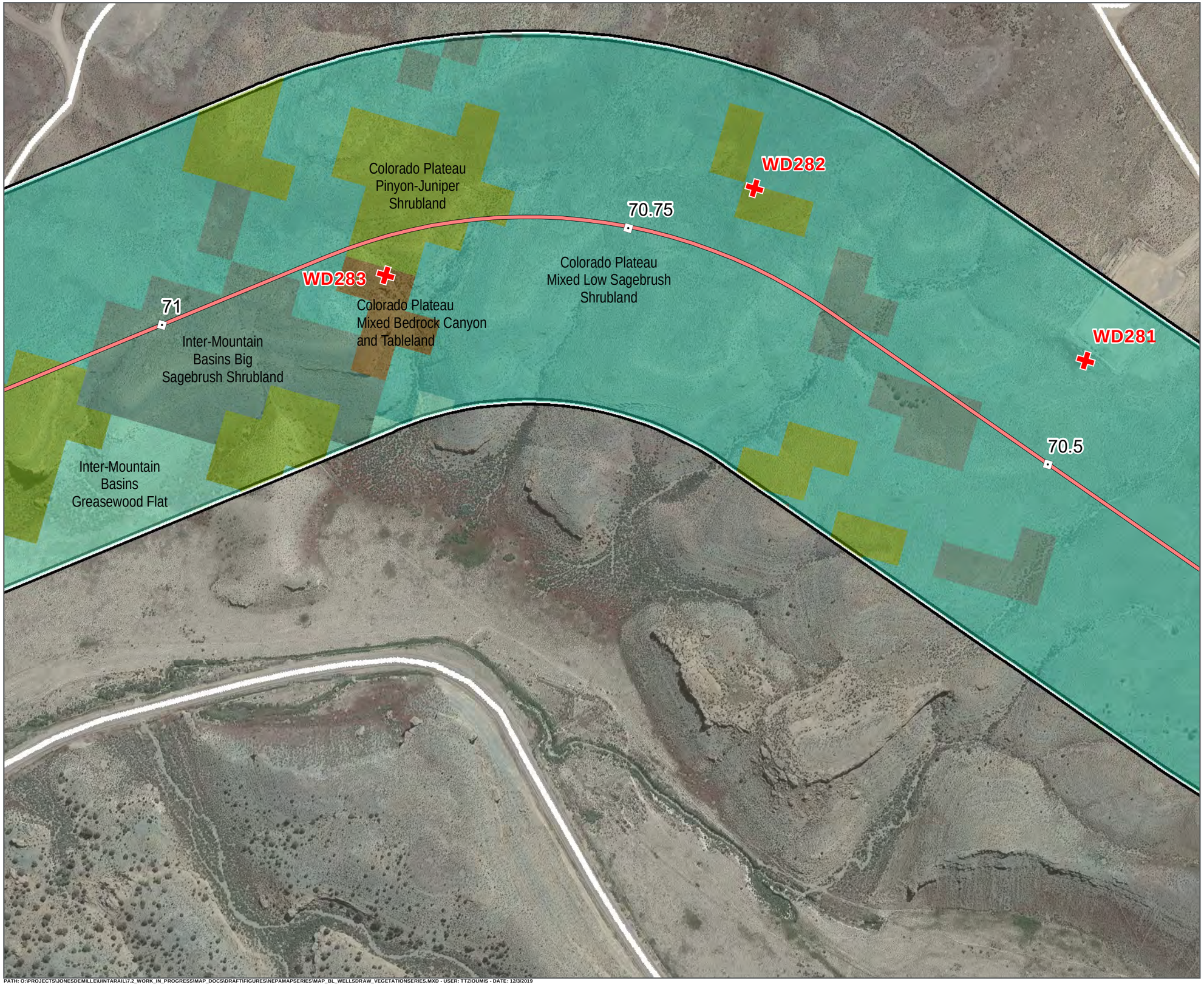

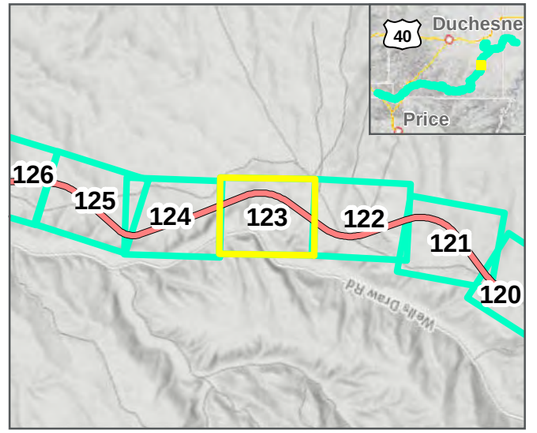

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Vegetation Communities

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SEPTEMBER 2019

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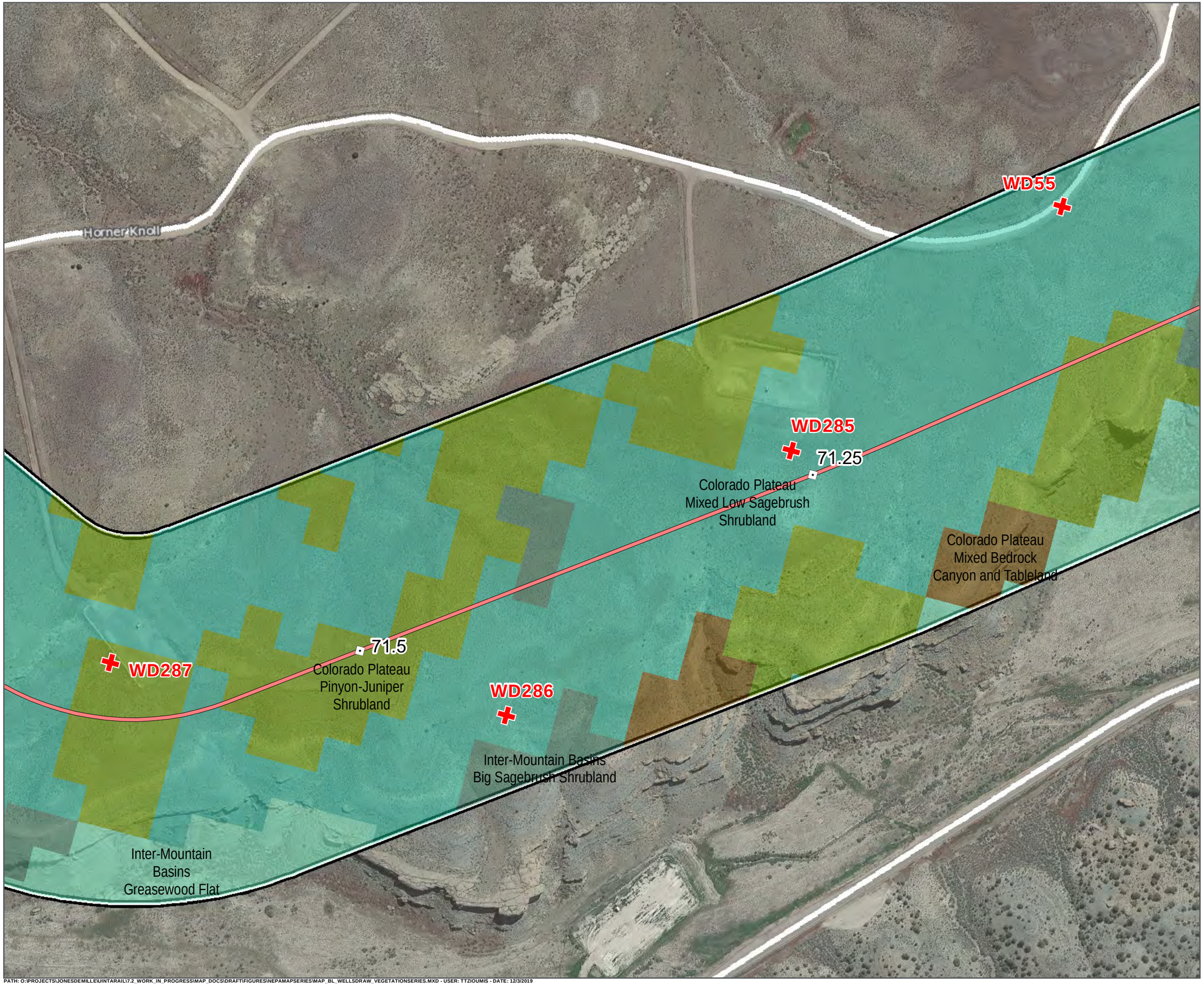

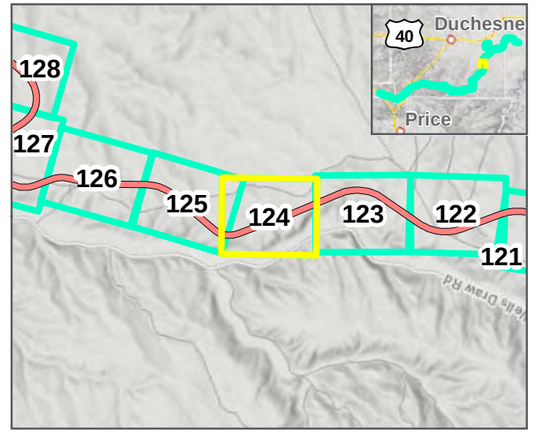

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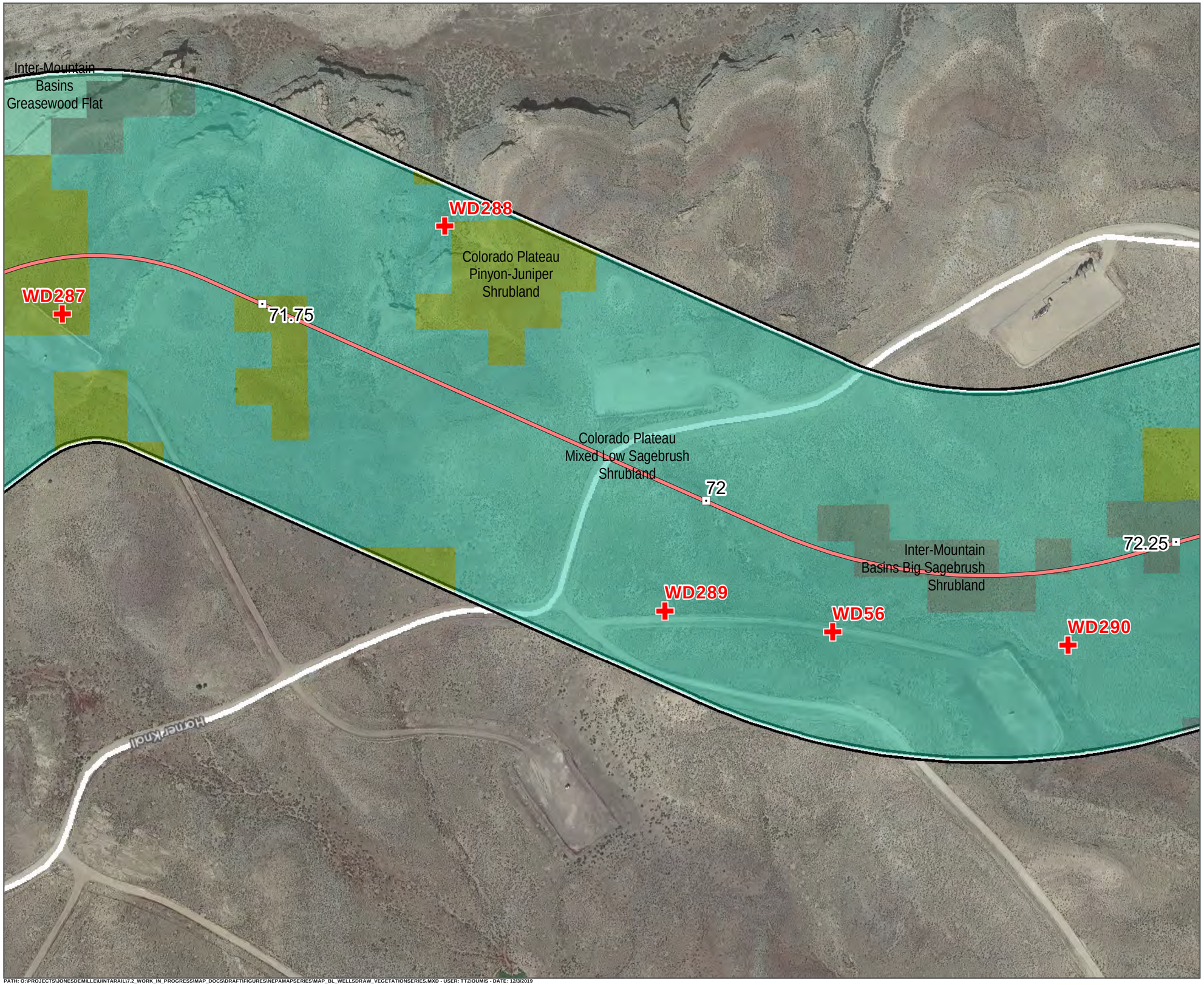

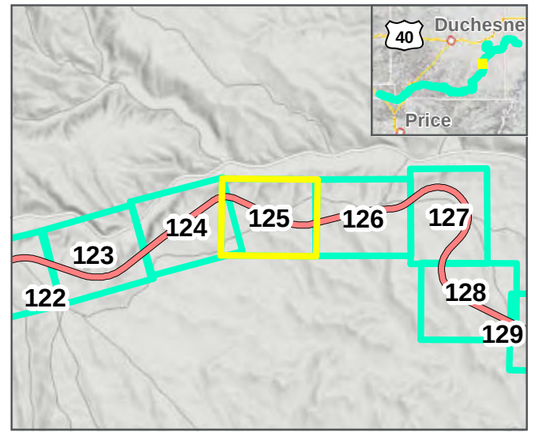

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Vegetation Communities

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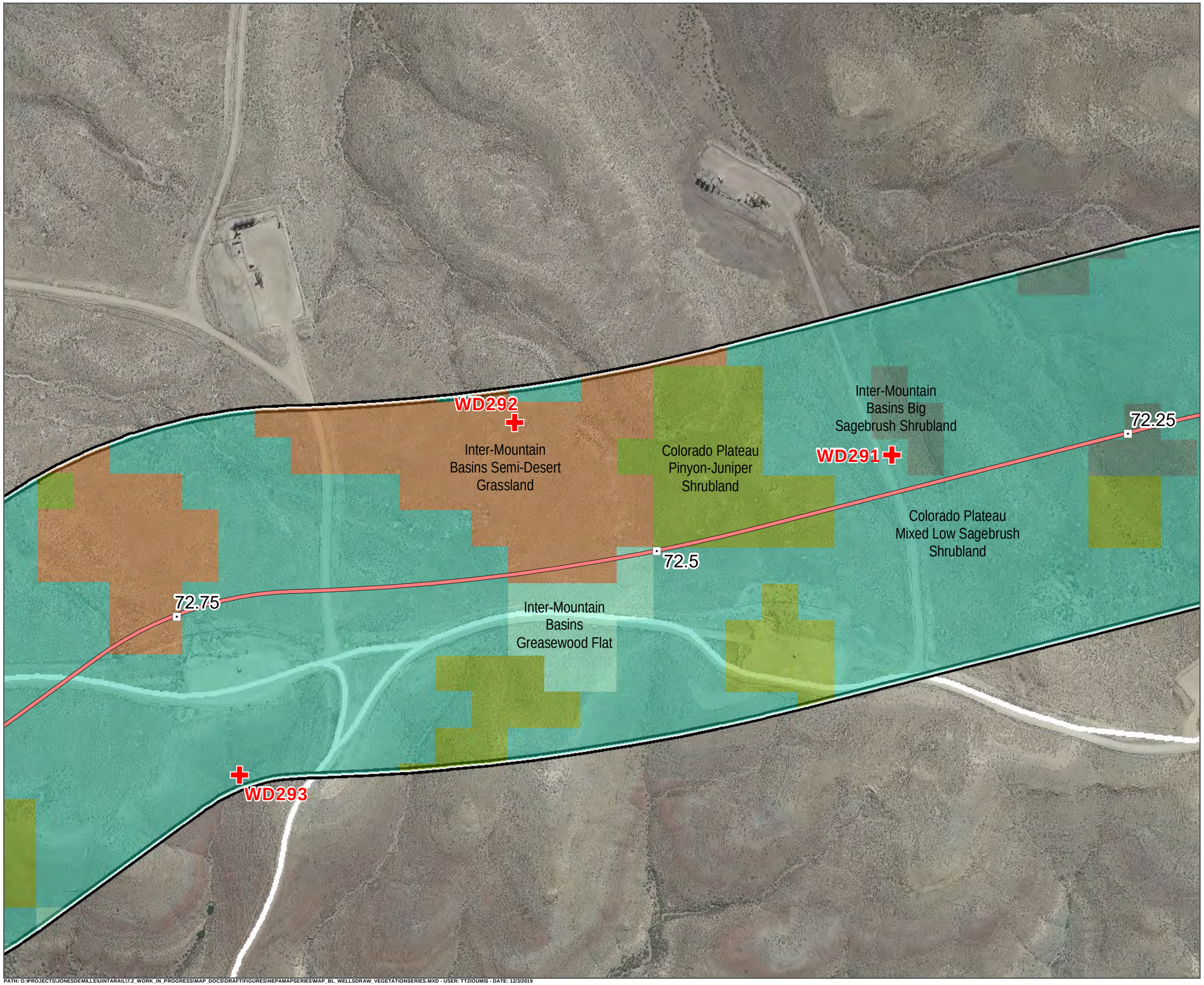

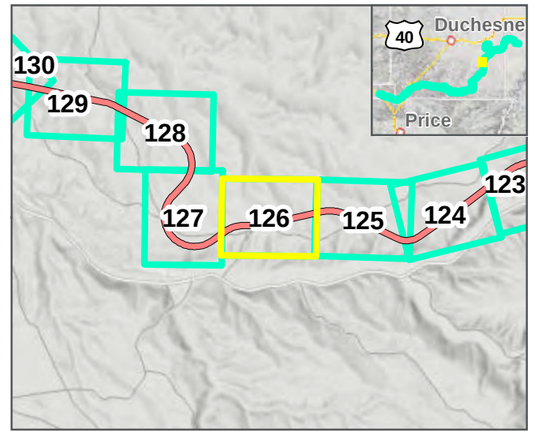

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Vegetation Communities

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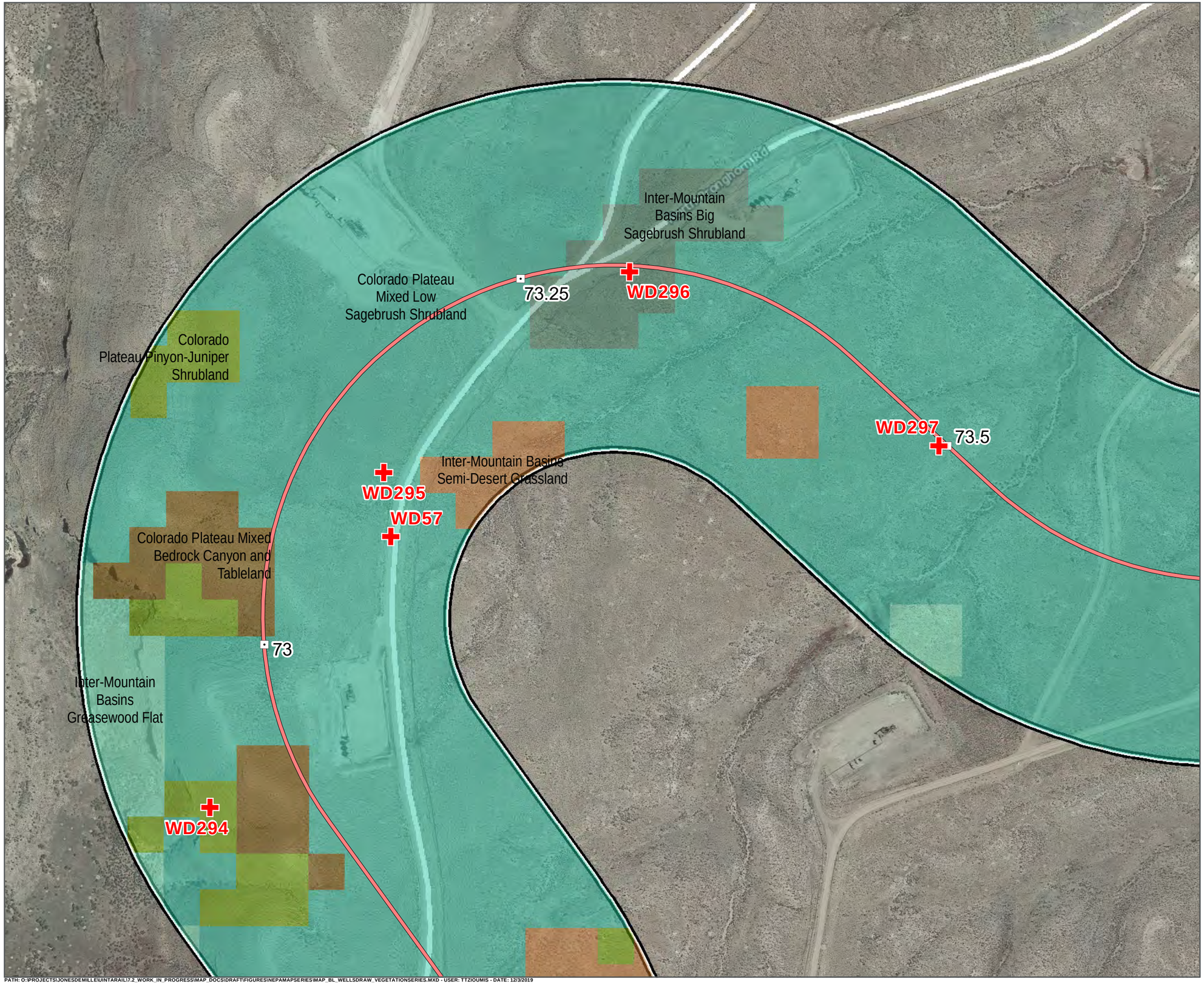

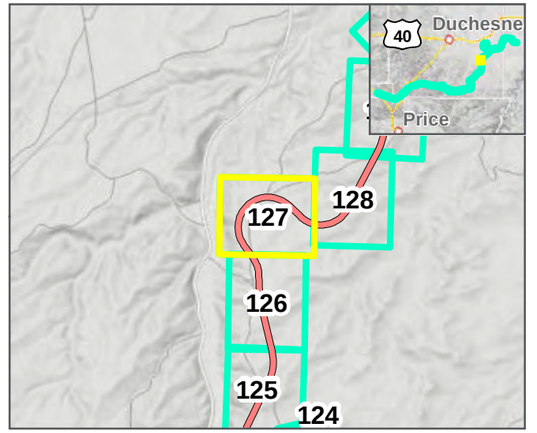

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Vegetation Communities

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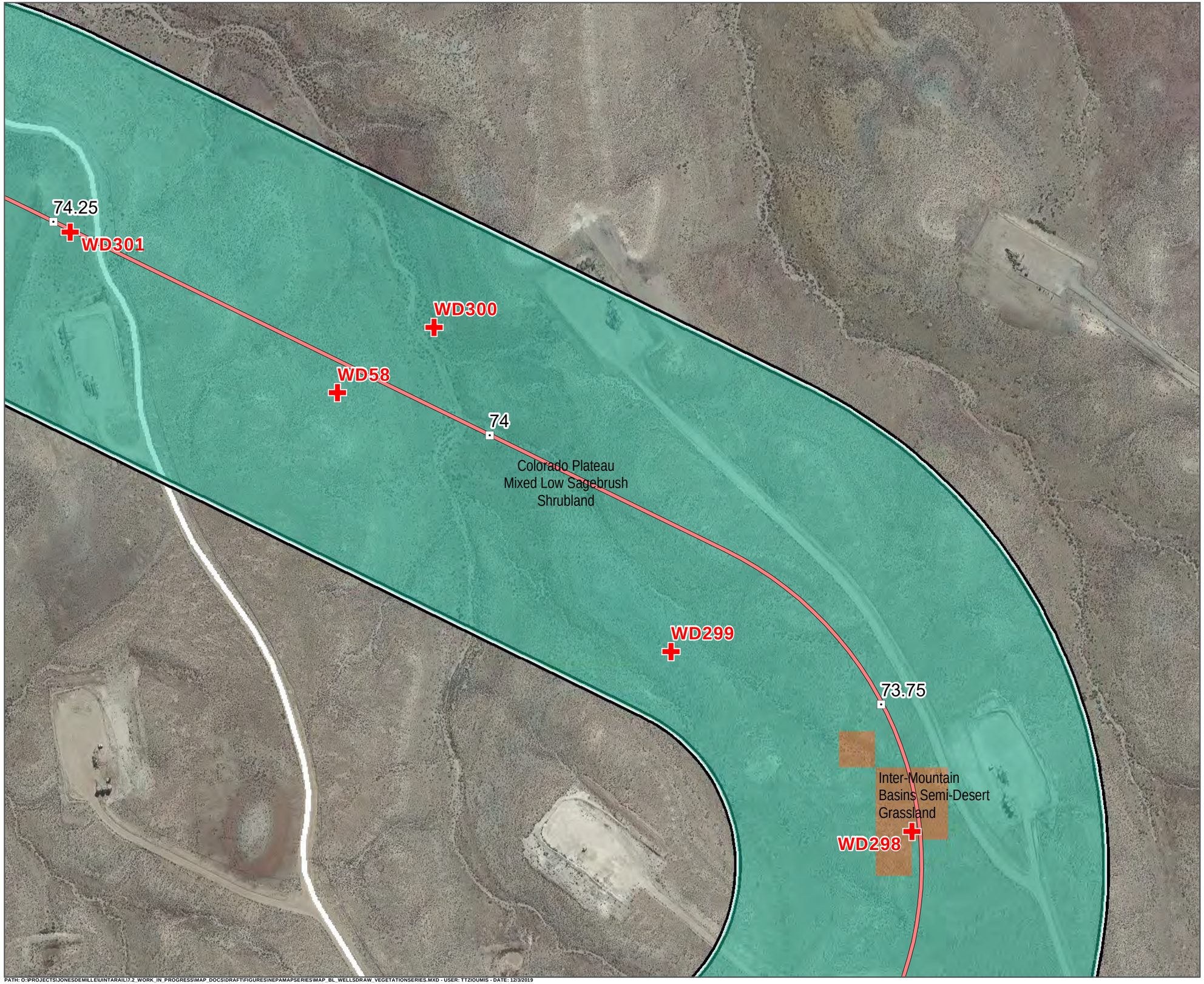

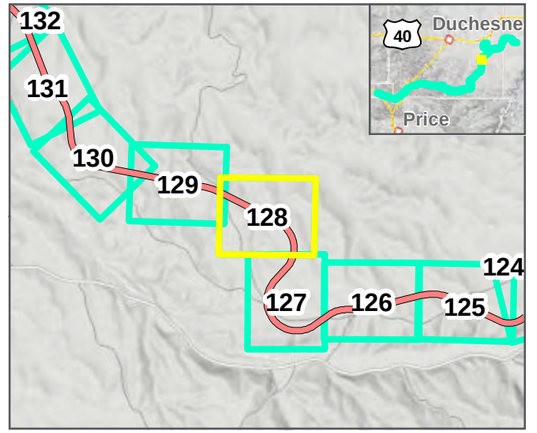

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Vegetation Communities

Colorado Plateau Mixed Low Sagebrush Shrubland

Inter-Mountain Basins Semi-Desert Grassland

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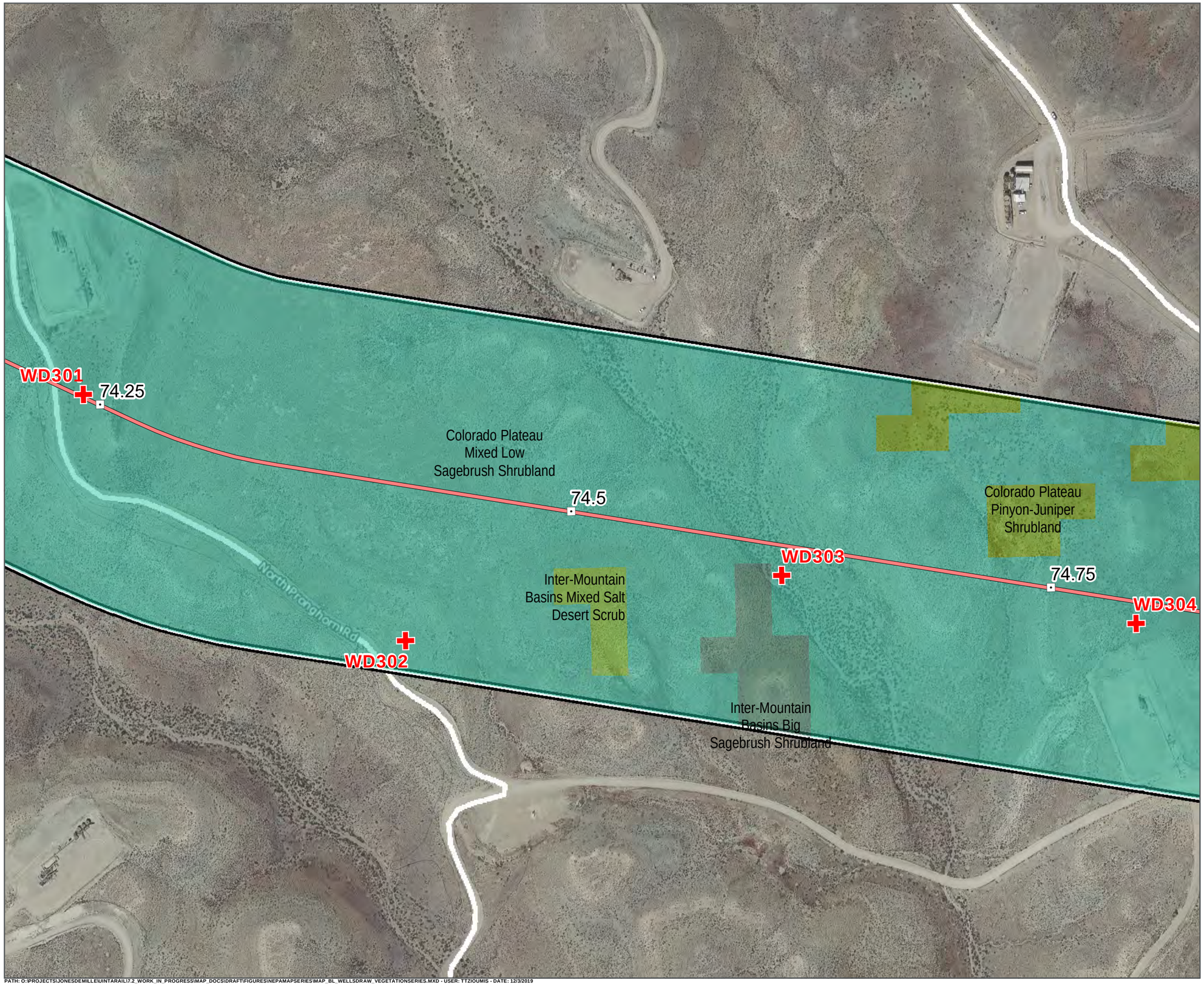

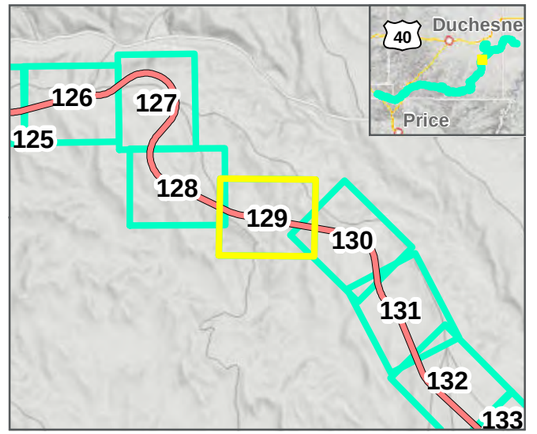

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Vegetation Communities

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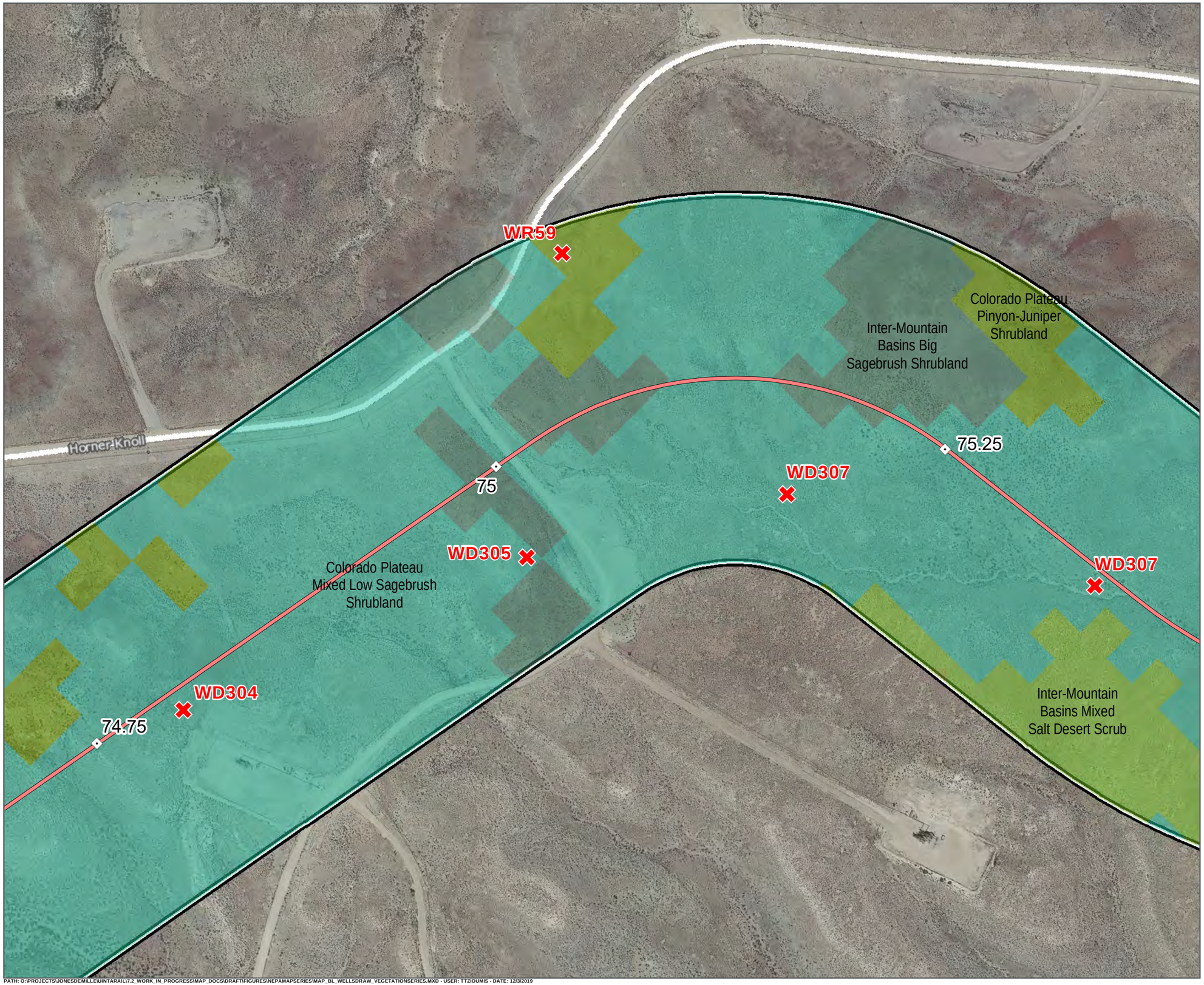

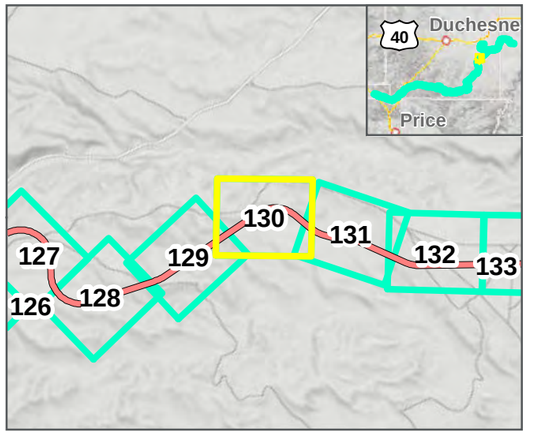

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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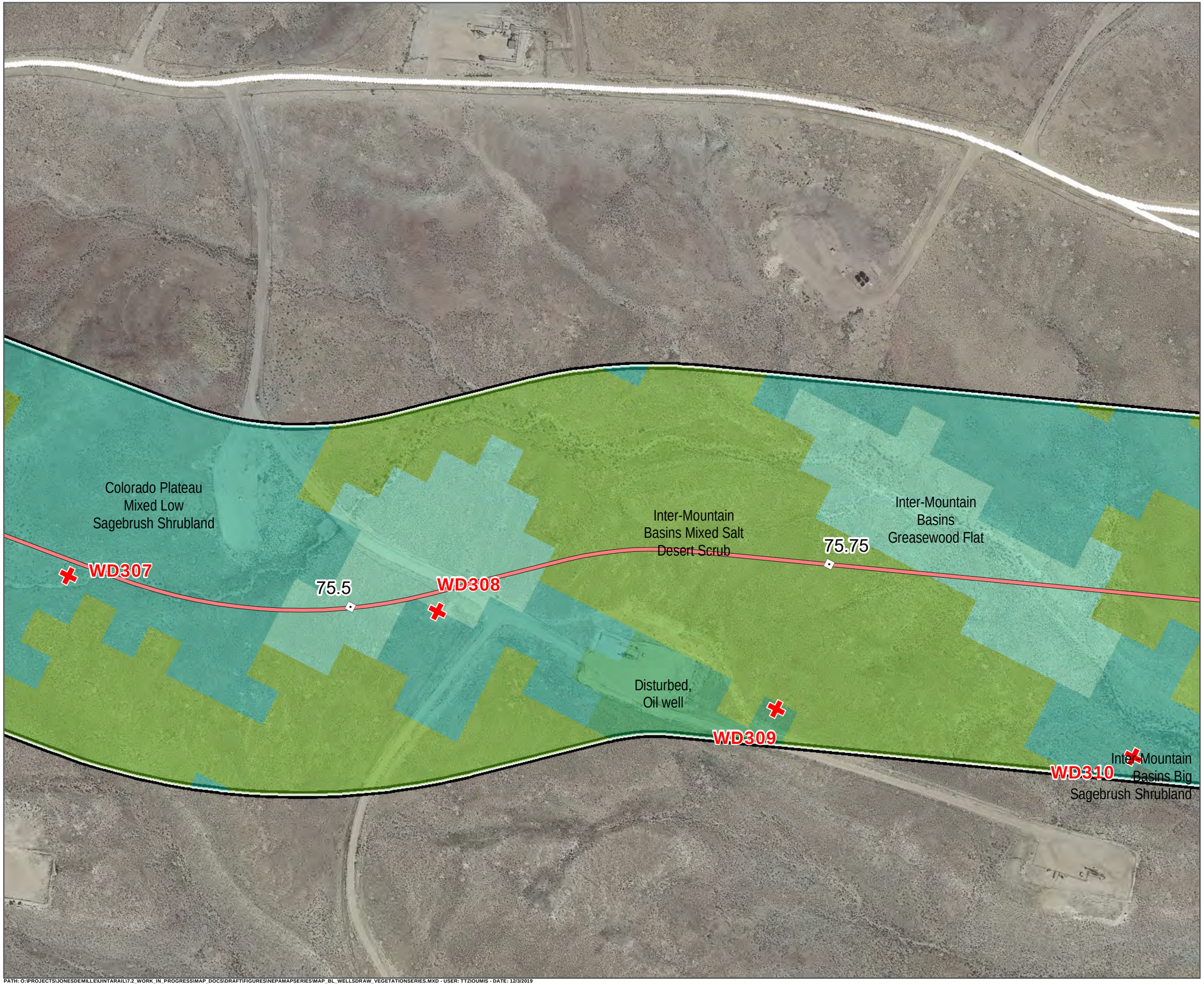

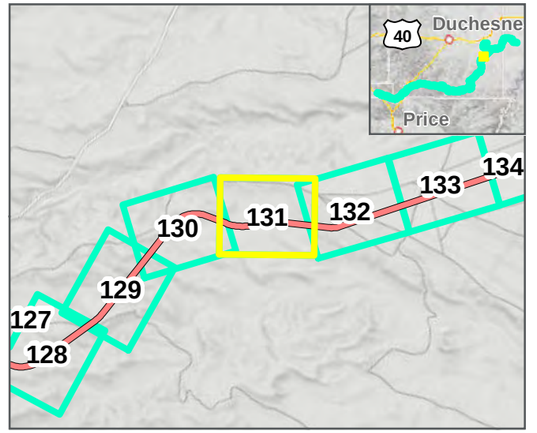

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Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
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- Inter-Mountain Basins Greasewood Flat
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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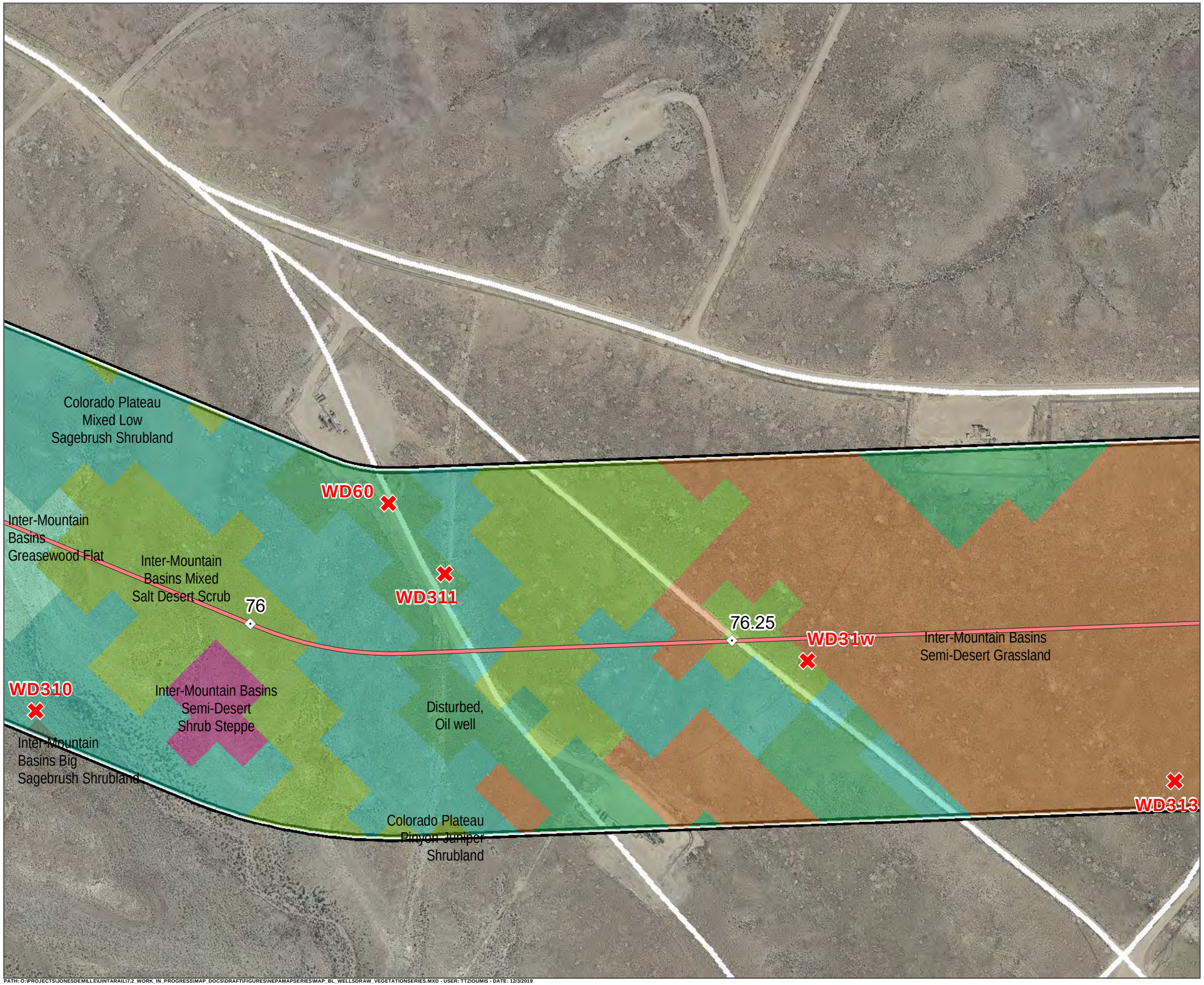

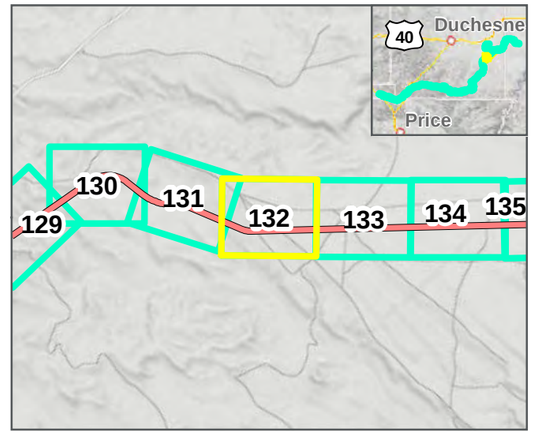

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WELLS DRAW ALTERNATIVE: 5/30/2019

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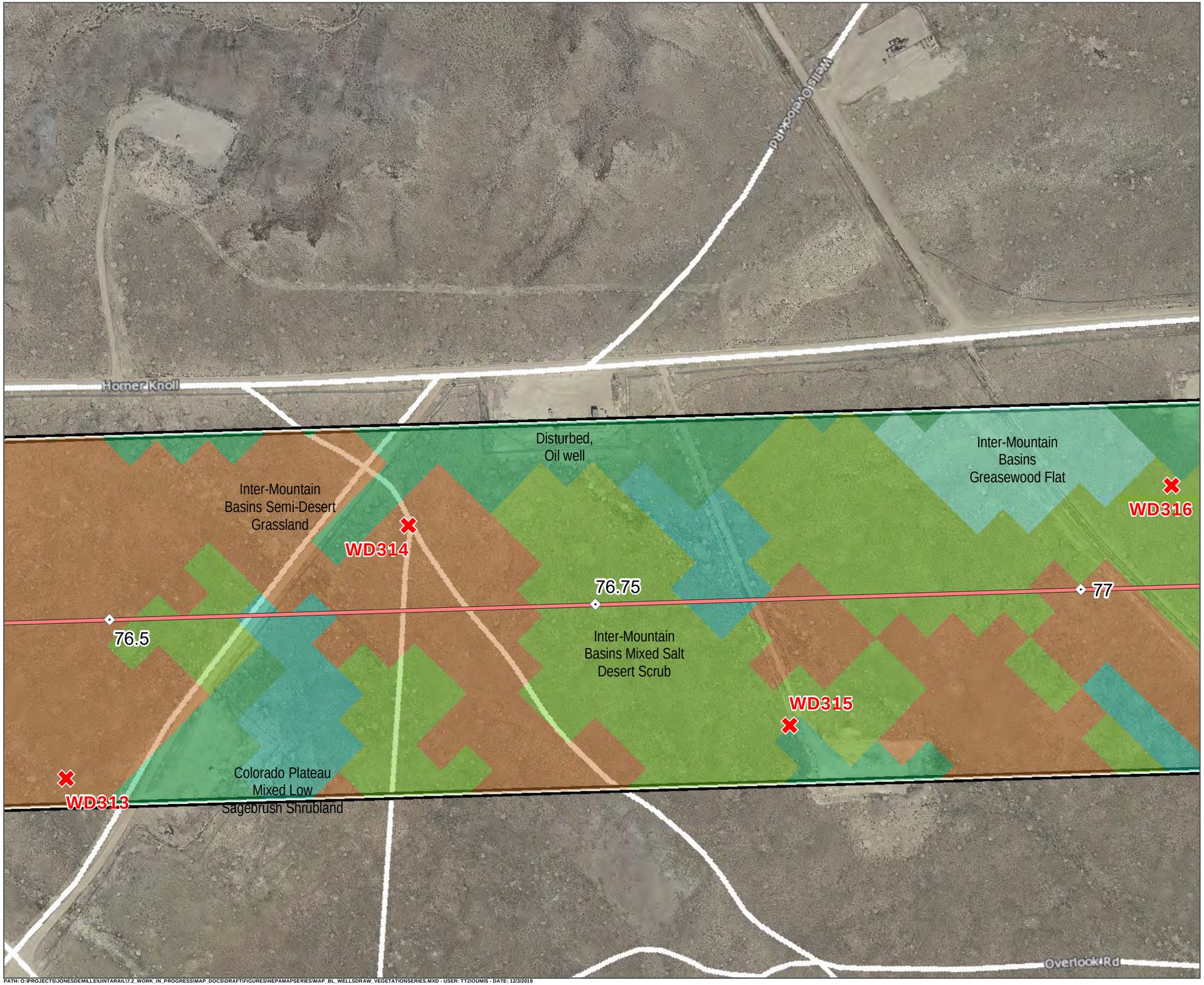

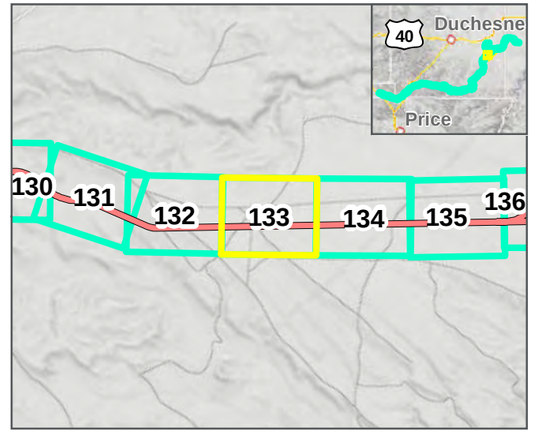

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Vegetation Communities

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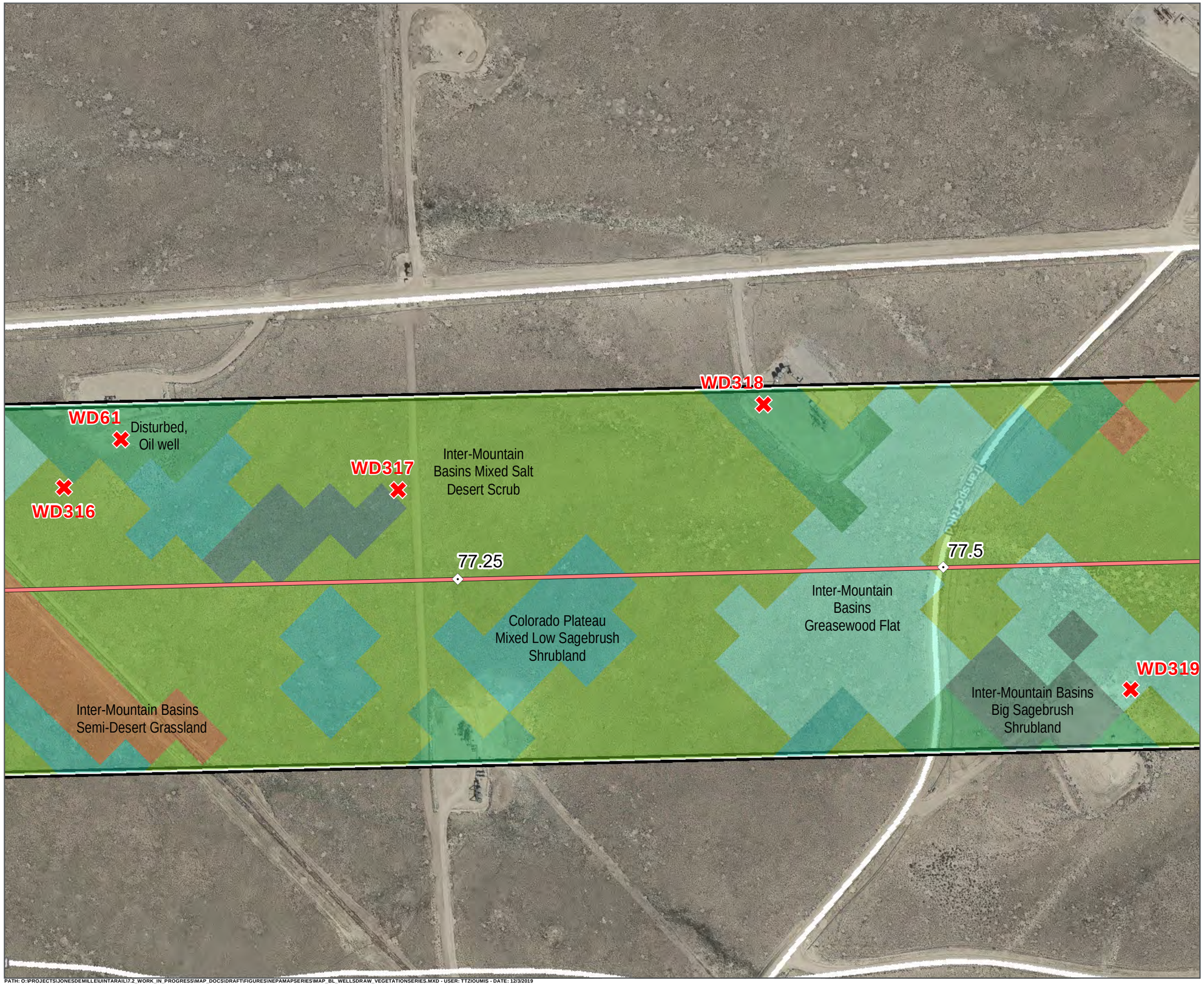

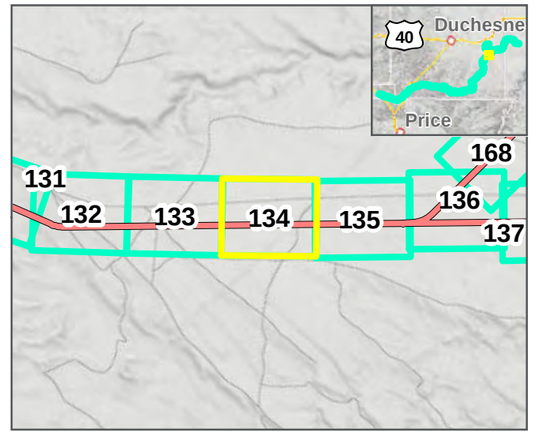

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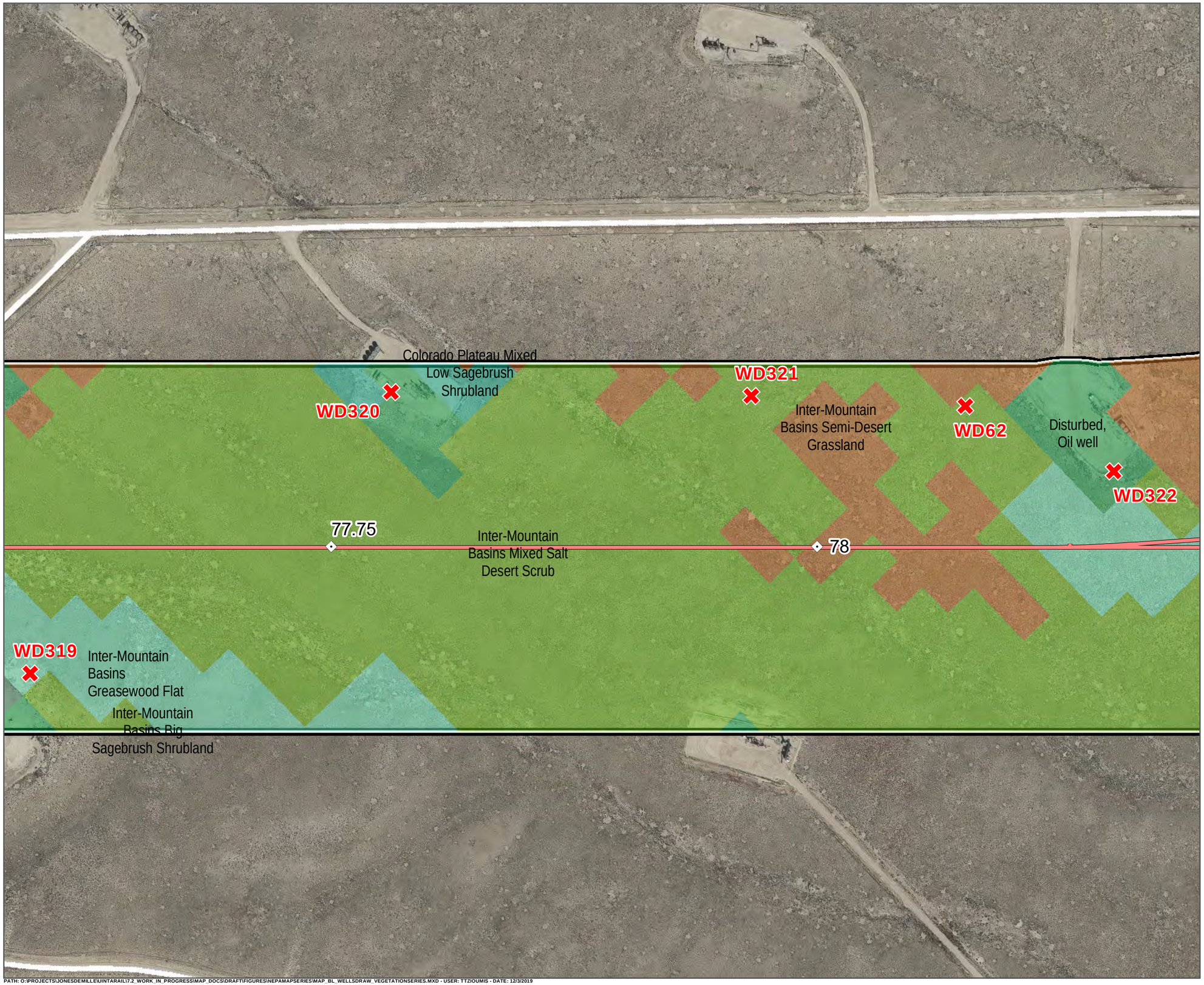

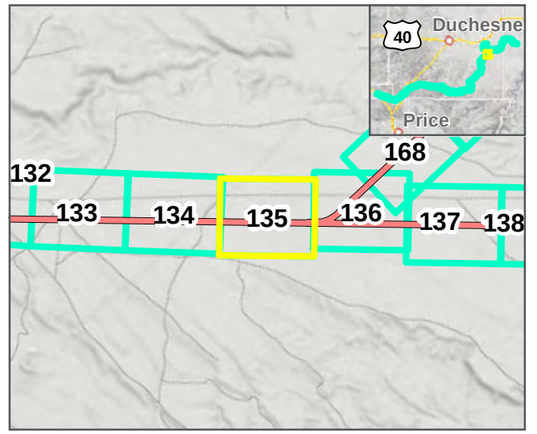

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Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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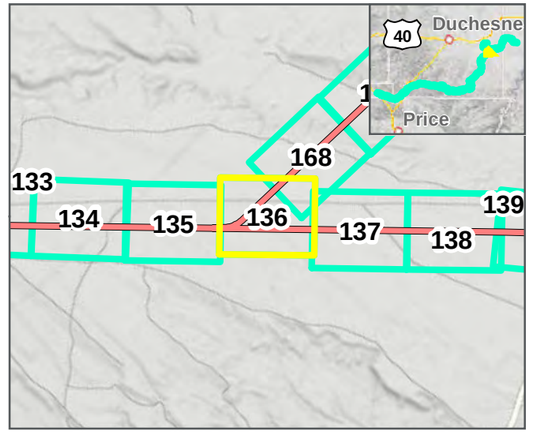

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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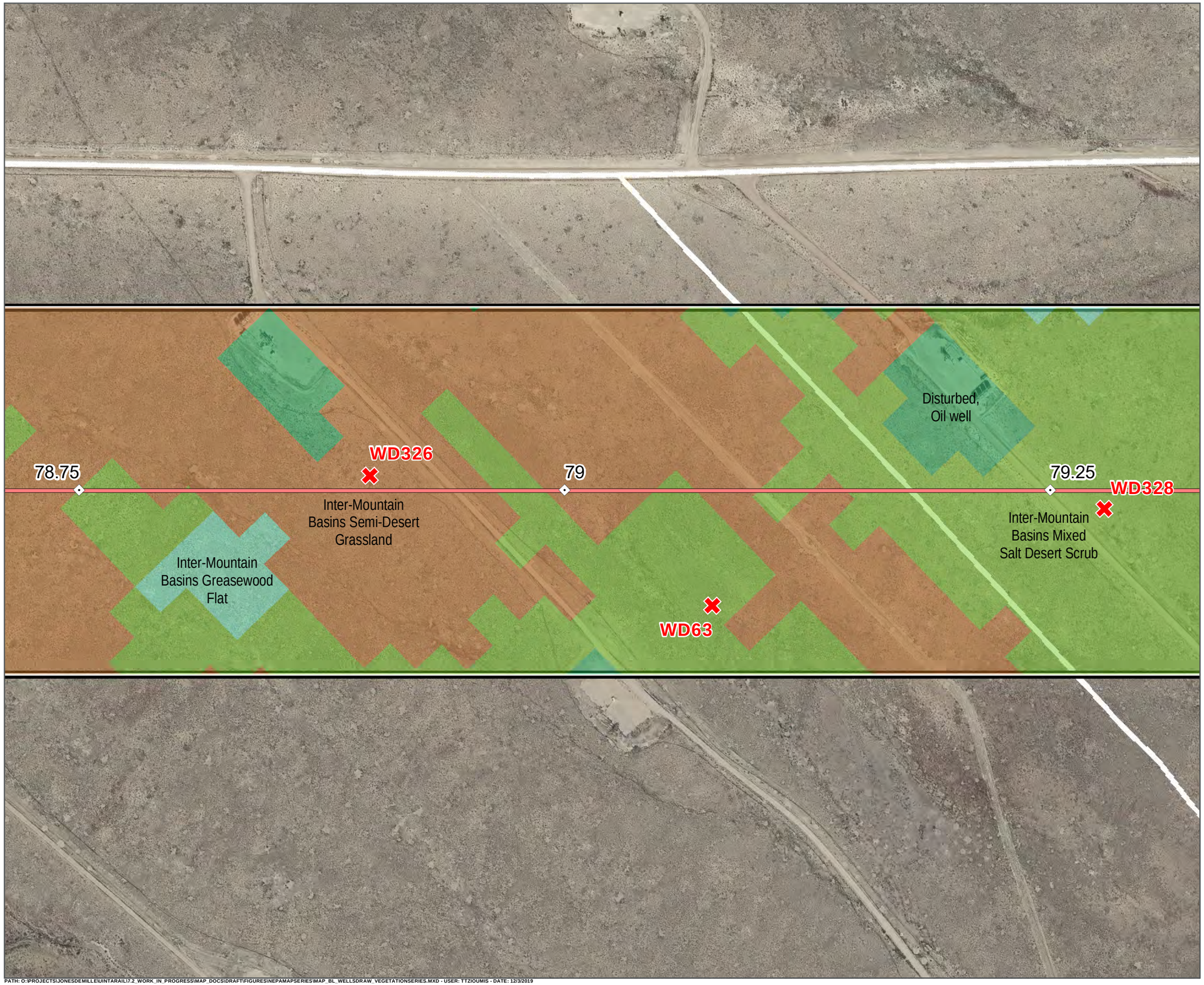

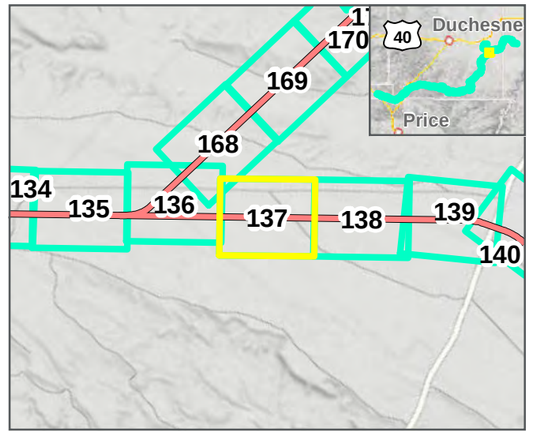

Photo Points

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Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Disturbed, Oil well
- Inter-Mountain Basins Greasewood Flat
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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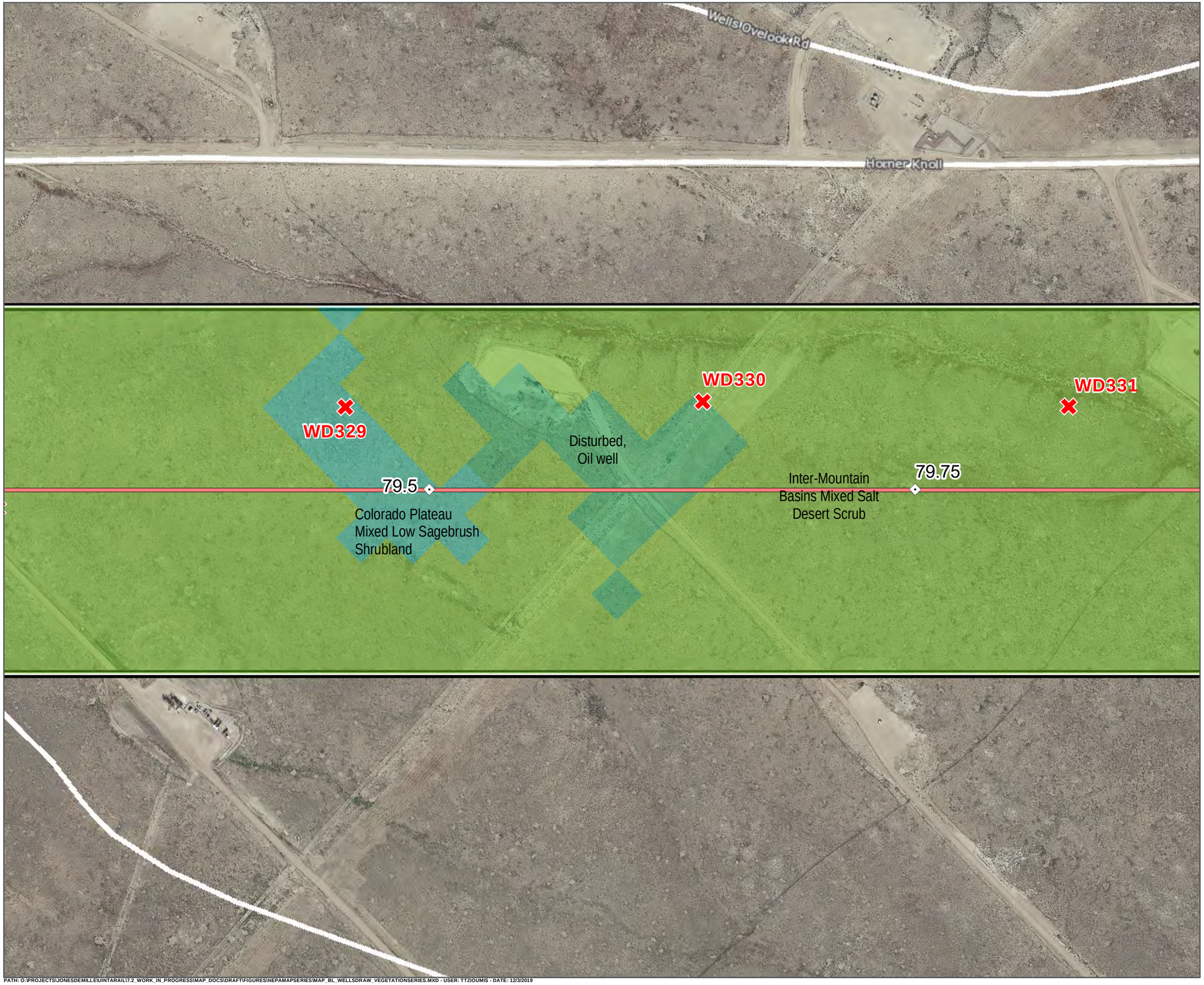

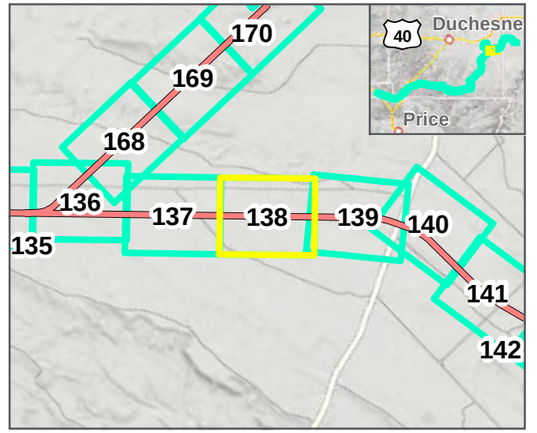

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

Colorado Plateau Mixed Low Sagebrush Shrubland

Disturbed, Oil well

Inter-Mountain Basins Mixed Salt Desert Scrub

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

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DATA SOURCES:
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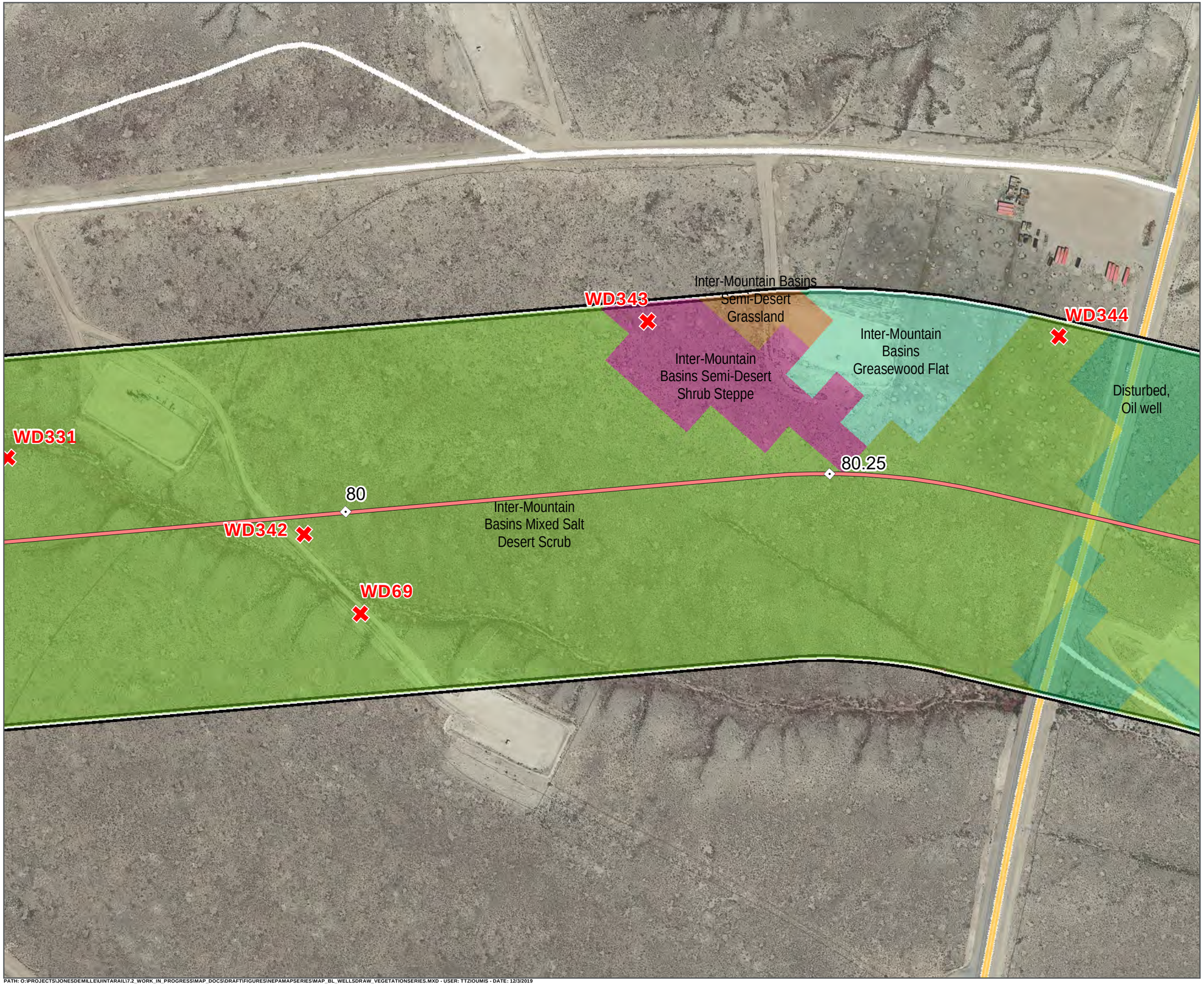

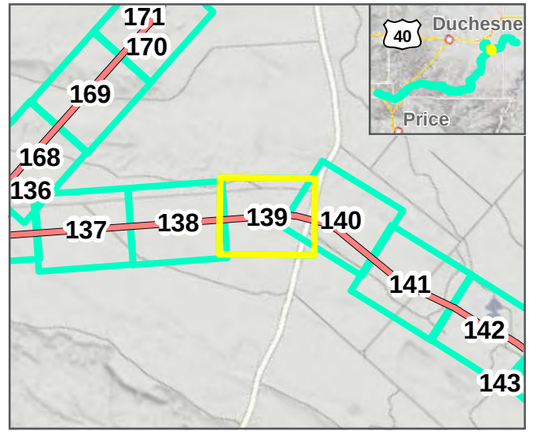

Photo Points
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Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Disturbed, Oil well
- Inter-Mountain Basins Big Sagebrush Shrubland
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SEPTEMBER 2019

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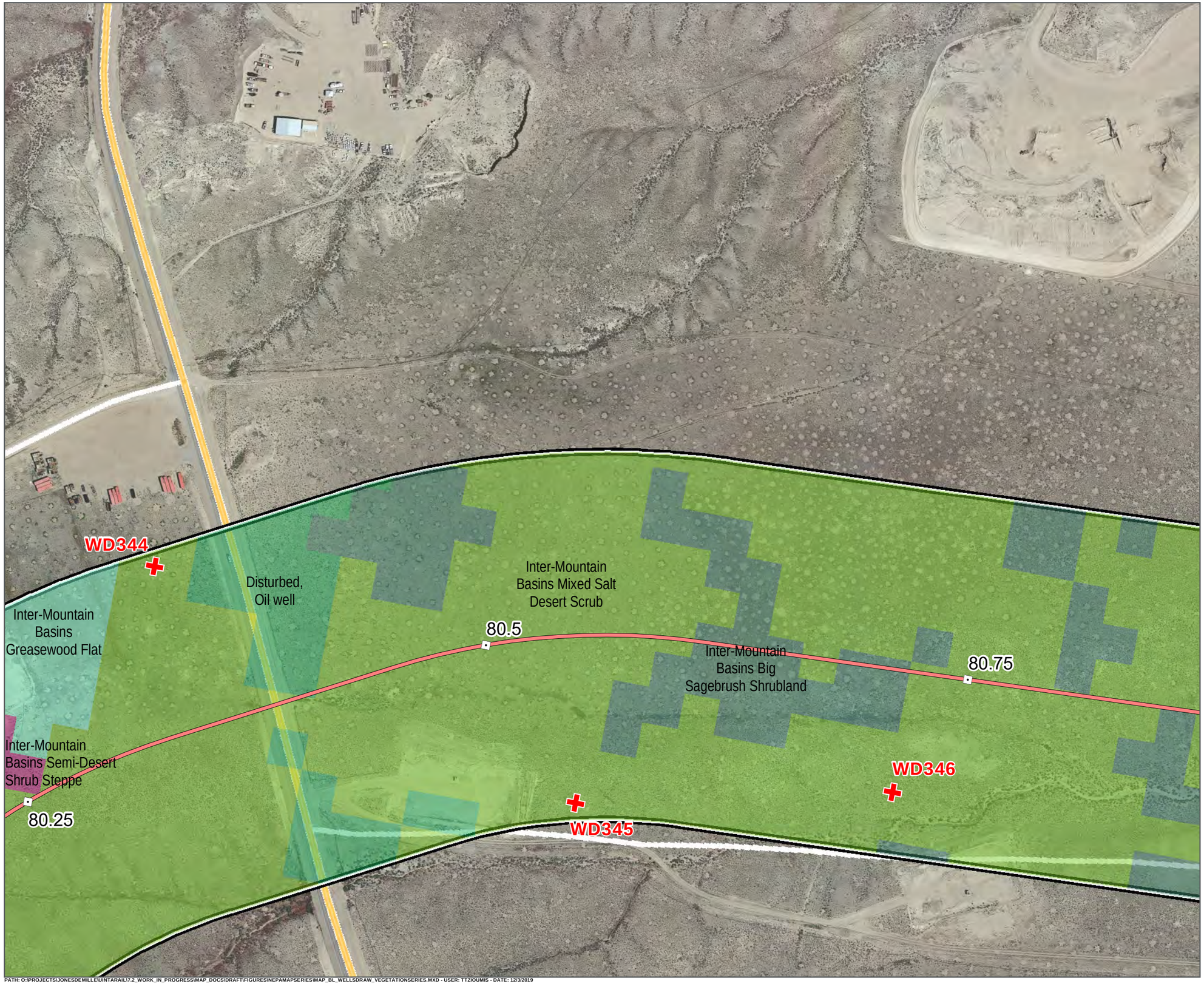

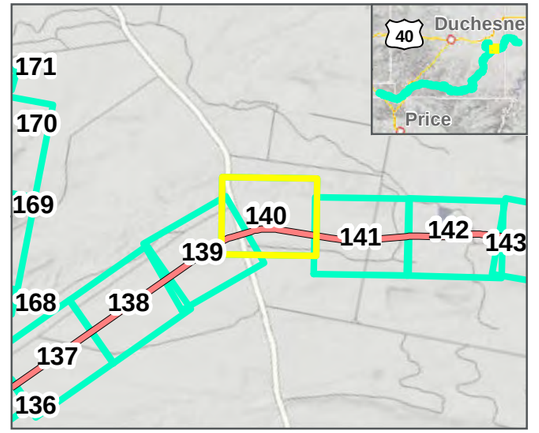

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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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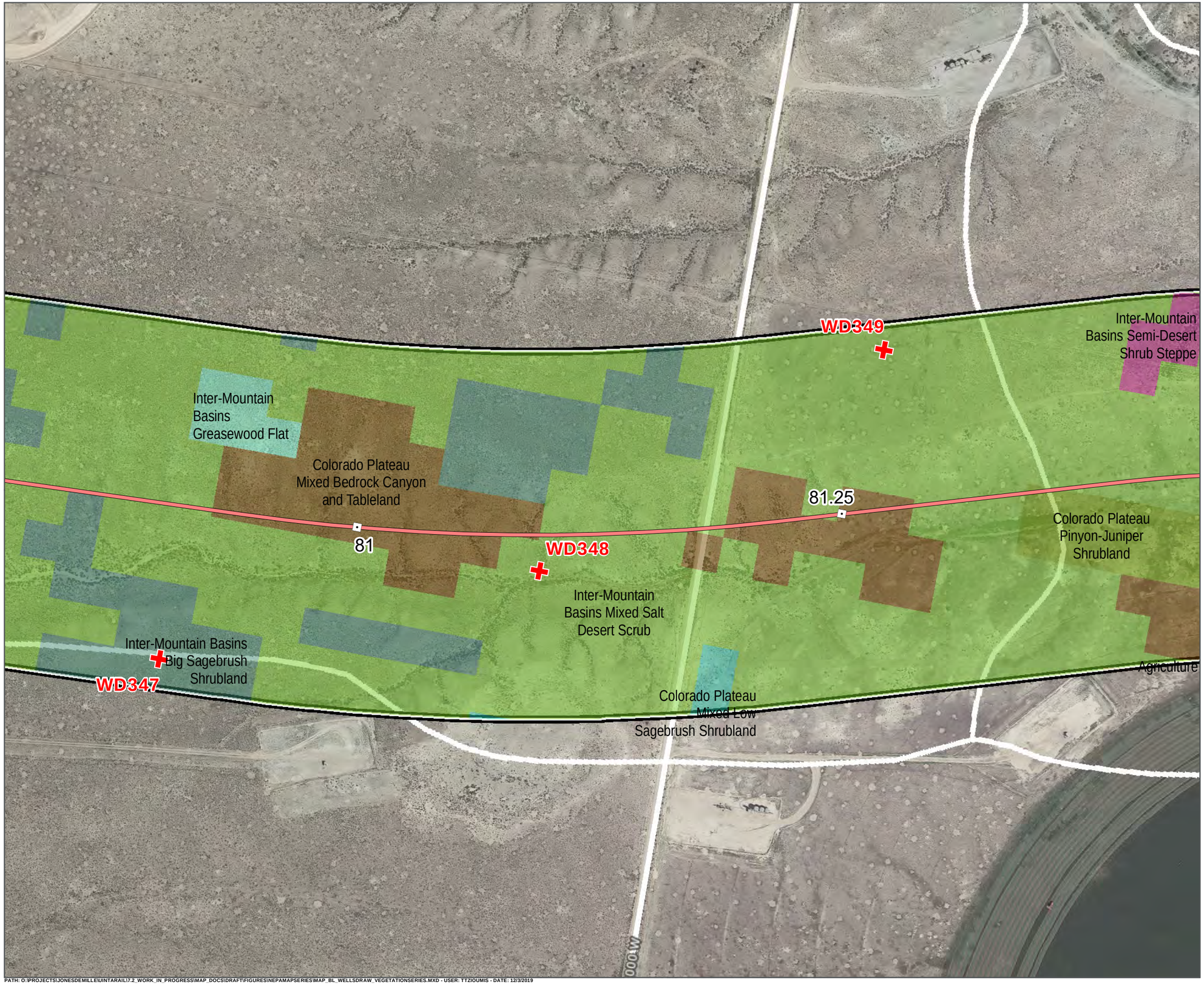

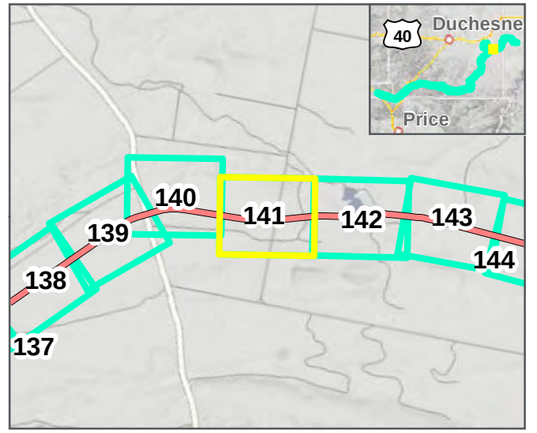

Photo Points
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Wells Draw Centerline
Study Area
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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
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VEGETATION COMMUNITIES
SEPTEMBER 2019

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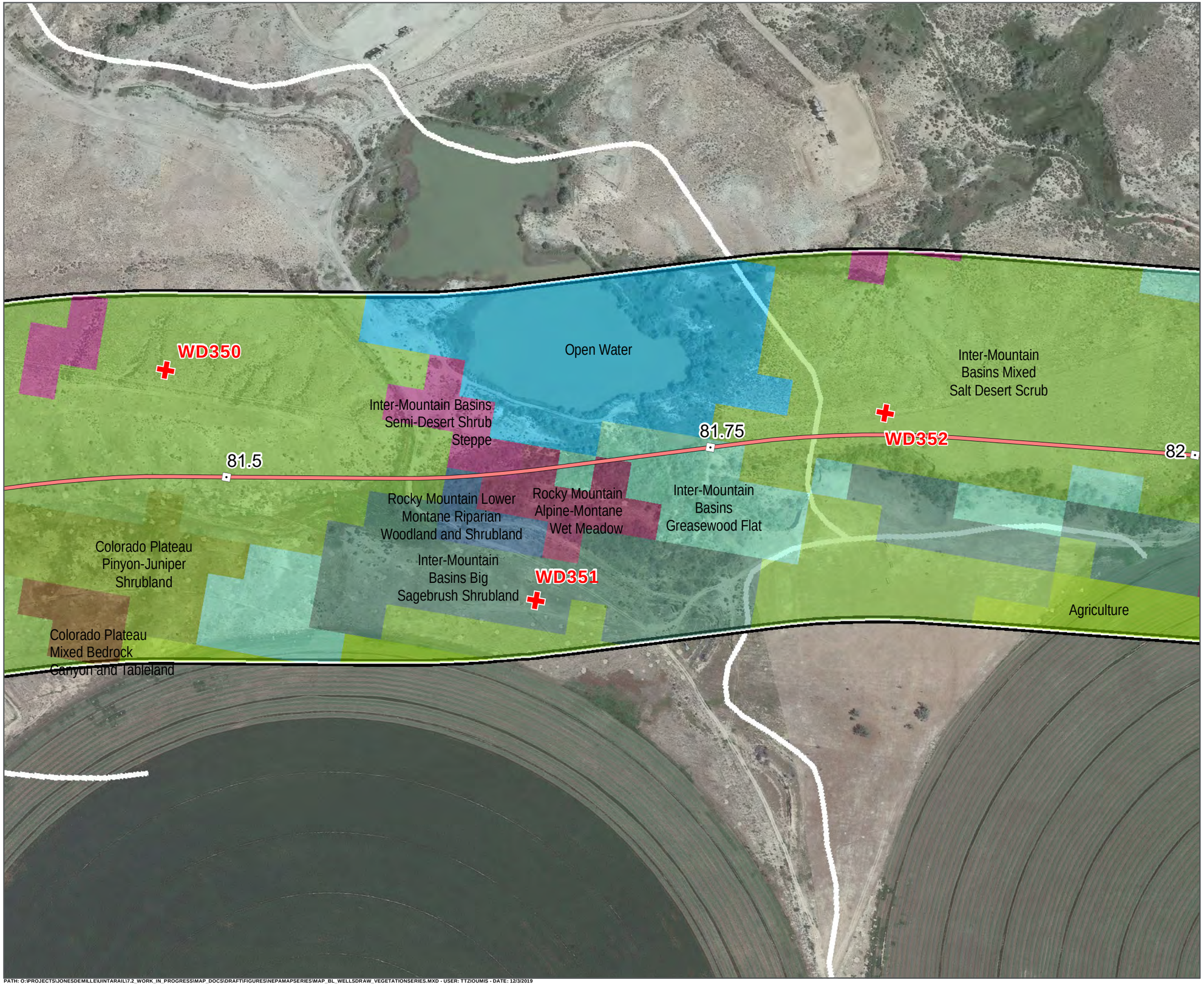

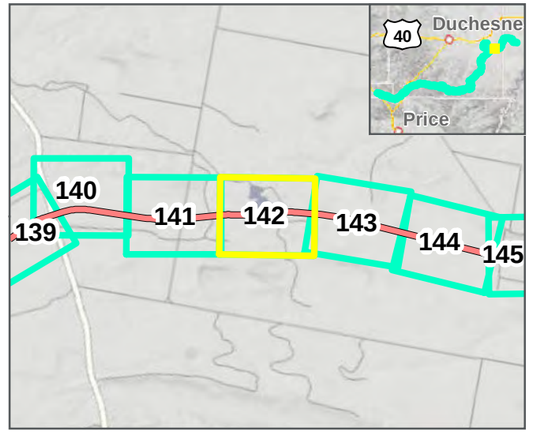

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Vegetation Communities

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- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Open Water
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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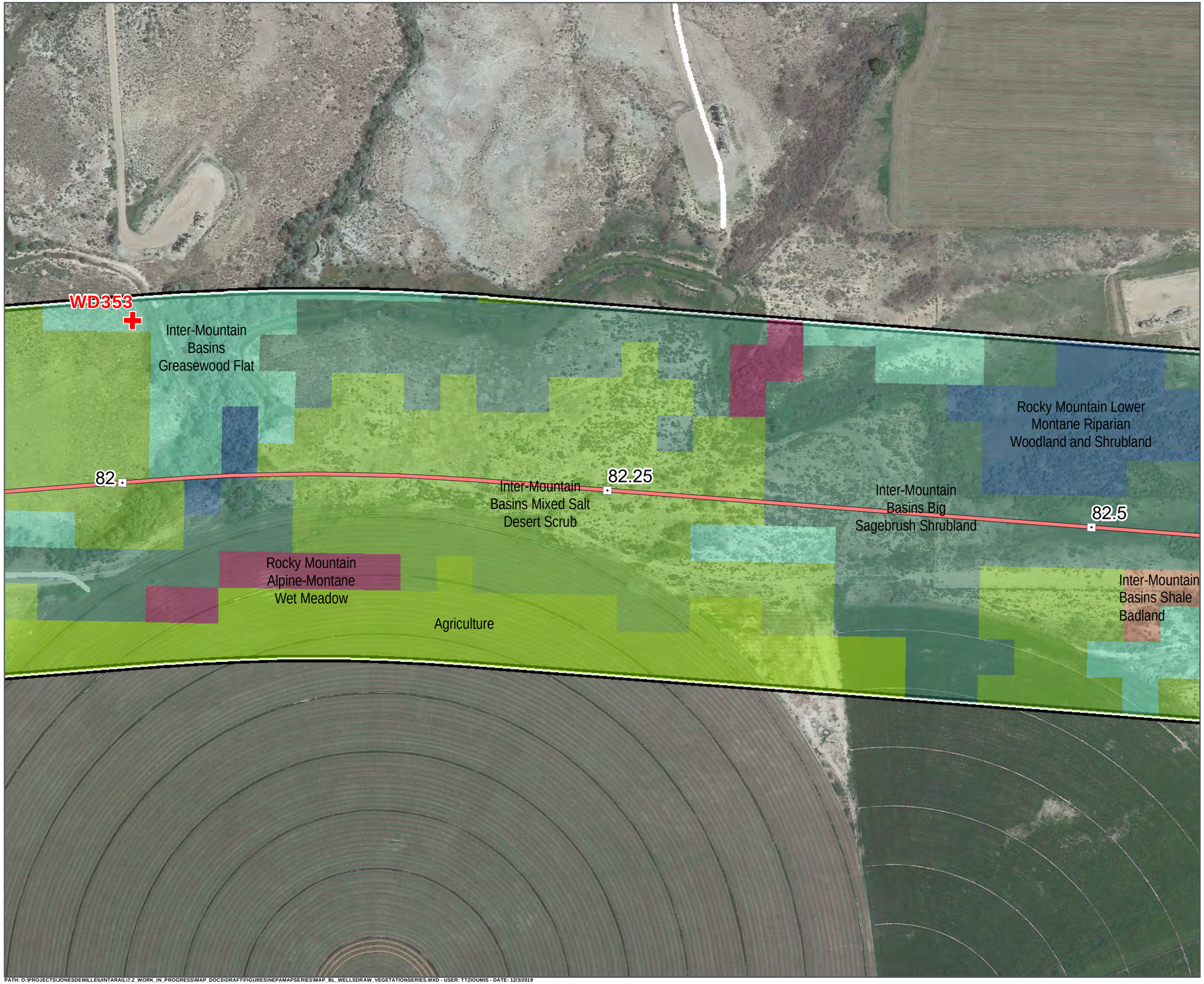

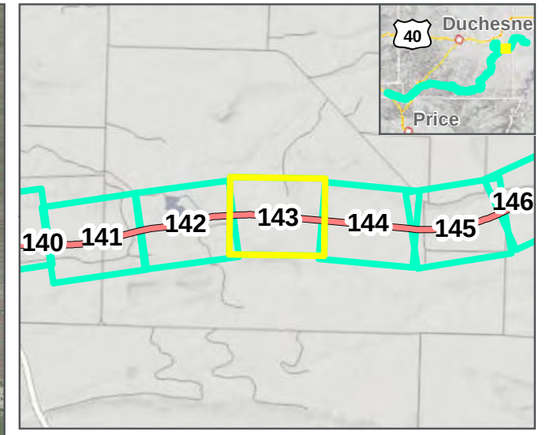

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Vegetation Communities

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- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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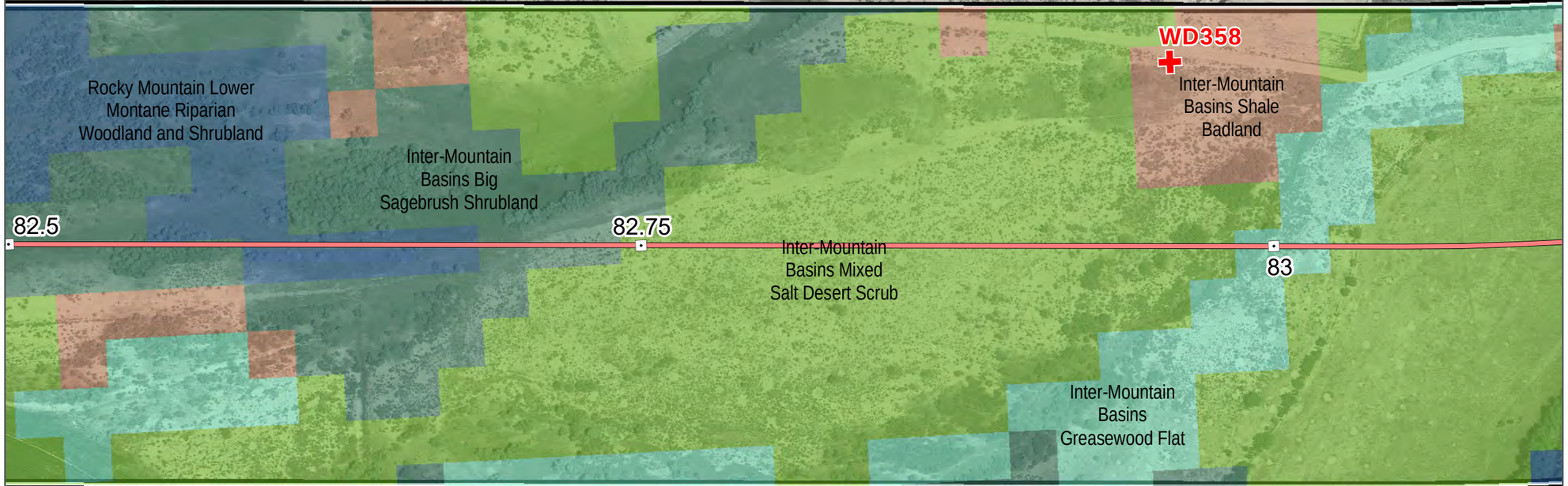

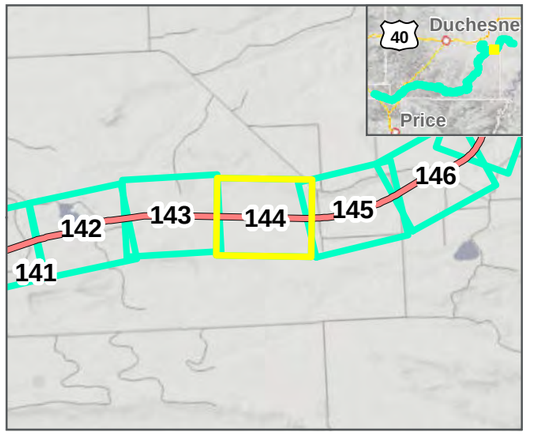

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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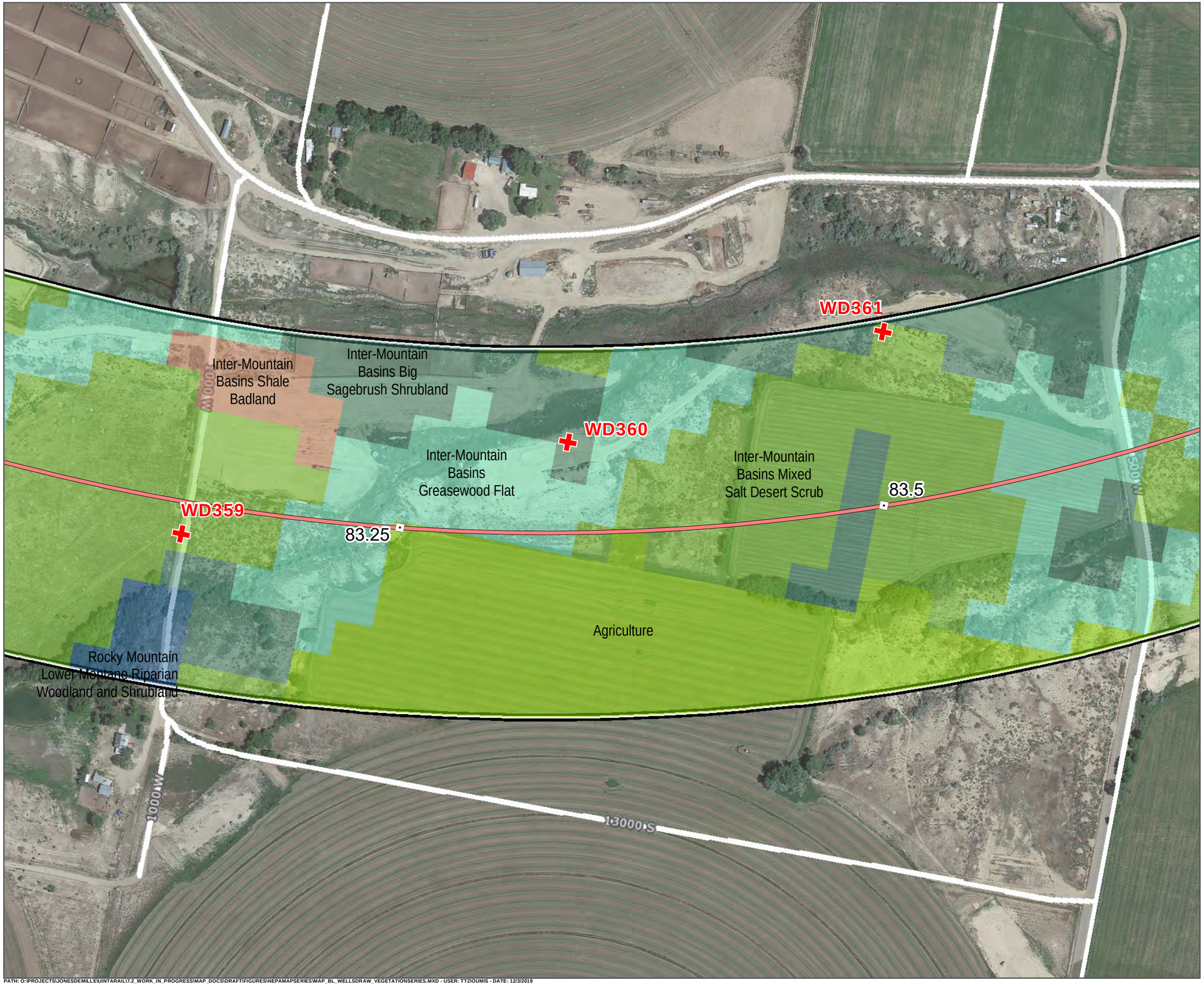

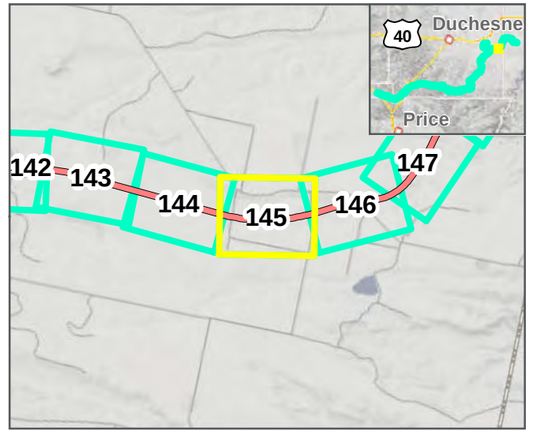

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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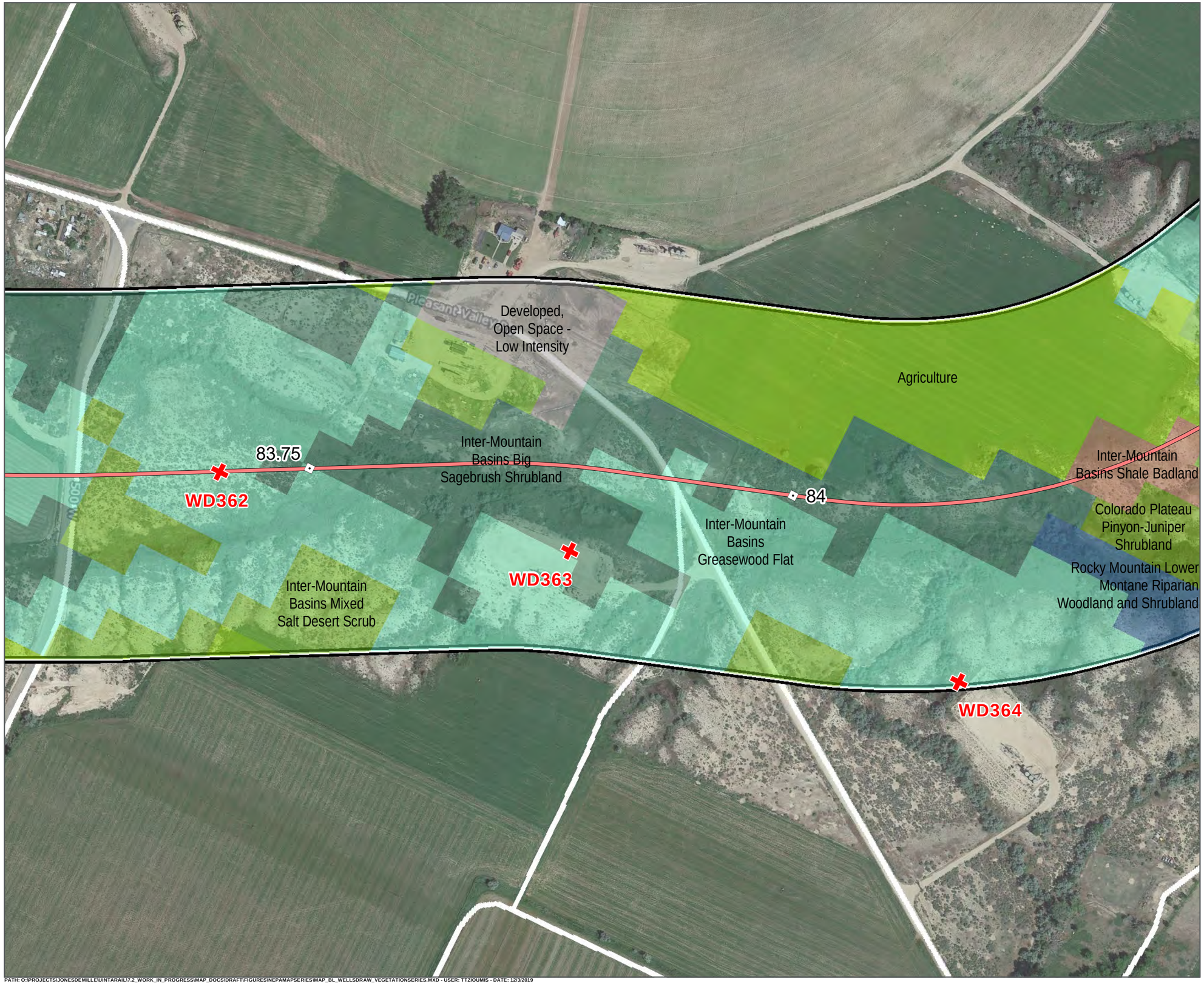

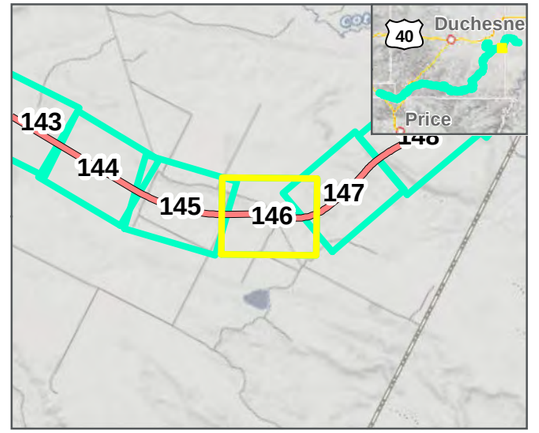

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Pinyon-Juniper Shrubland
- Developed, Open Space - Low Intensity
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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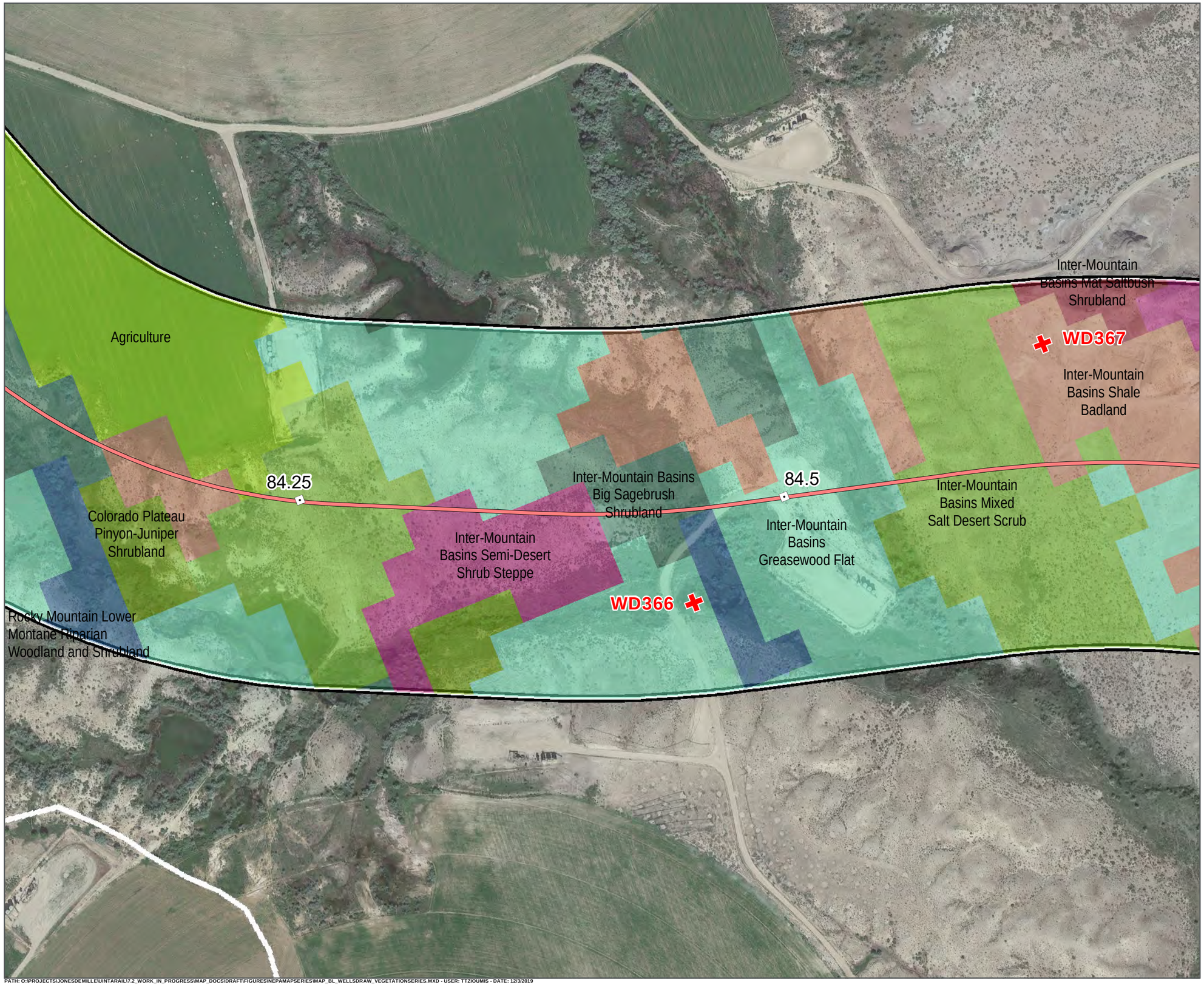

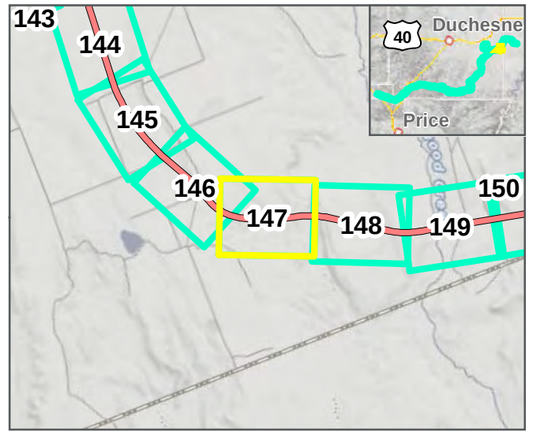

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Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
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- Inter-Mountain Basins Shale Badland
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VEGETATION COMMUNITIES
SEPTEMBER 2019

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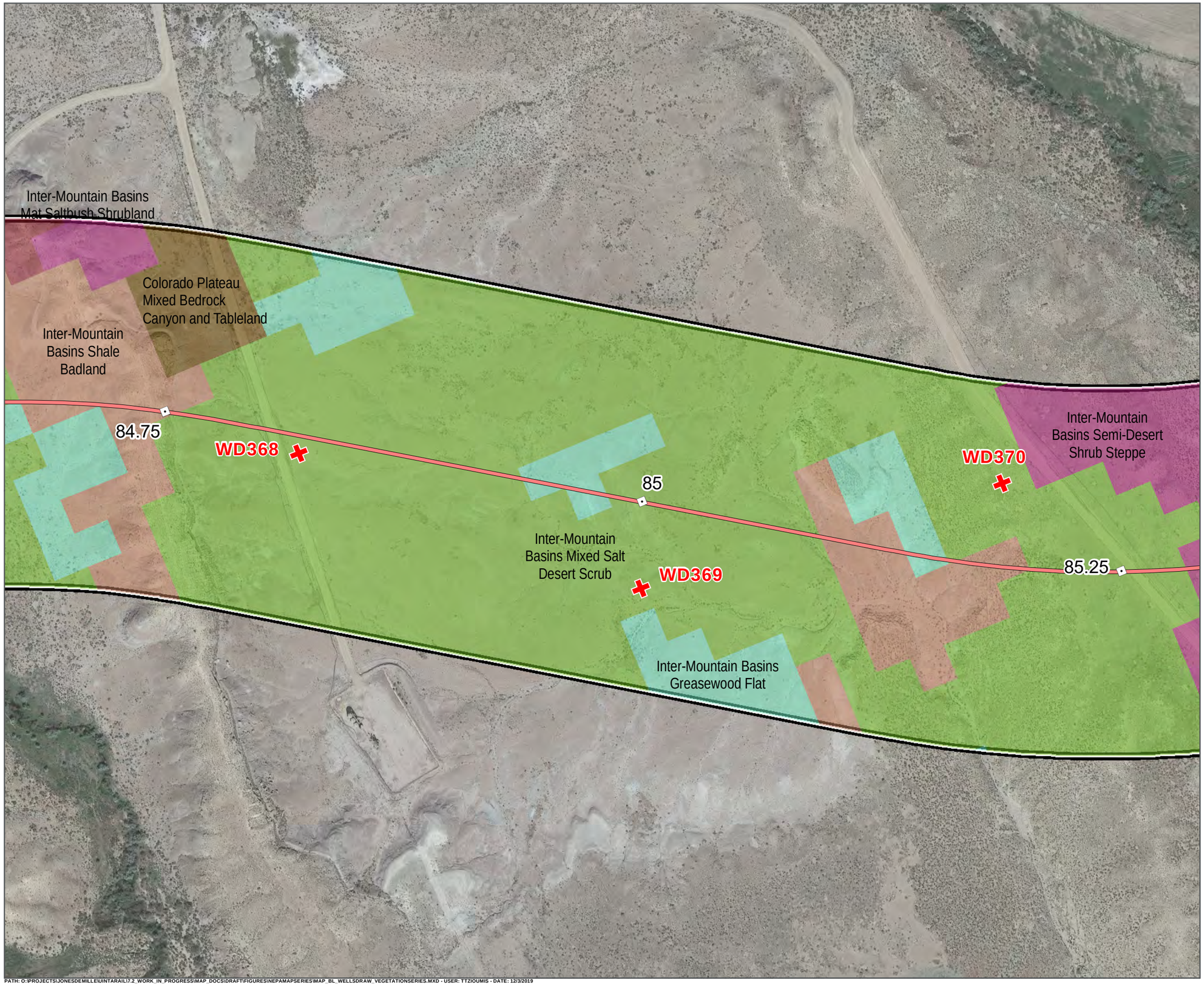

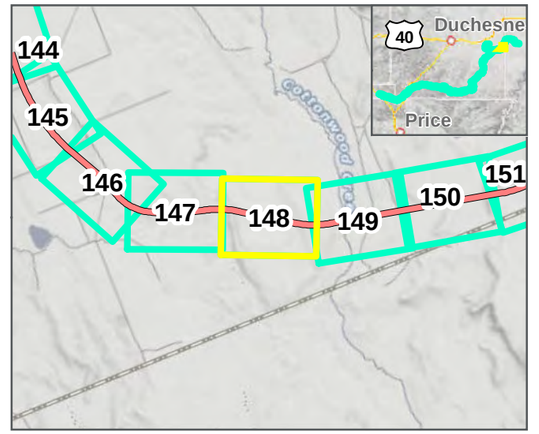

Photo Points
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Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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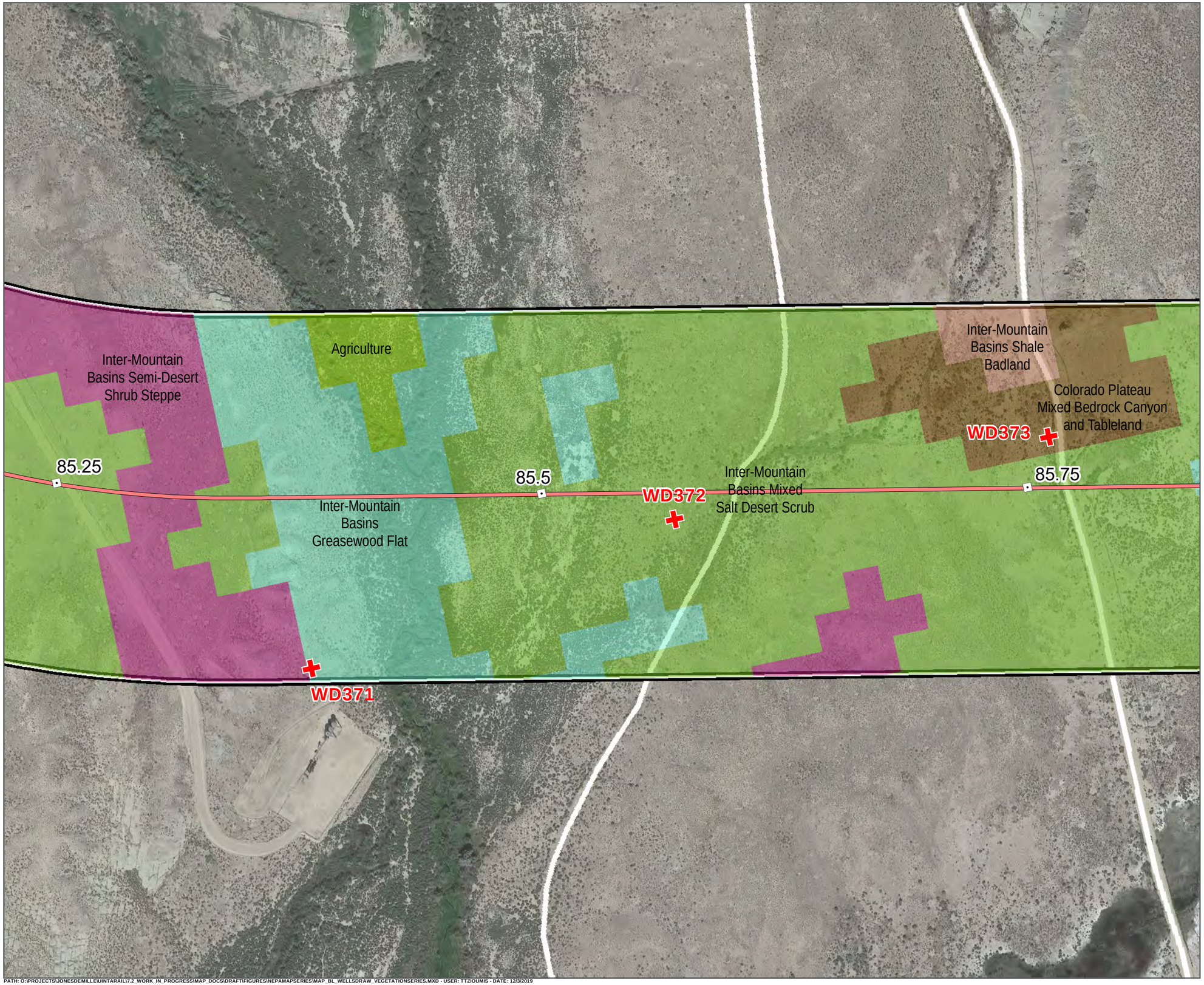

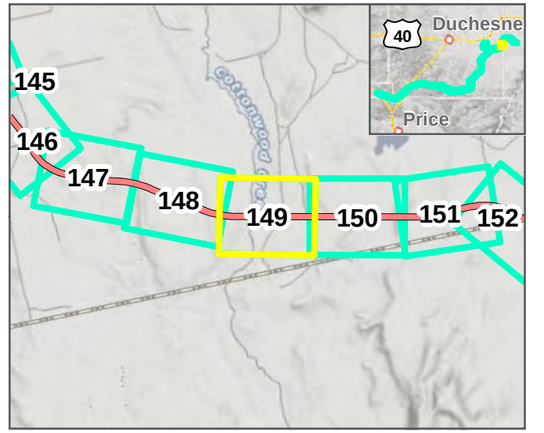

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
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VEGETATION COMMUNITIES
SEPTEMBER 2019

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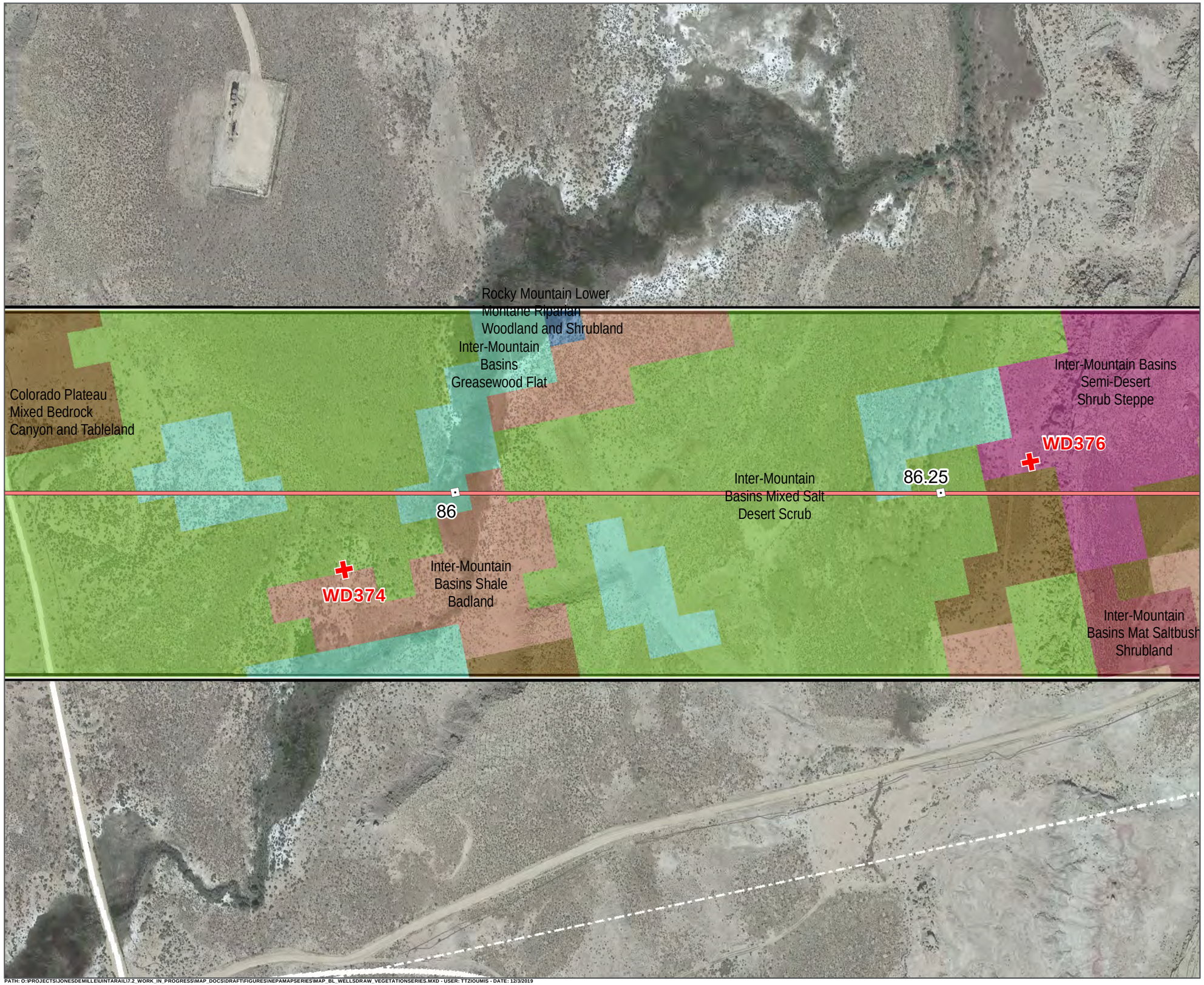

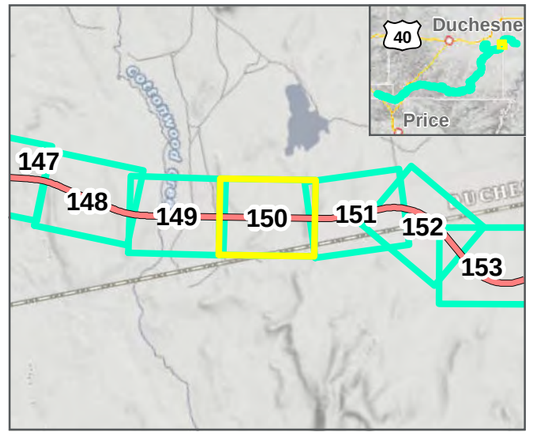

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Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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SEVEN COUNTY INFRASTRUCTURE COALITION

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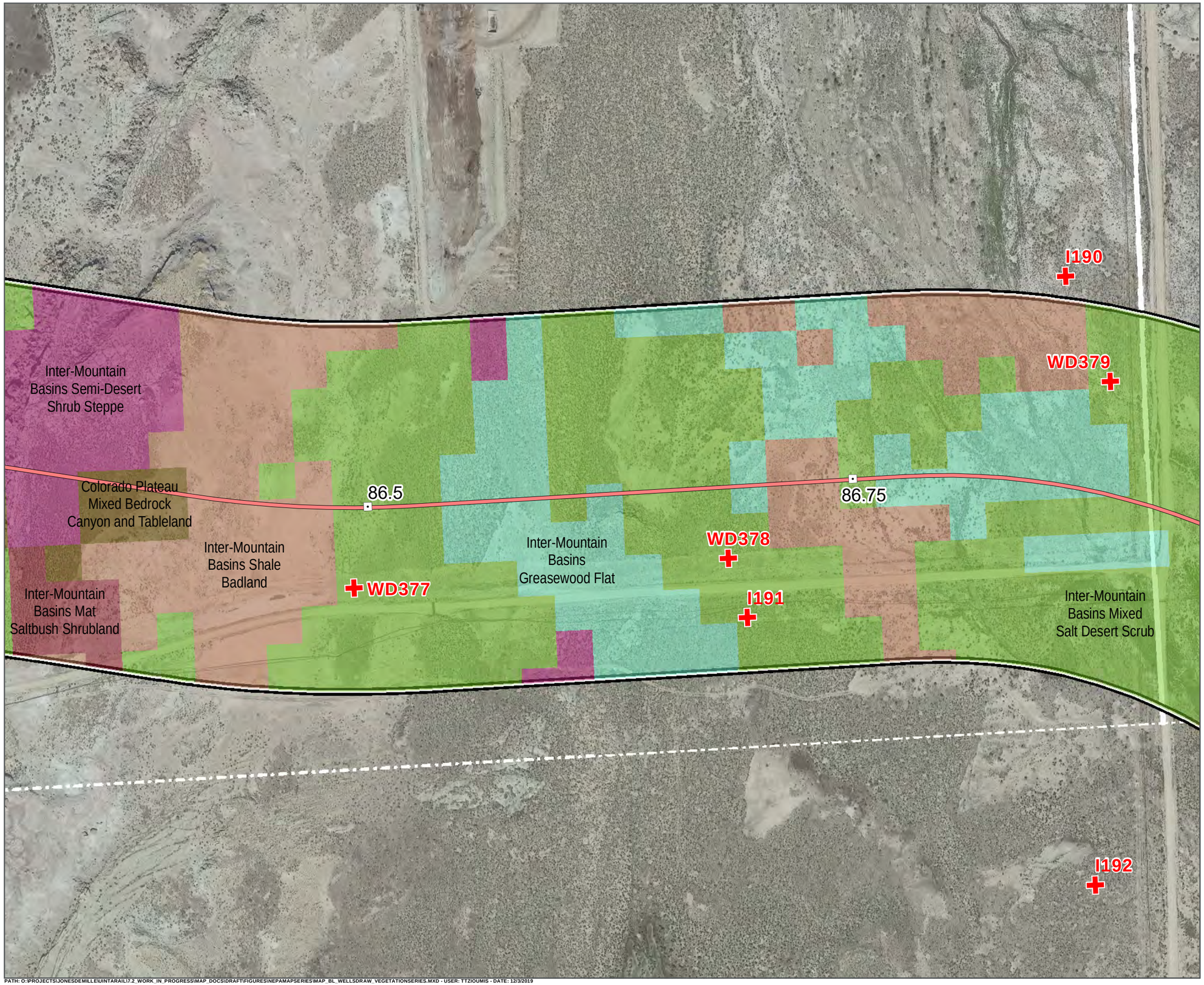

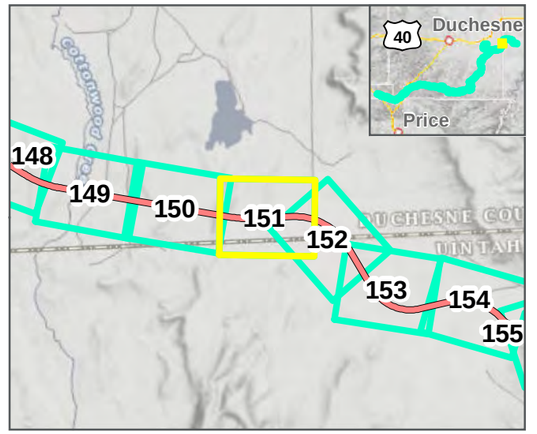

Photo Points
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Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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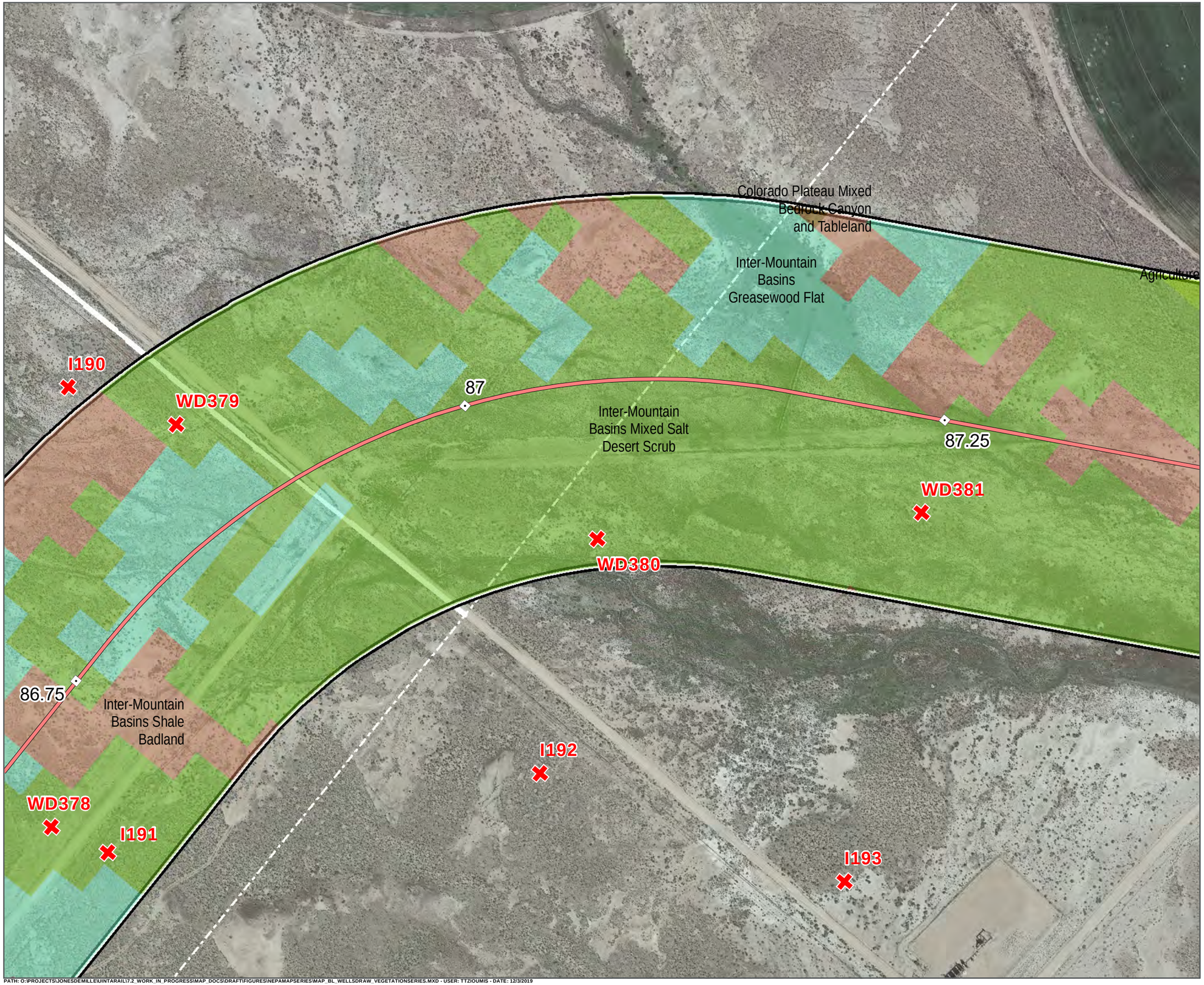

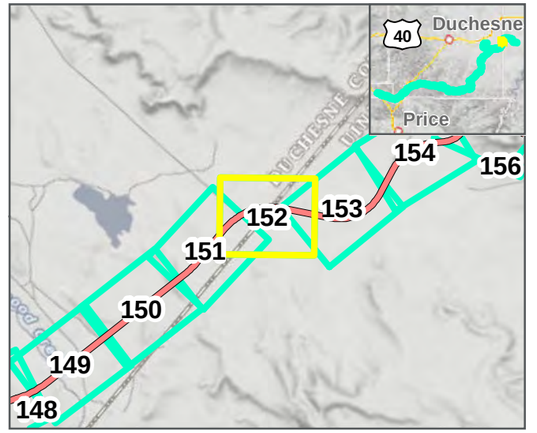

Photo Points
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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
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WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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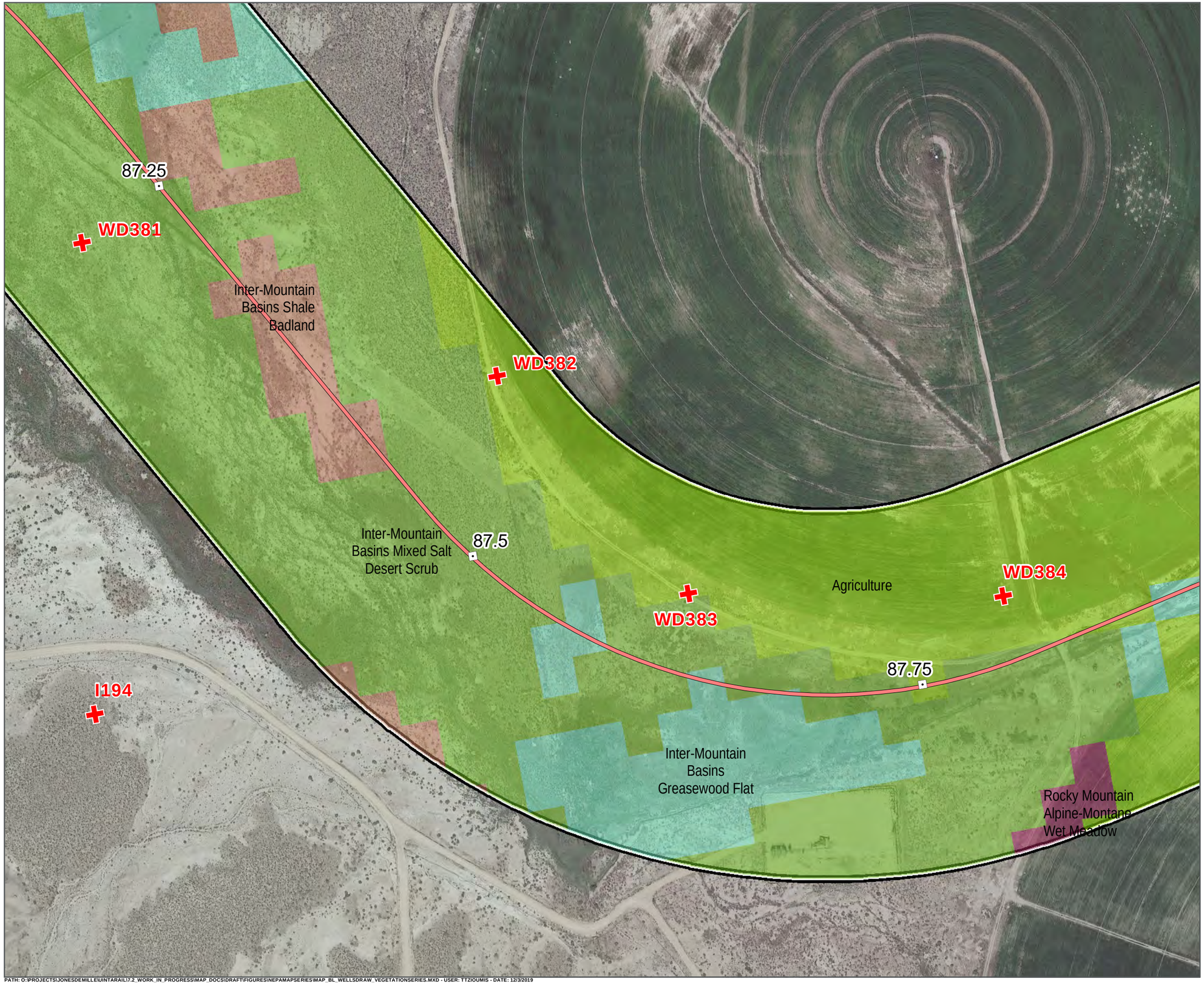

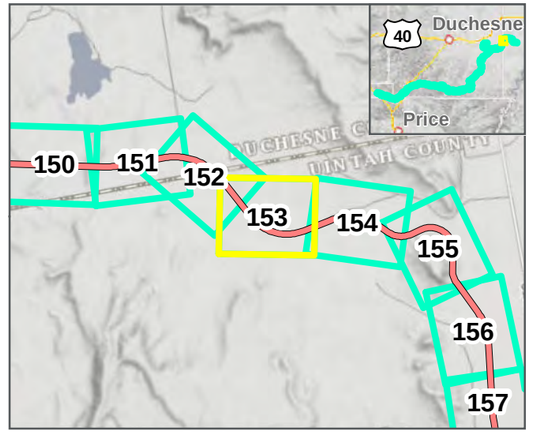

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Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland
- Rocky Mountain Alpine-Montane Wet Meadow

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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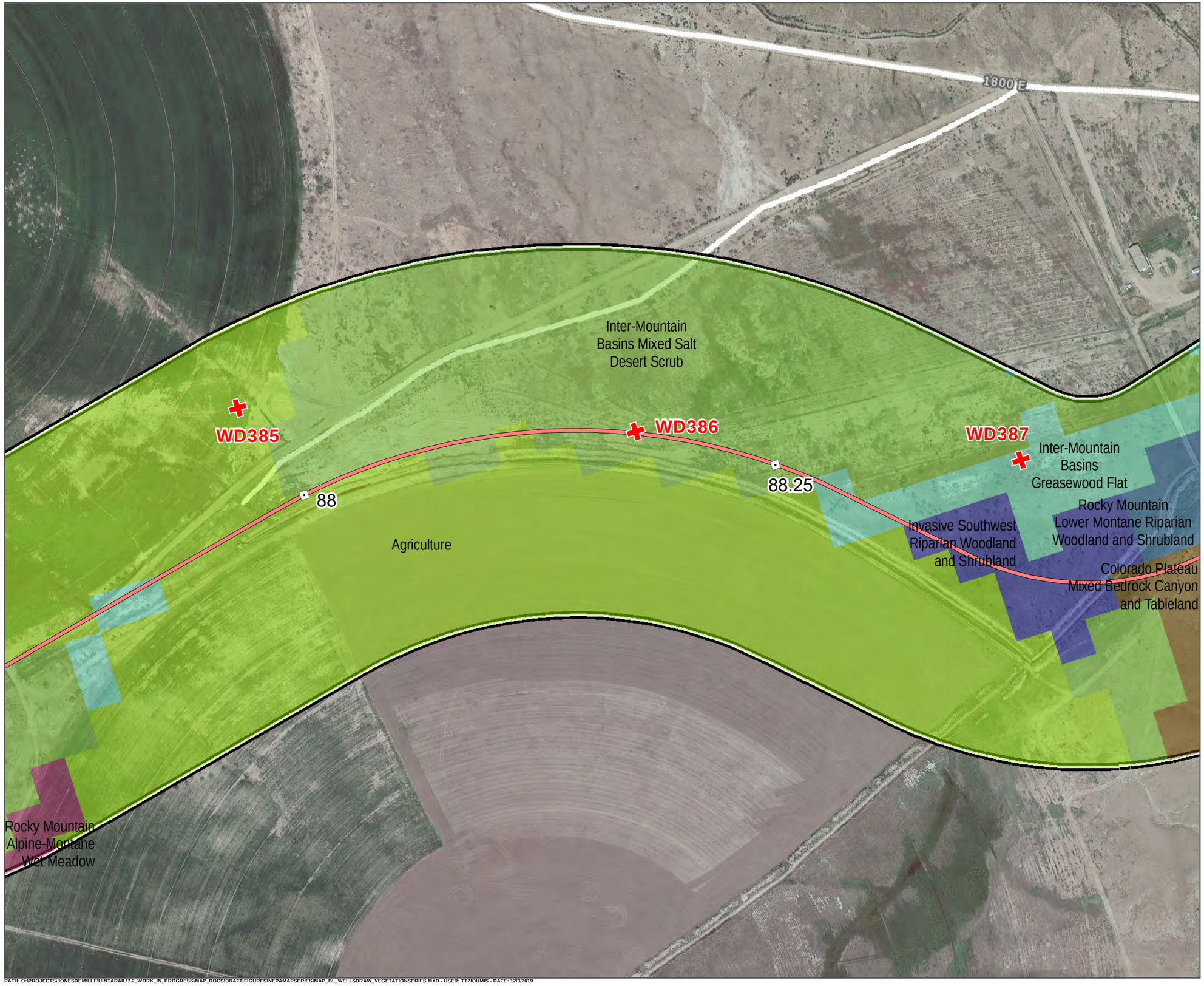

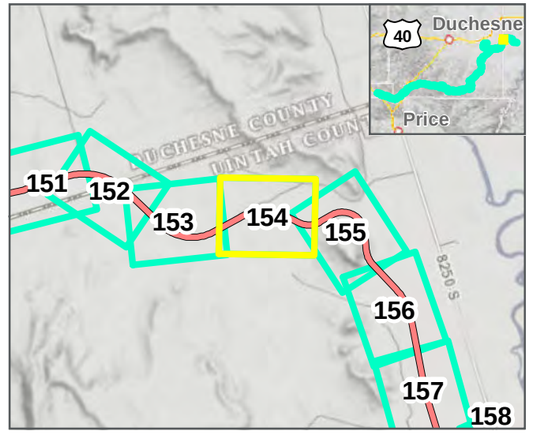

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Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Invasive Southwest Riparian Woodland and Shrubland
- Rocky Mountain Alpine-Montane Wet Meadow
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VEGETATION COMMUNITIES
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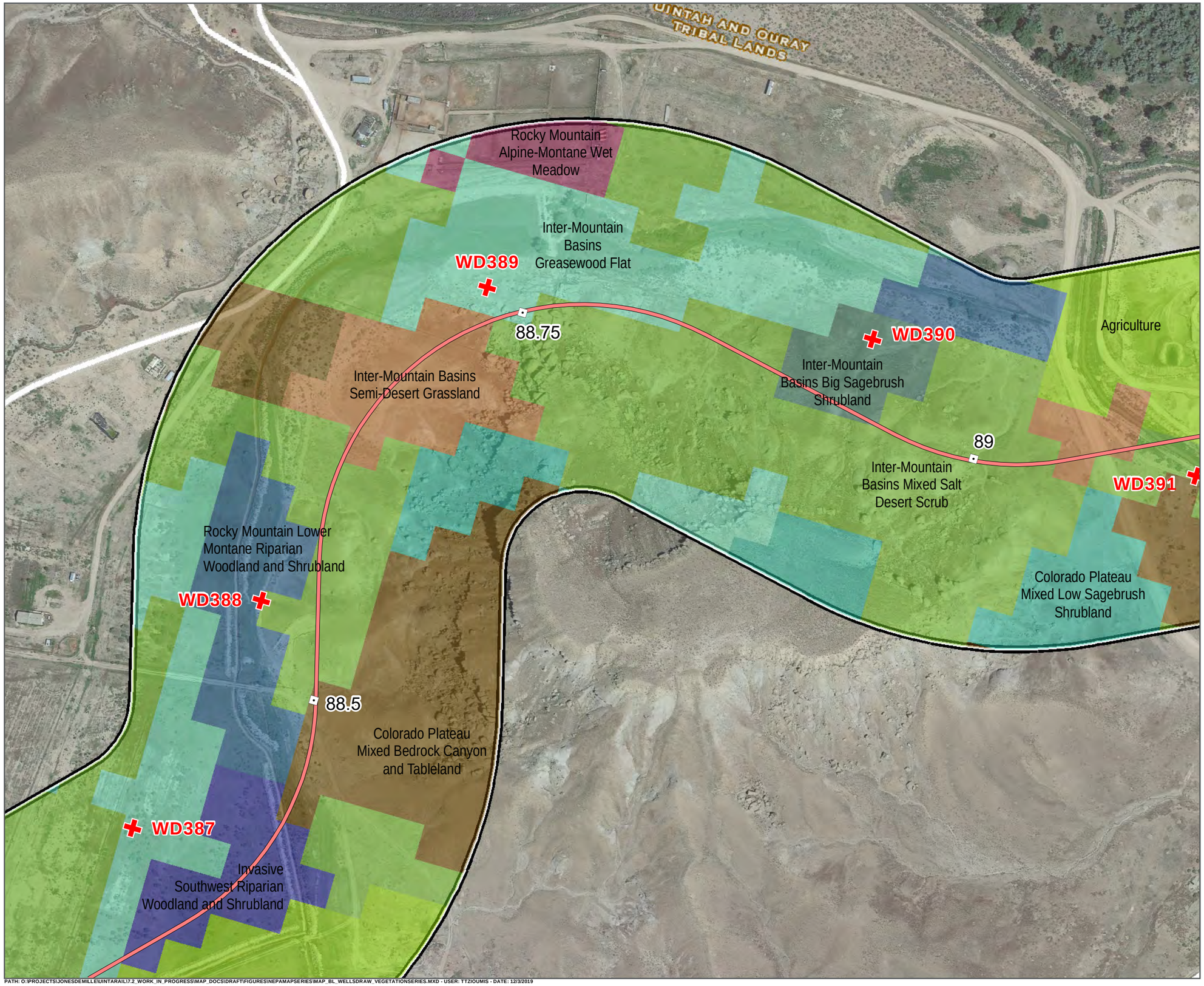

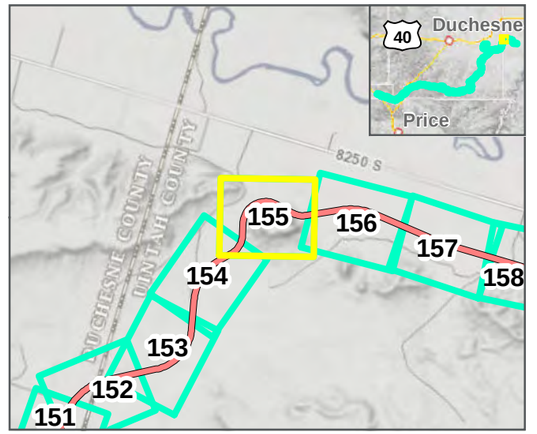

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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
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VEGETATION COMMUNITIES
SEPTEMBER 2019

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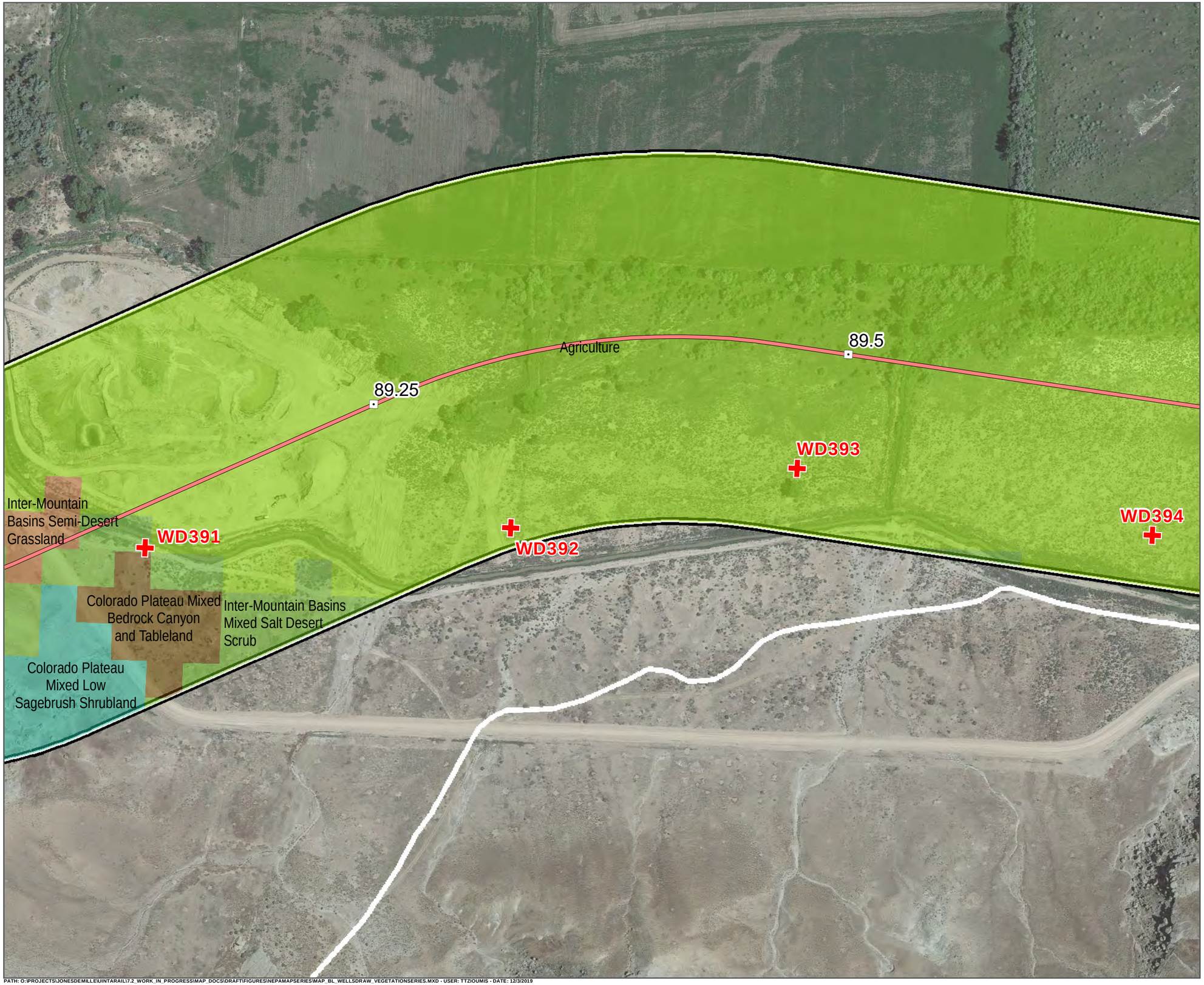

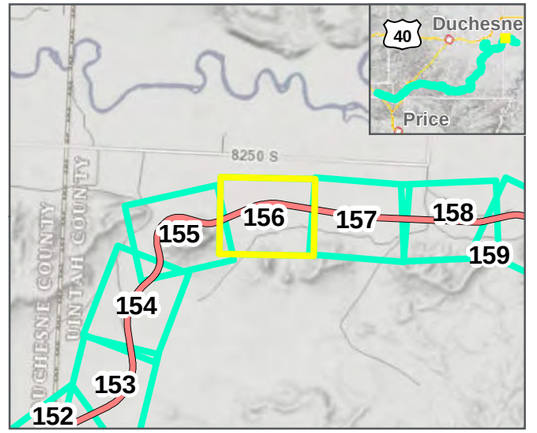

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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland

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VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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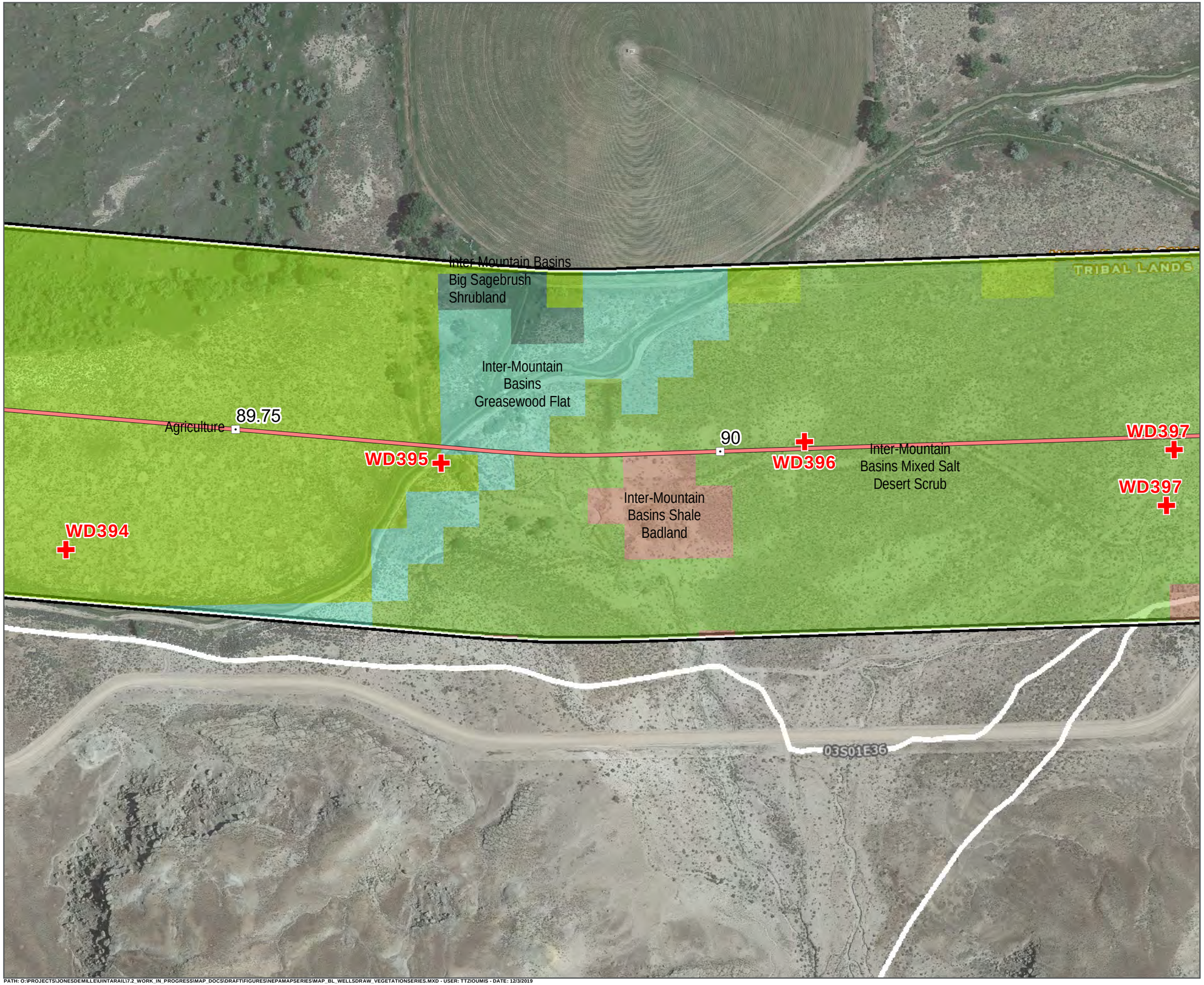

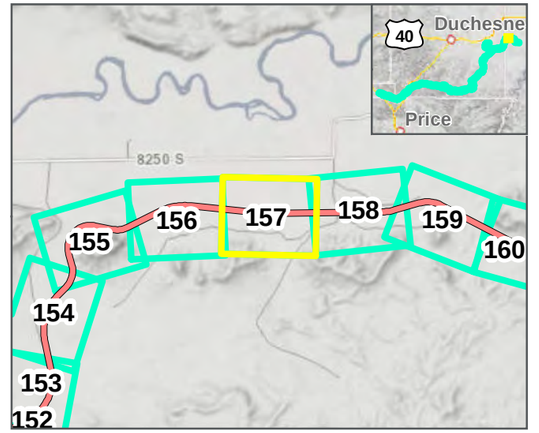

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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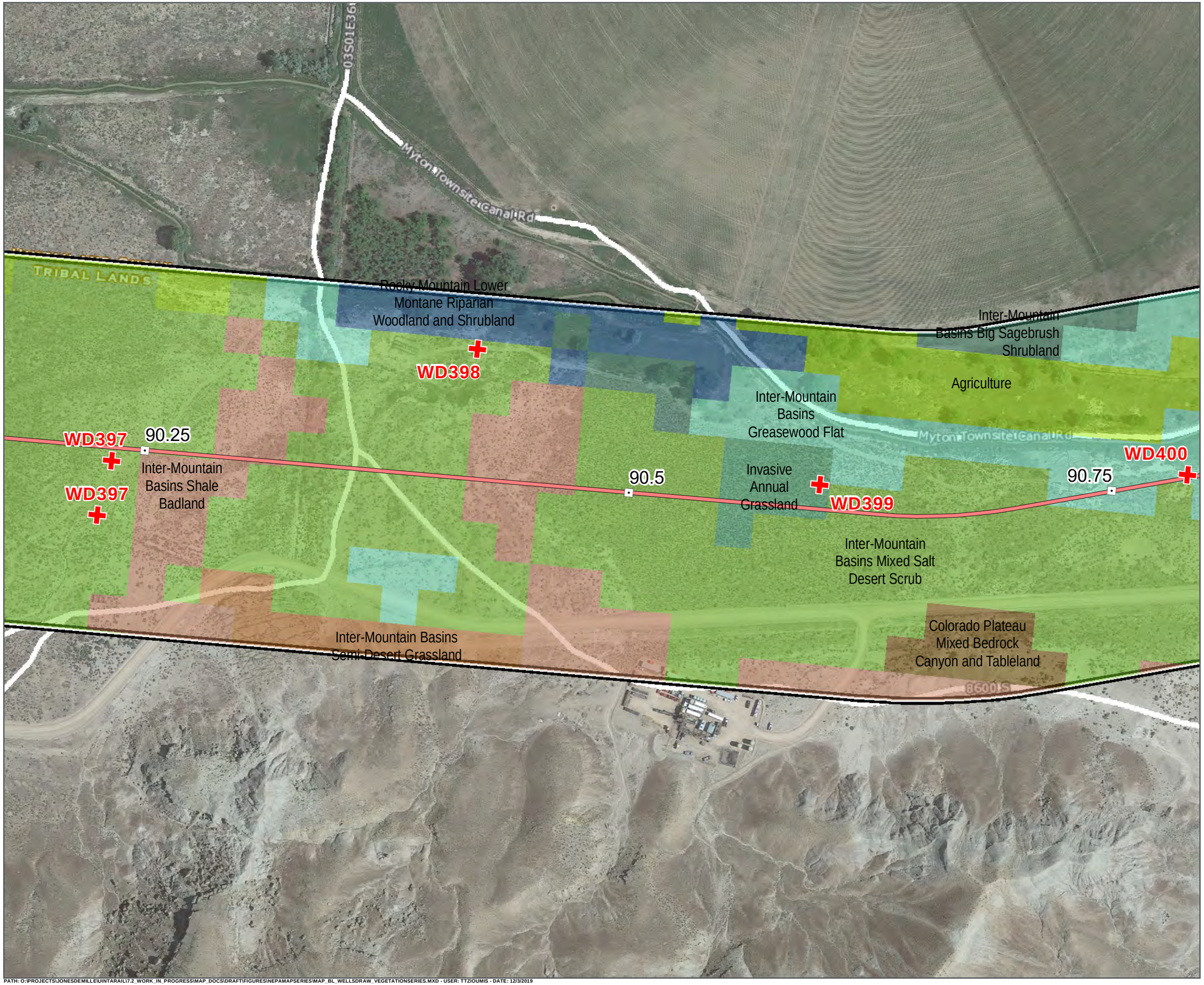

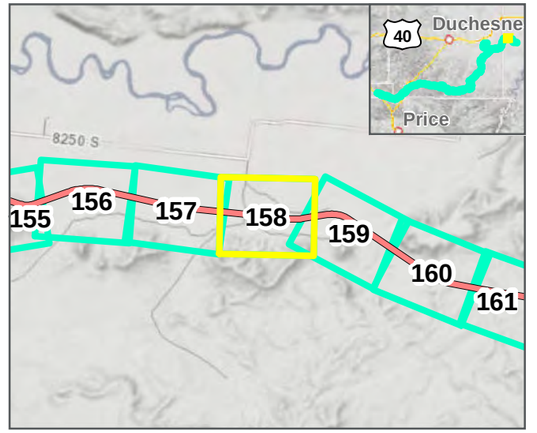

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Shale Badland
- Invasive Annual
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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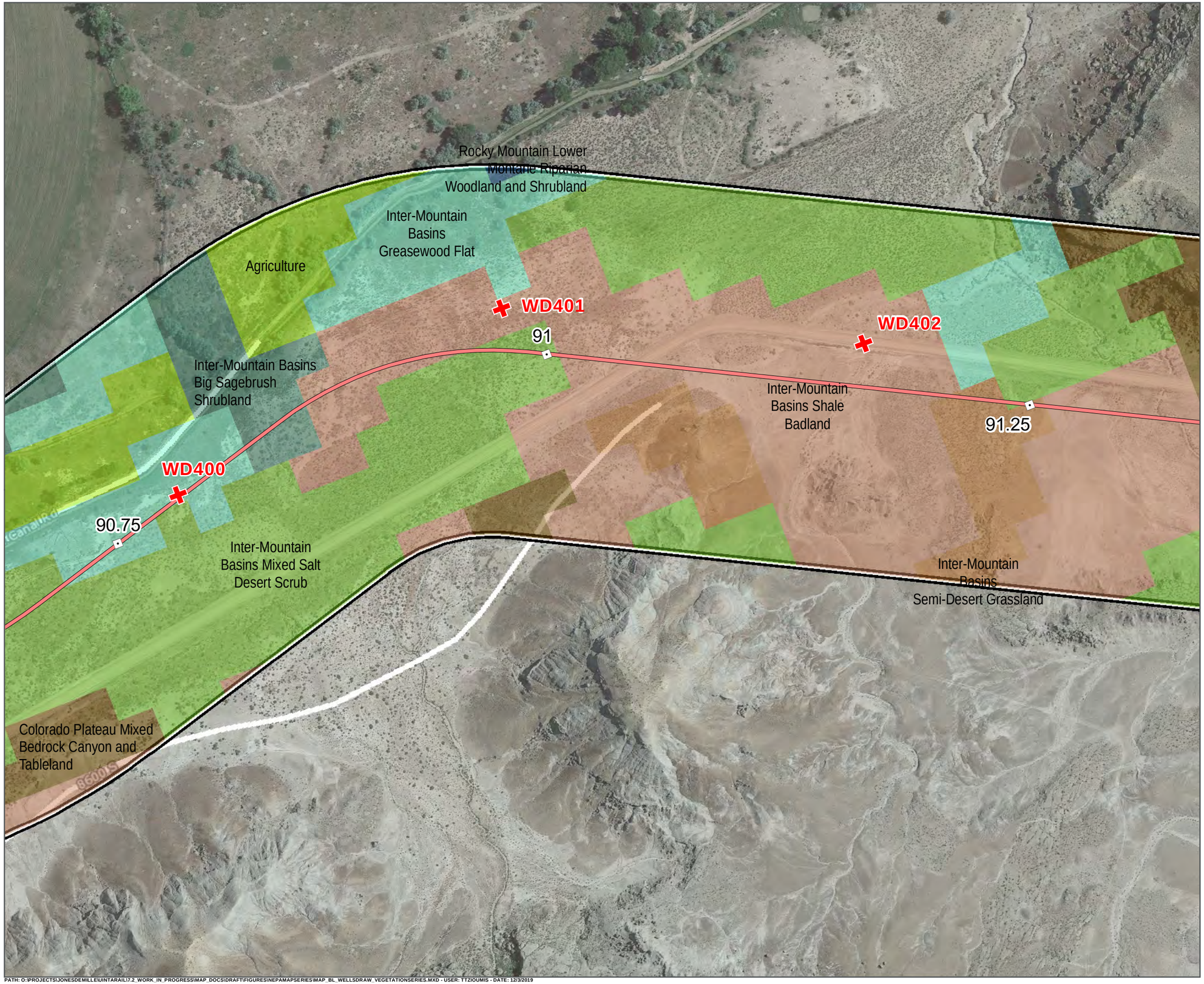

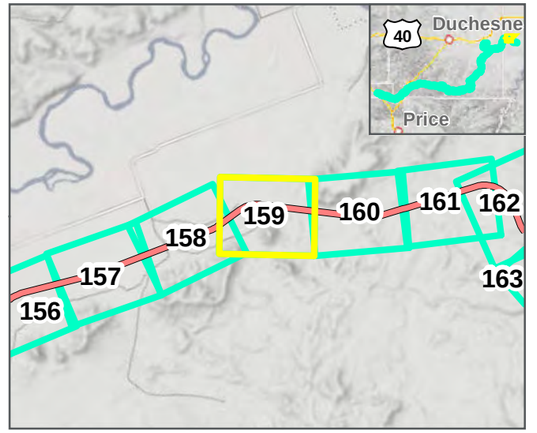

- Photo Points
- Milepost
- Wells Draw Centerline
- Study Area
- Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Shale Badland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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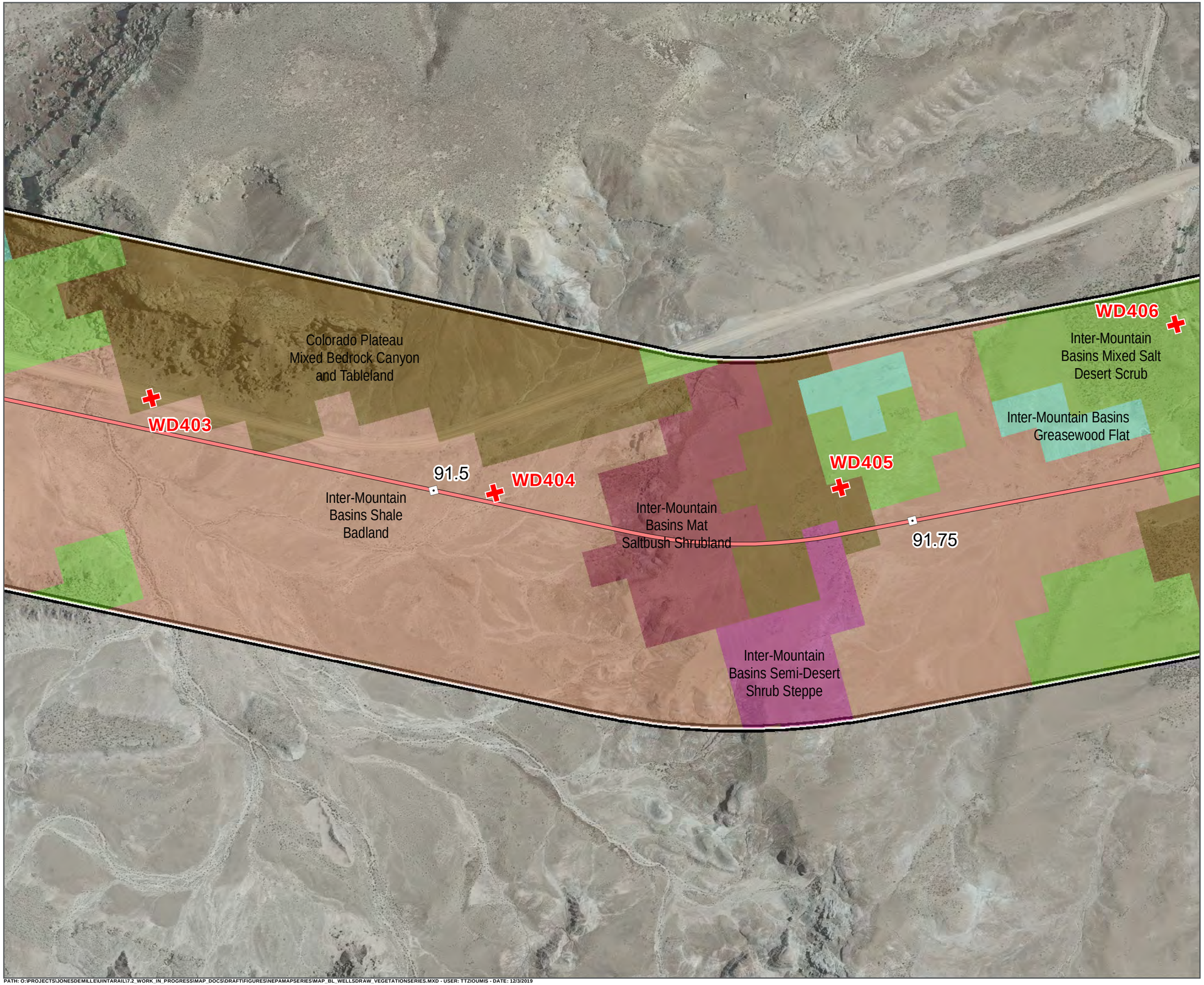

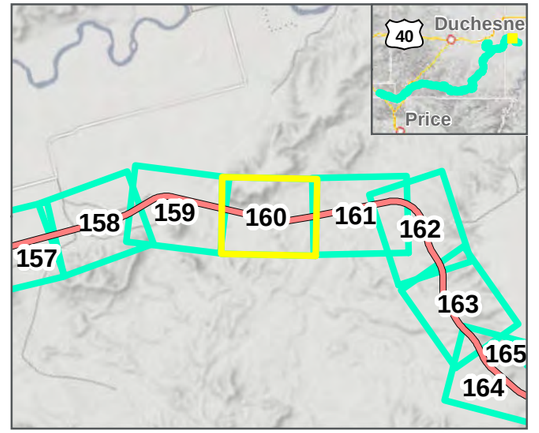

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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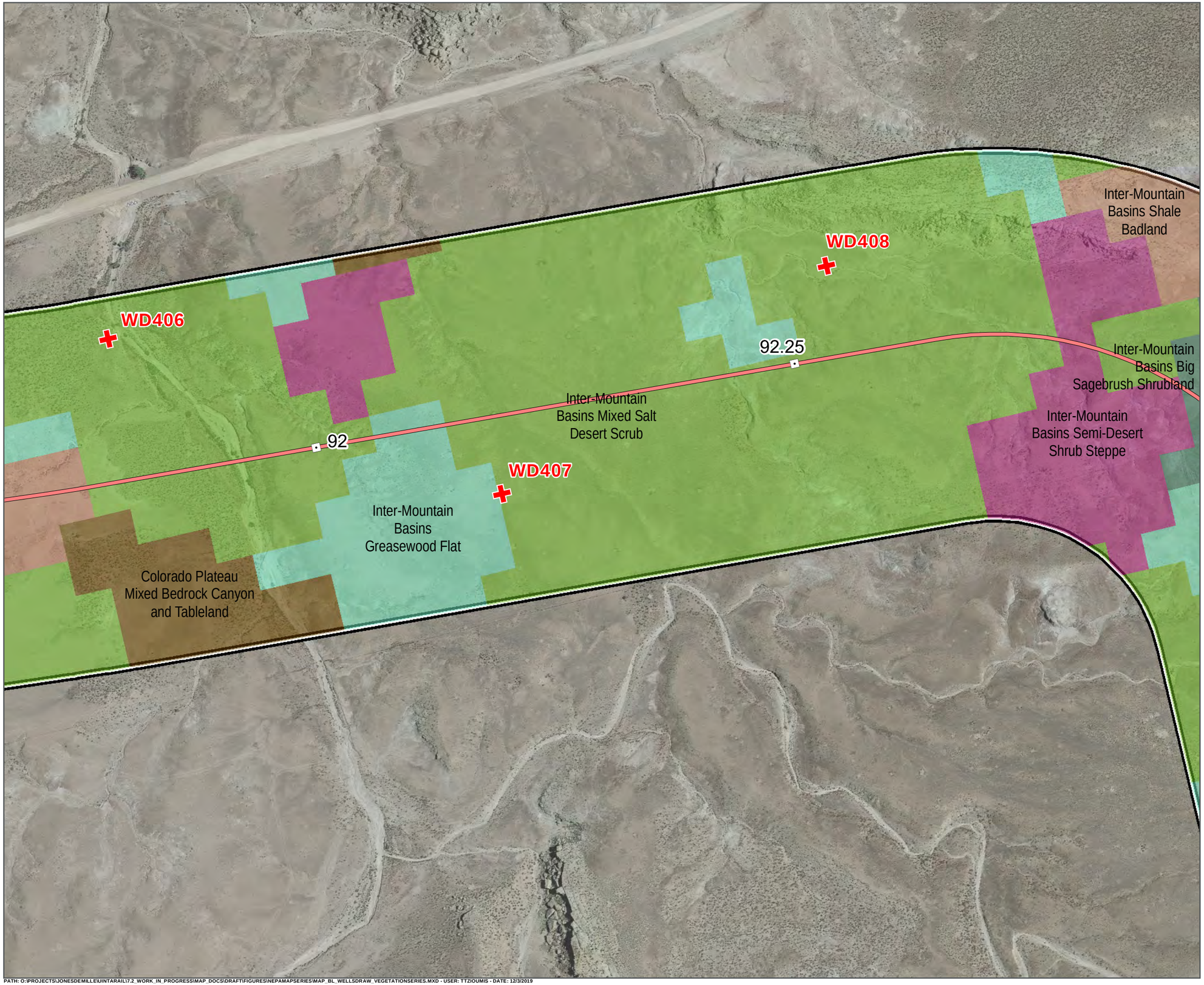

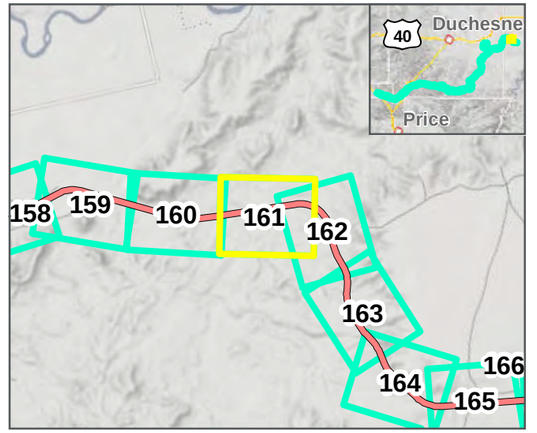

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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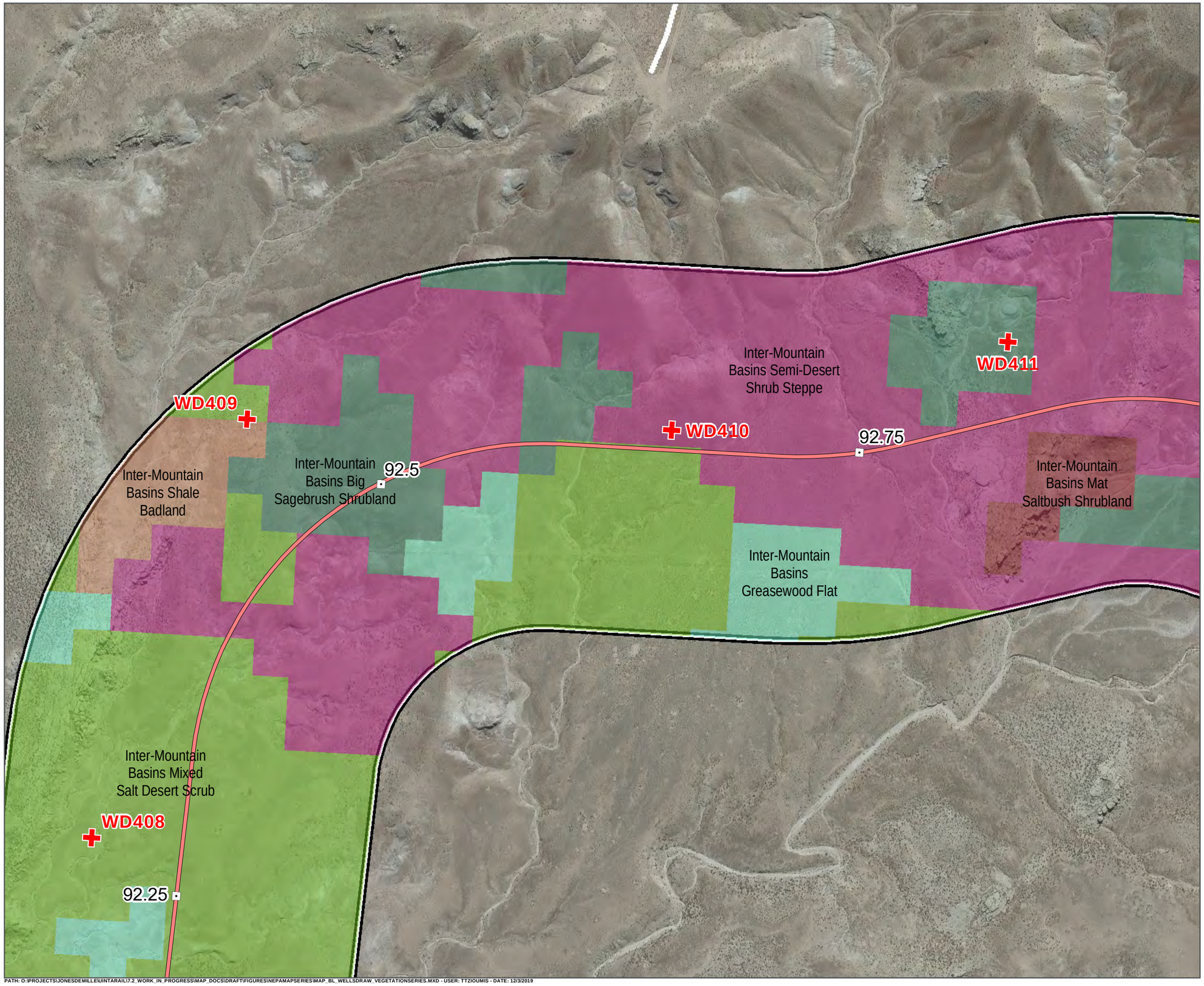

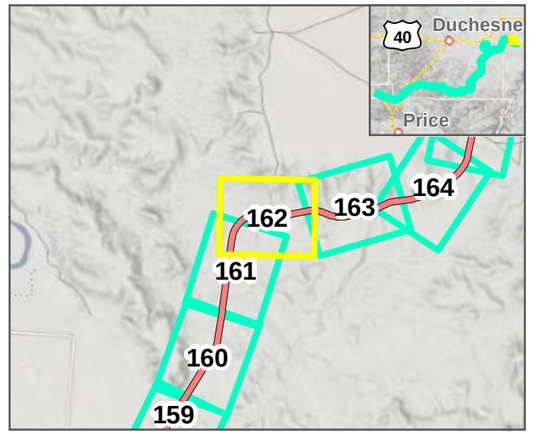

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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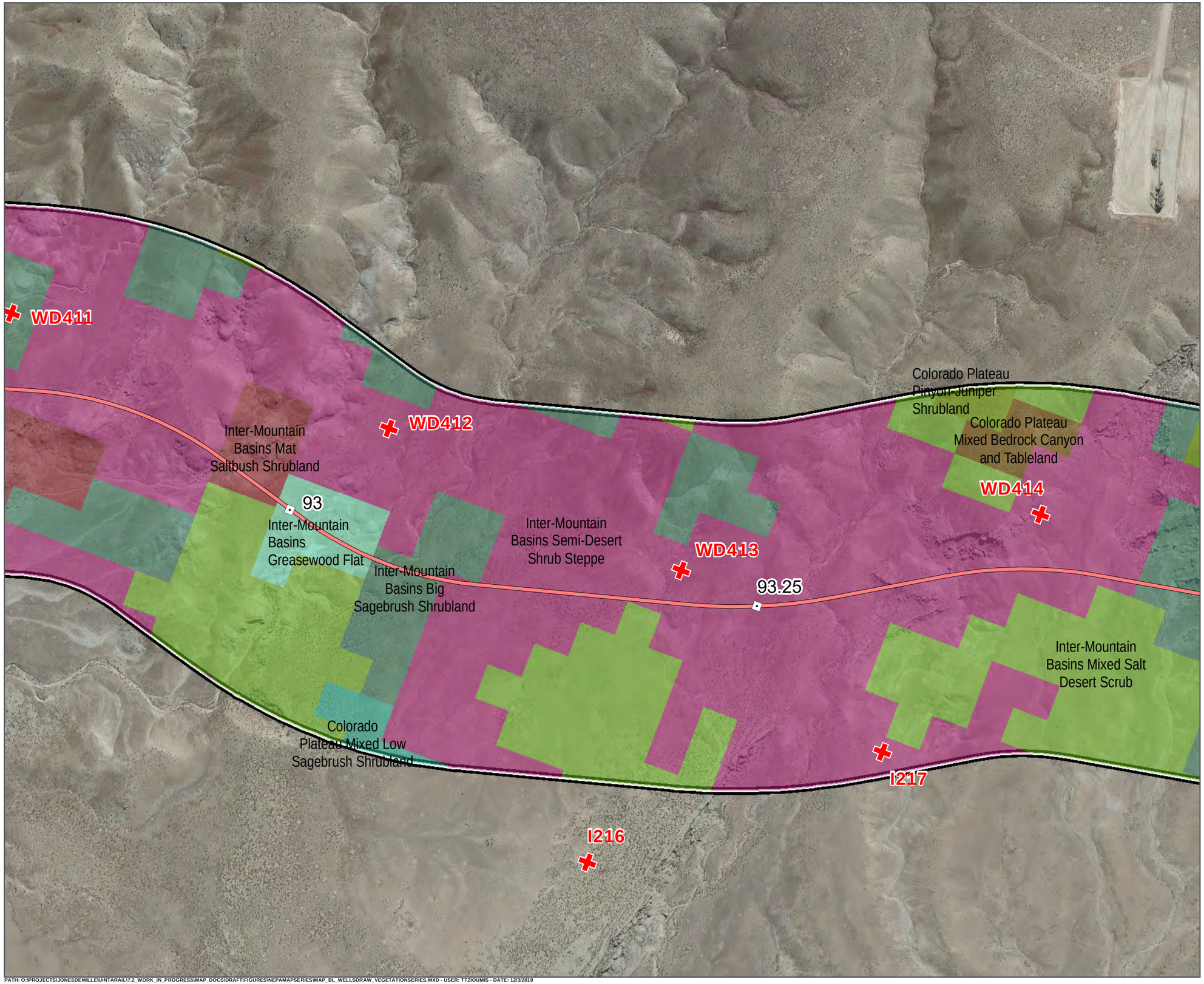


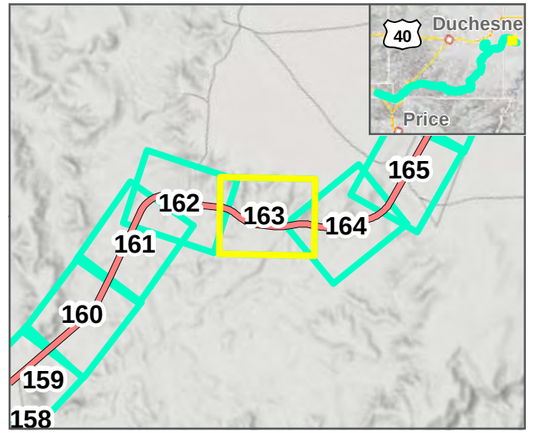


Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

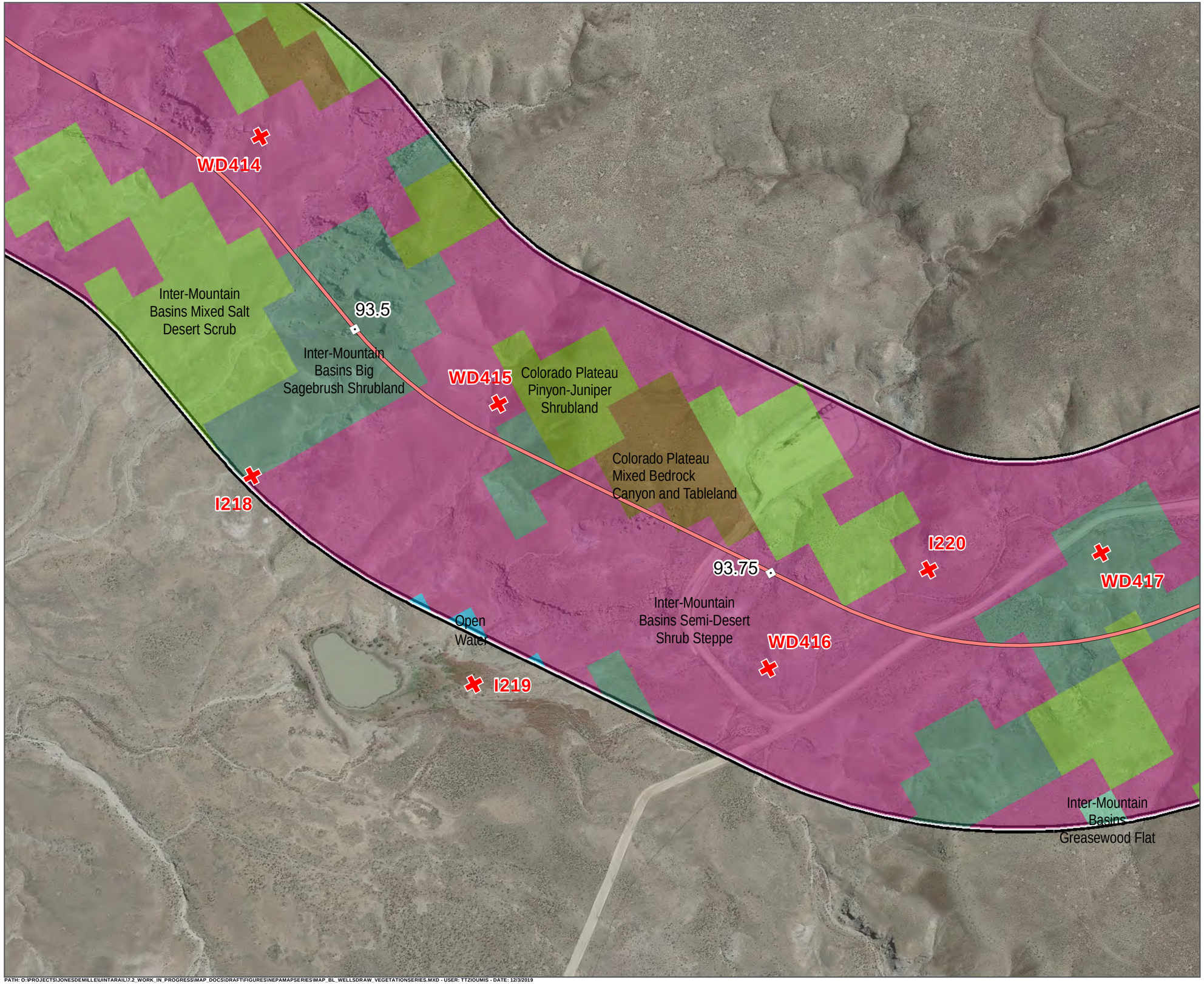
N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019



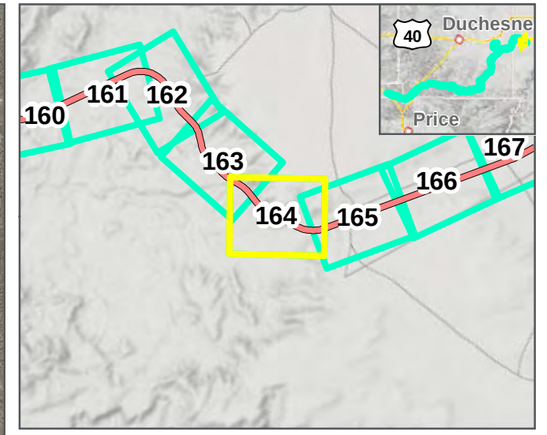


Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Open Water

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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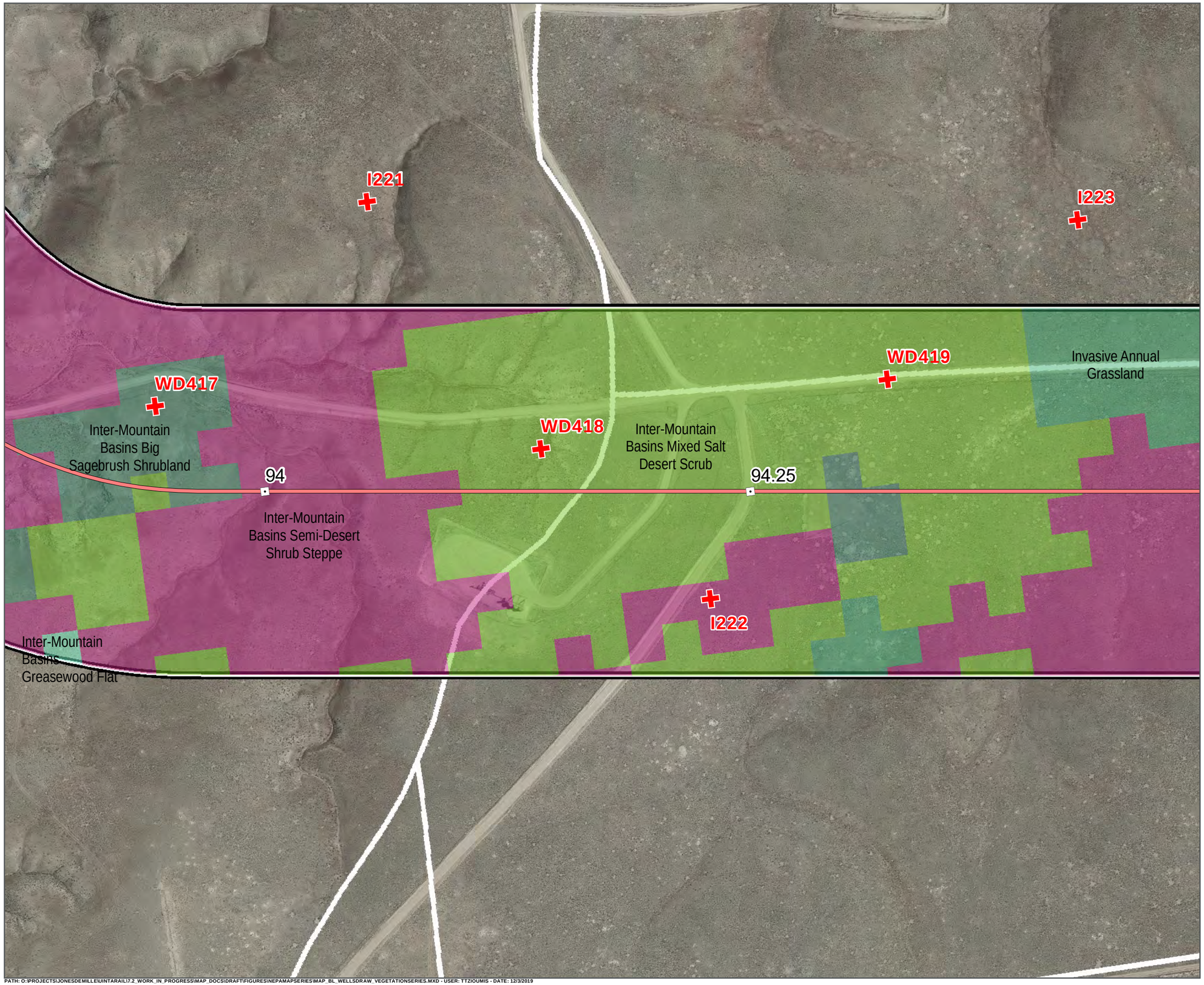

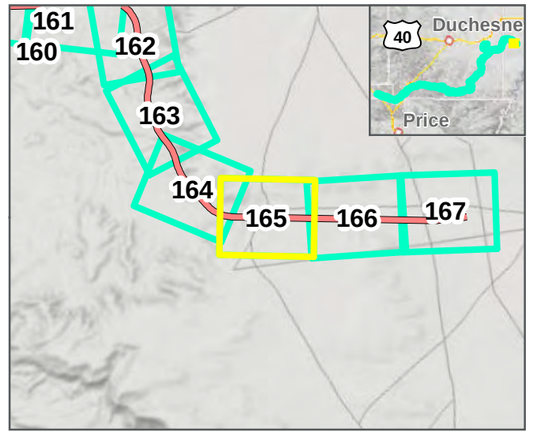

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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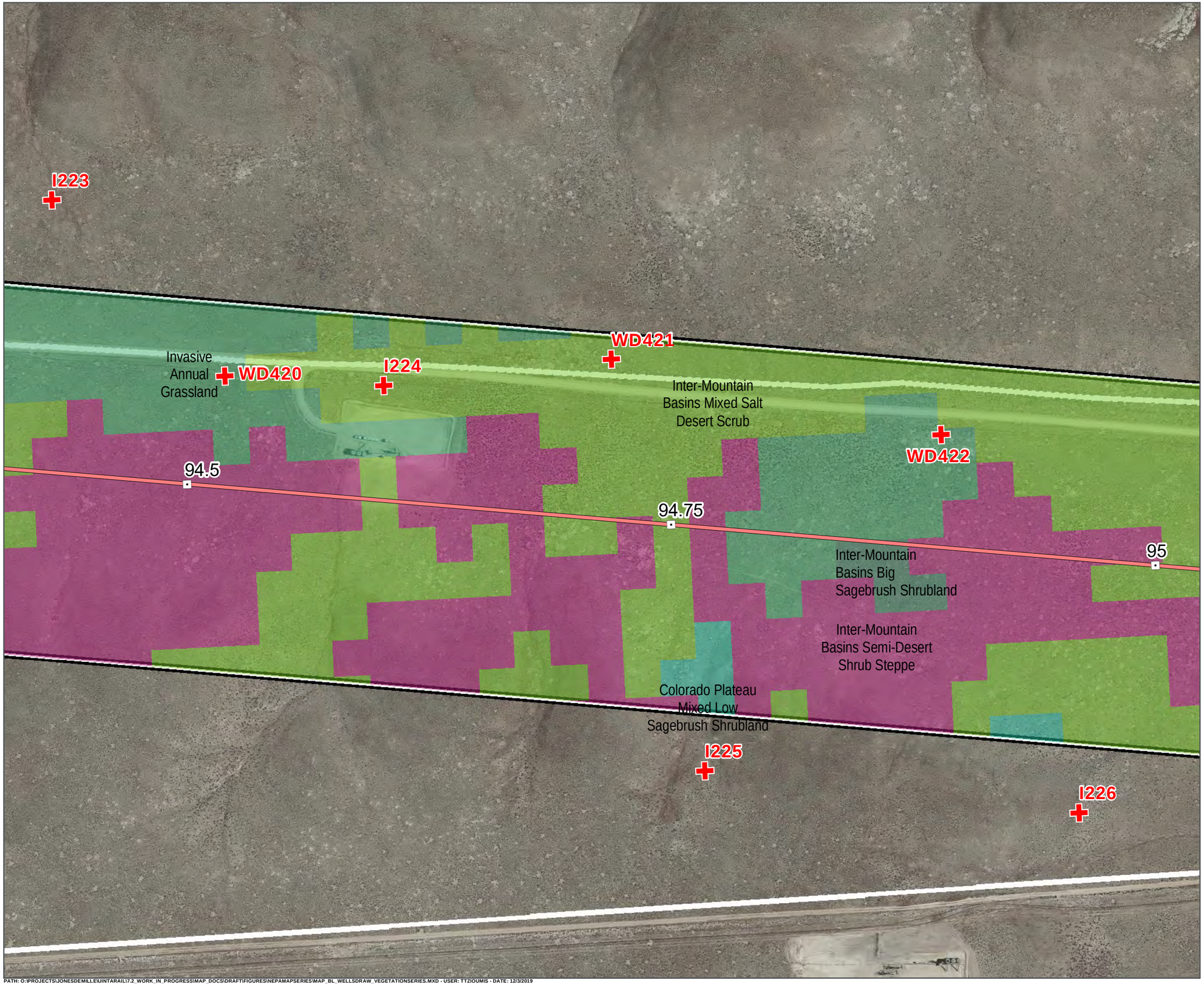

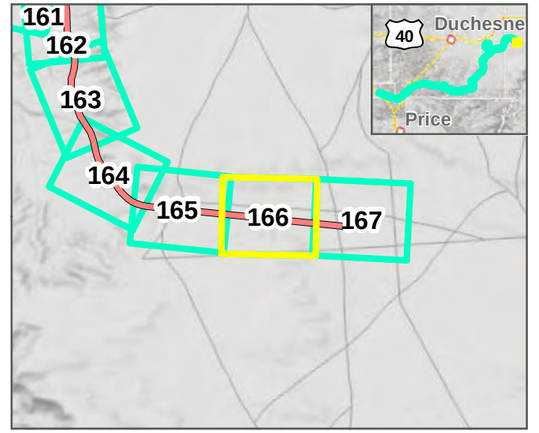

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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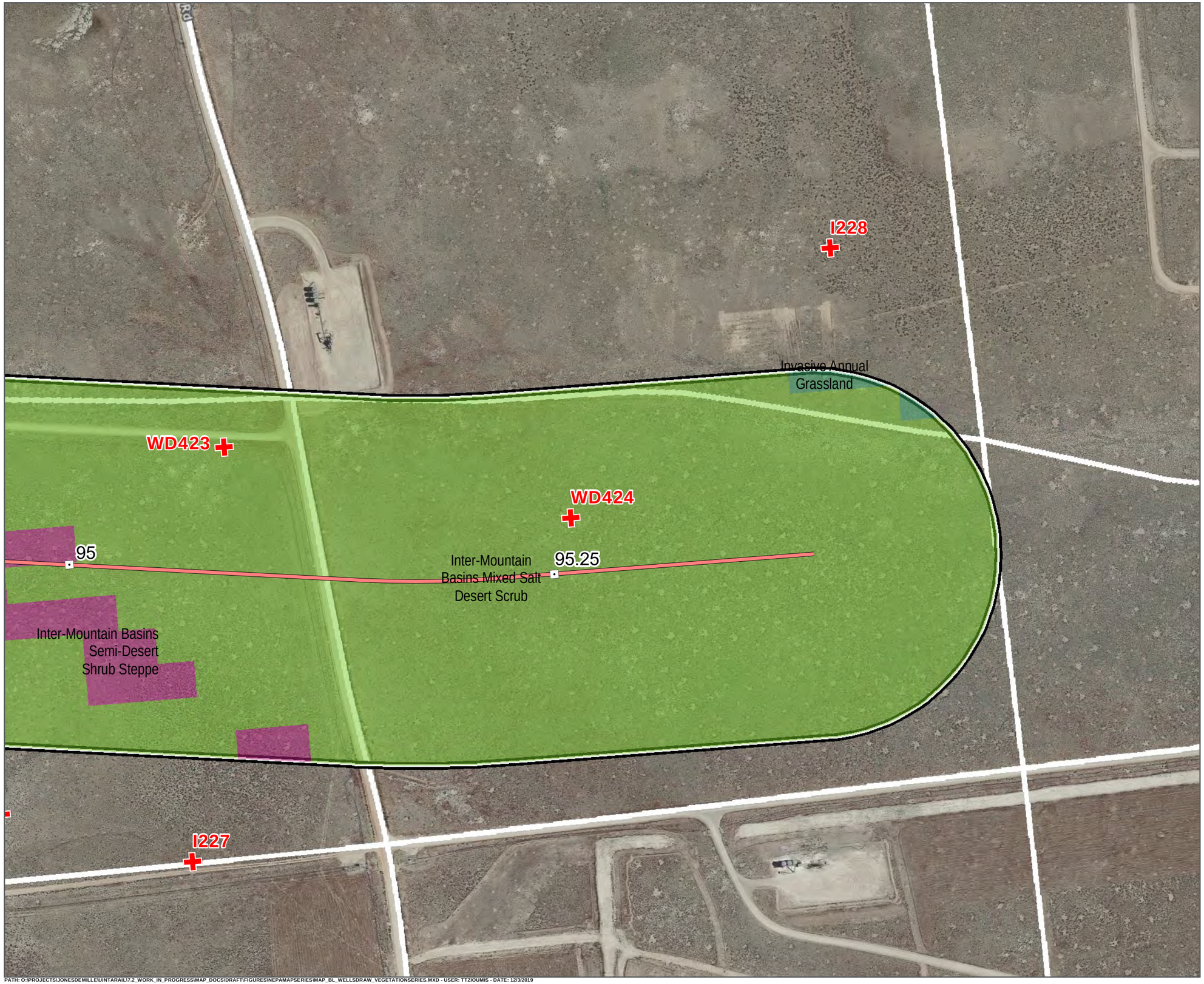

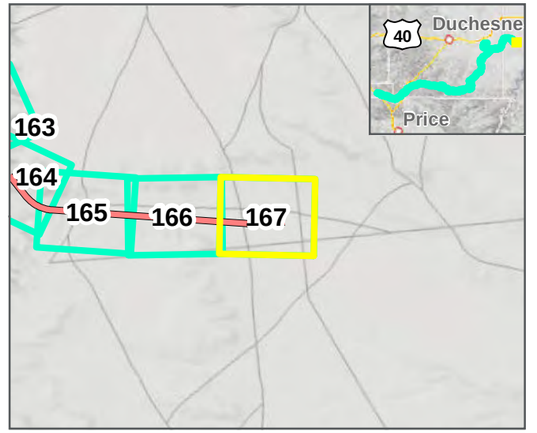

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

Inter-Mountain Basins Mixed Salt Desert Scrub

Inter-Mountain Basins Semi-Desert Shrub Steppe

Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
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COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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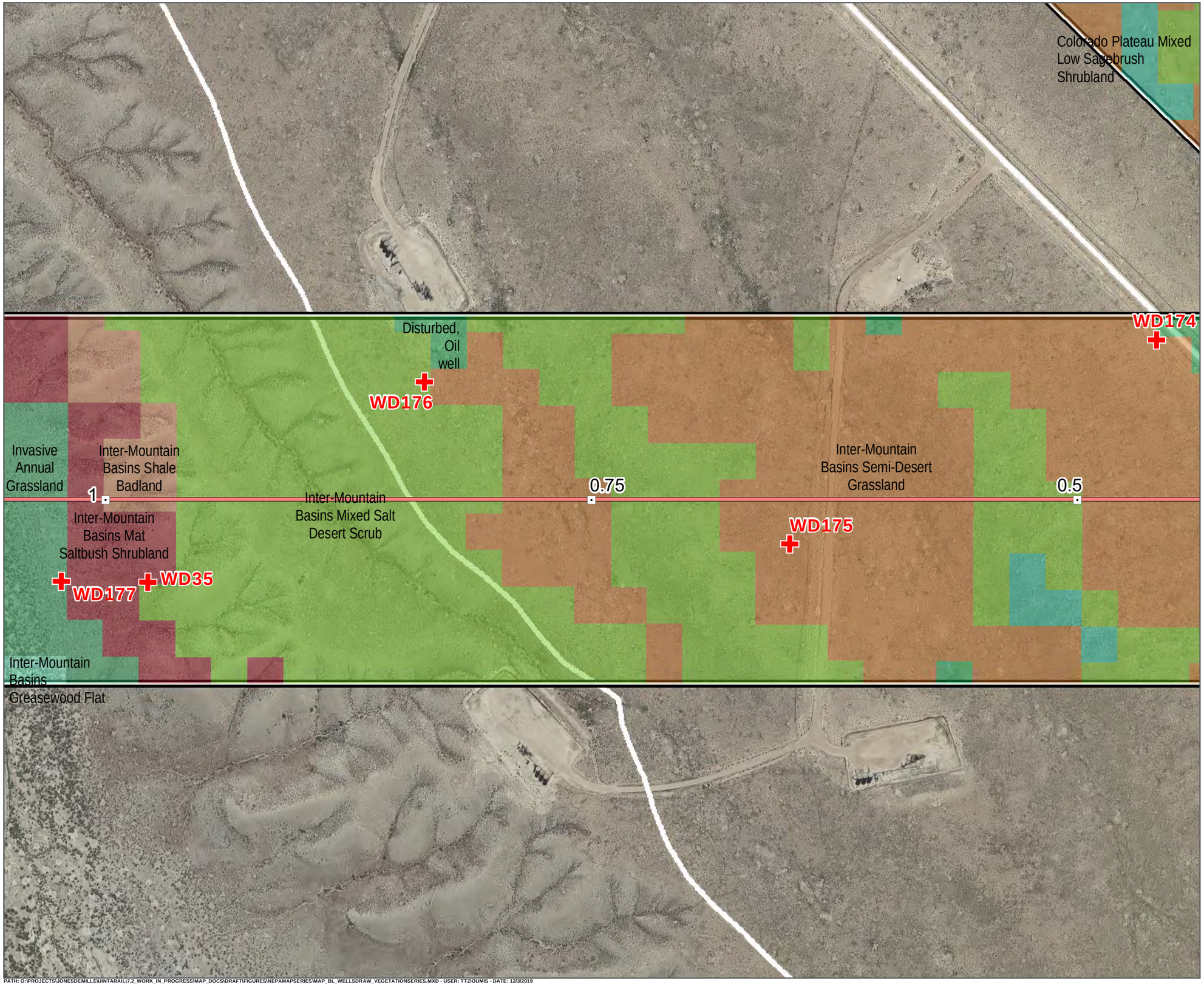

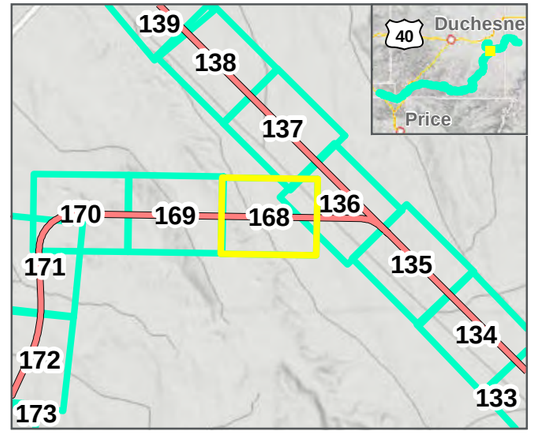

- Photo Points
- Milepost
- Wells Draw Centerline
- Study Area
- Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Disturbed, Oil well
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Shale Badland
- Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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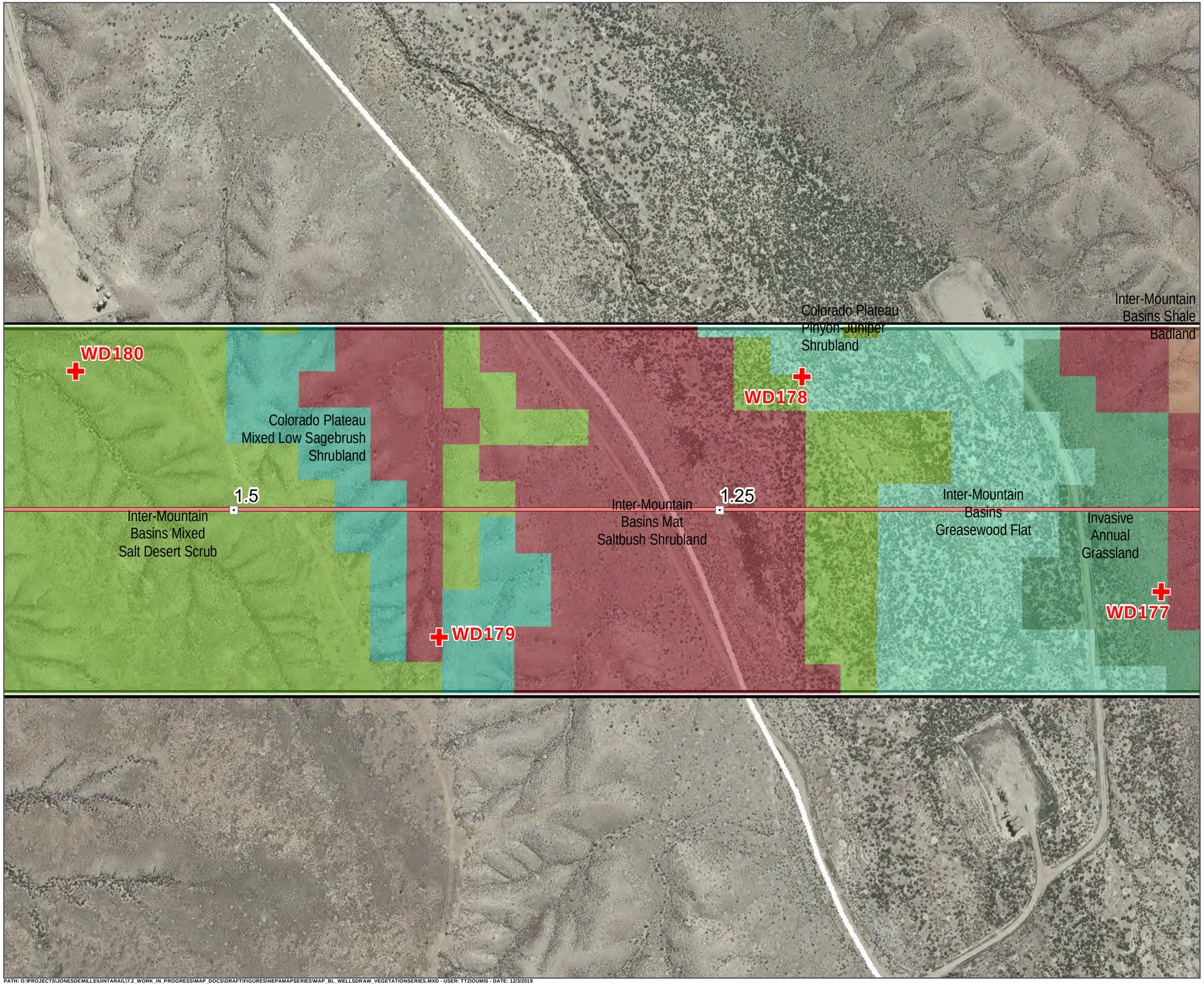

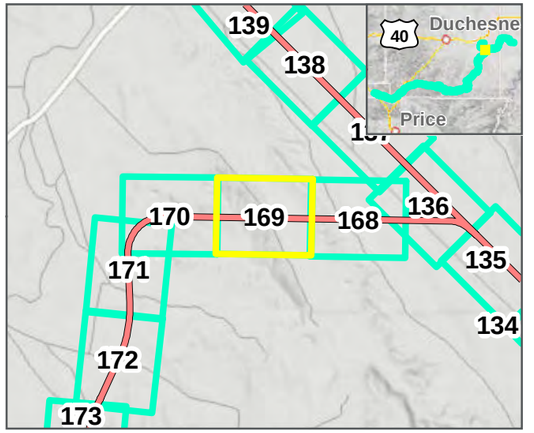

Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland
- Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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HDR

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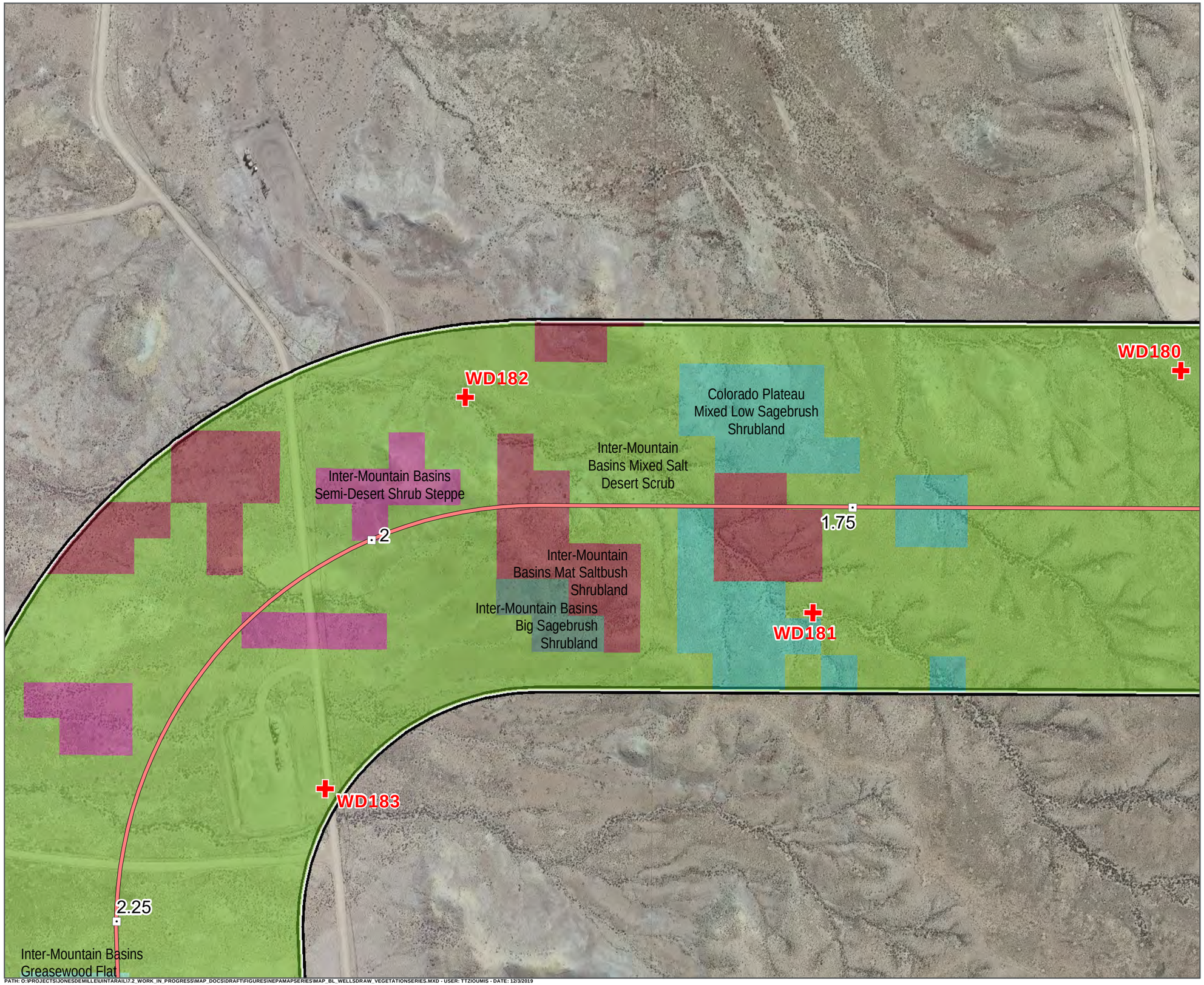


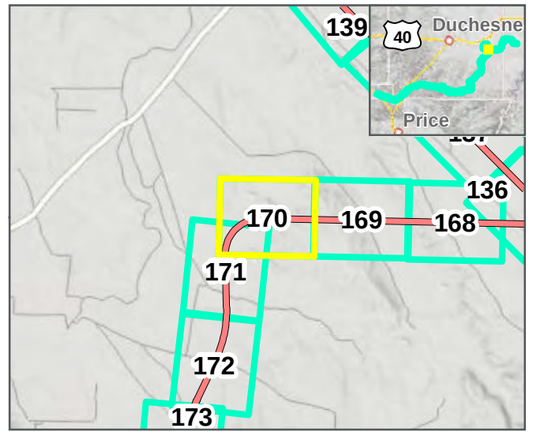


Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019

WD184

Inter-Mountain Basins Mat Saltbush Shrubland

Inter-Mountain Basins Shale Badland

Inter-Mountain Basins Semi-Desert Shrub Steppe

WD185

2.25

2.5

Inter-Mountain Basins Greasewood Flat

Inter-Mountain Basins Mixed Salt Desert Scrub

WD183

Inter-Mountain Basins Big Sagebrush Shrubland

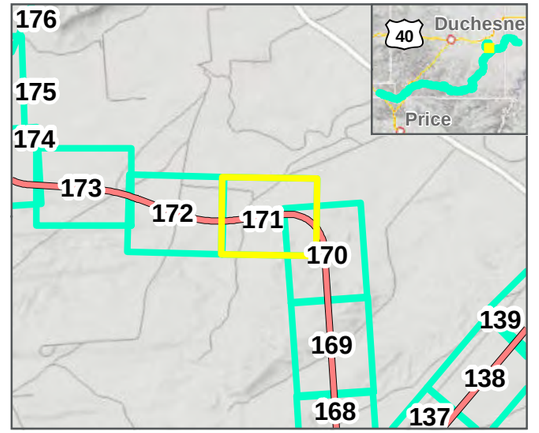


Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

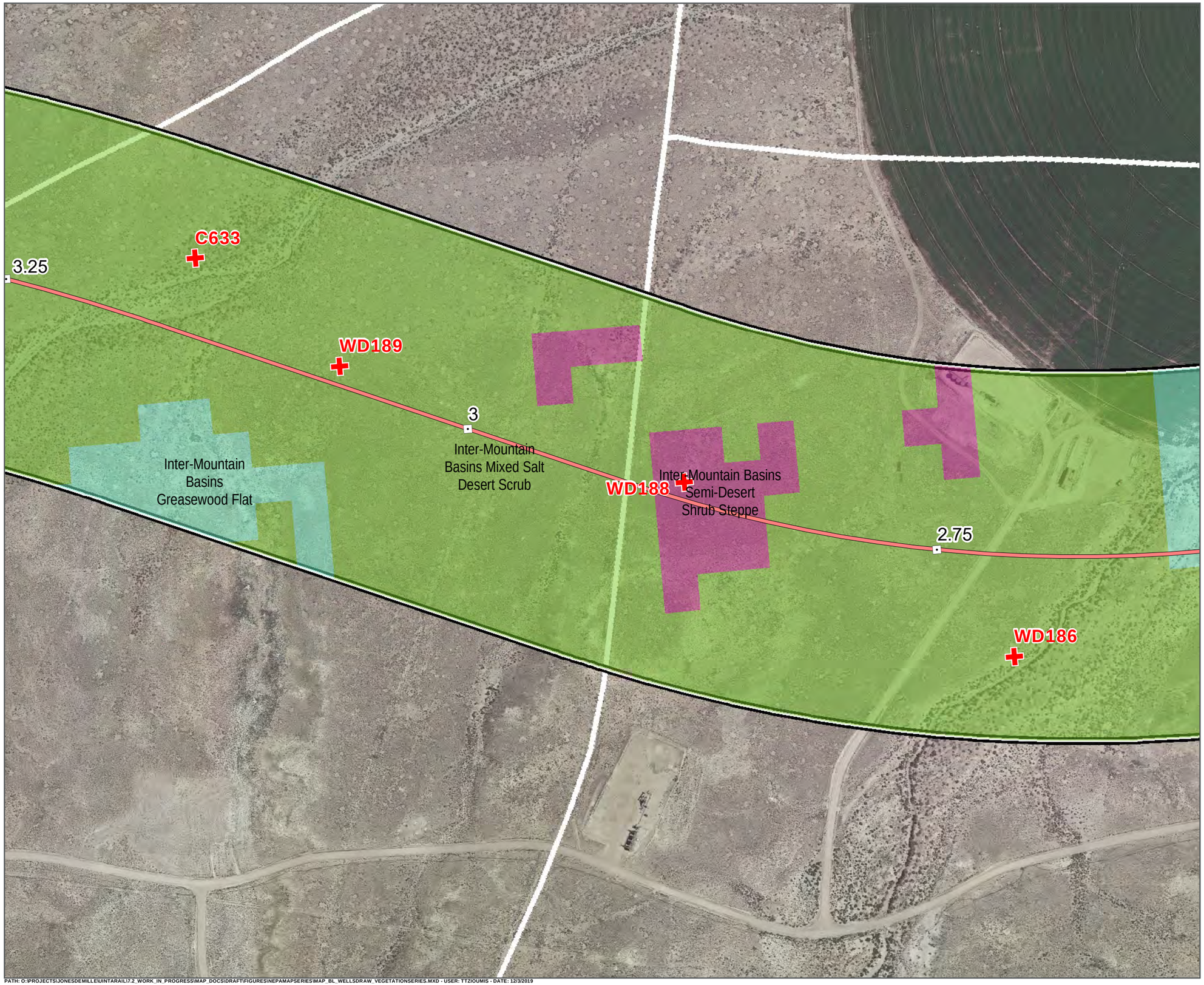
1 inch = 250 Feet

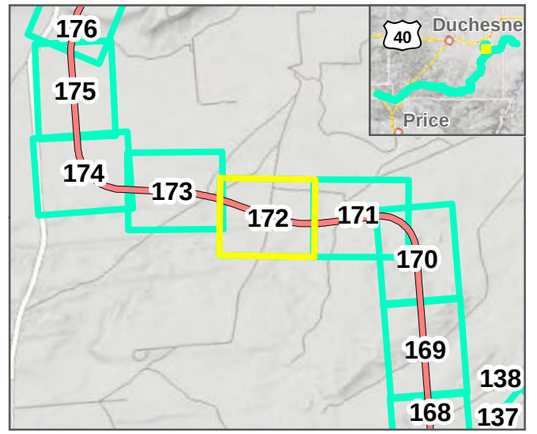
DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019





- Photo Points
- Milepost
- Wells Draw Centerline
- Study Area
- Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019

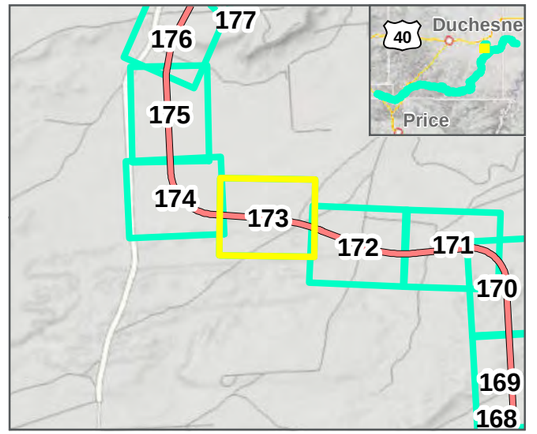


Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

Inter-Mountain Basins Greasewood Flat

Inter-Mountain Basins Mixed Salt Desert Scrub

Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7-2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019

Colorado Plateau Mixed Bedrock Canyon and Tableland

C639

4.25

Inter-Mountain Basins Mixed Salt Desert Scrub

Inter-Mountain Basins Semi-Desert Shrub Steppe

C638

Inter-Mountain Basins Big Sagebrush Shrubland

4

3.75

Inter-Mountain Basins Greasewood Flat

C637

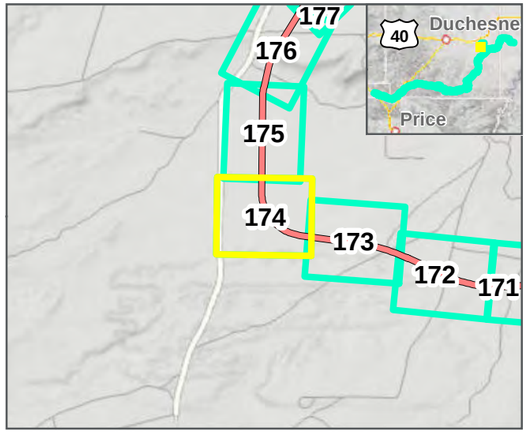


Photo Points

Milepost

Wells Draw Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

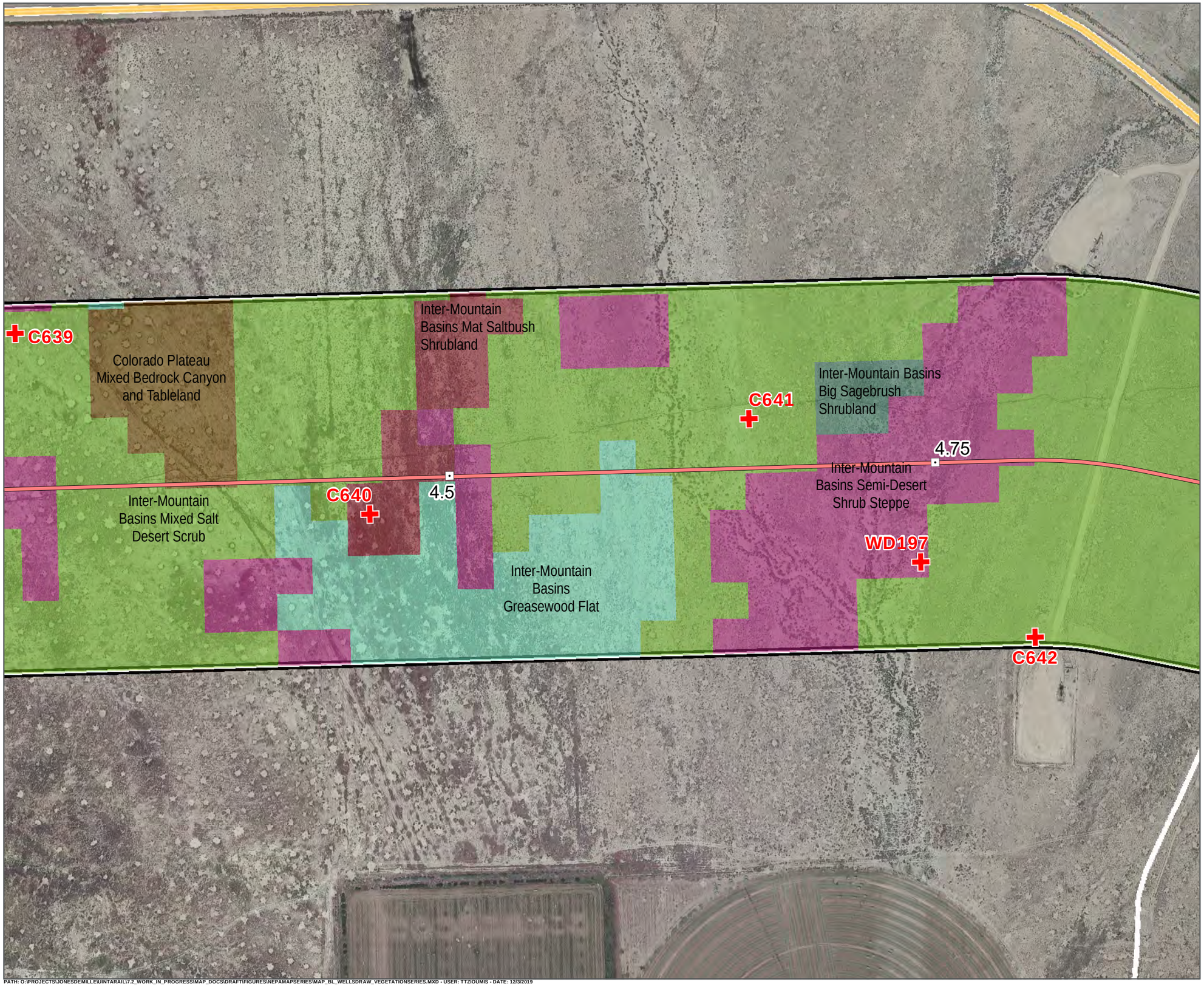
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019



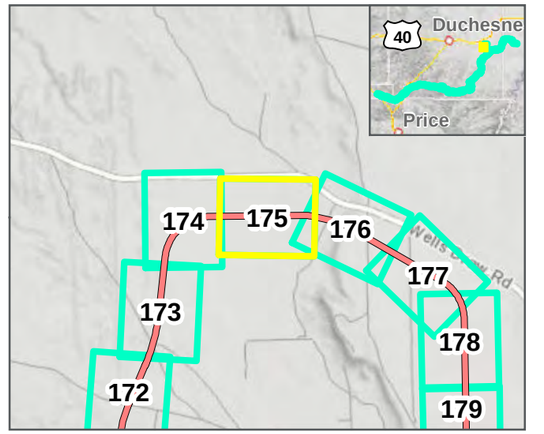


Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

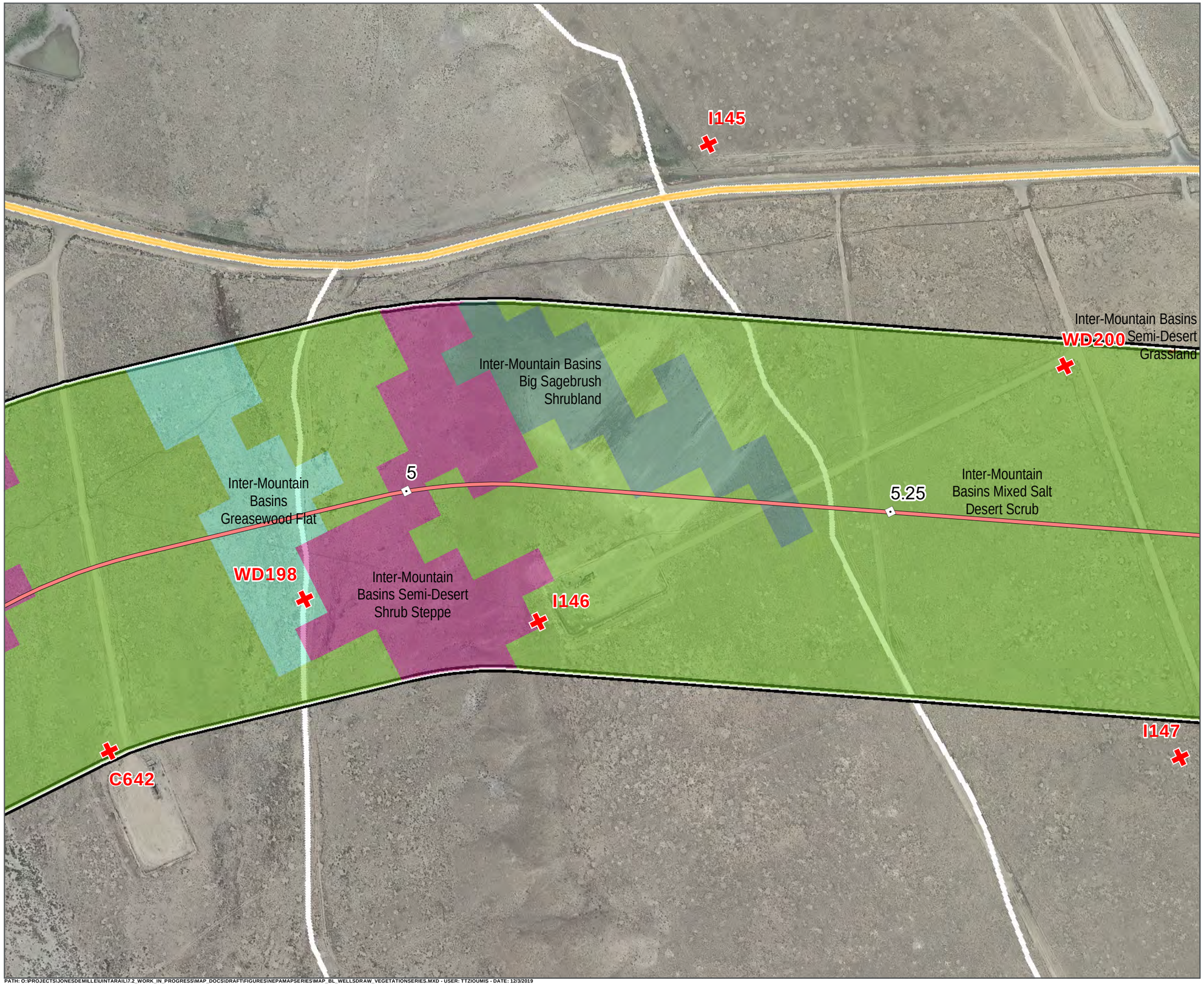
N
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019



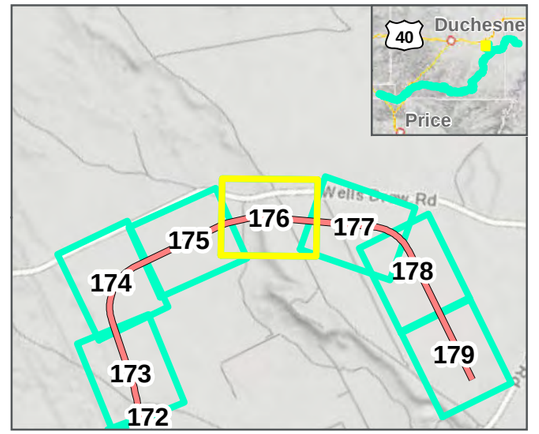


Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

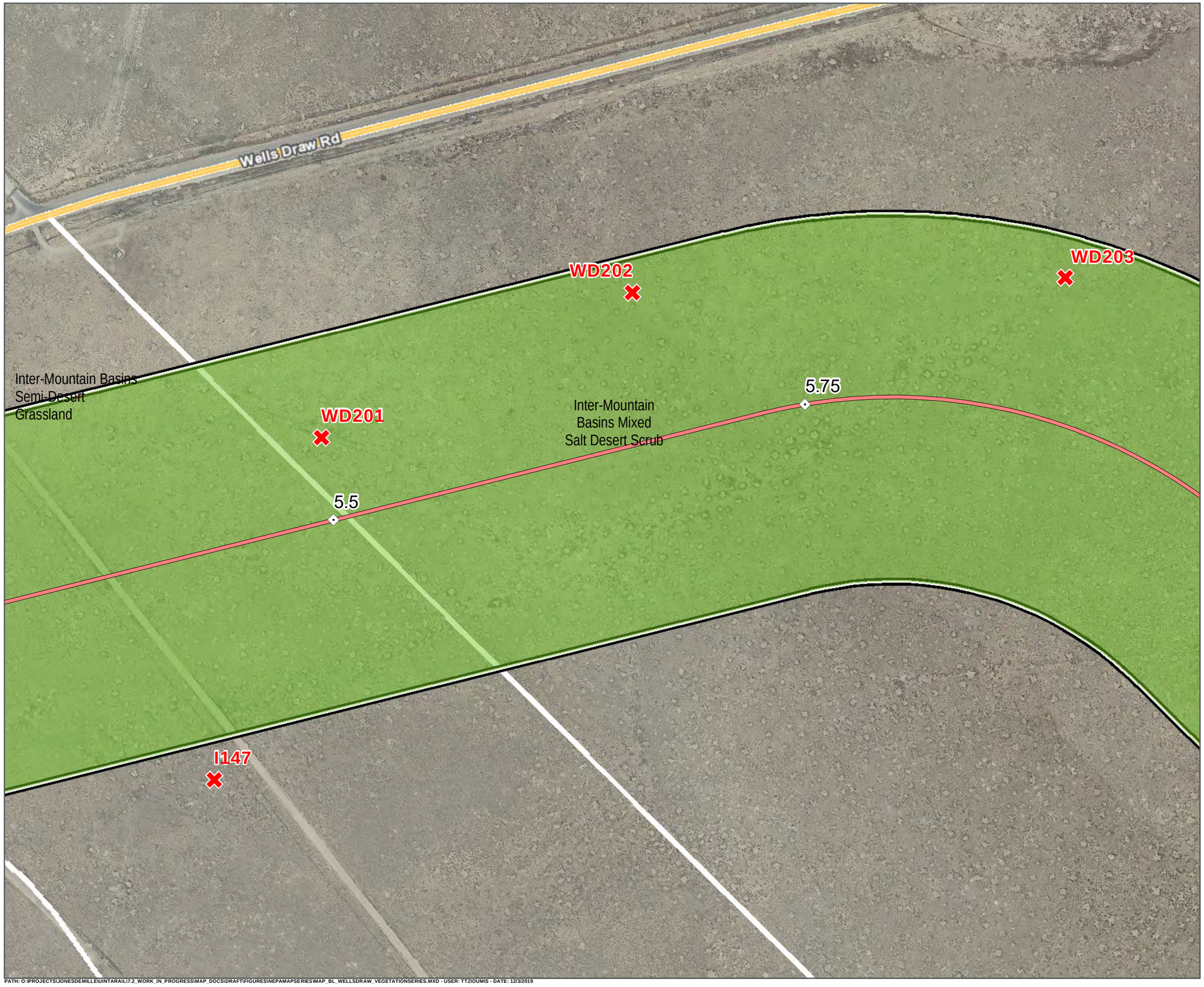
0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019



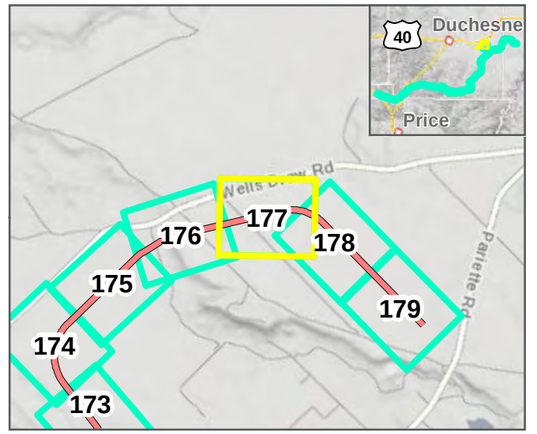


Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

Inter-Mountain Basins Mixed Salt Desert Scrub

Inter-Mountain Basins Semi-Desert Grassland

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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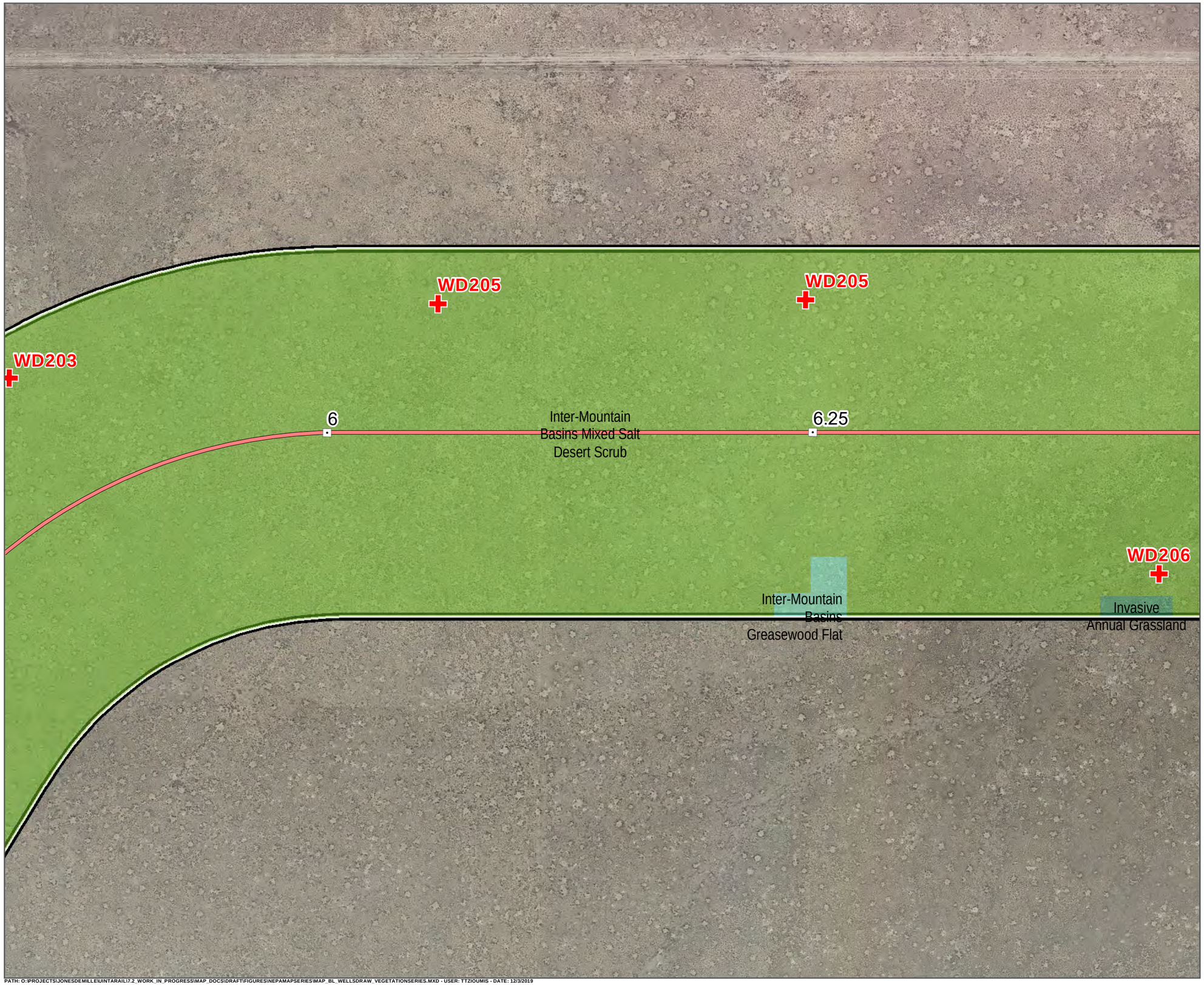

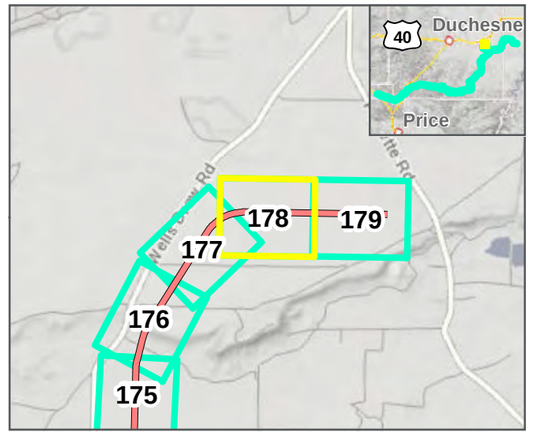

Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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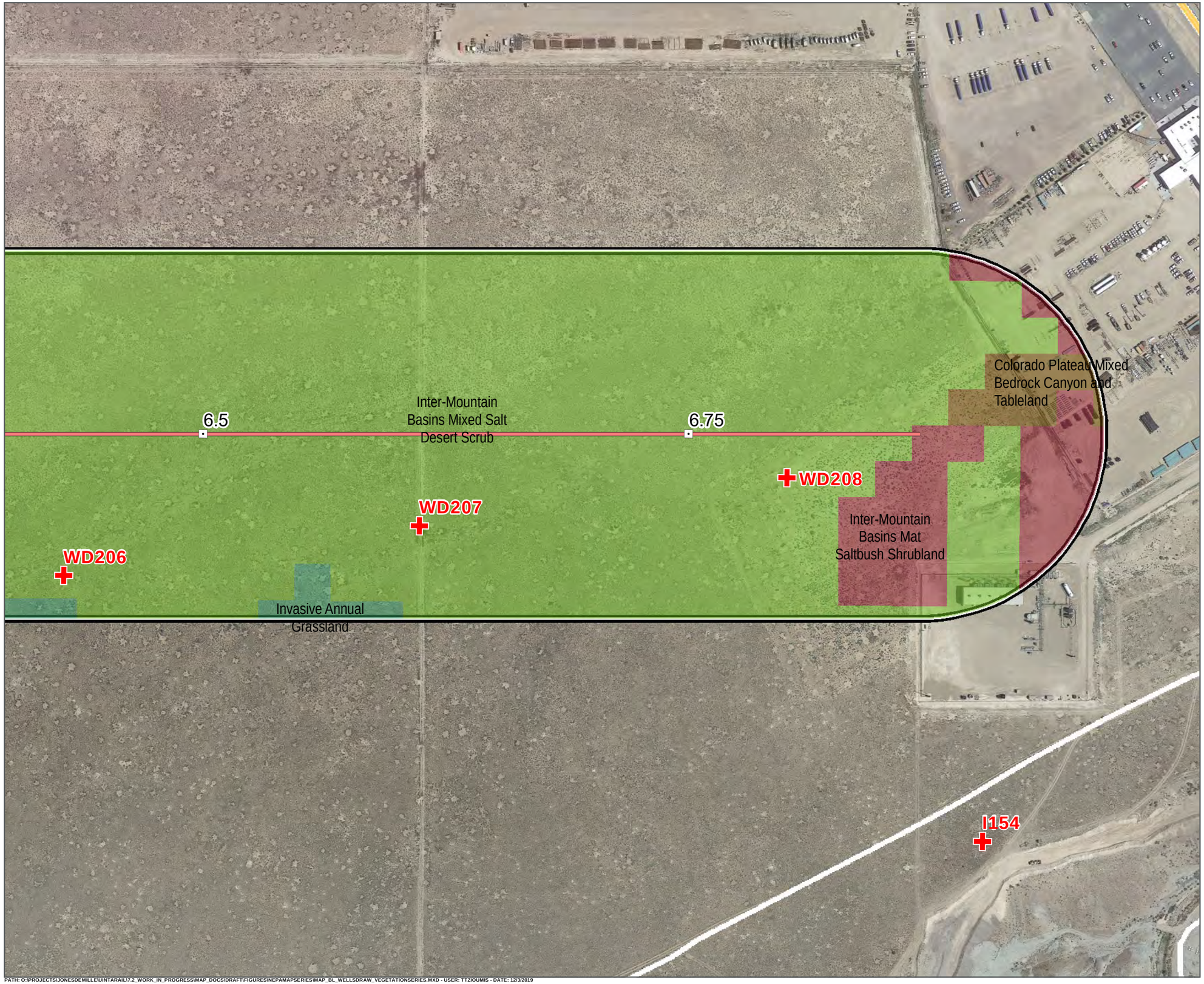


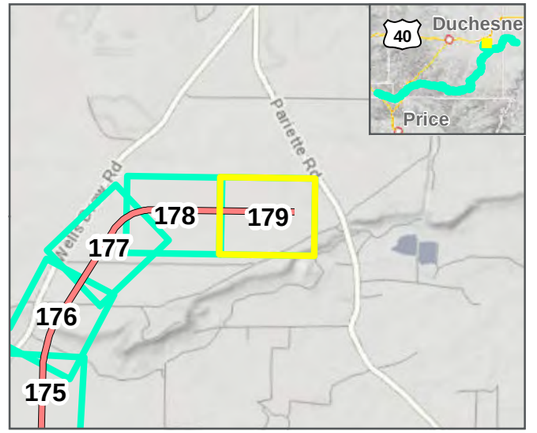


Photo Points
Milepost
Wells Draw Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Invasive Annual

WELLS DRAW ALTERNATIVE: 5/30/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

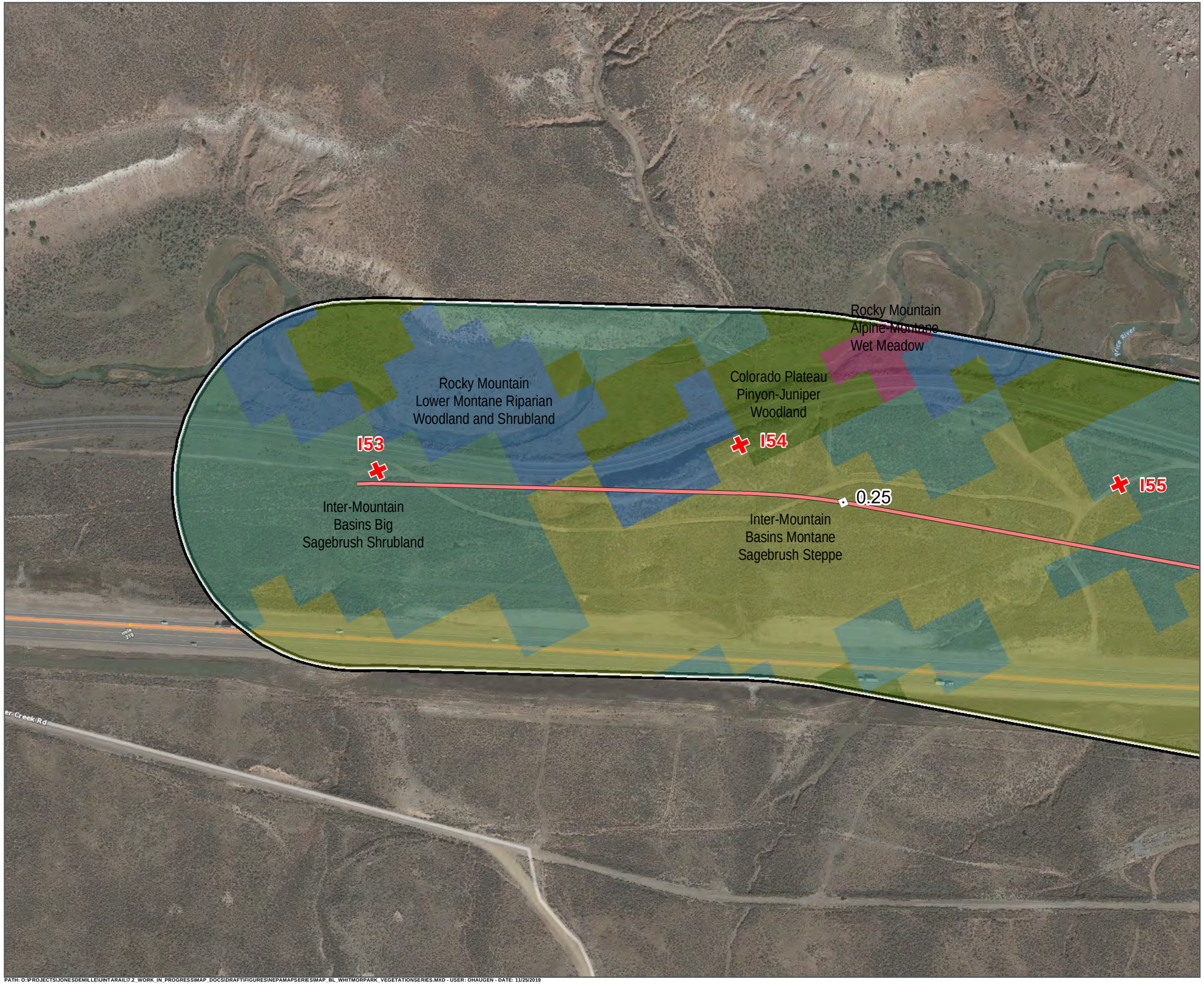
SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WELLSDRAW_VEGETATIONSERIES.MXD - USER: TTZIOUMIS - DATE: 12/3/2019

APPENDIX D

Vegetation Community Maps for the Whitmore Park Study Area



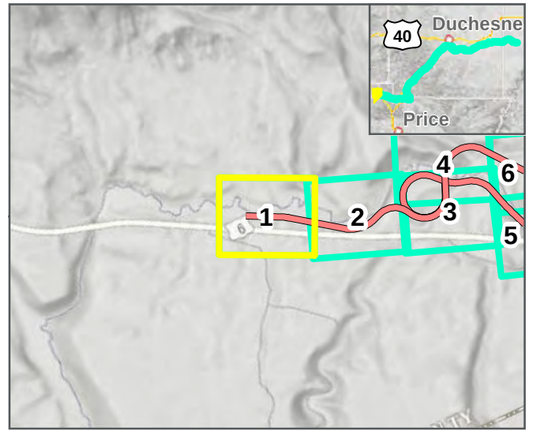


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

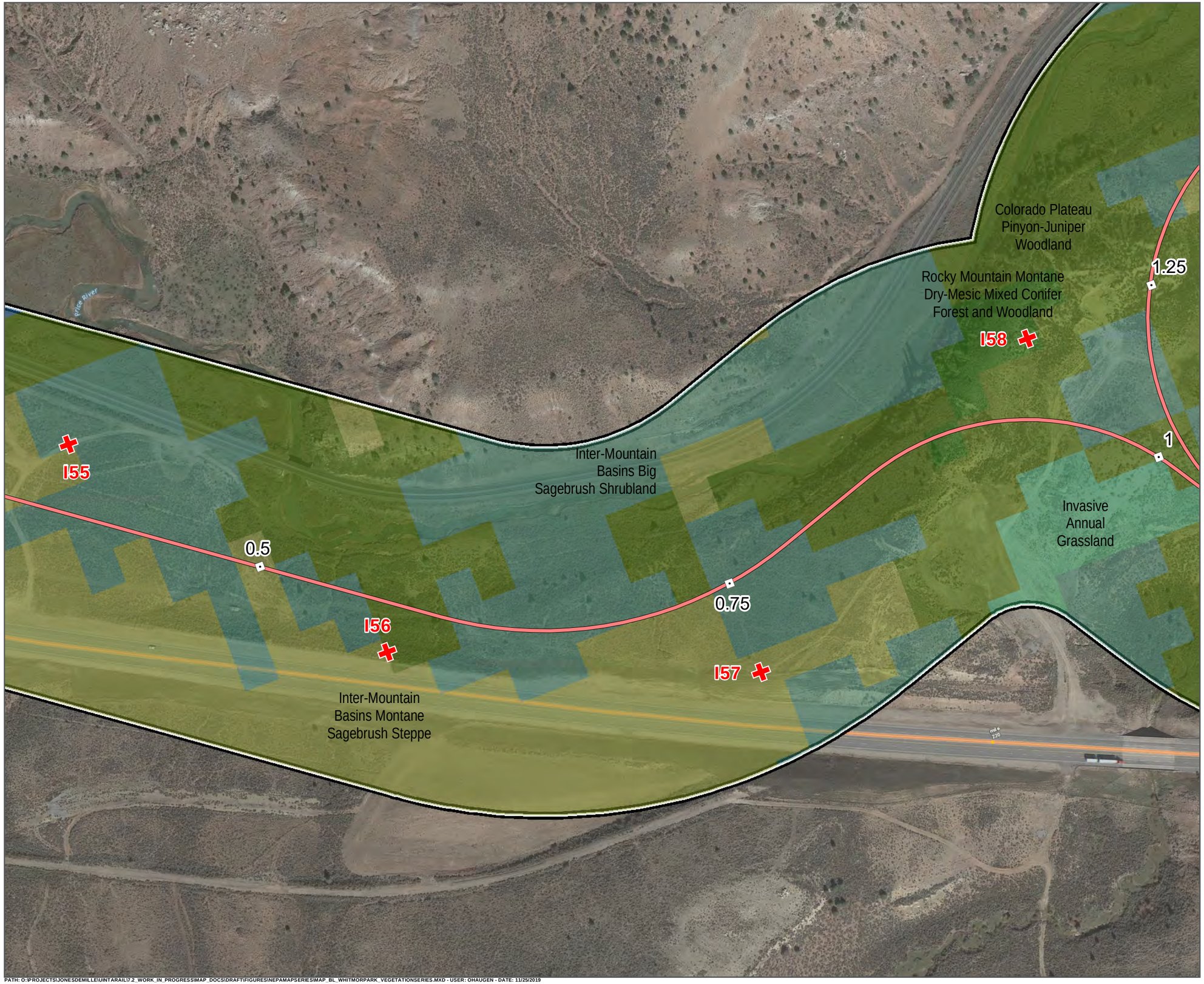
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



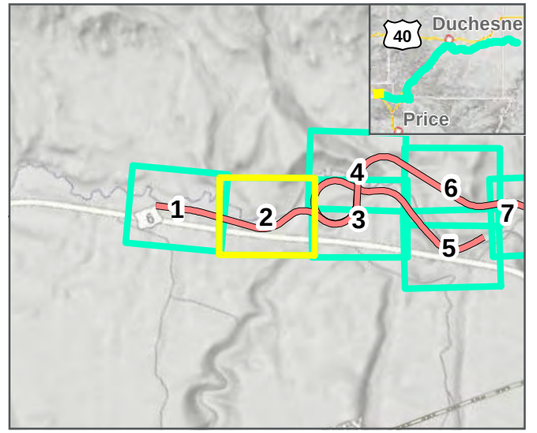


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Invasive Annual Grassland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

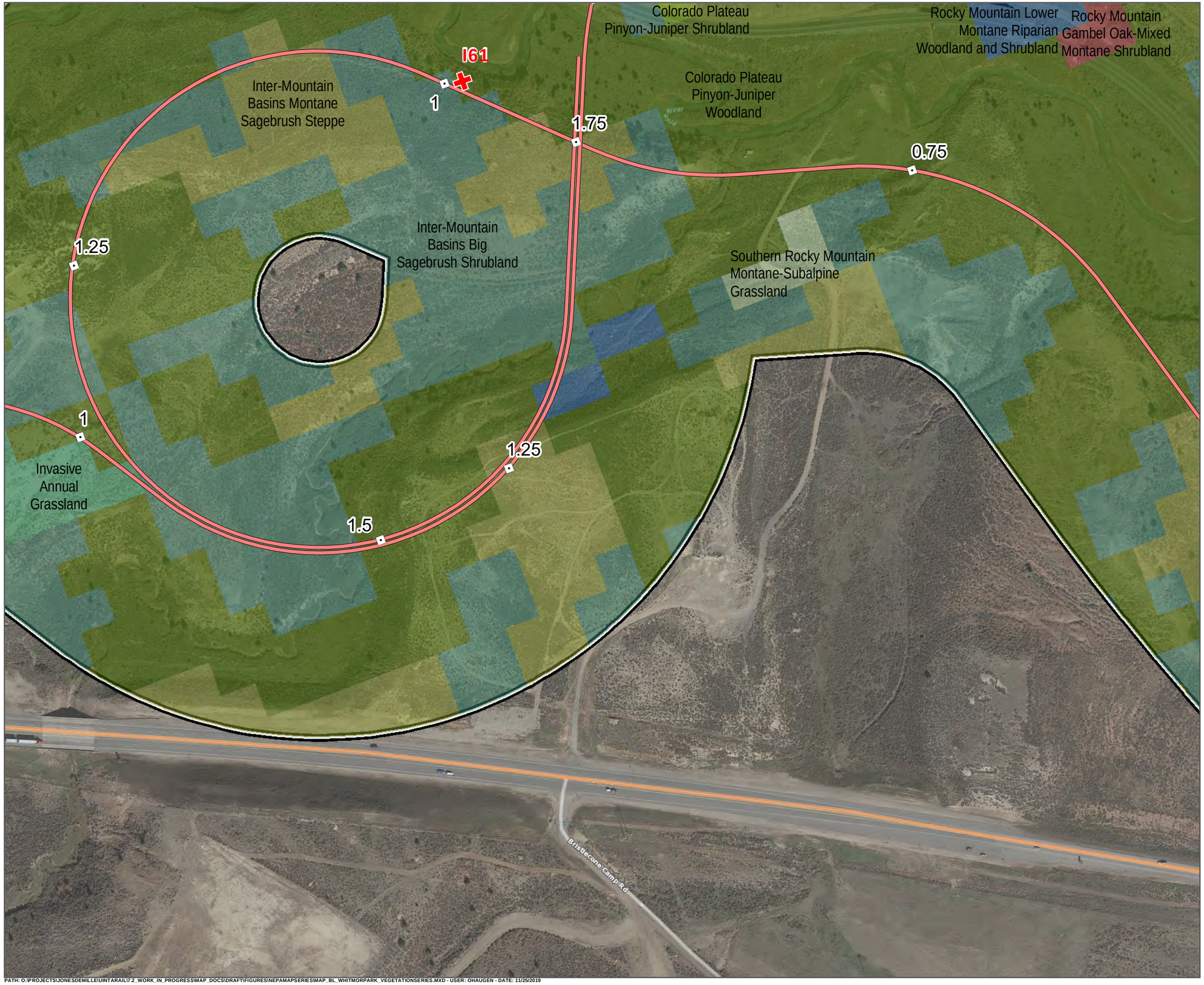
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



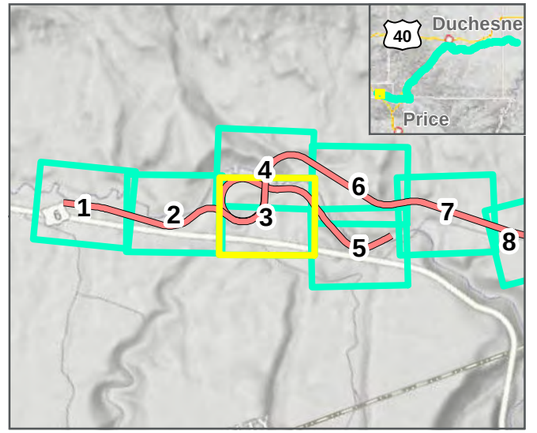


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Invasive Annual
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Southern Rocky Mountain Montane-Subalpine Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

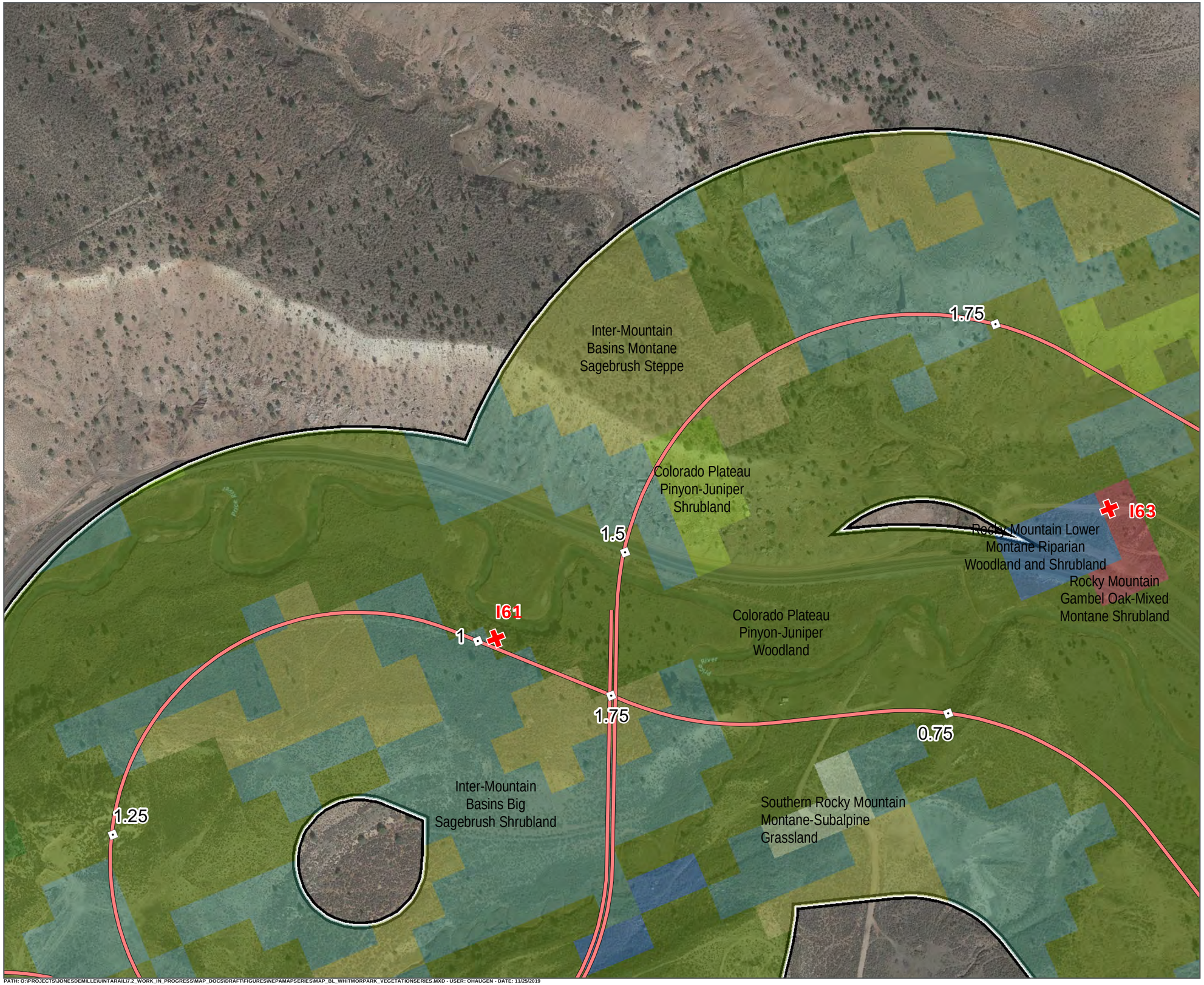
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7-2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



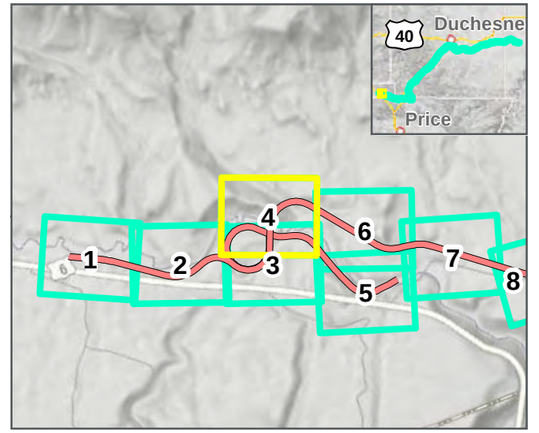


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Southern Rocky Mountain Montane-Subalpine Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

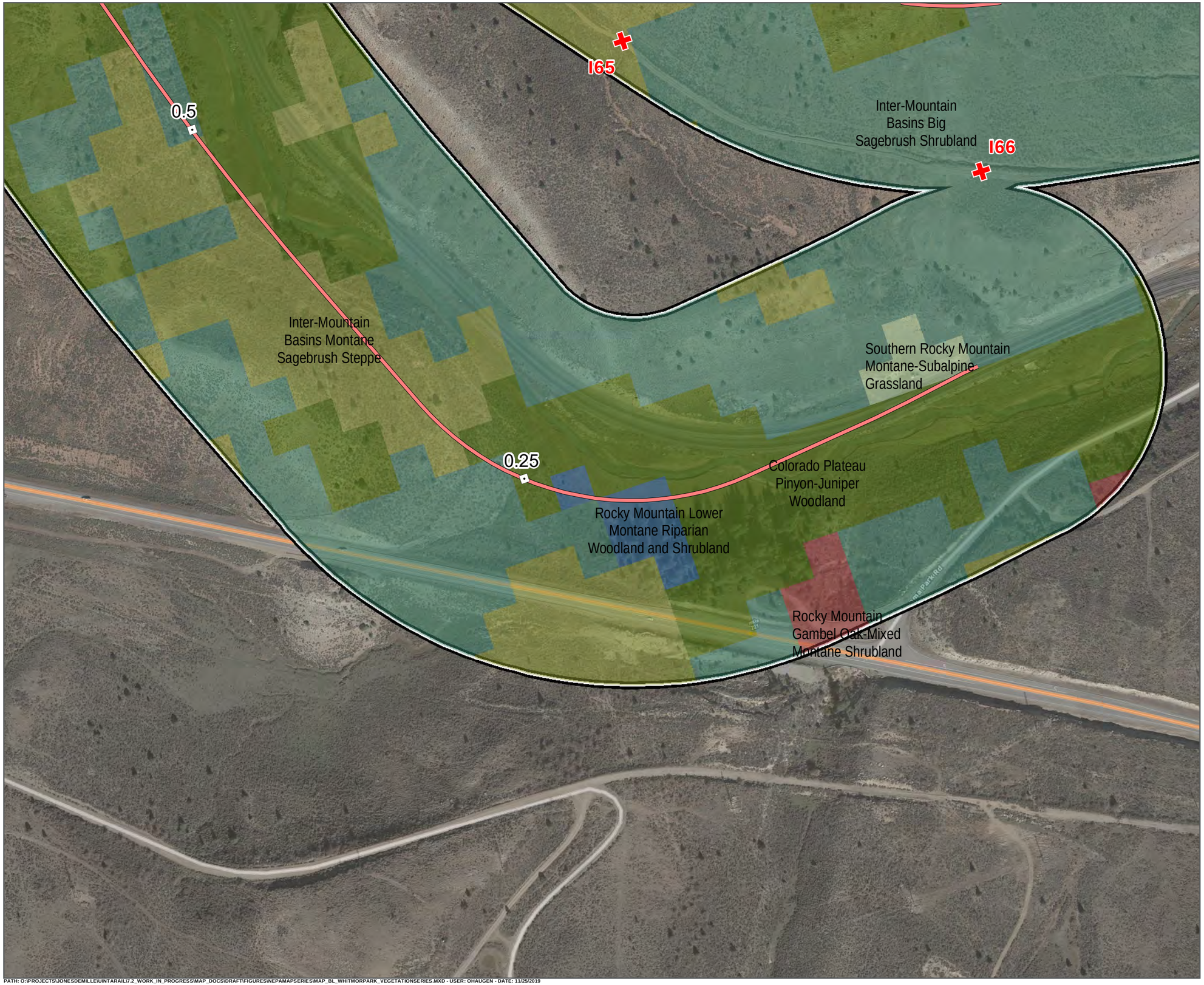
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7-2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



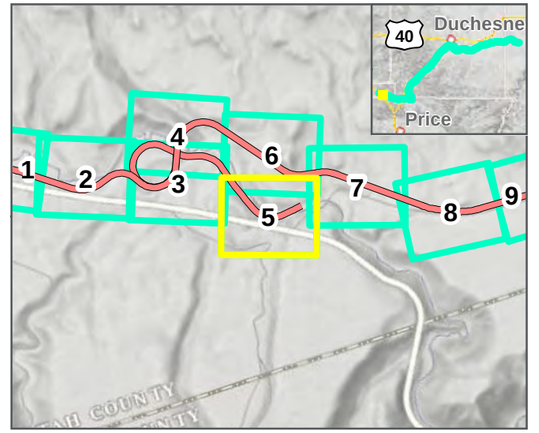


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Southern Rocky Mountain Montane-Subalpine Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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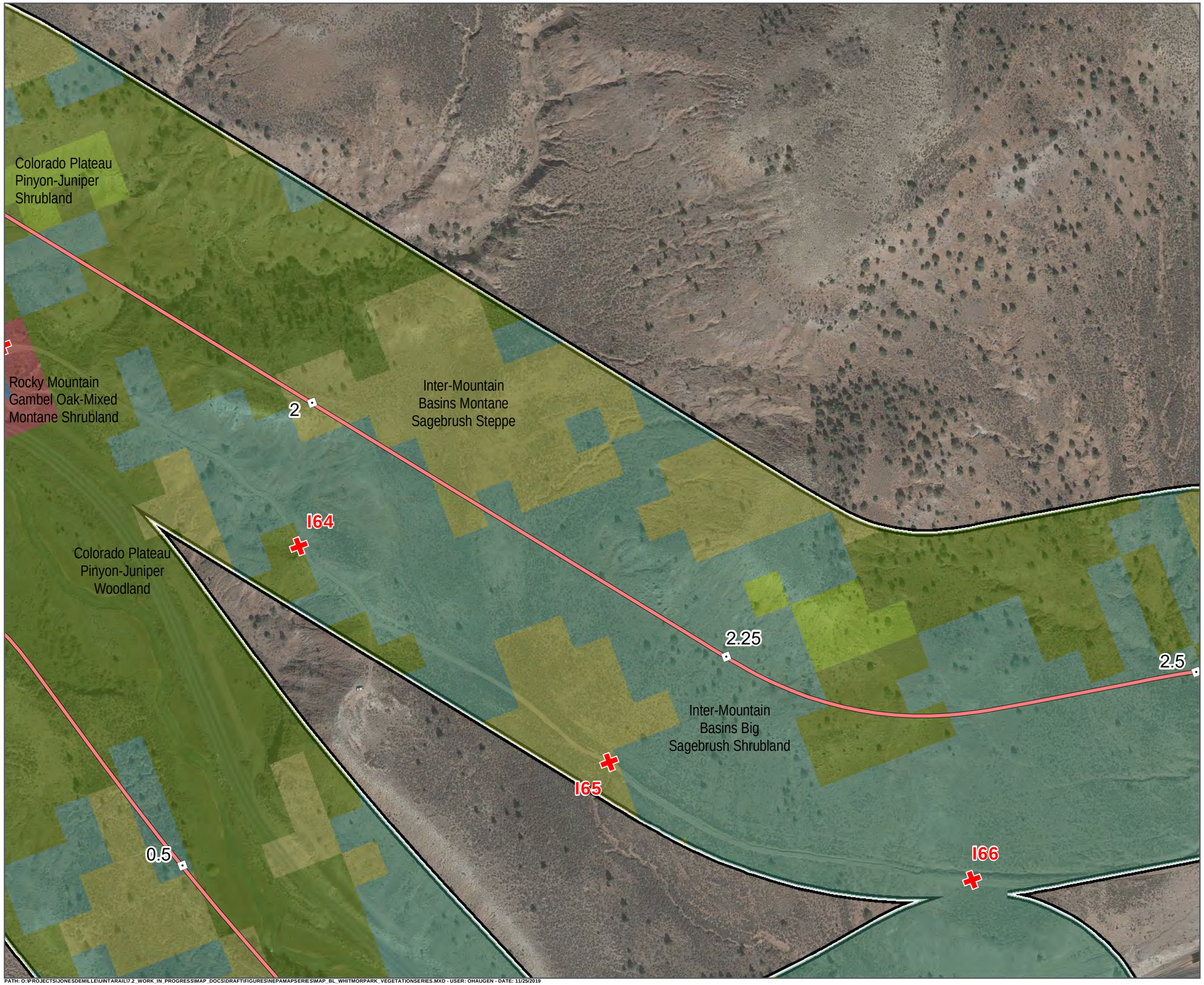

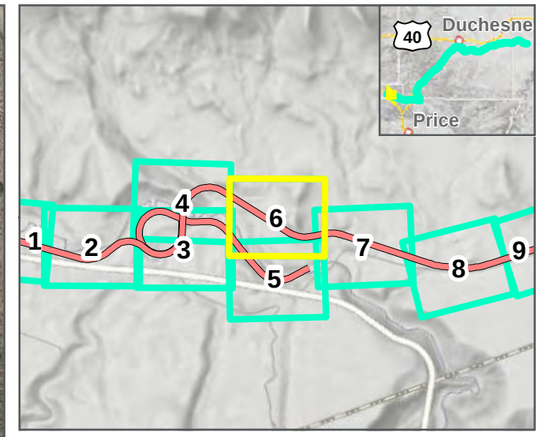

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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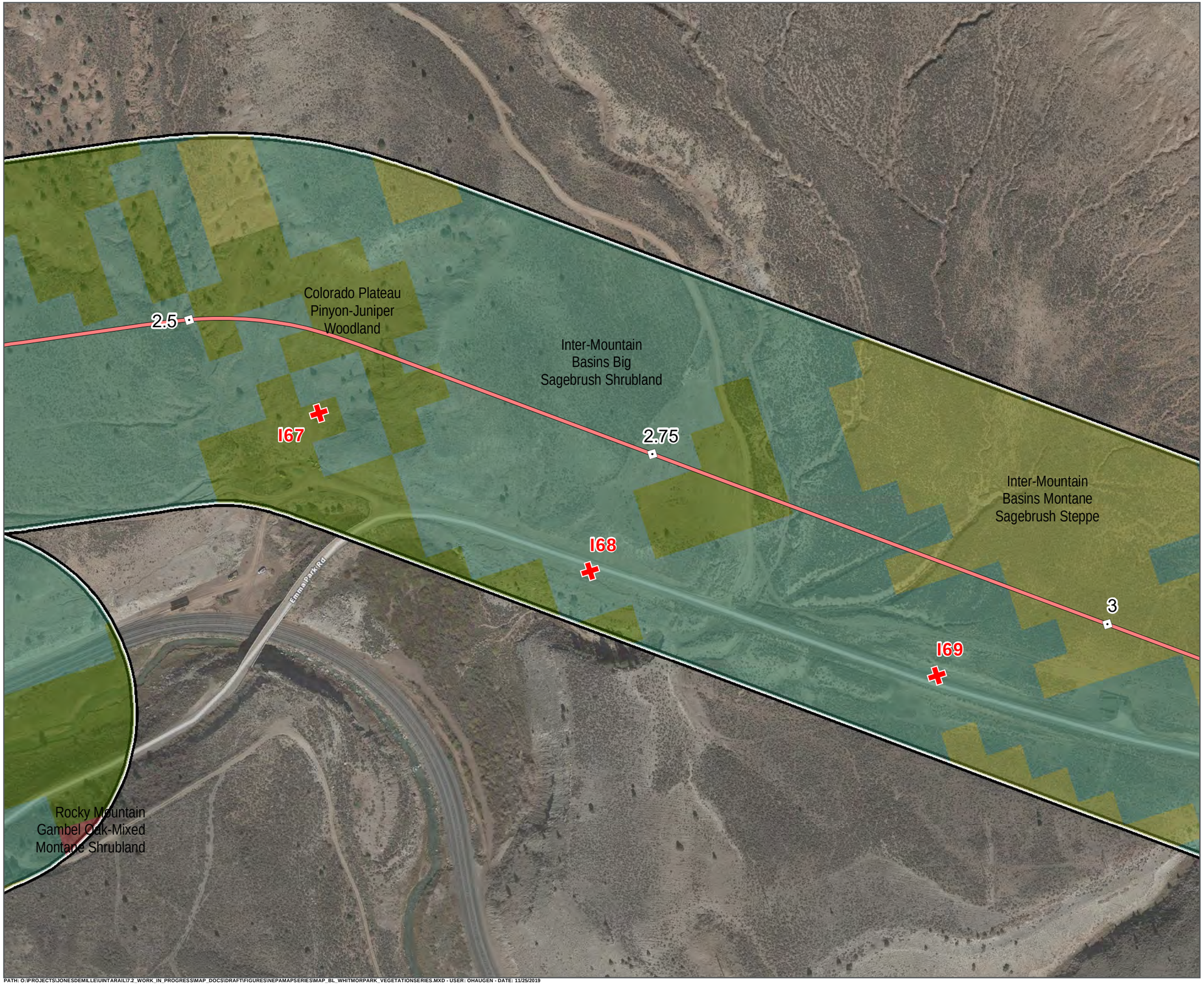

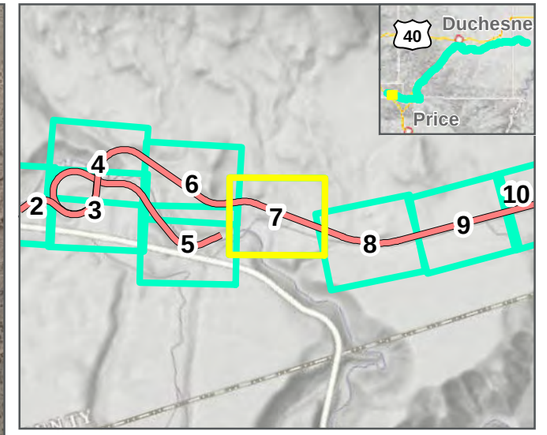

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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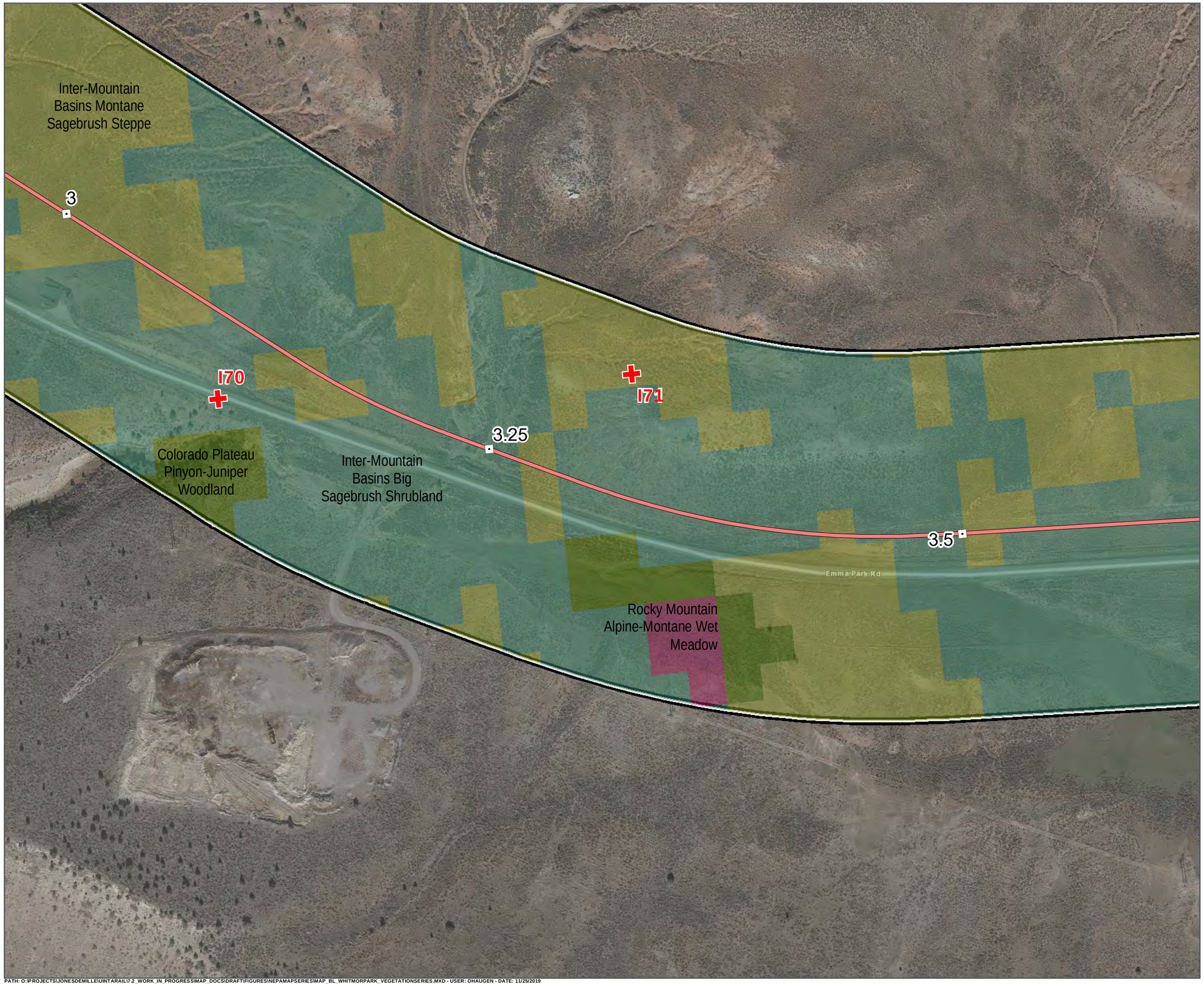

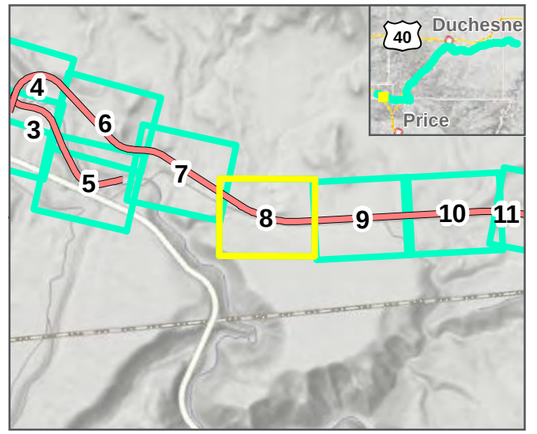

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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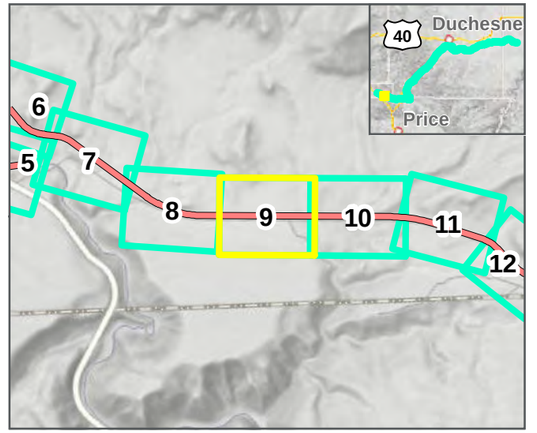

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
SWReGAP Landcover
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Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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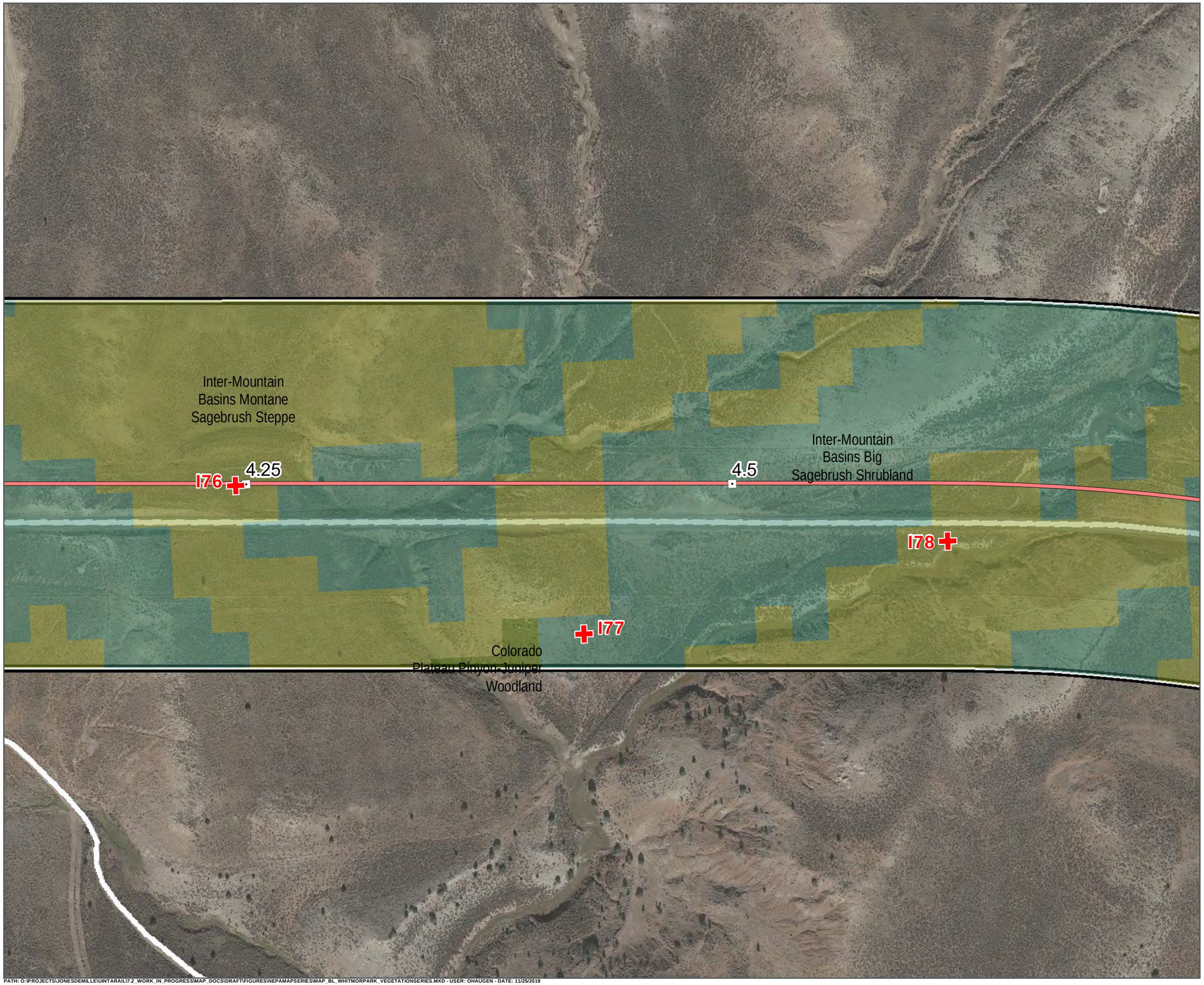

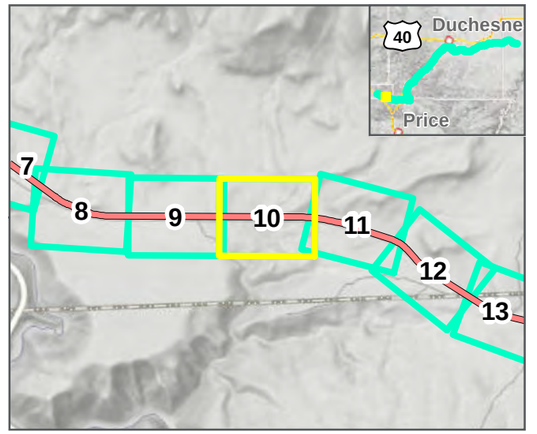

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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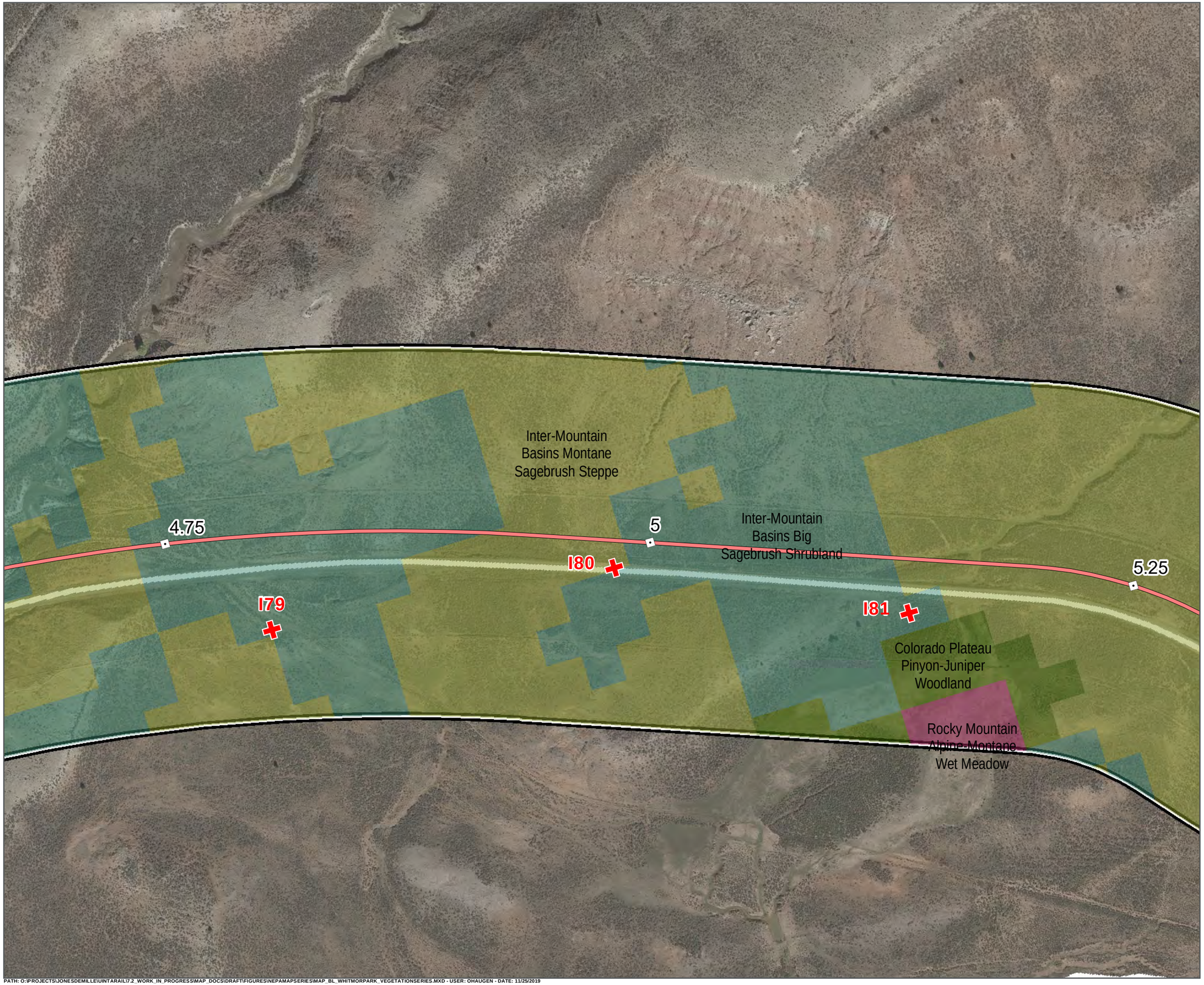

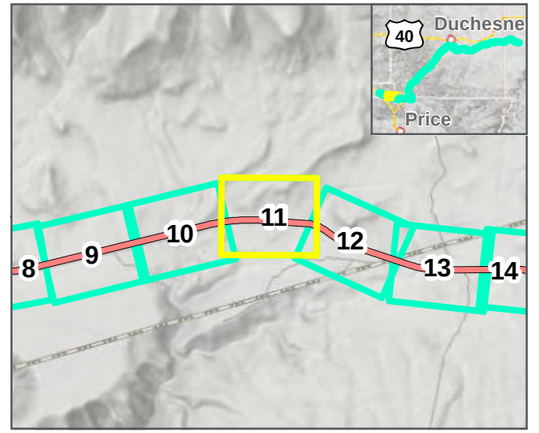

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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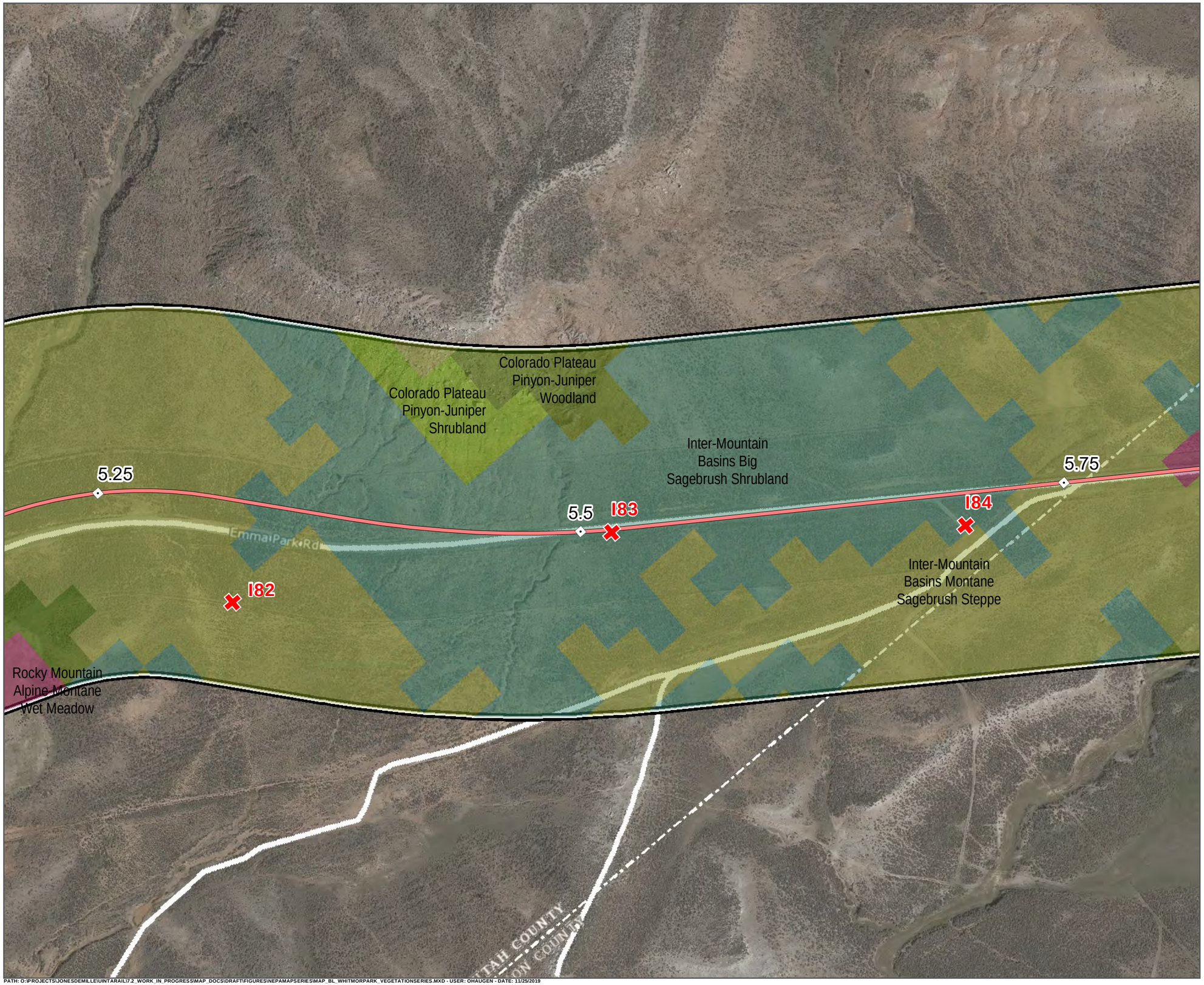

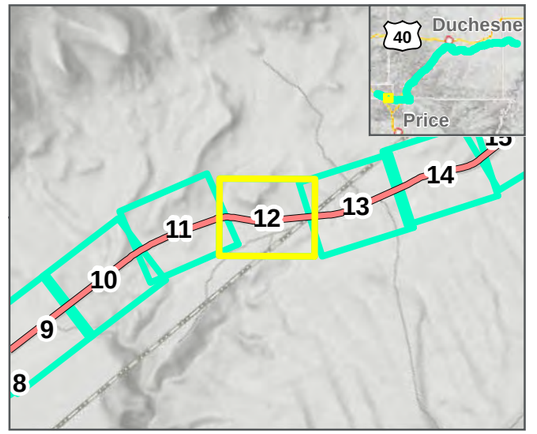

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
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Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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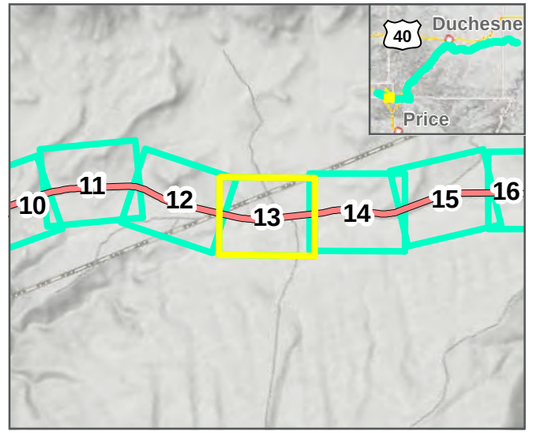

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

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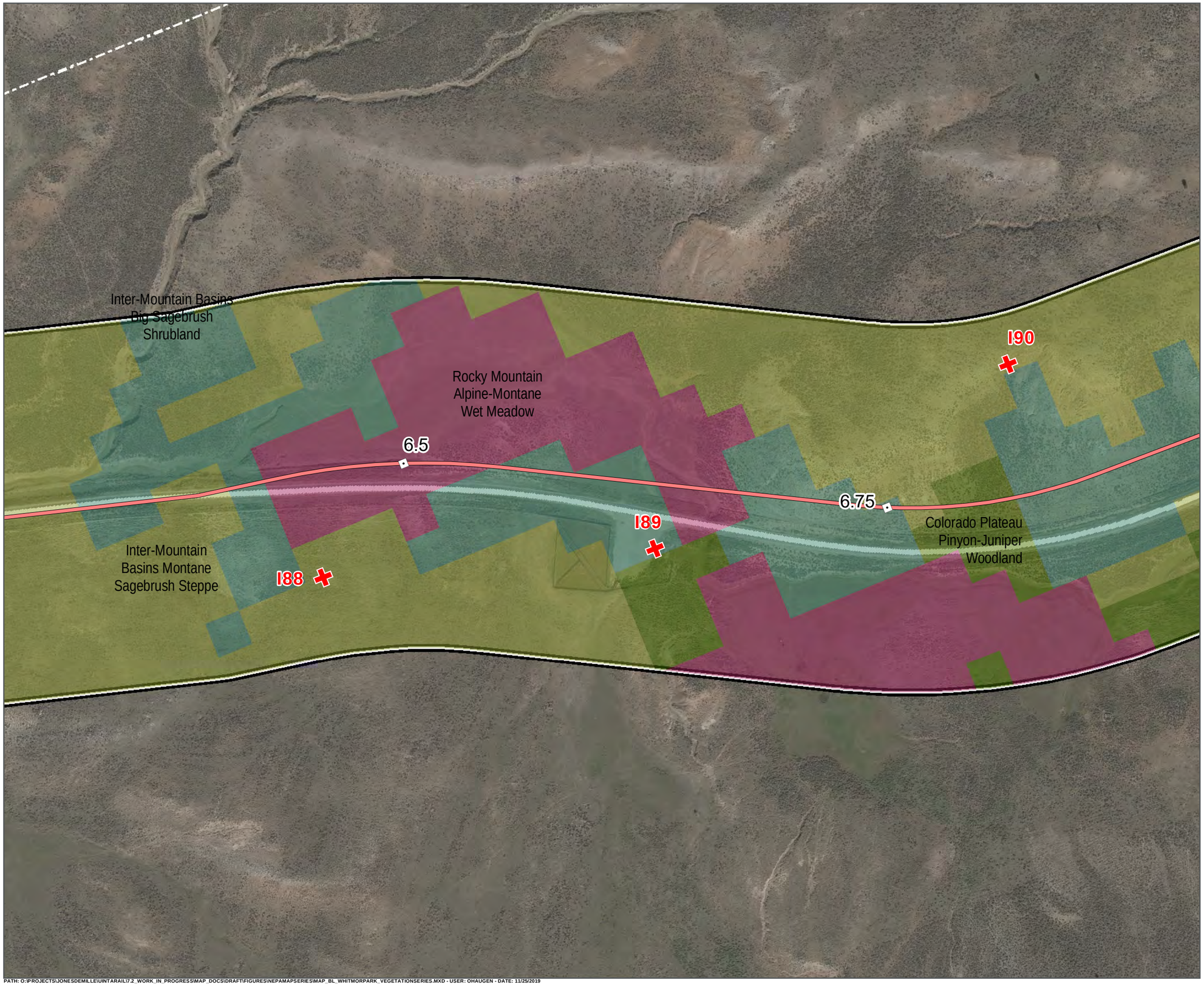

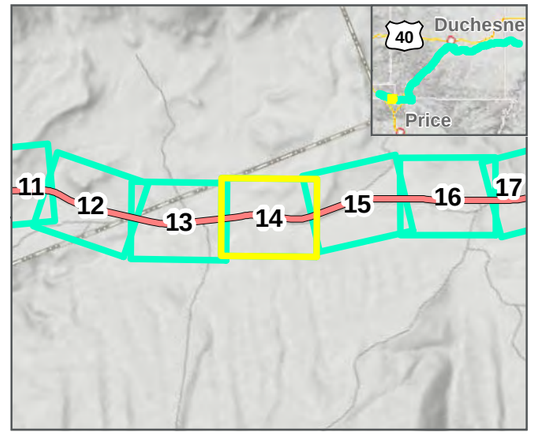

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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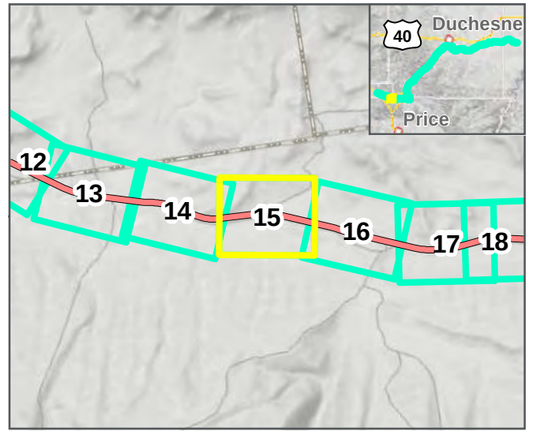

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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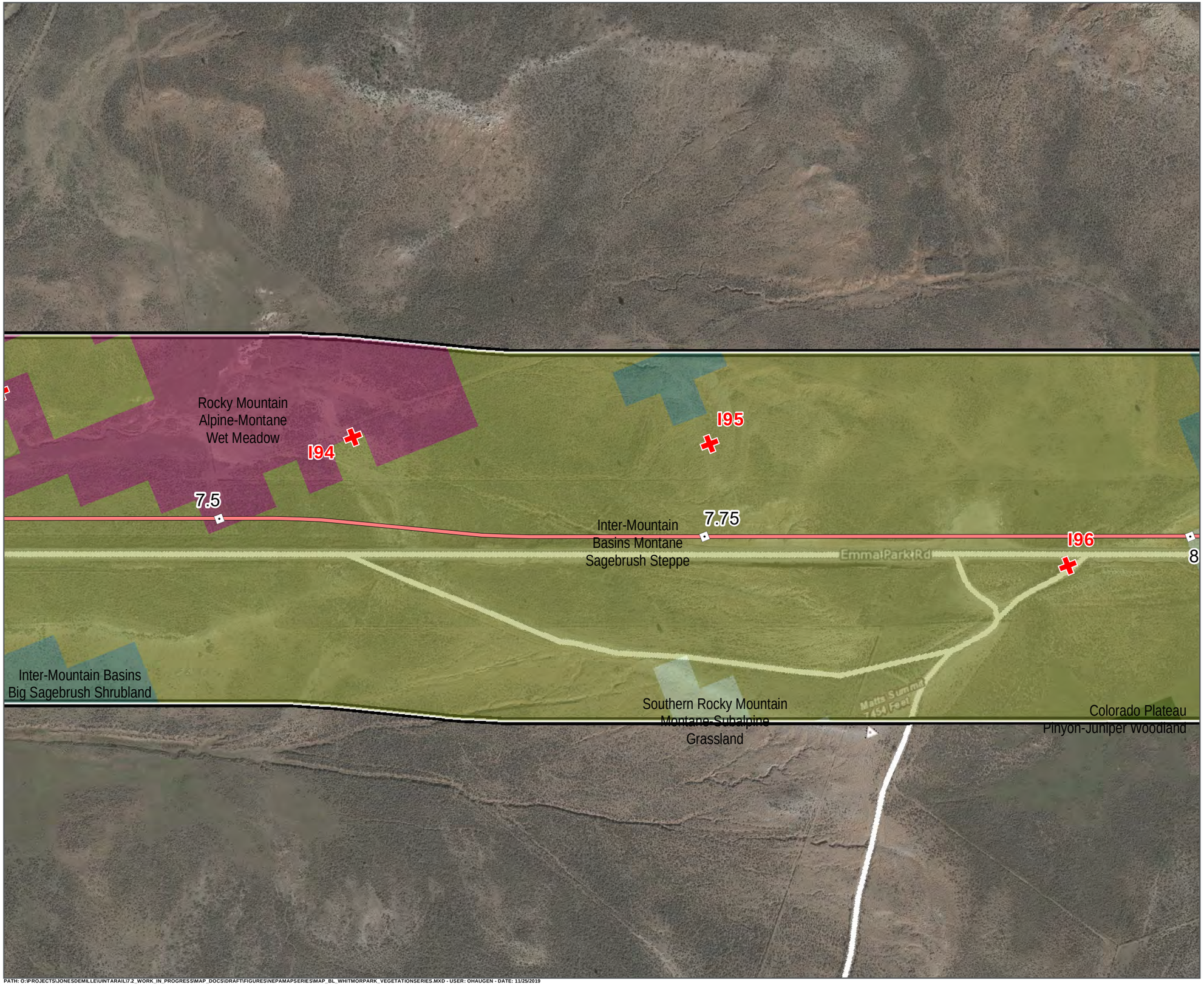

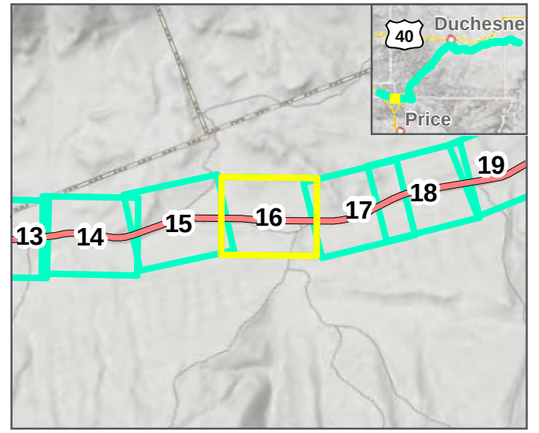

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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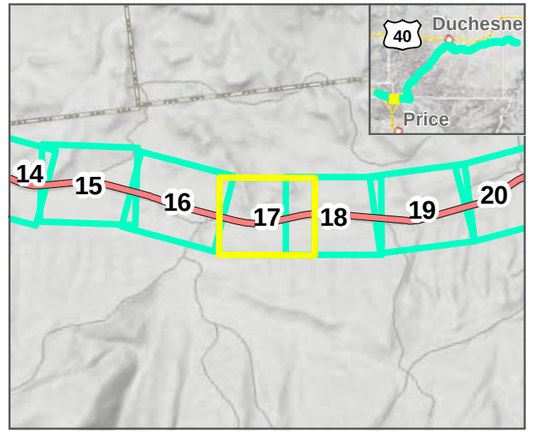

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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DATA SOURCES:
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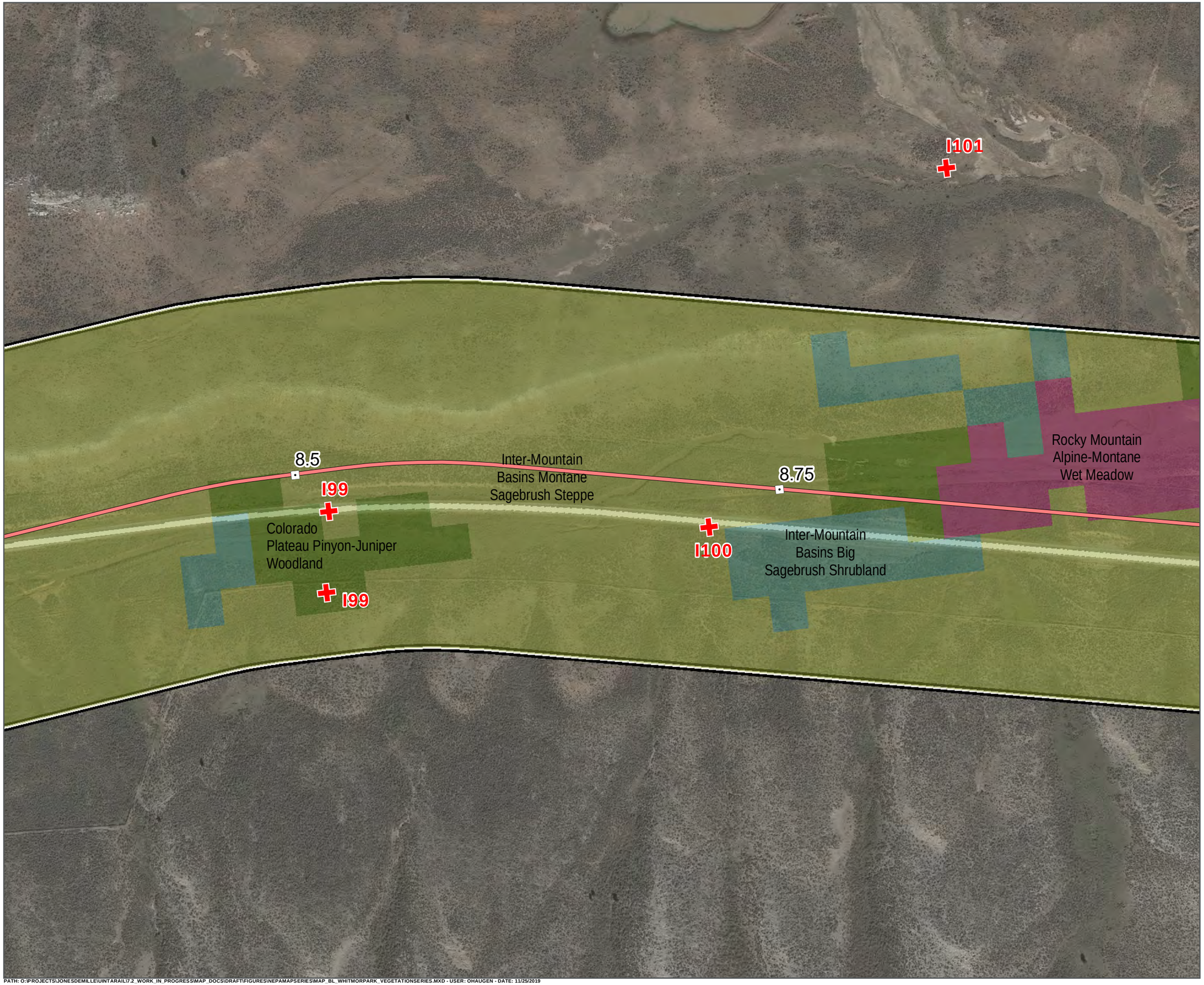

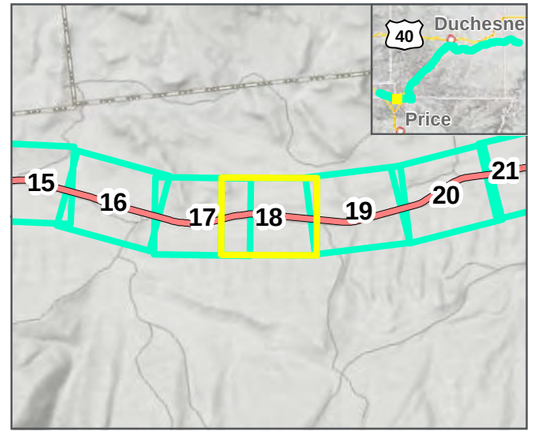

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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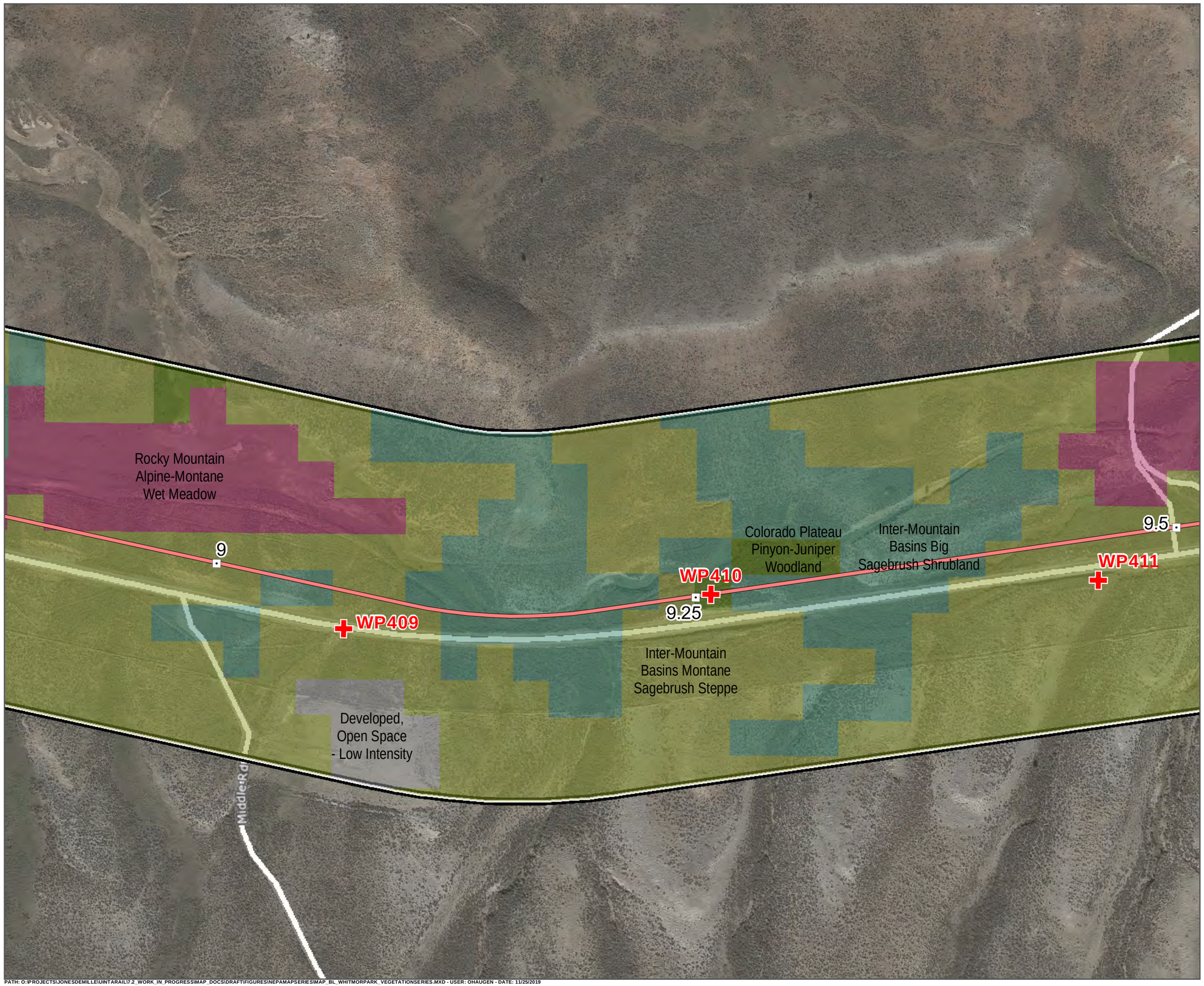

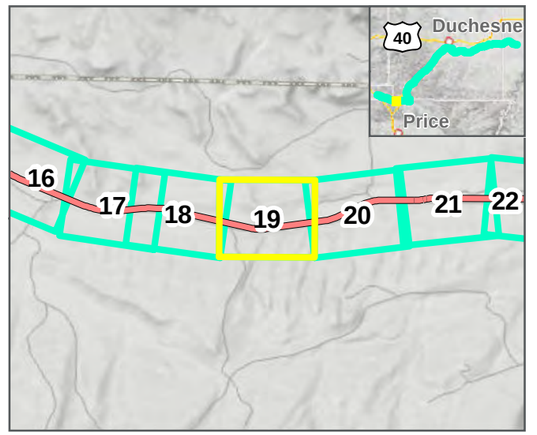

Photo Points

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Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Developed, Open Space - Low Intensity
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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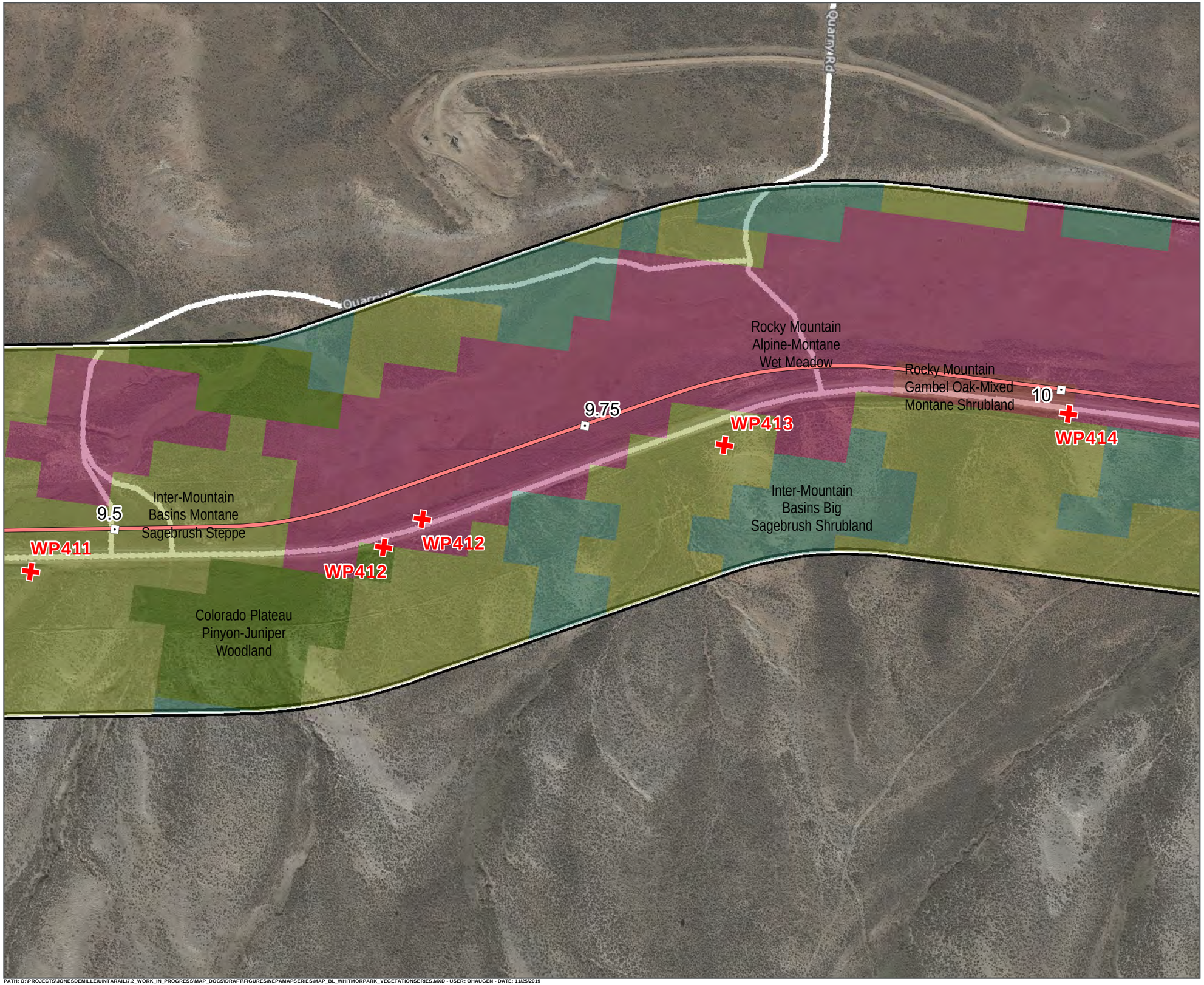

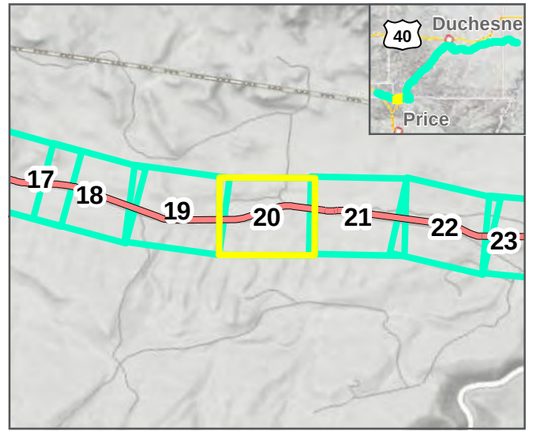

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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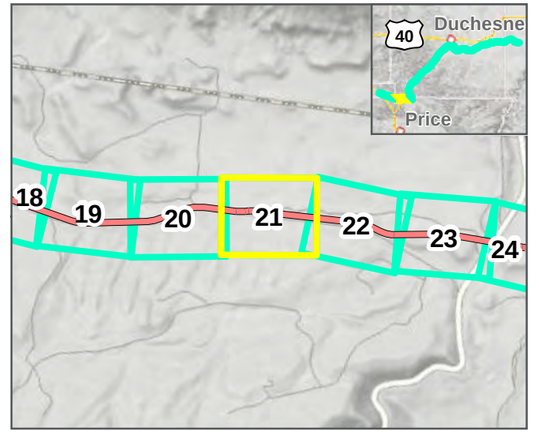

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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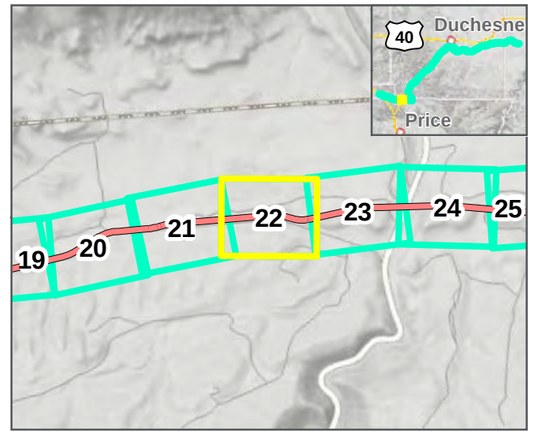

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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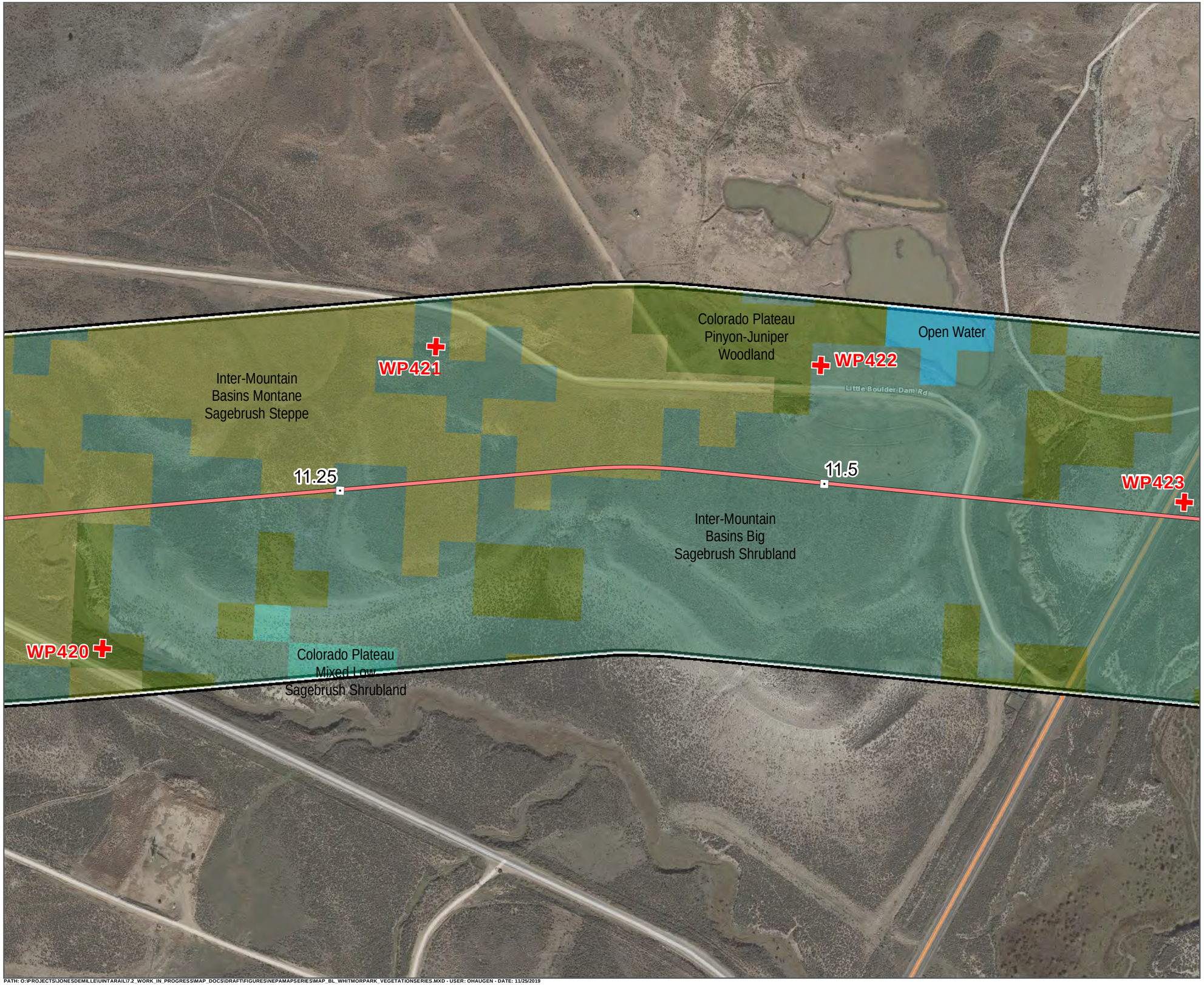

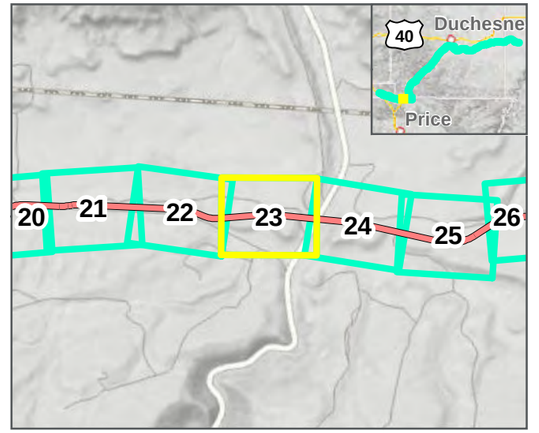

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Open Water

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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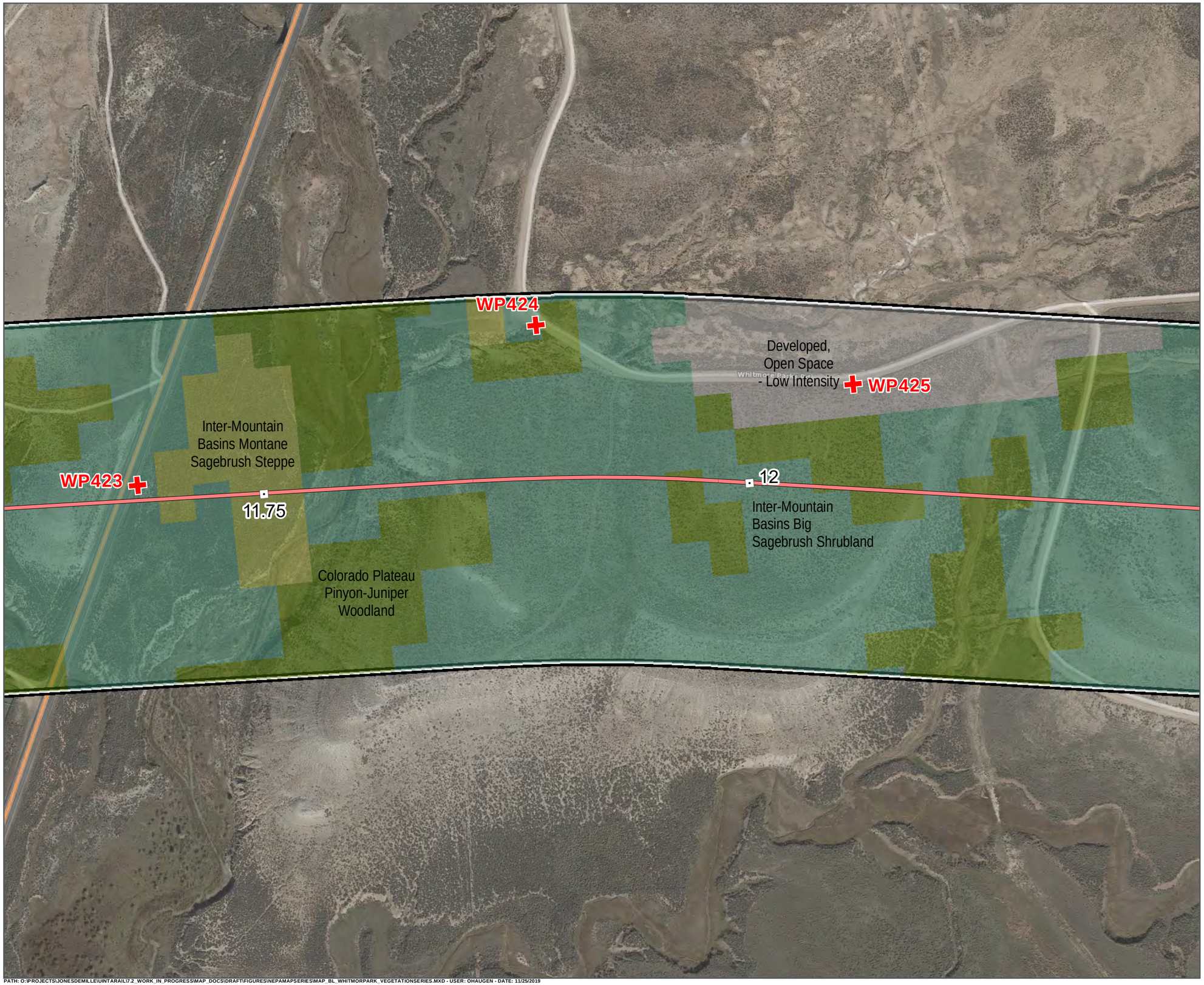

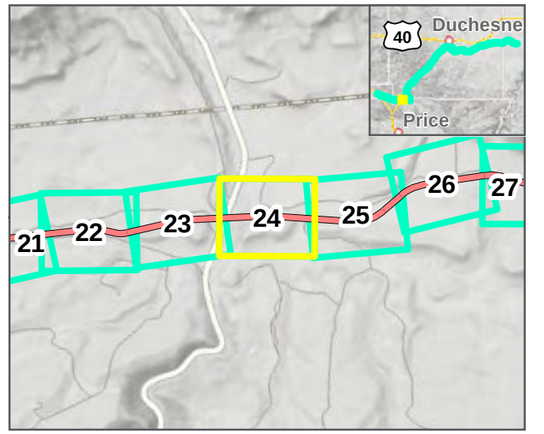

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Developed, Open Space - Low Intensity
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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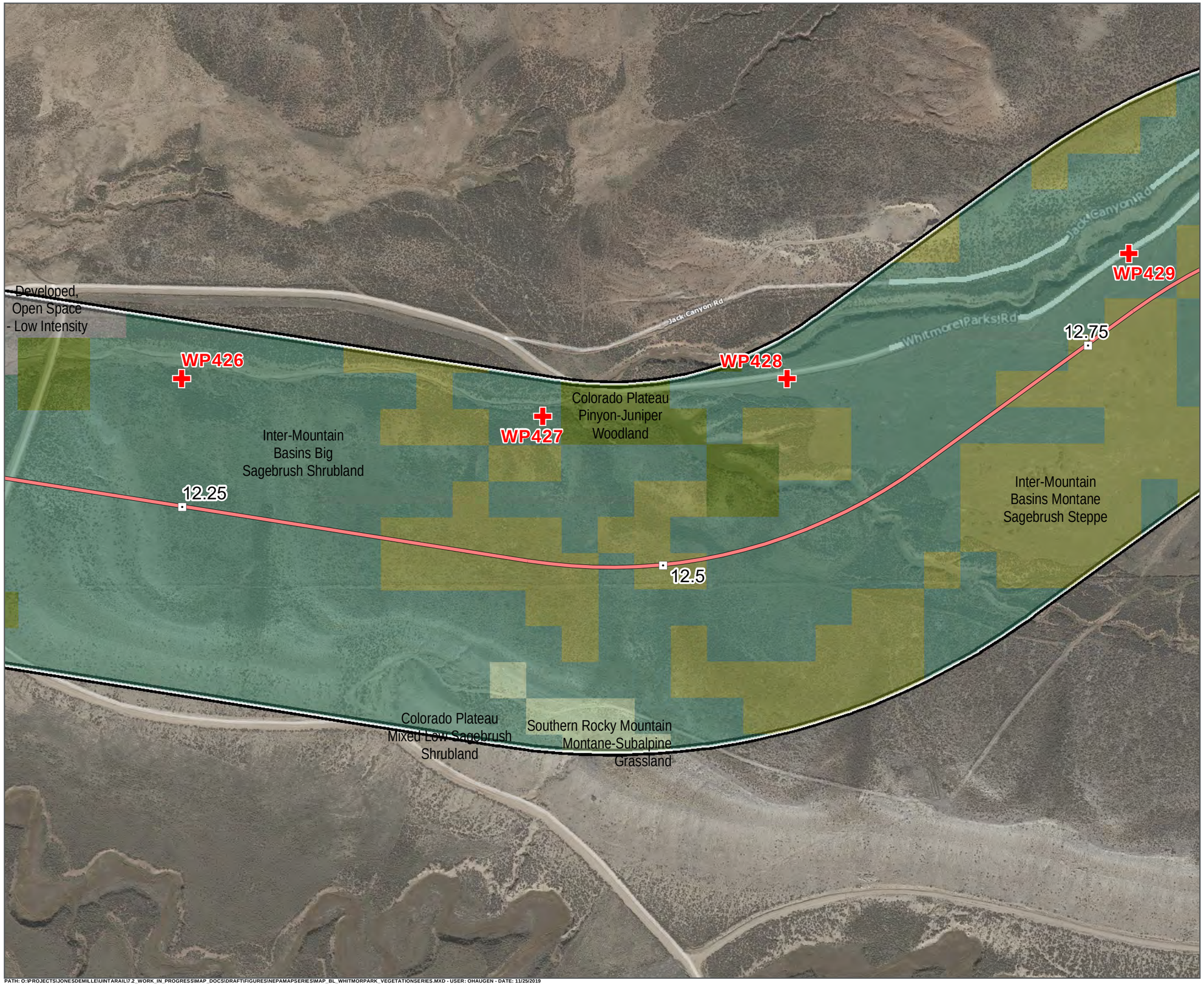

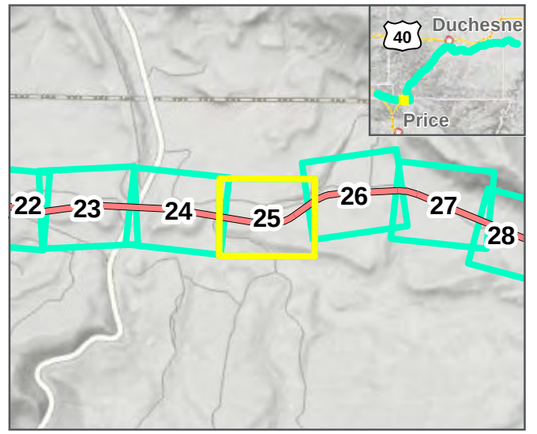

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Developed, Open Space - Low Intensity
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Southern Rocky Mountain Montane-Subalpine Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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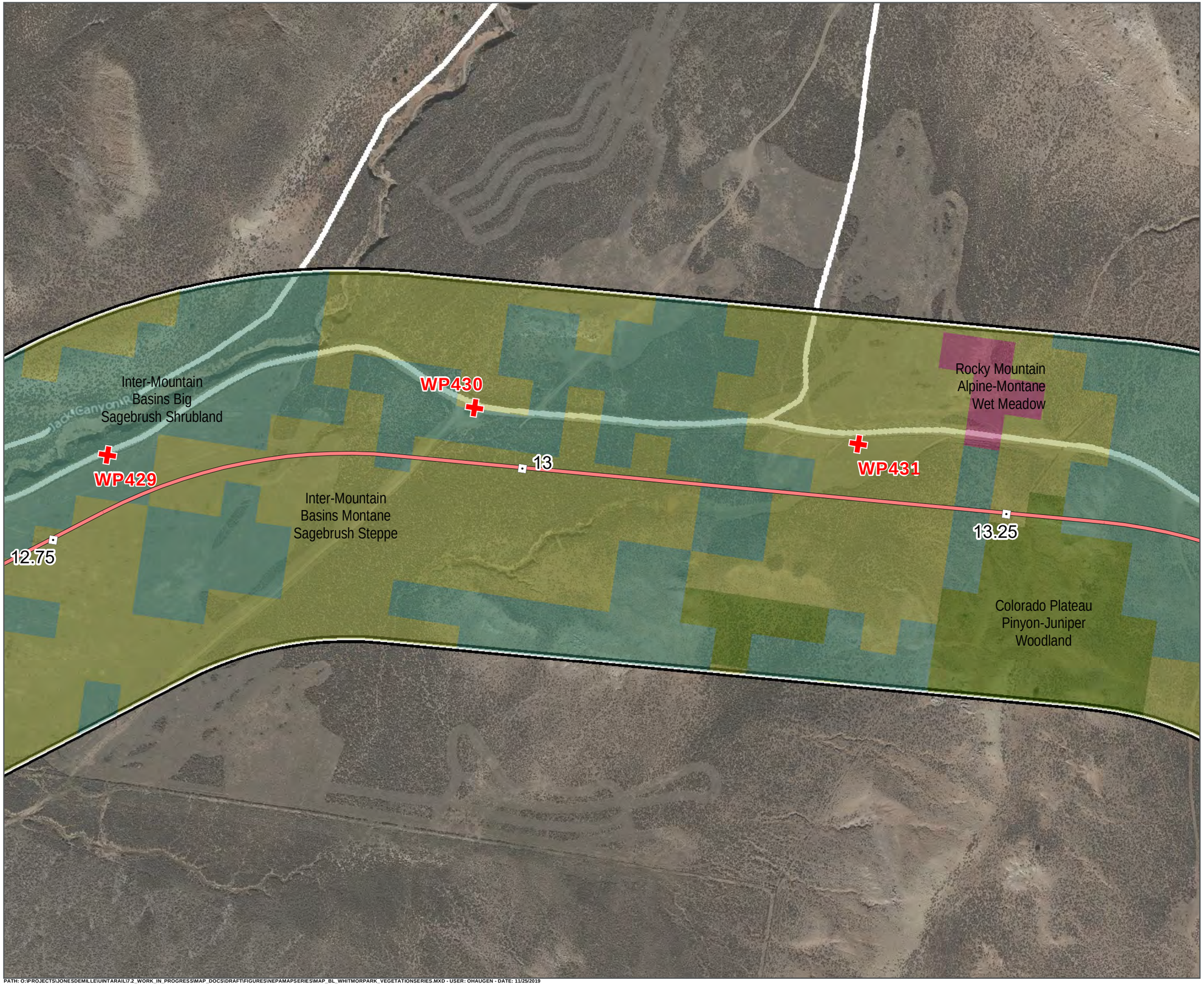

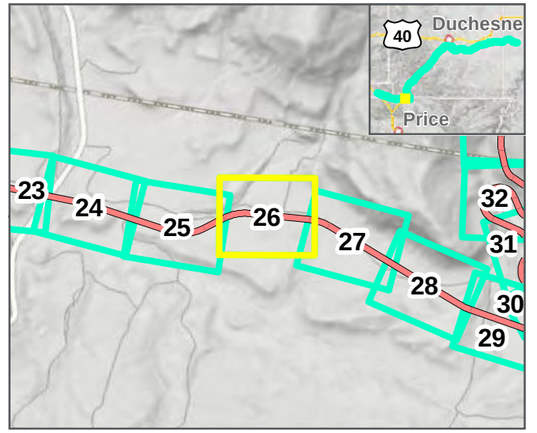

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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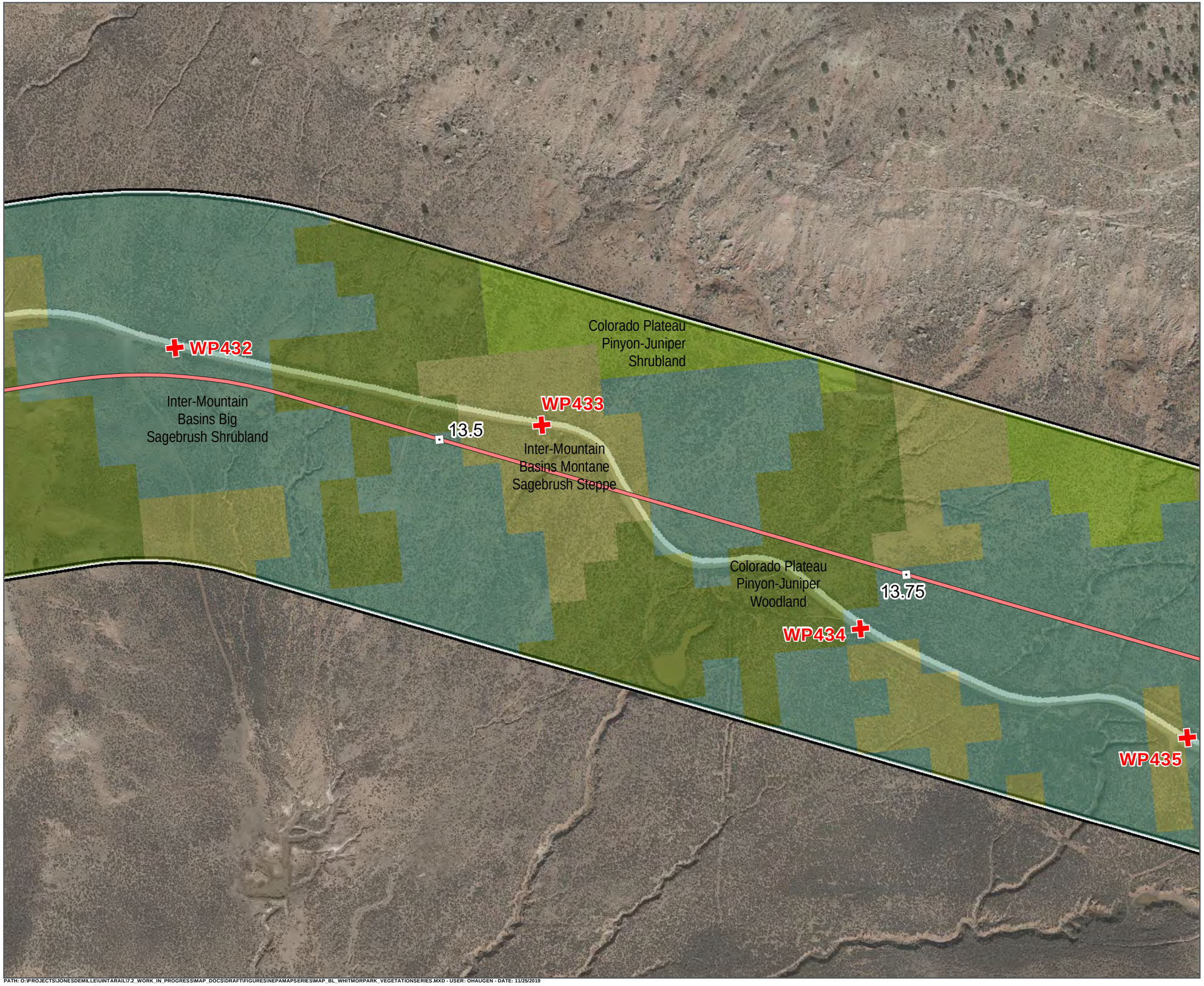

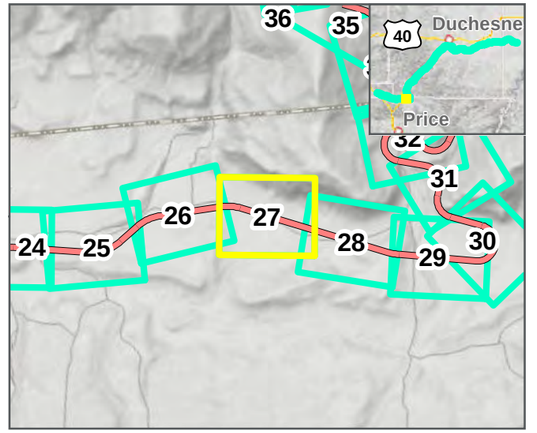

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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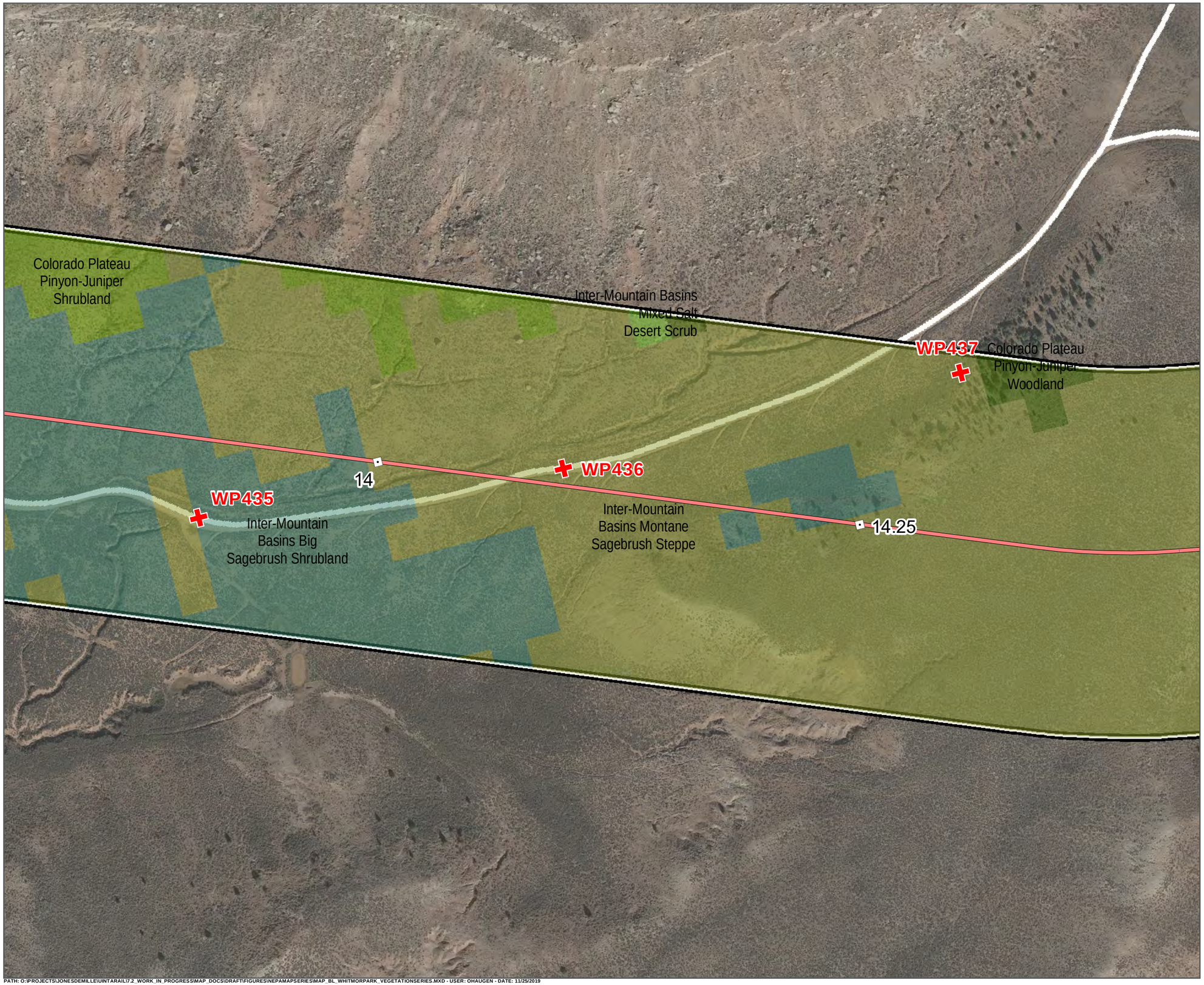

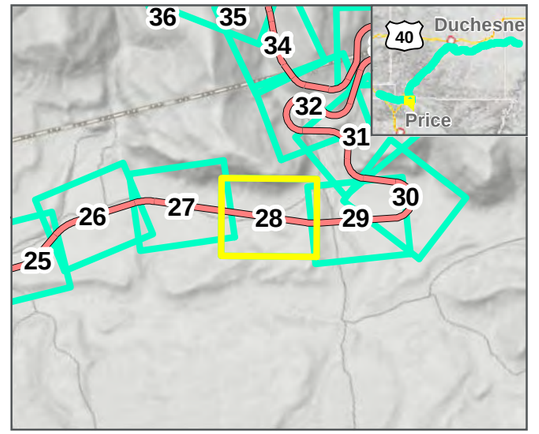

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Montane Sagebrush Steppe

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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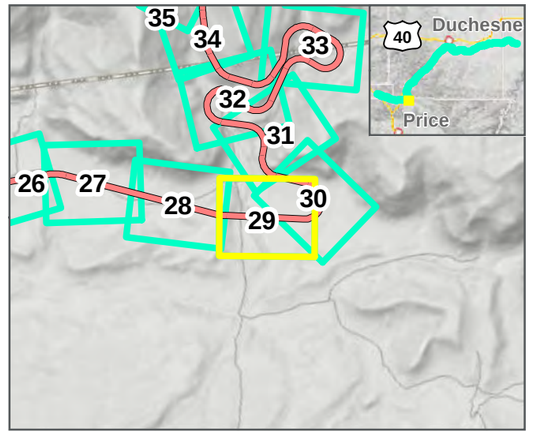

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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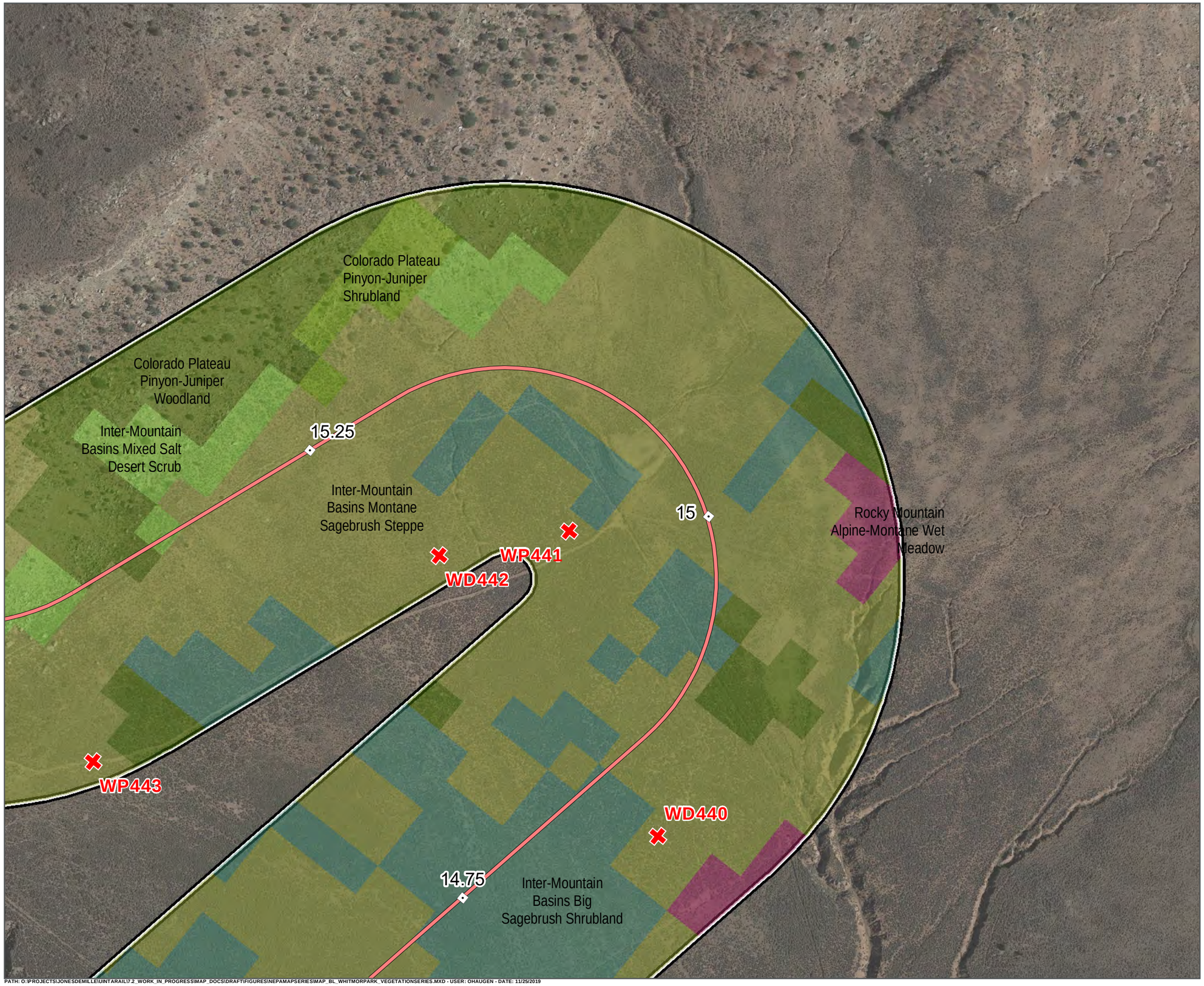

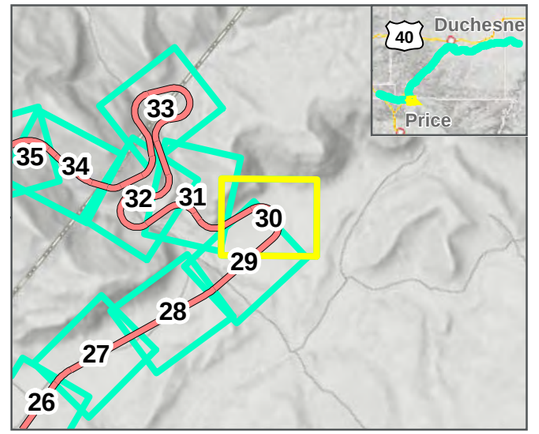

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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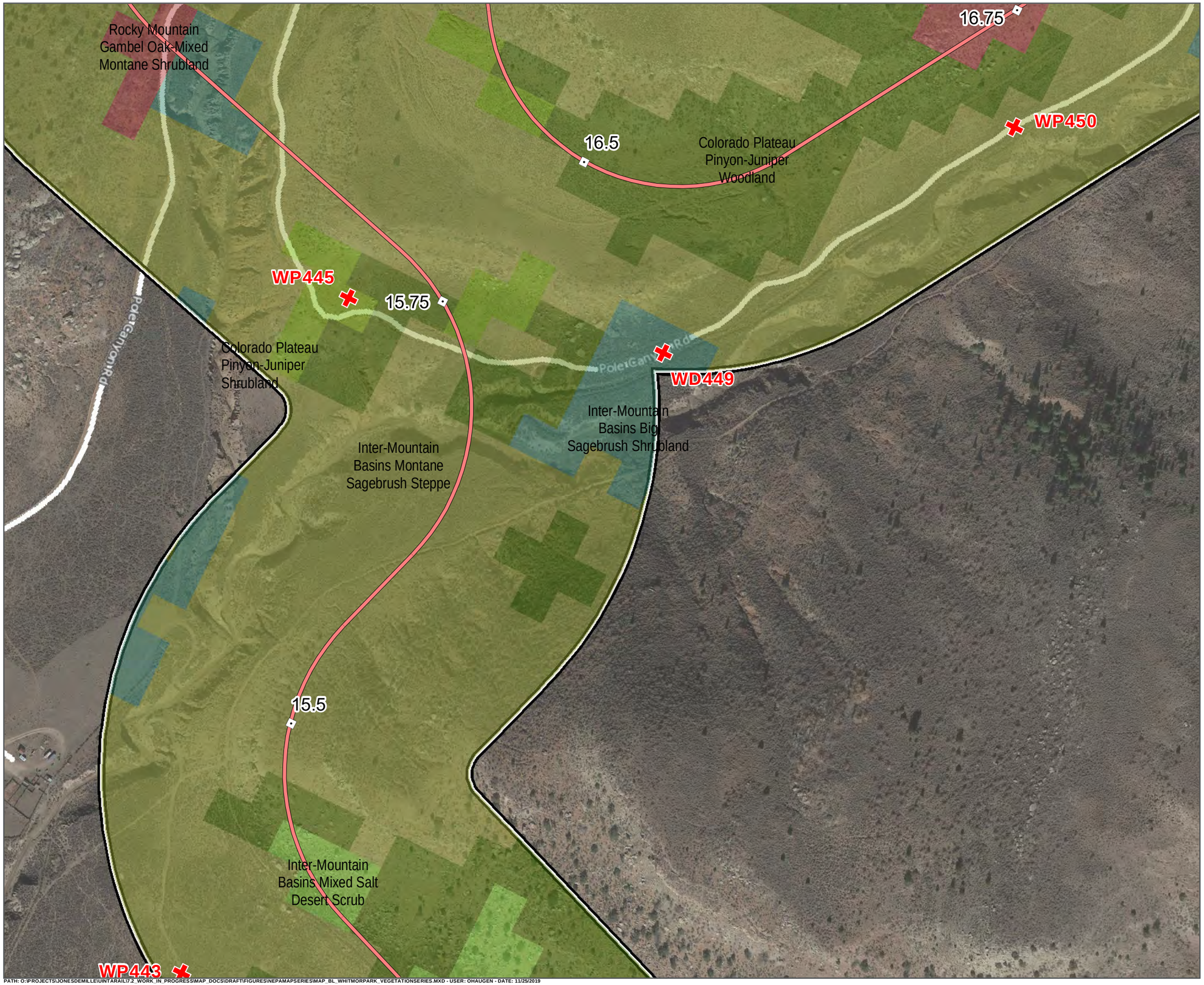

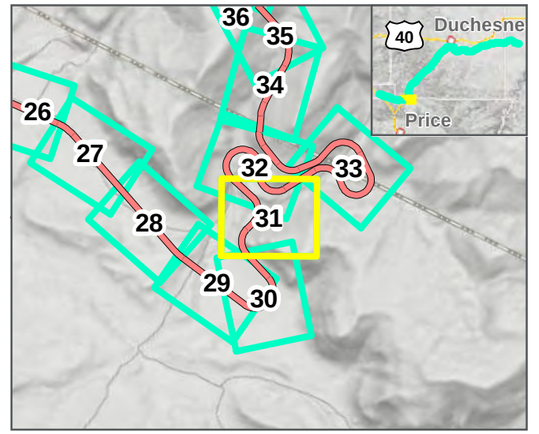

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
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Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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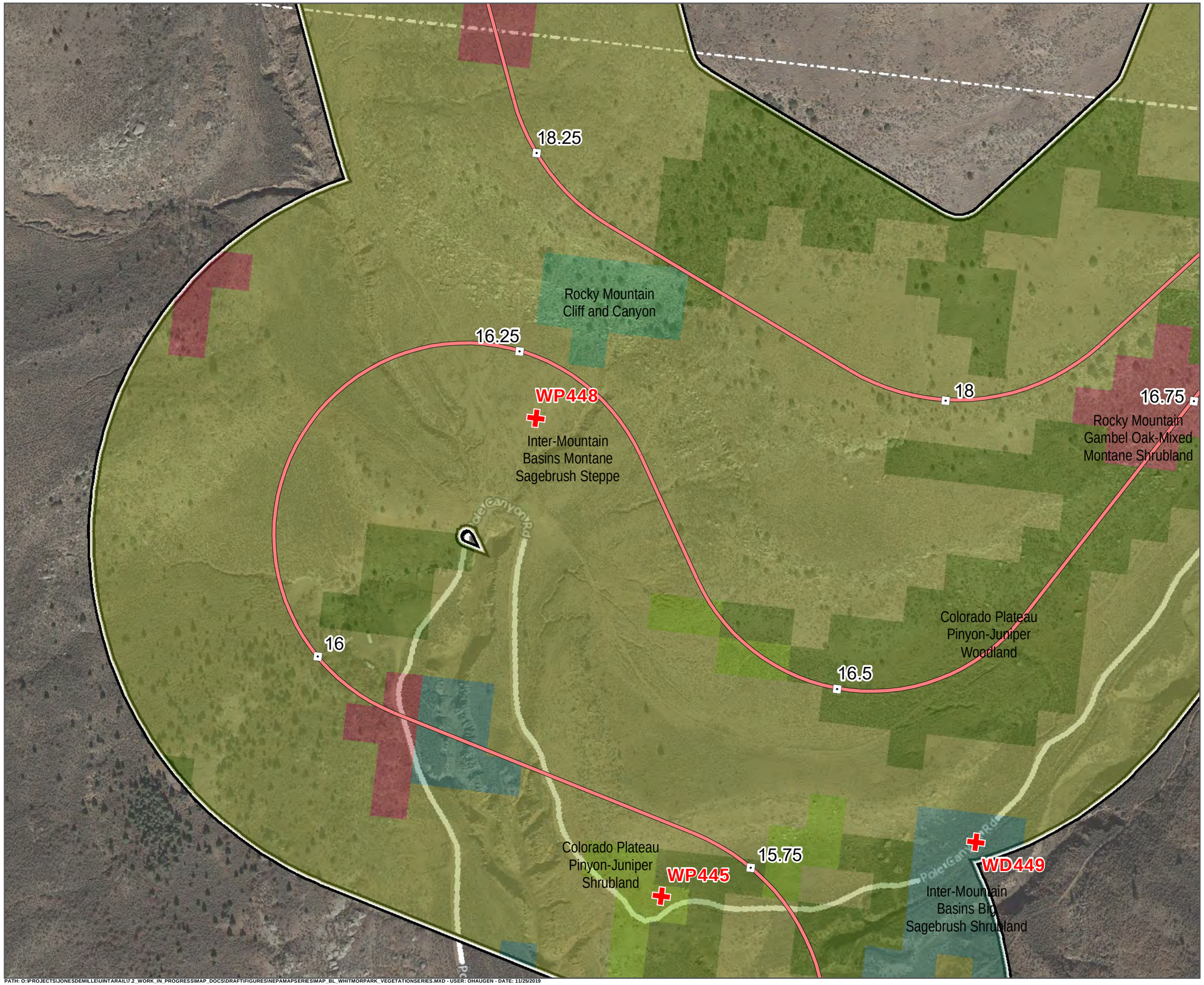

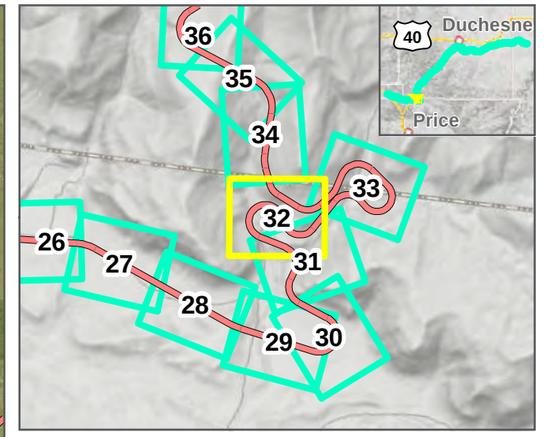

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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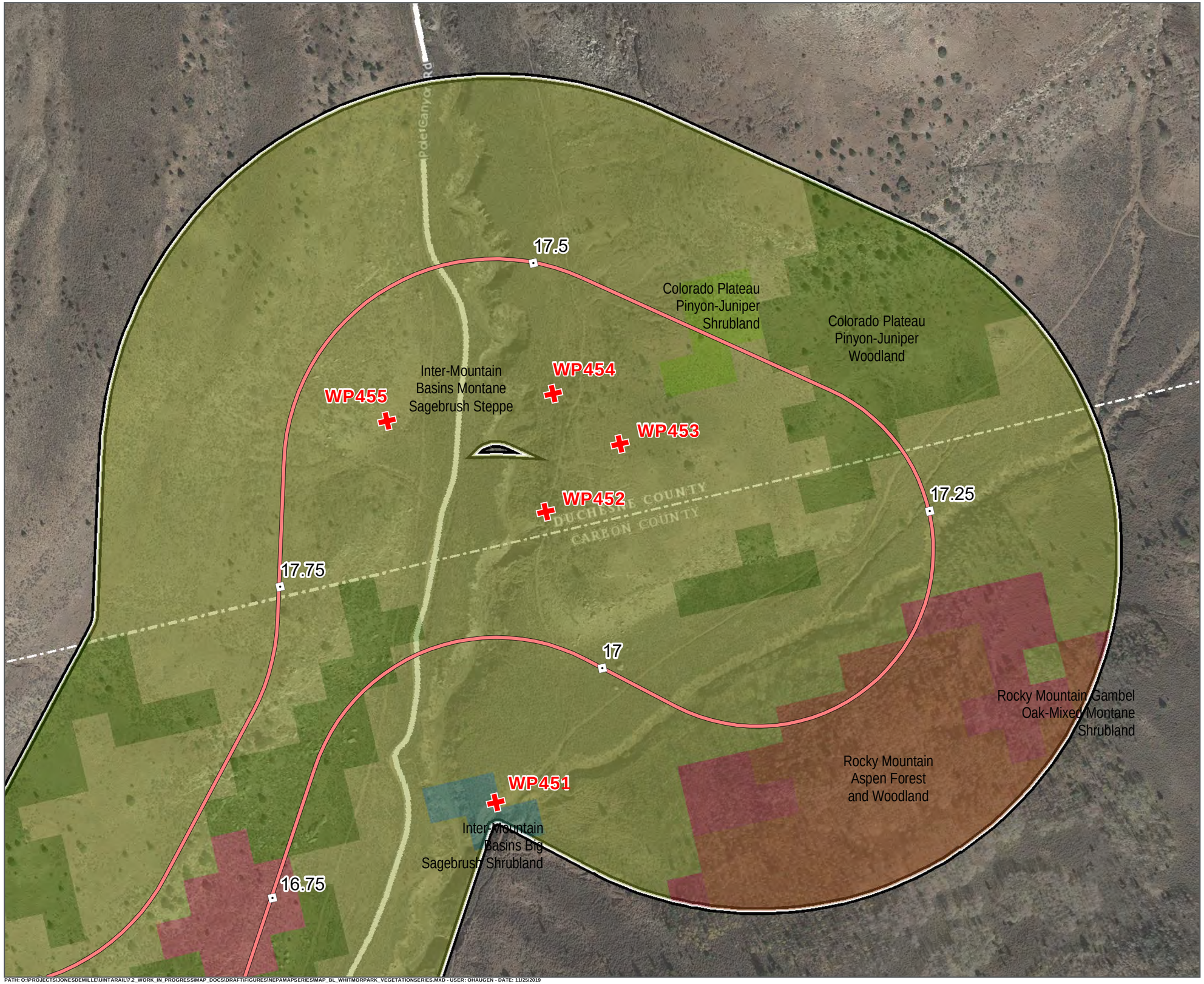

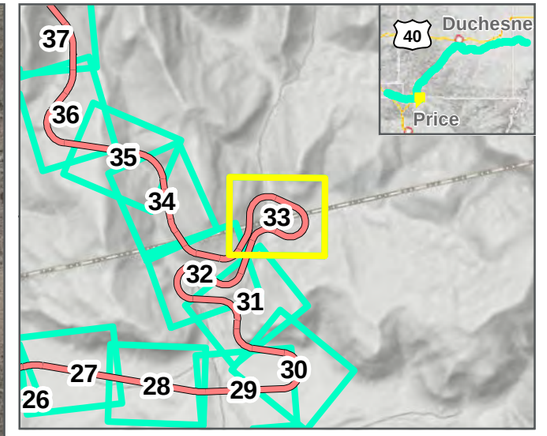

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Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

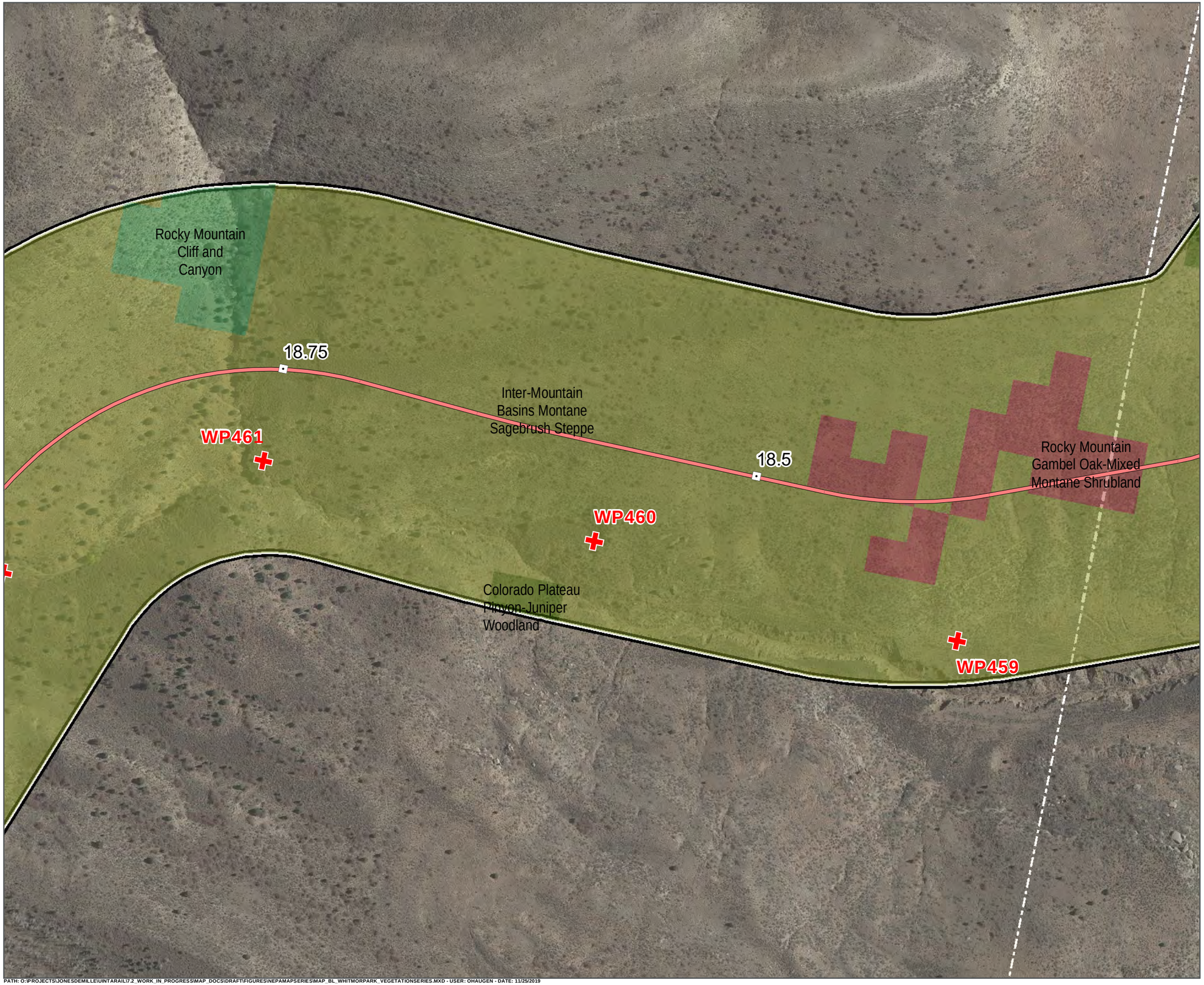
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



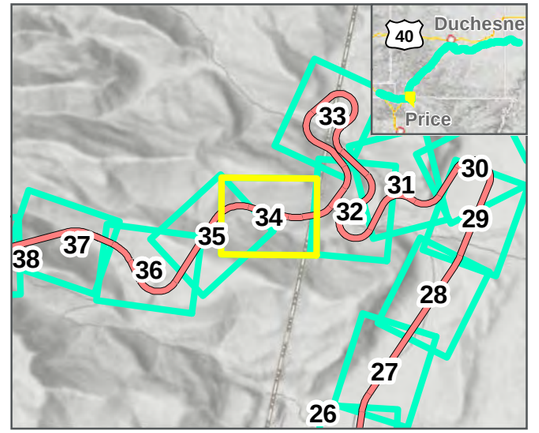


Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

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SEVEN COUNTY INFRASTRUCTURE COALITION

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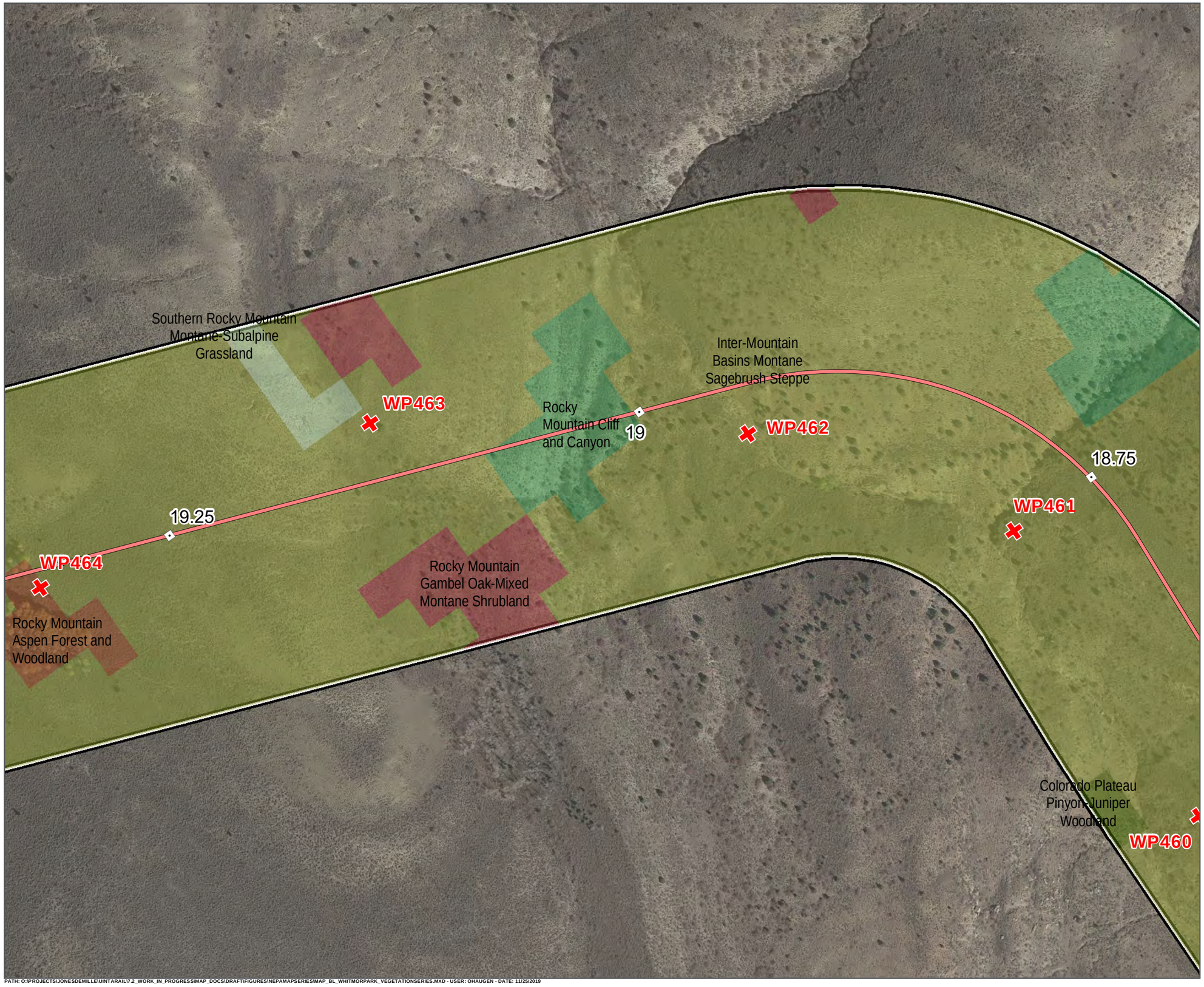

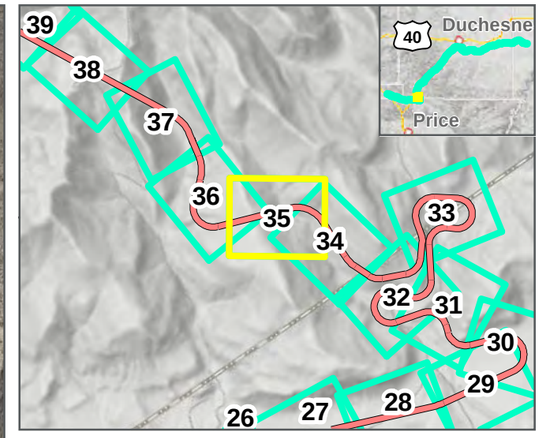

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

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SEPTEMBER 2019

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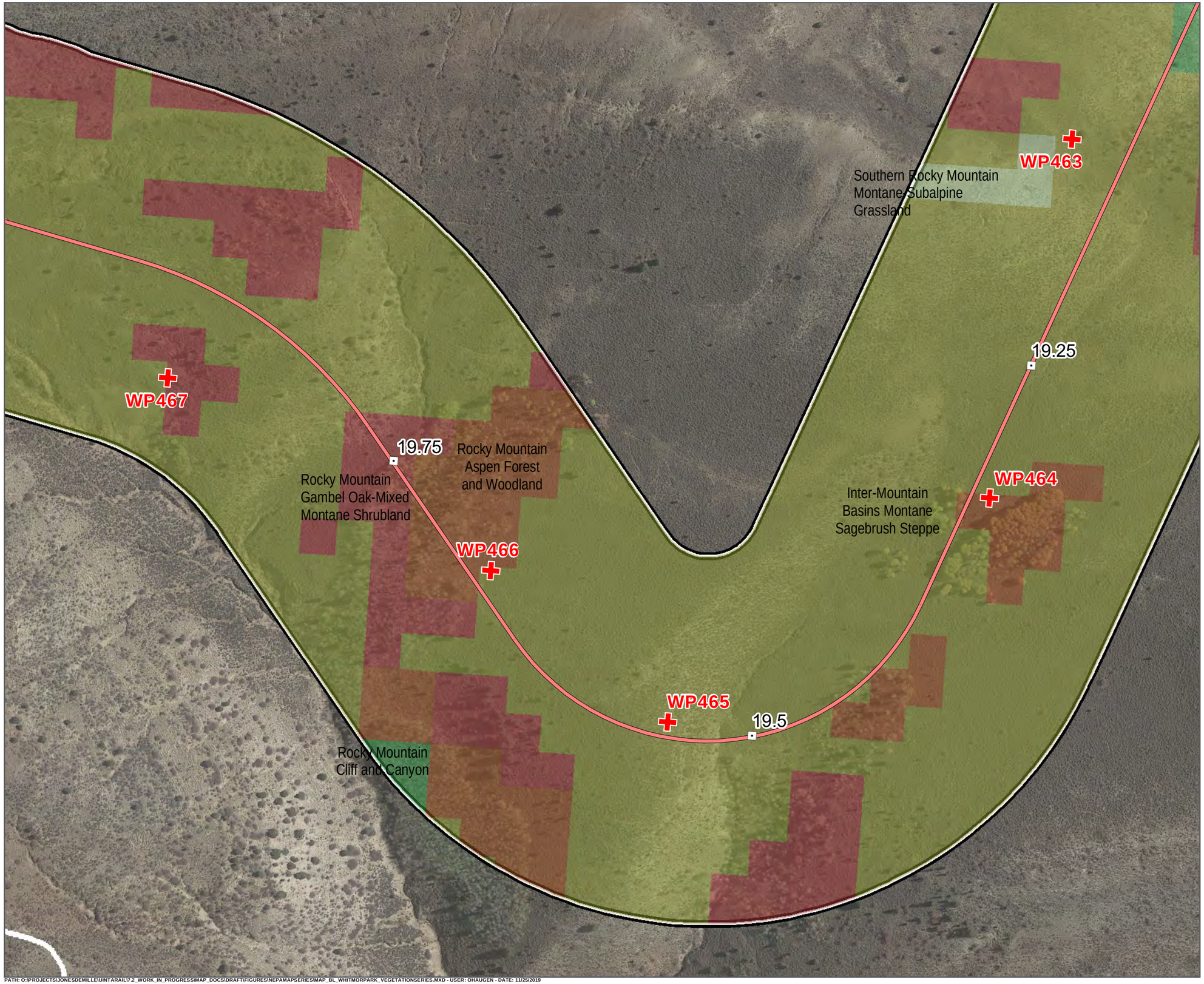

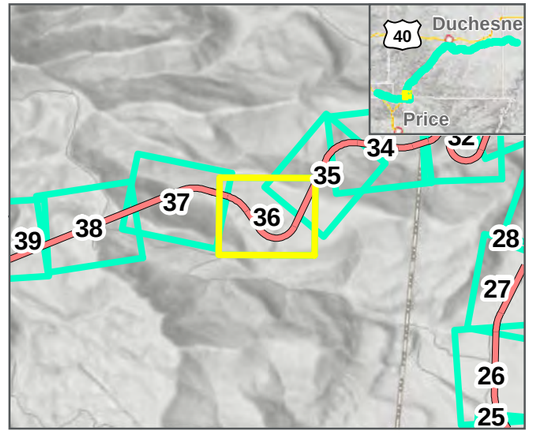

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Study Area
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Vegetation Communities

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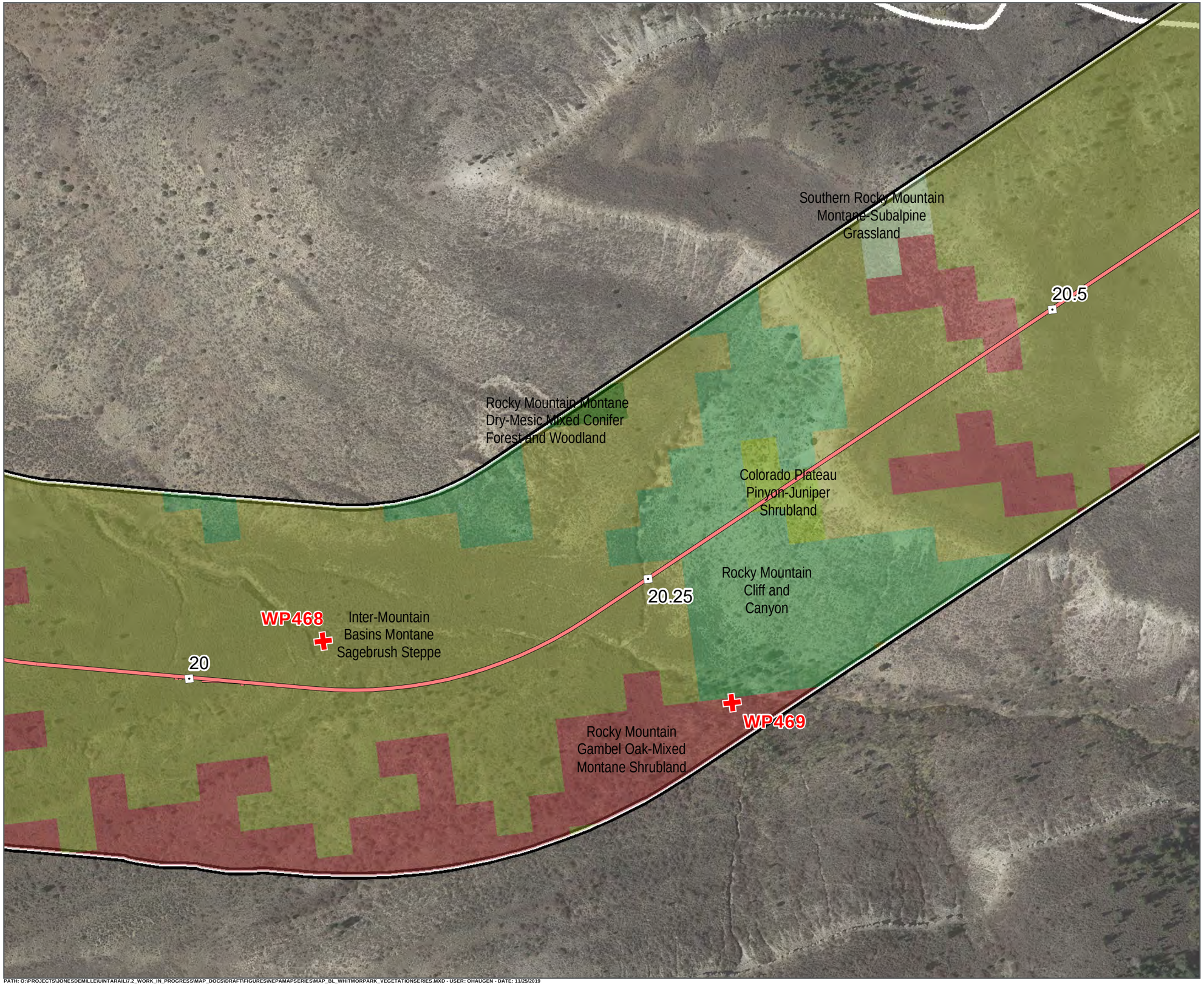

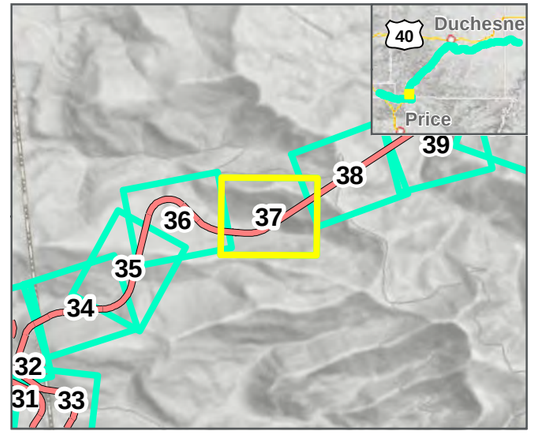

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Vegetation Communities

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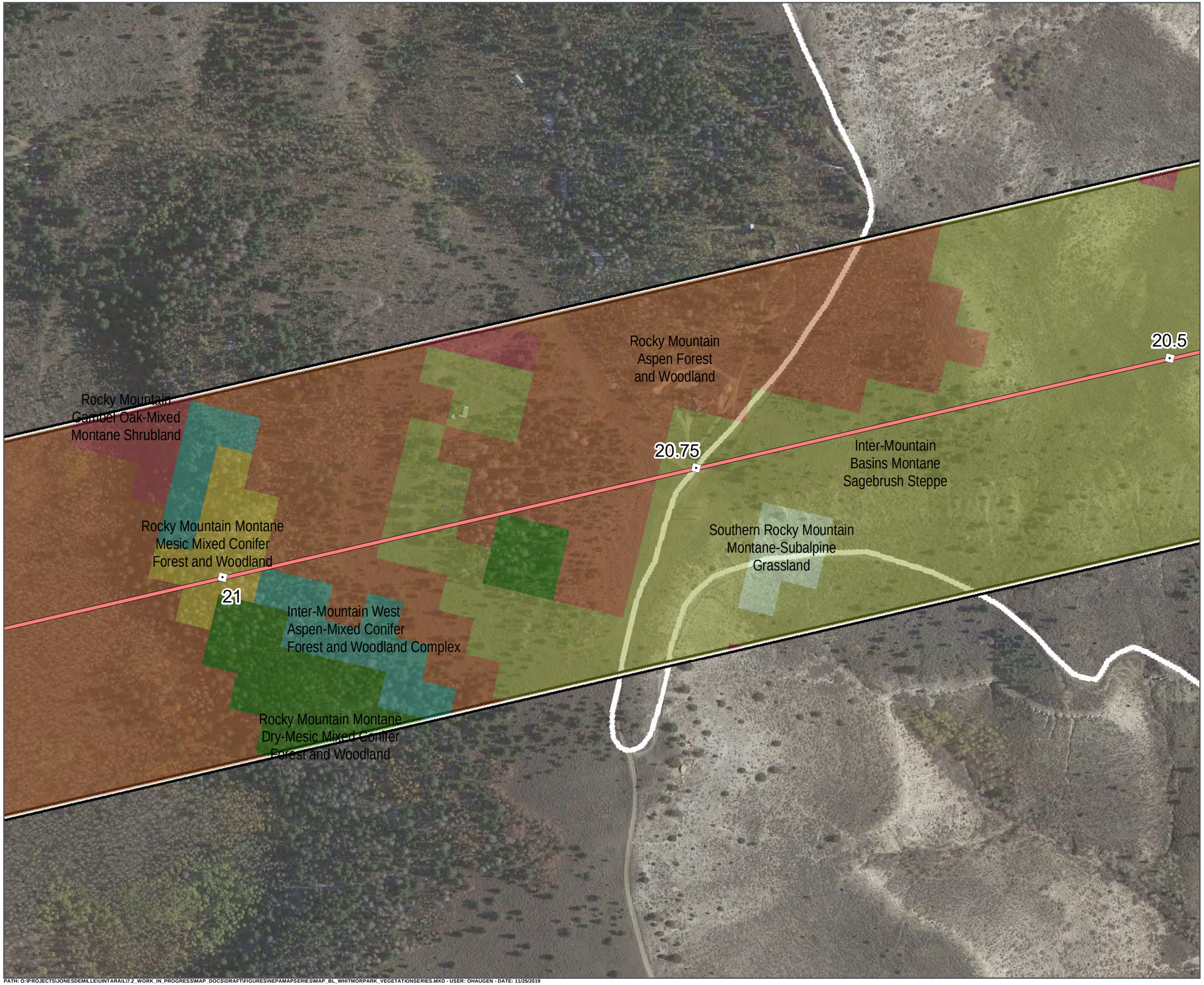

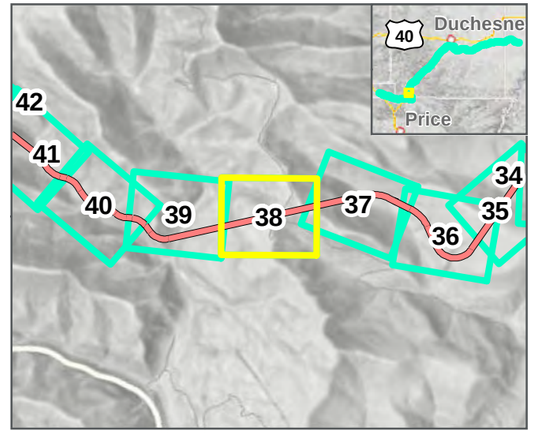

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
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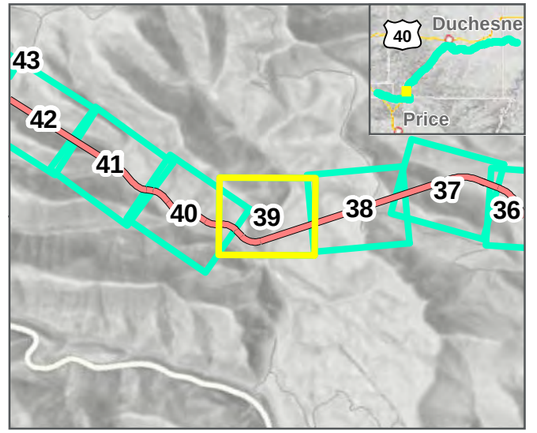

Photo Points

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Whitmore Park Centerline

Study Area

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Vegetation Communities

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VEGETATION COMMUNITIES
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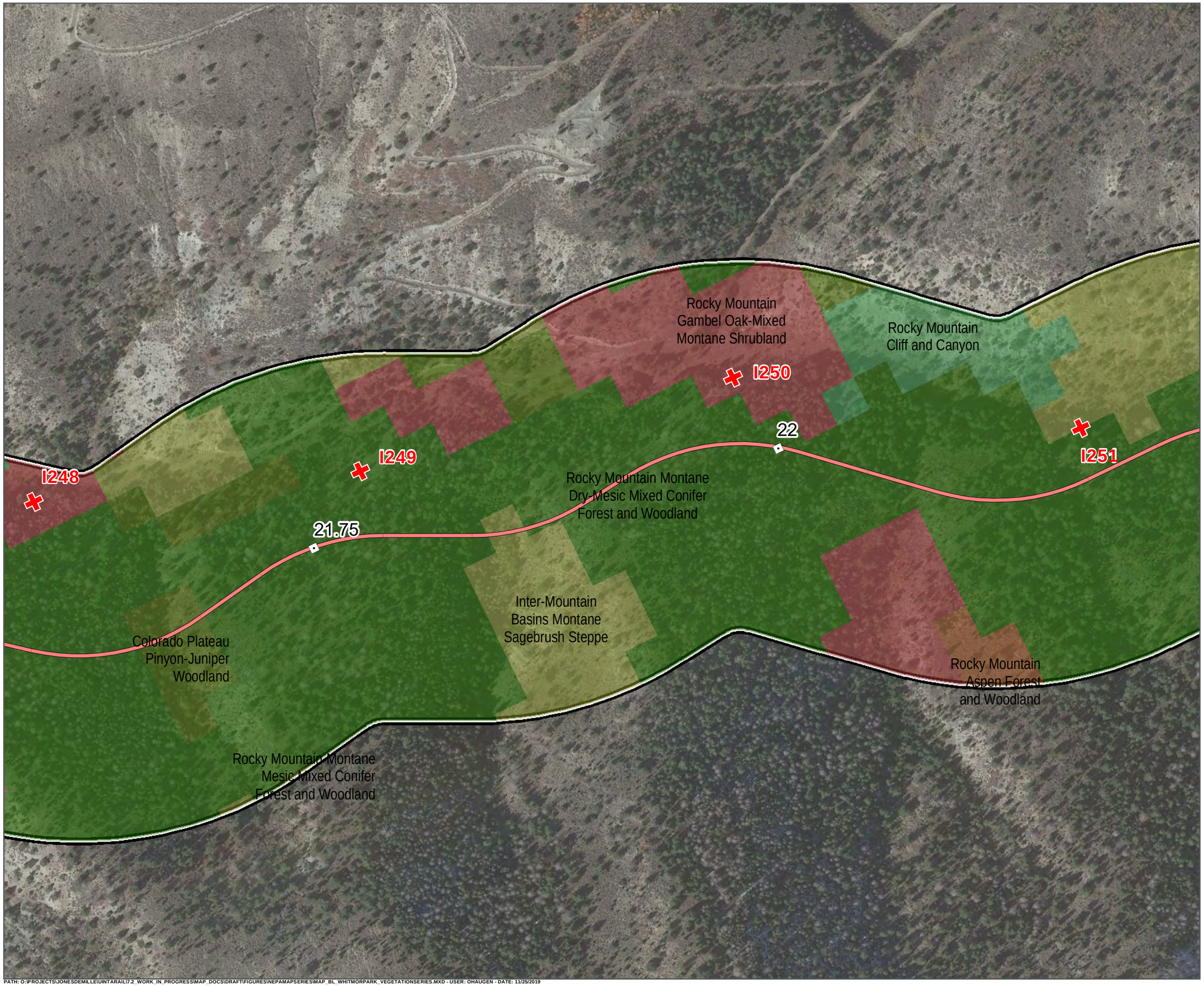

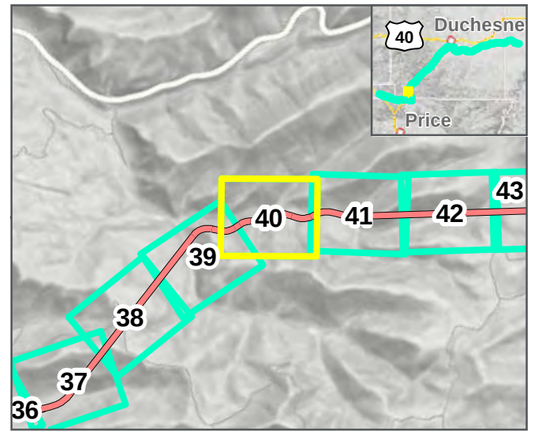

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Study Area
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Vegetation Communities

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VEGETATION COMMUNITIES
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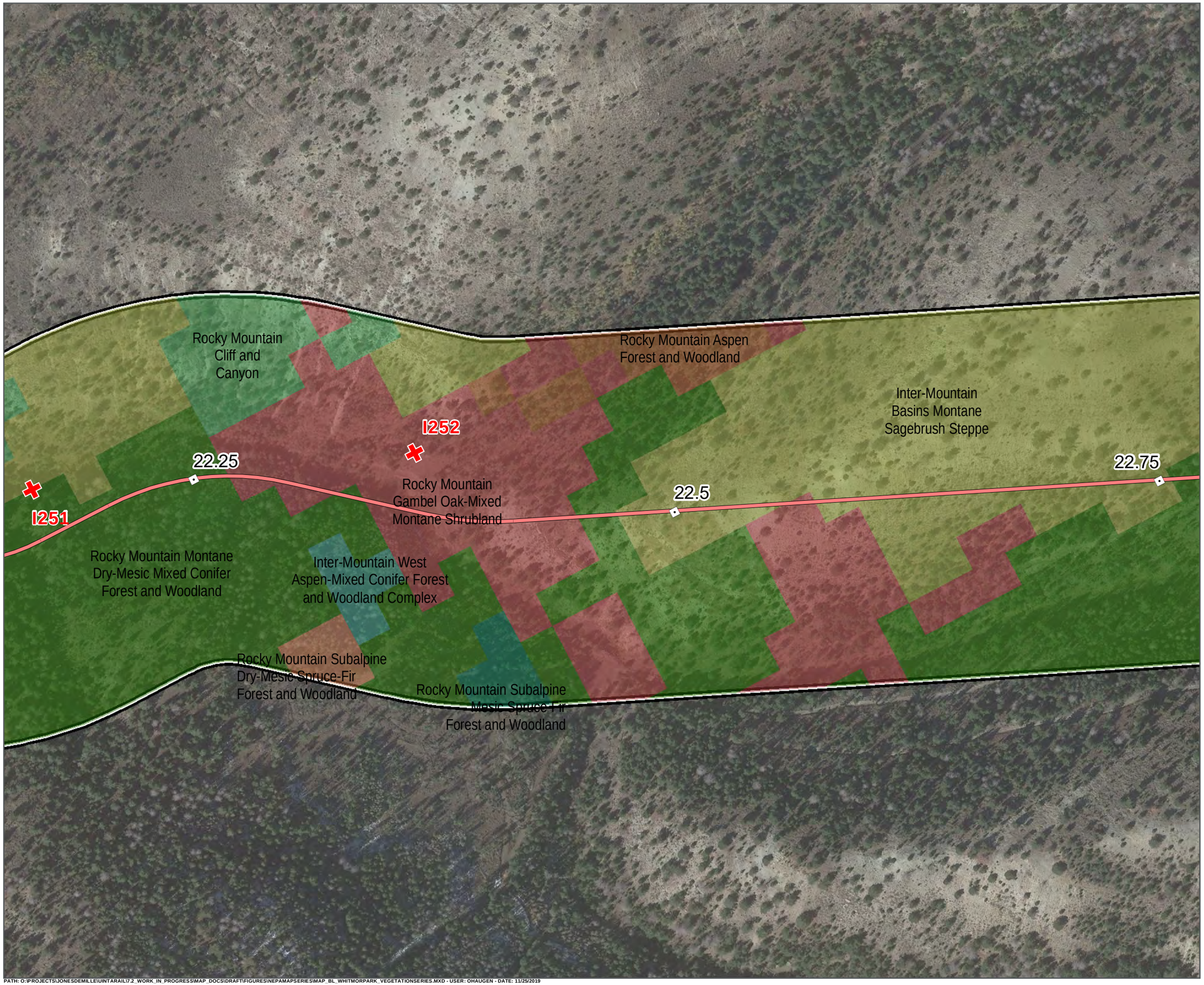

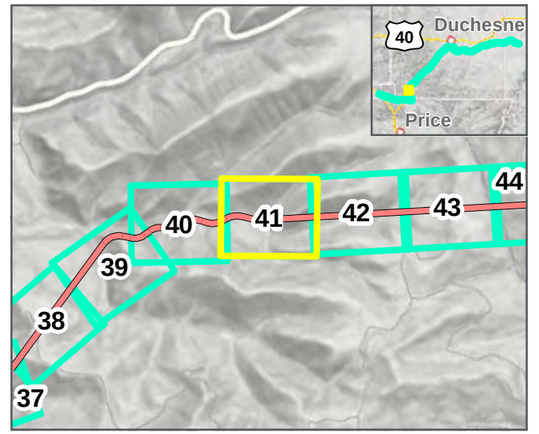

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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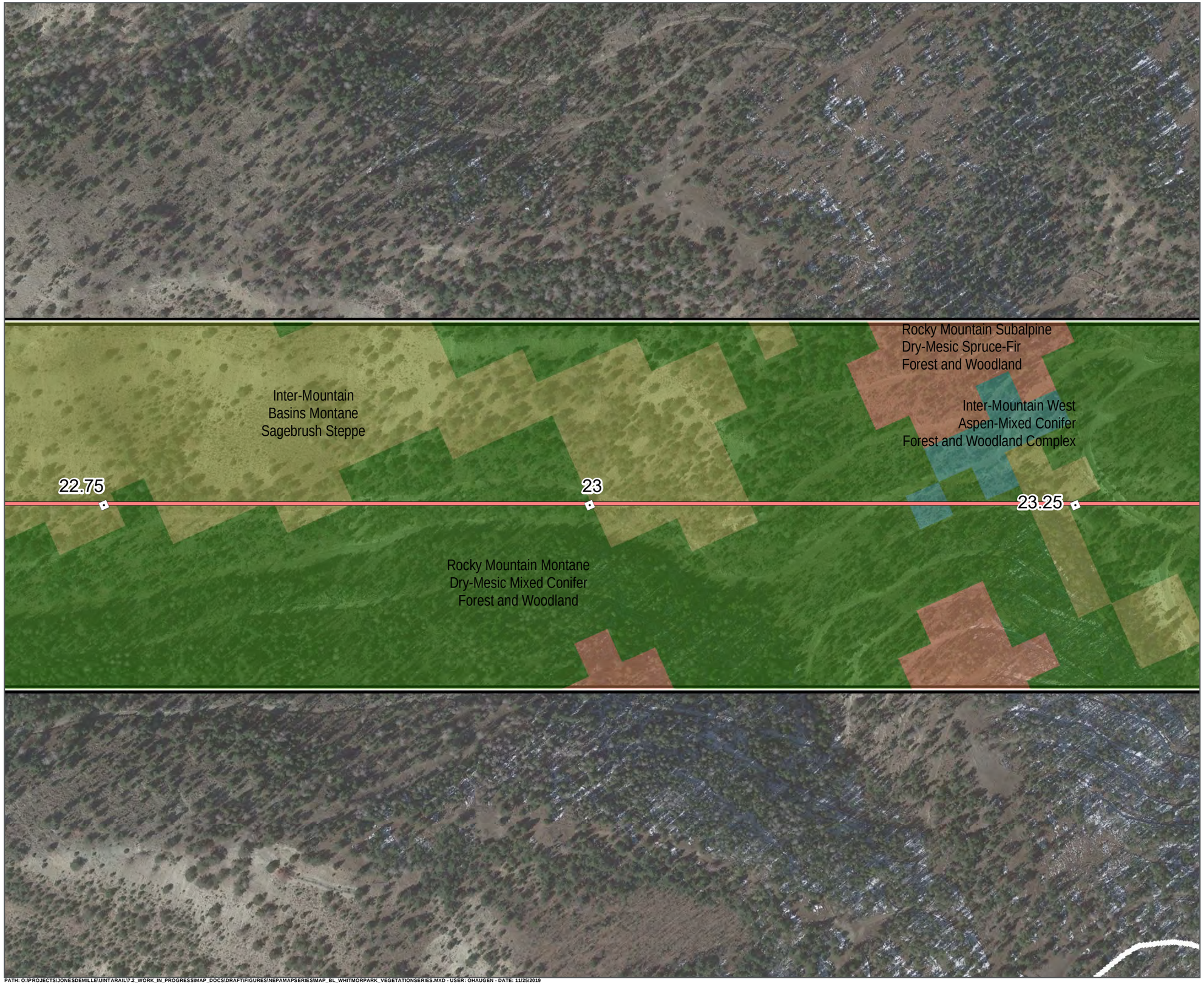

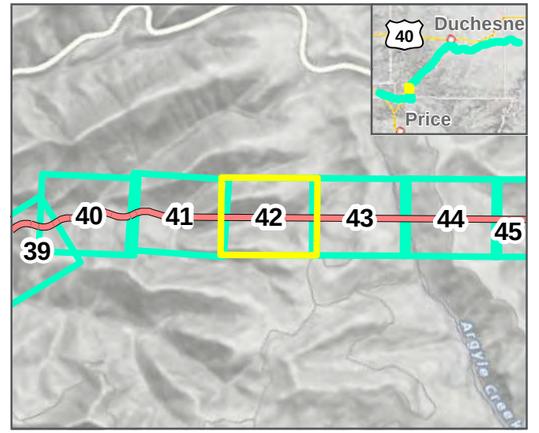

Photo Points
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Whitmore Park Centerline
Study
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Vegetation Communities

- Inter-Mountain Basins Montane Sagebrush Steppe
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VEGETATION COMMUNITIES
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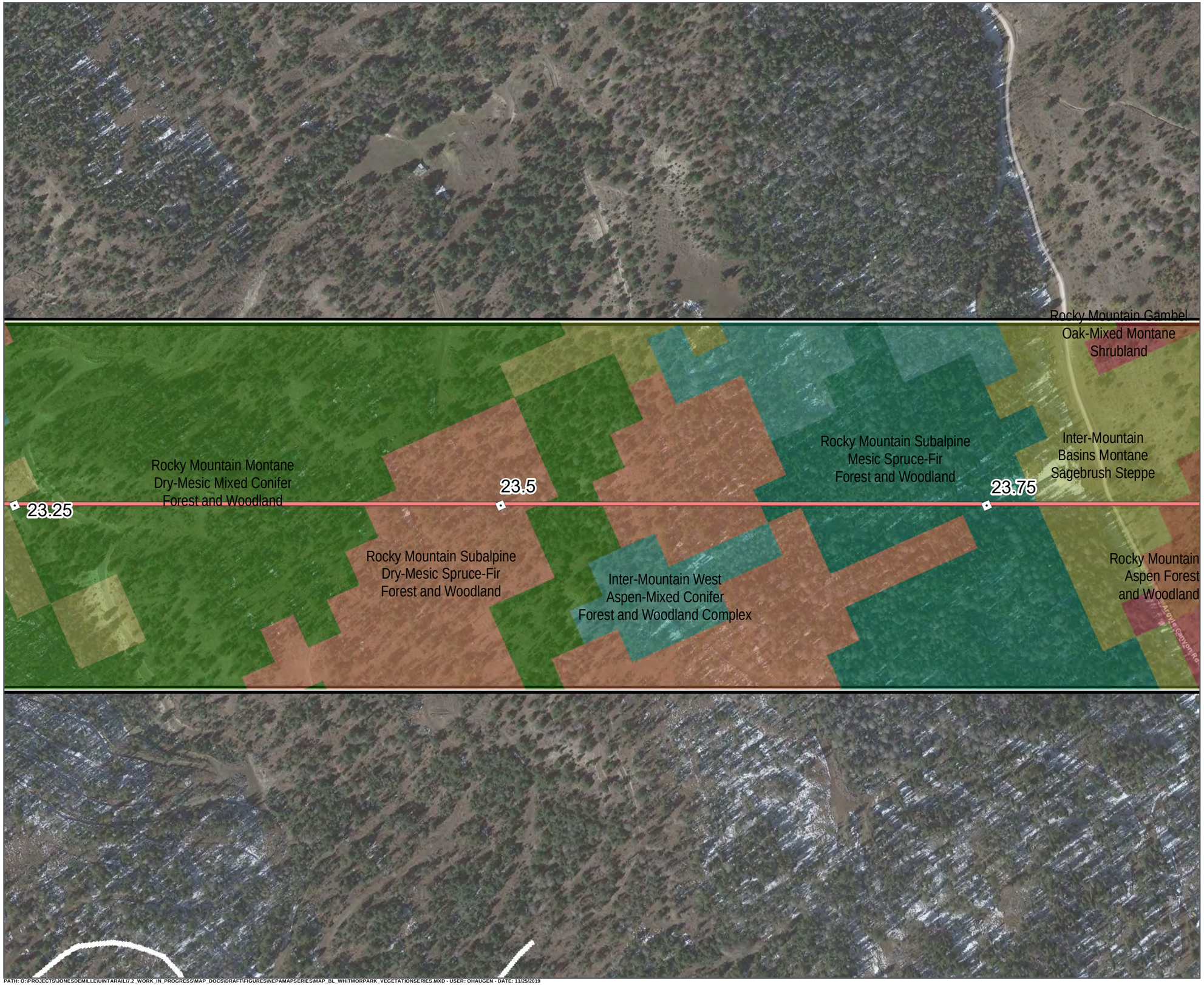

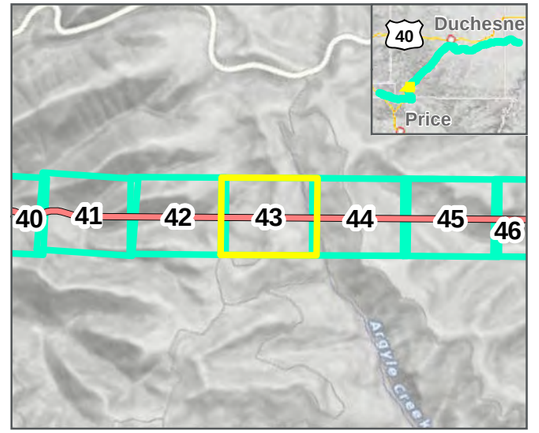

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WHITMORE PARK ALTERNATIVE: 8/21/2019

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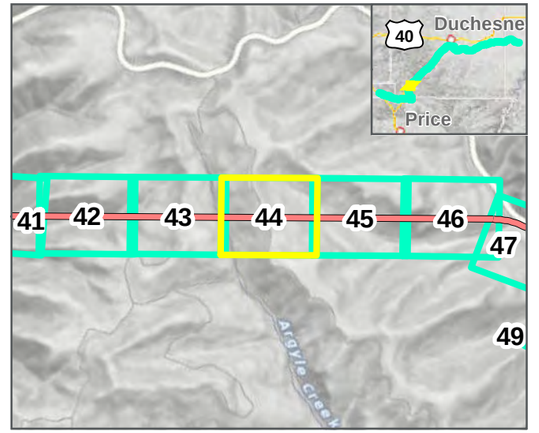

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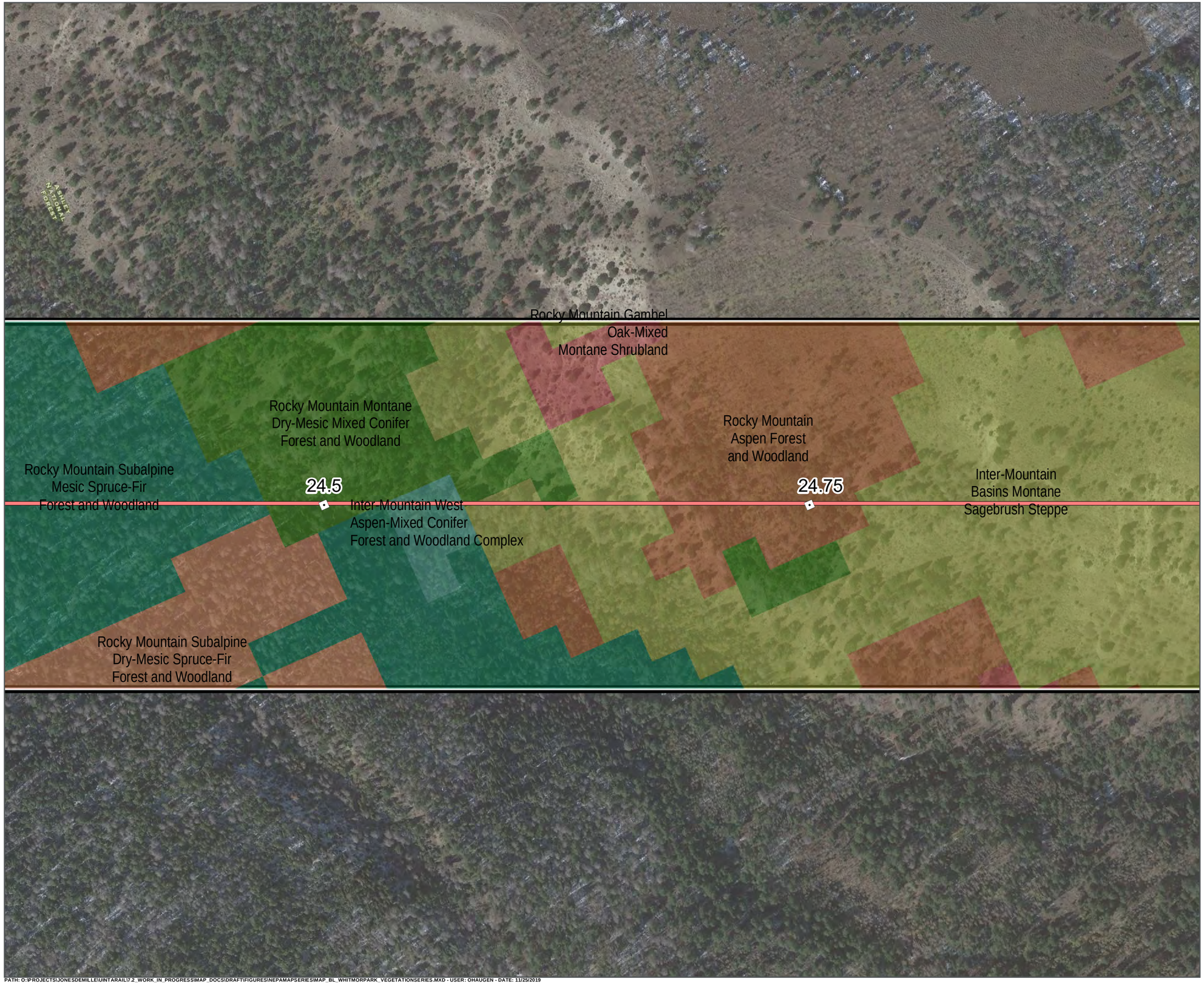

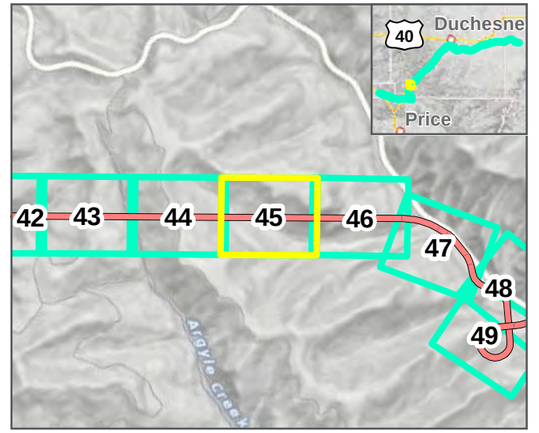

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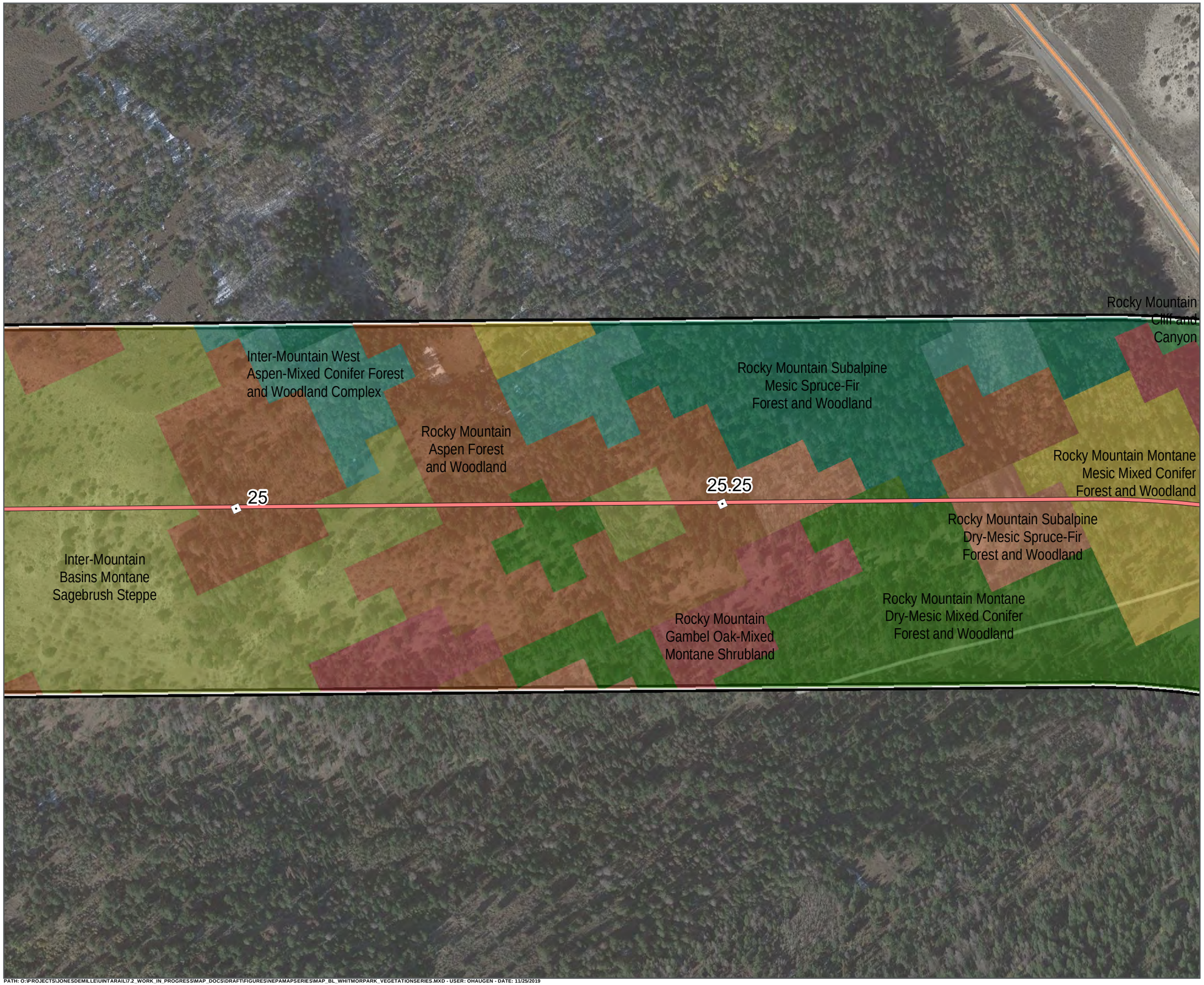

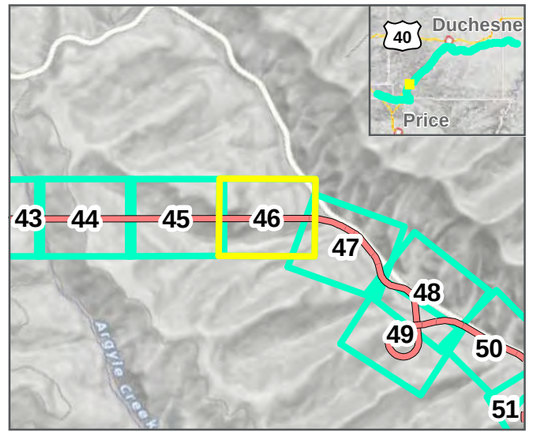

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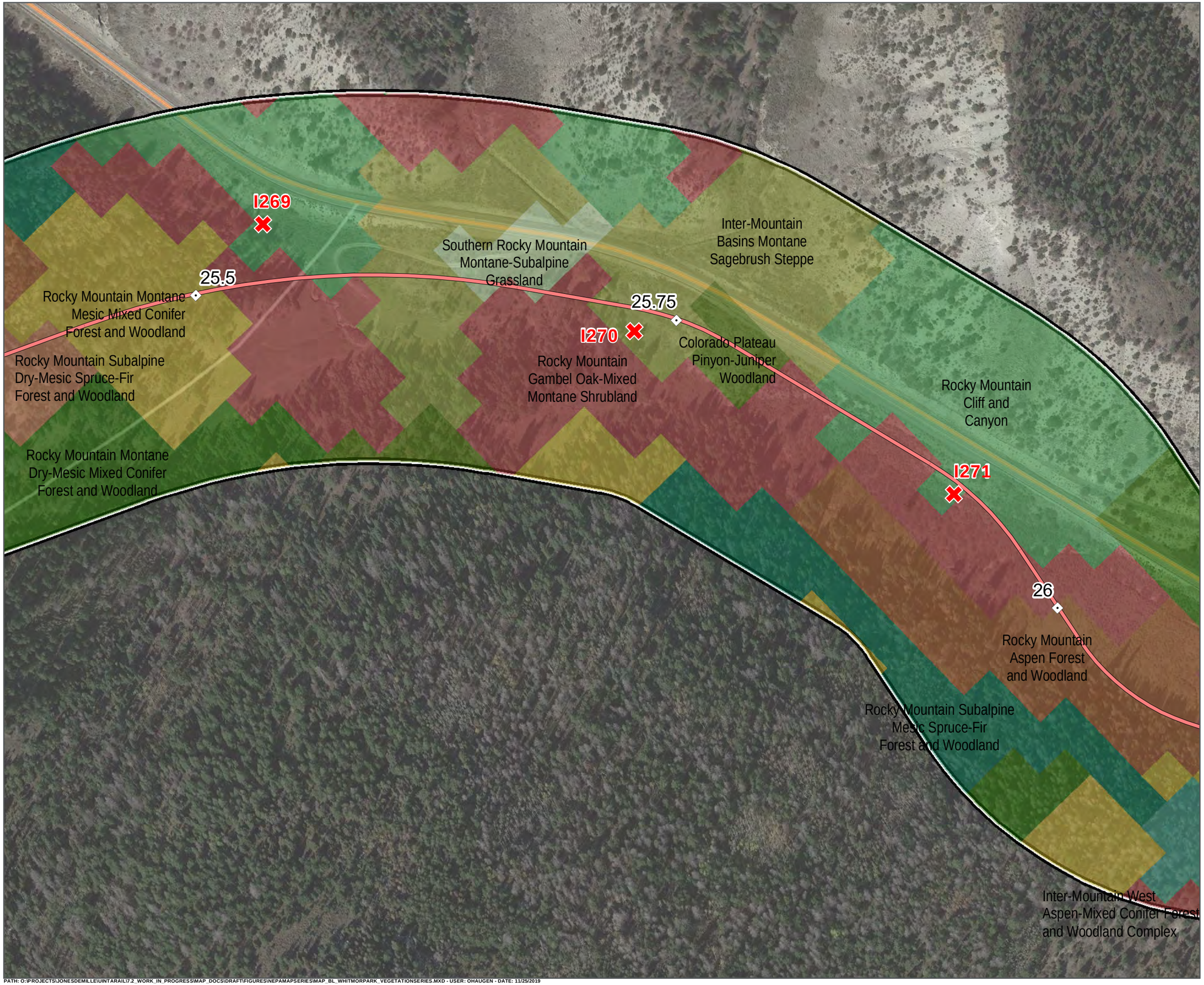

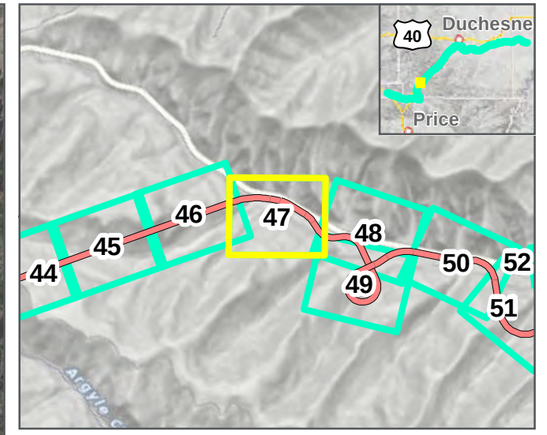

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Aspen Forest and Woodland
- Rocky Mountain Cliff and Canyon
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- Southern Rocky Mountain Montane-Subalpine Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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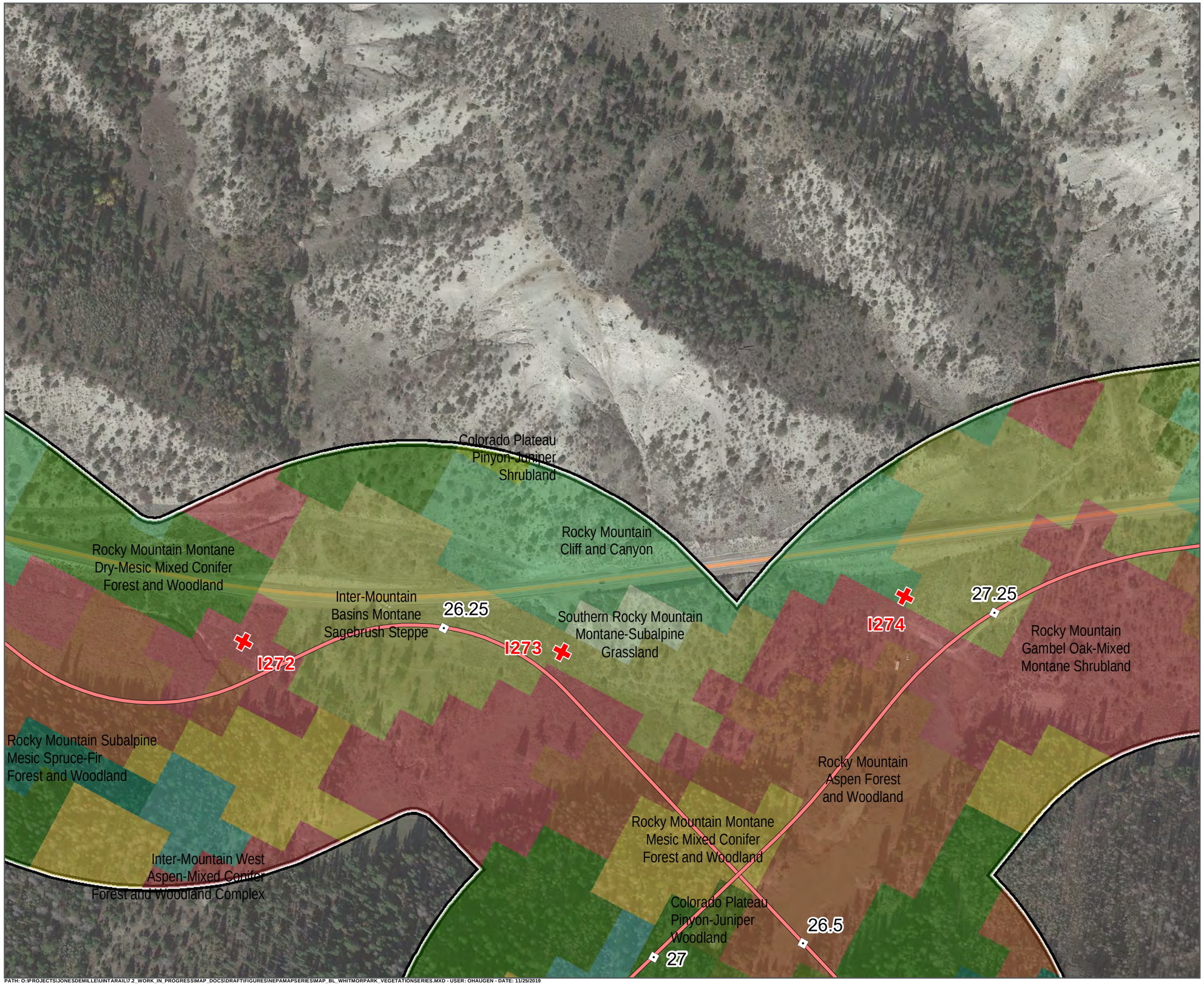

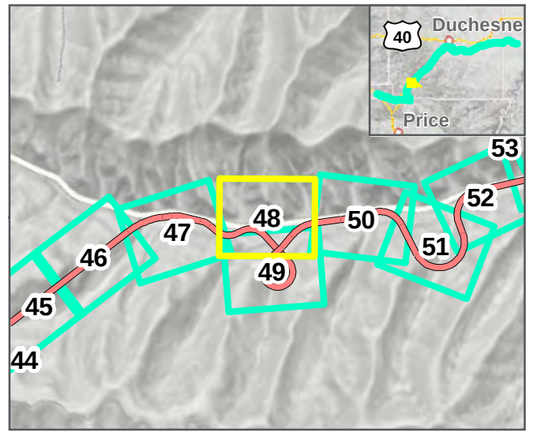

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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COODINATE SYSTEM:
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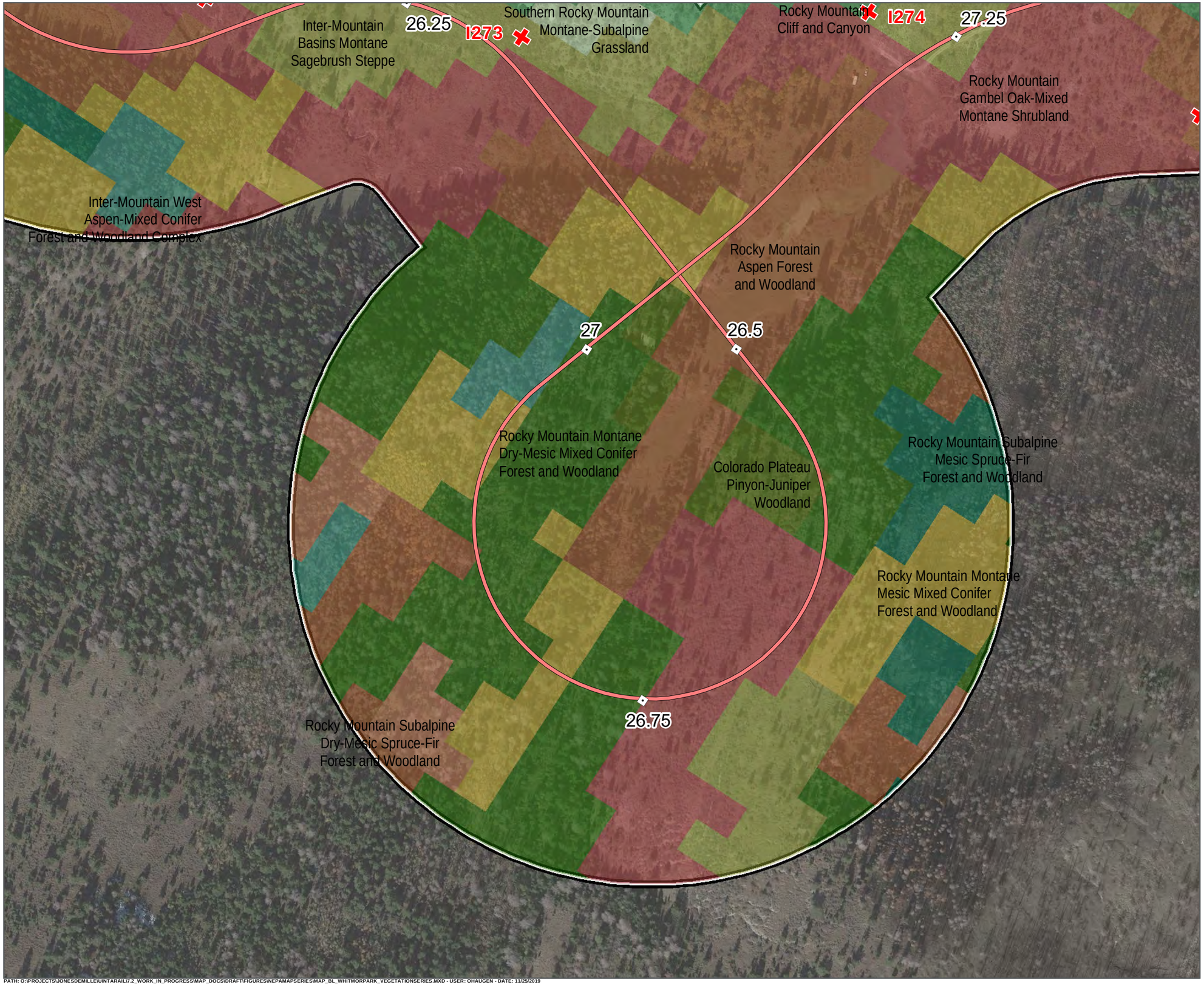

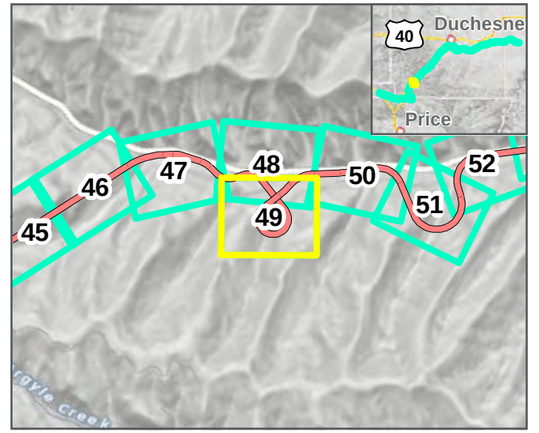

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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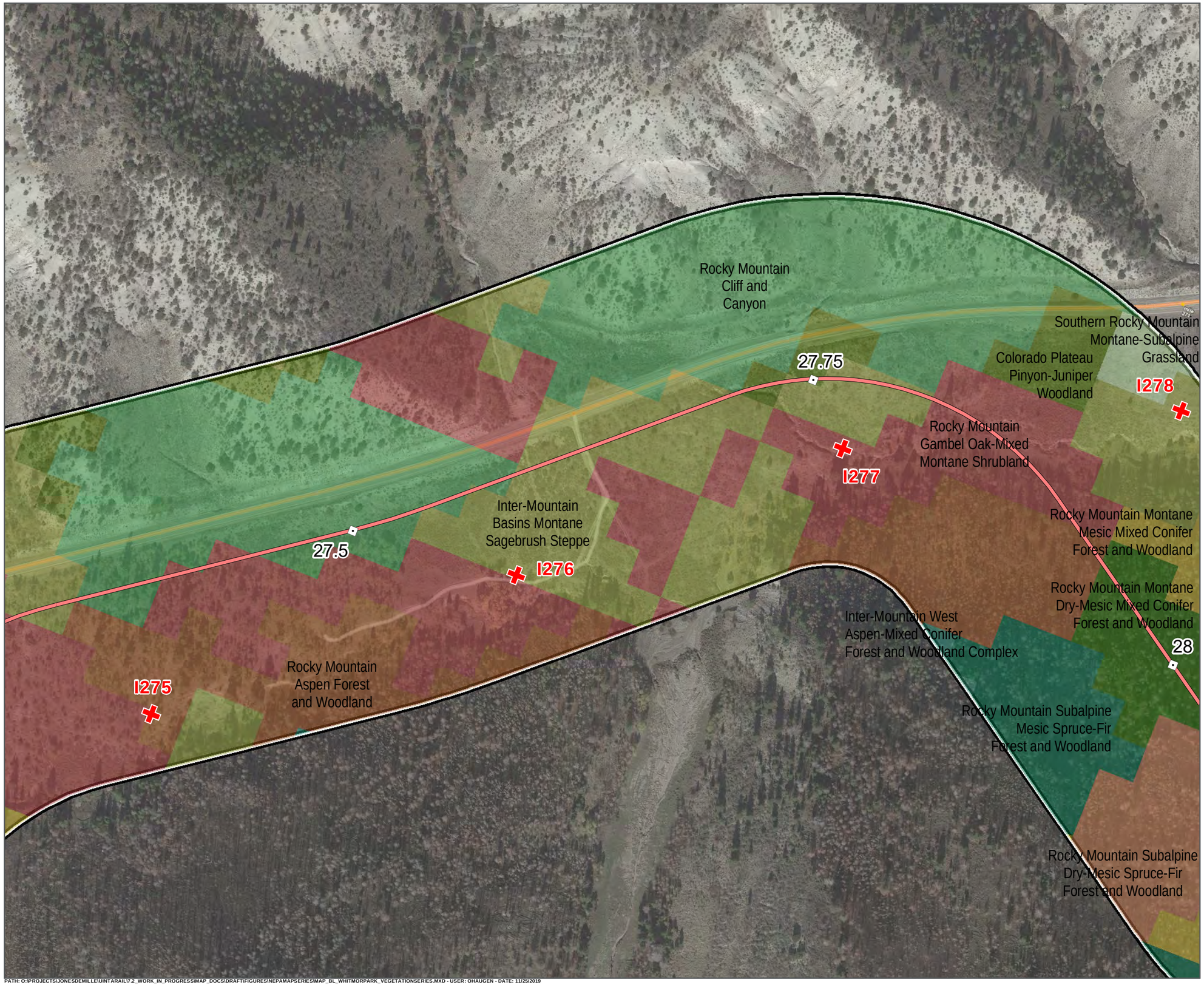

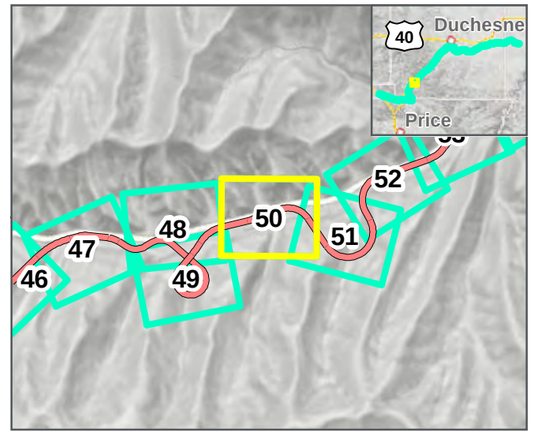

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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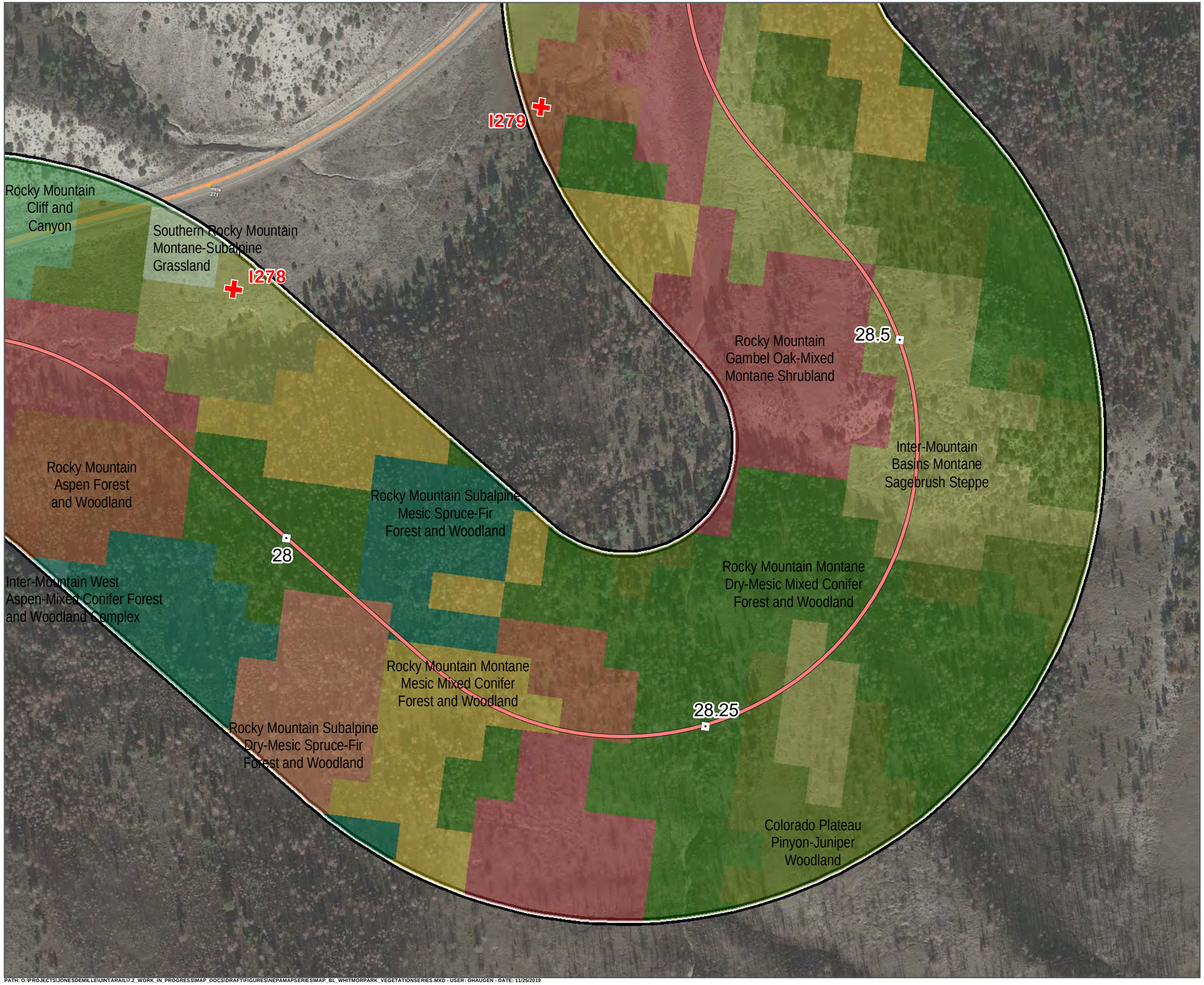

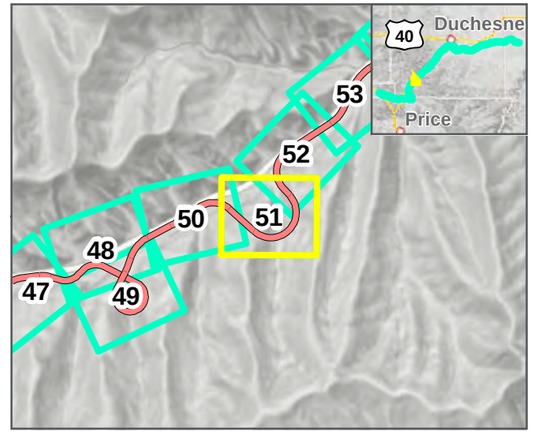

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Mileposts
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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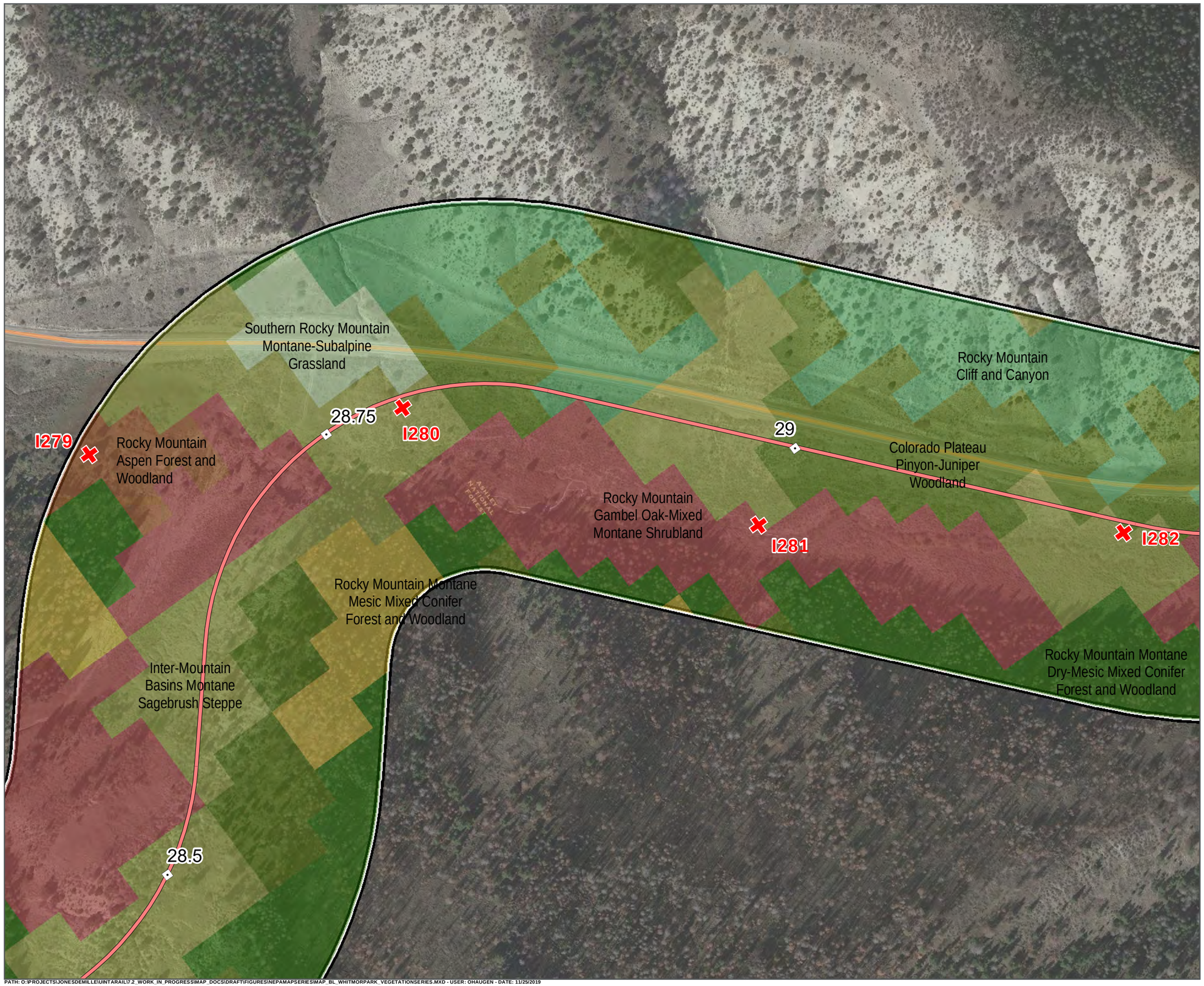

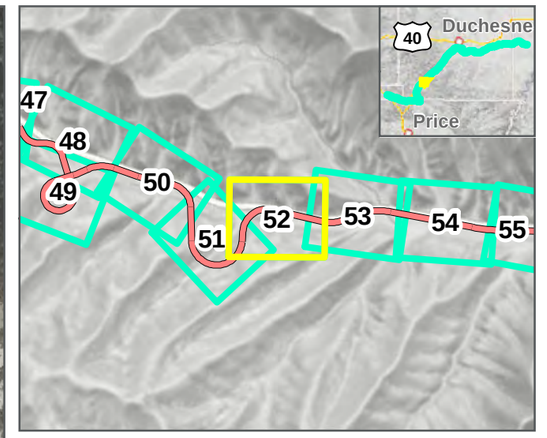

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
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SEVEN COUNTY INFRASTRUCTURE COALITION

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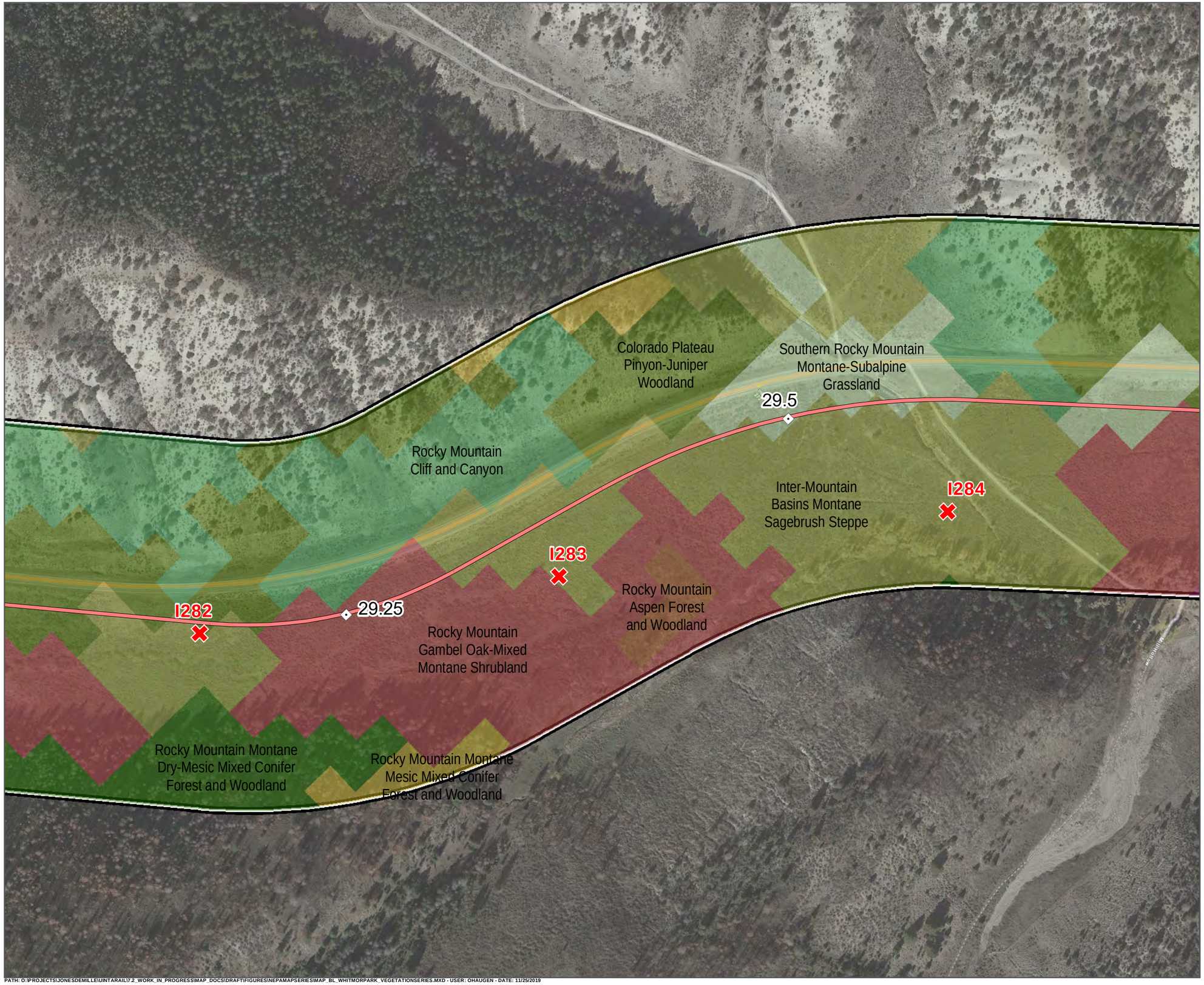

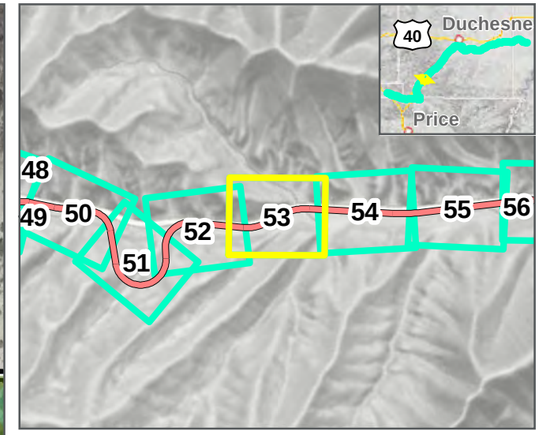

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Montane Sagebrush Steppe
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VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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Colorado Plateau Pinyon-Juniper Woodland

Rocky Mountain Cliff and Canyon

Colorado Plateau Pinyon-Juniper Shrubland

29.75

I285

Rocky Mountain Gambel Oak-Mixed Montane Shrubland

Southern Rocky Mountain Montane-Subalpine Grassland

30

I286

Rocky Mountain Aspen Forest and Woodland

Rocky Mountain Alpine-Montane Wet Meadow

Inter-Mountain Basins Montane Sagebrush Steppe

I287

I288

Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

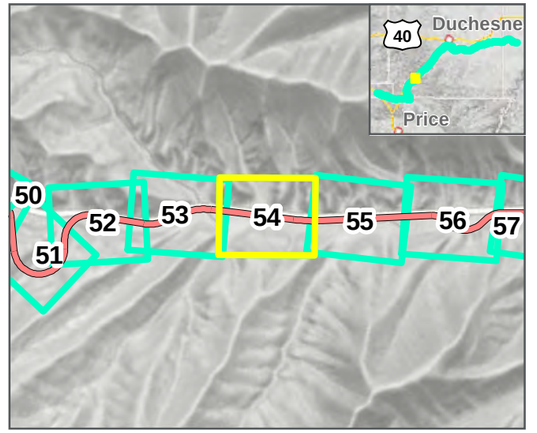

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

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DATA SOURCES:
SWReGAP Landcover
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SEVEN COUNTY INFRASTRUCTURE COALITION

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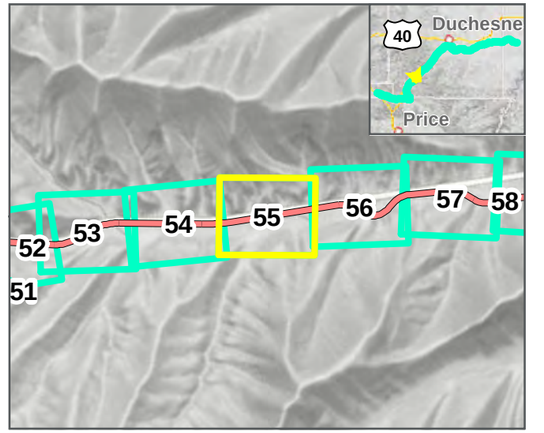

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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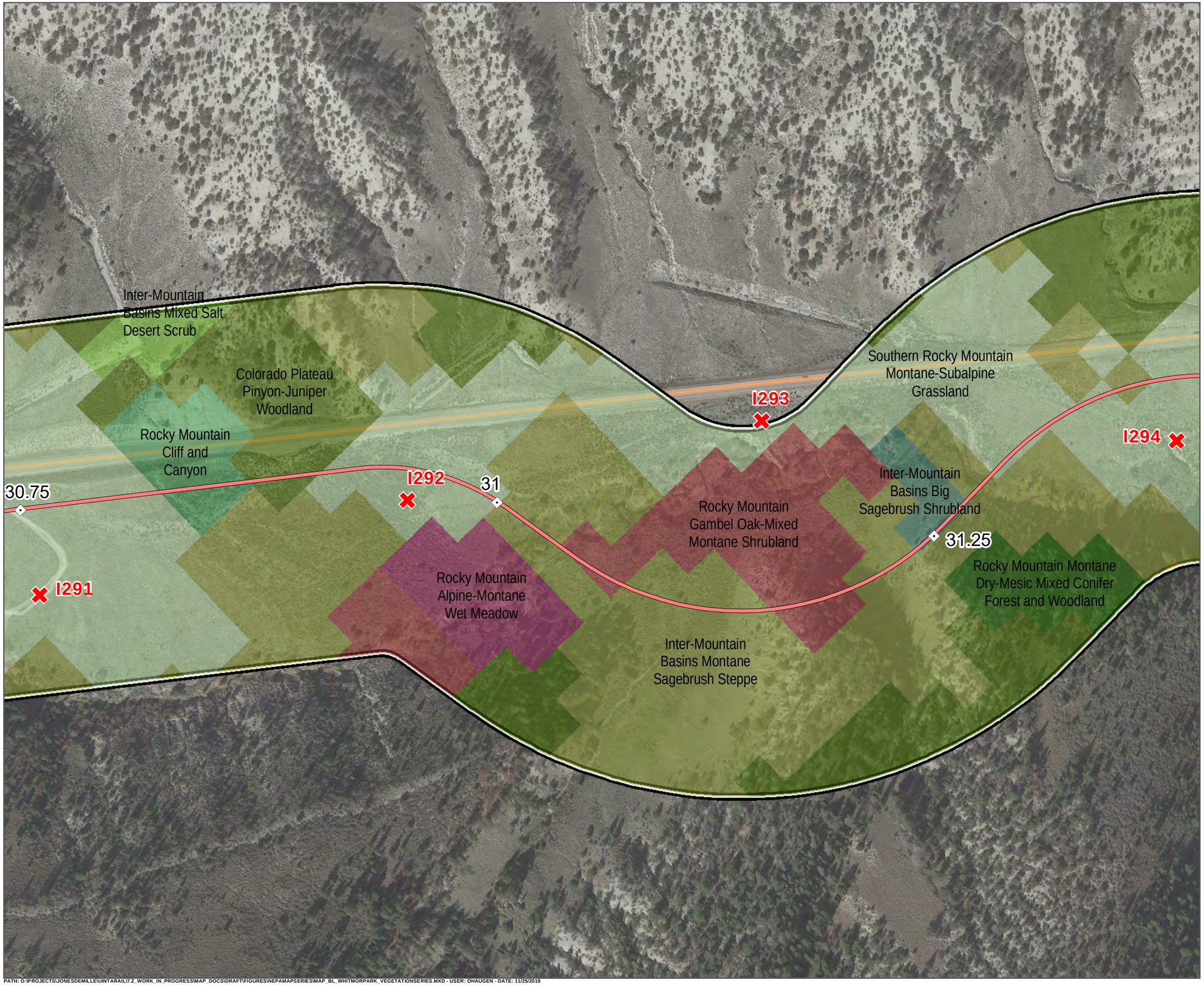

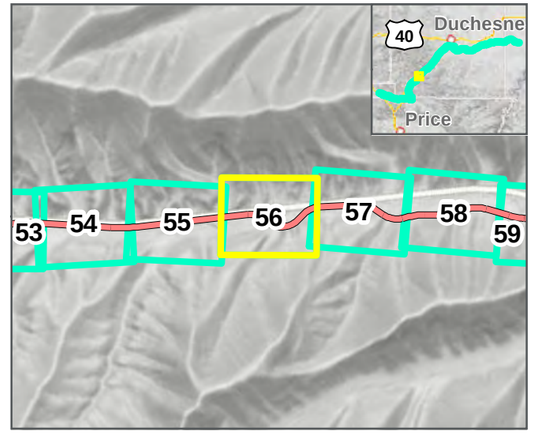

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Vegetation Communities

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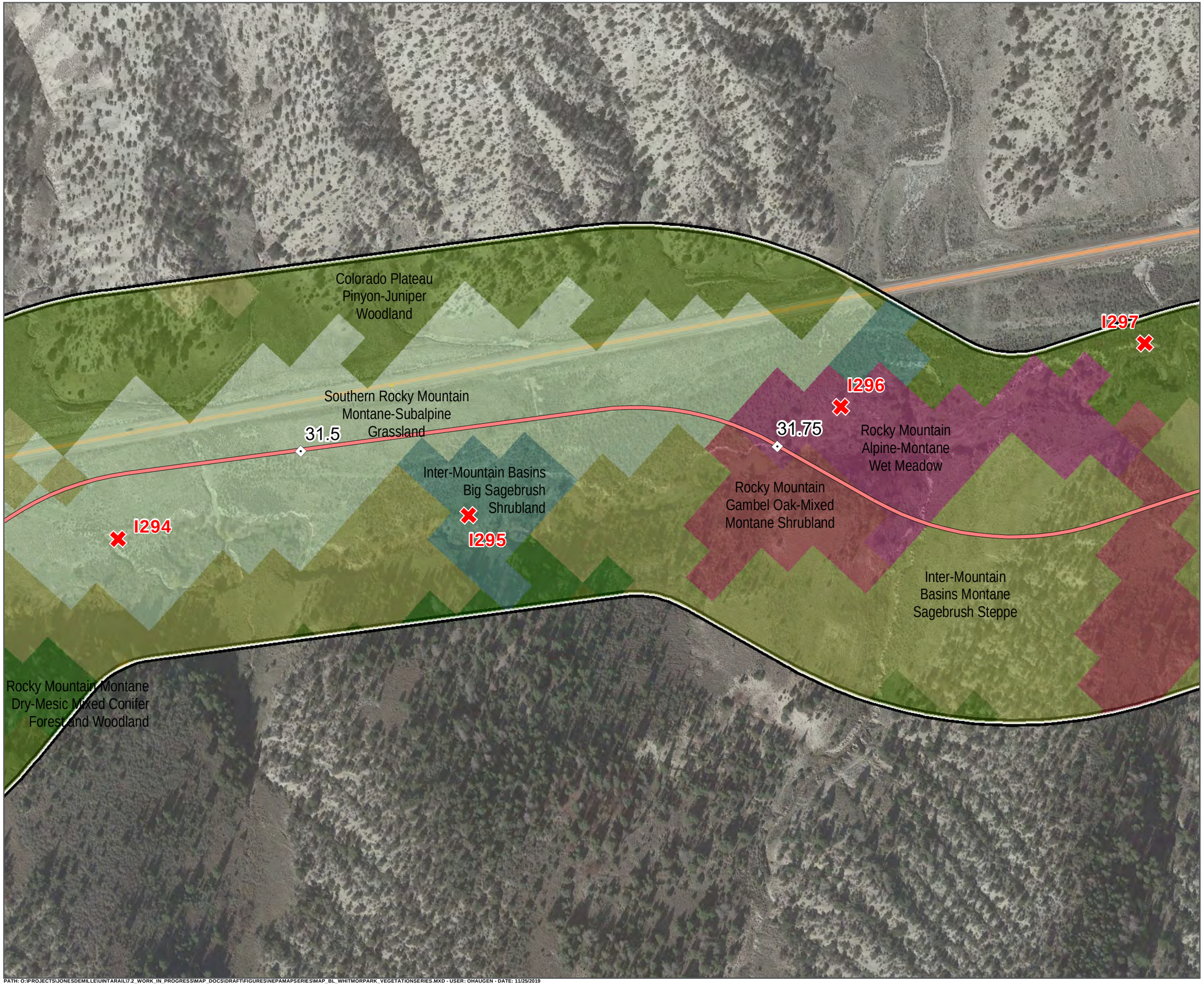

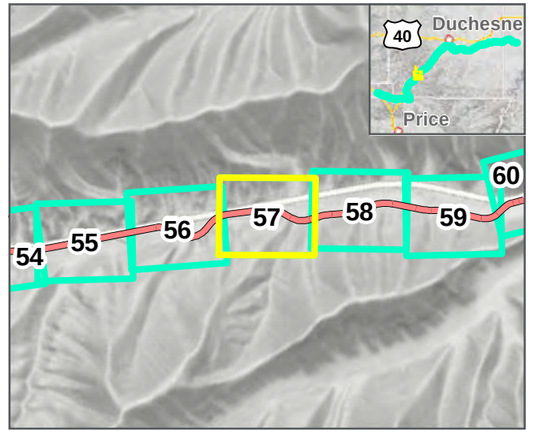

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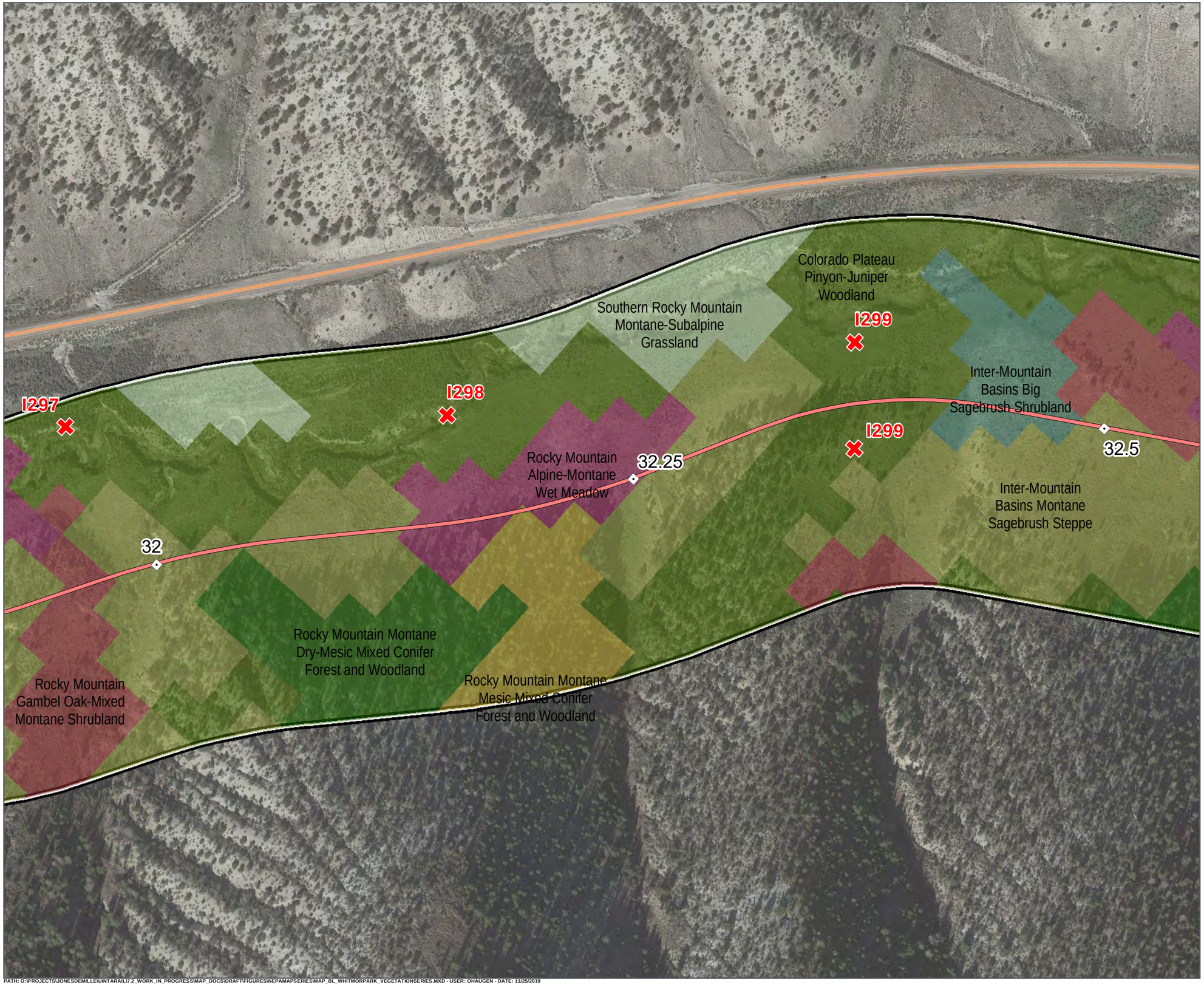

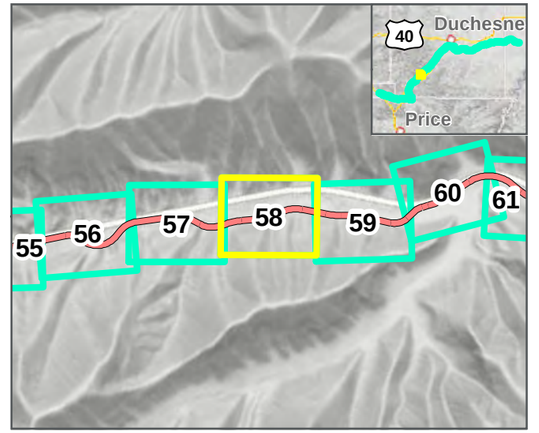

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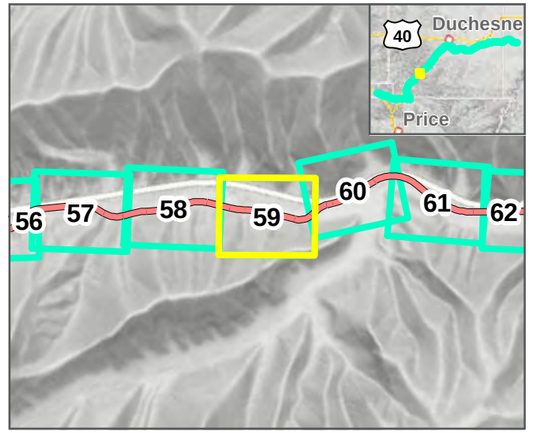

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

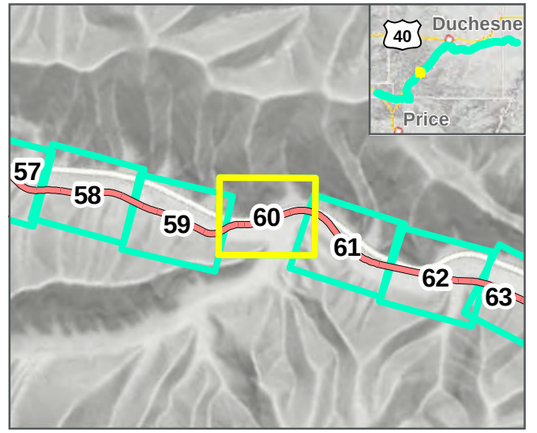

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
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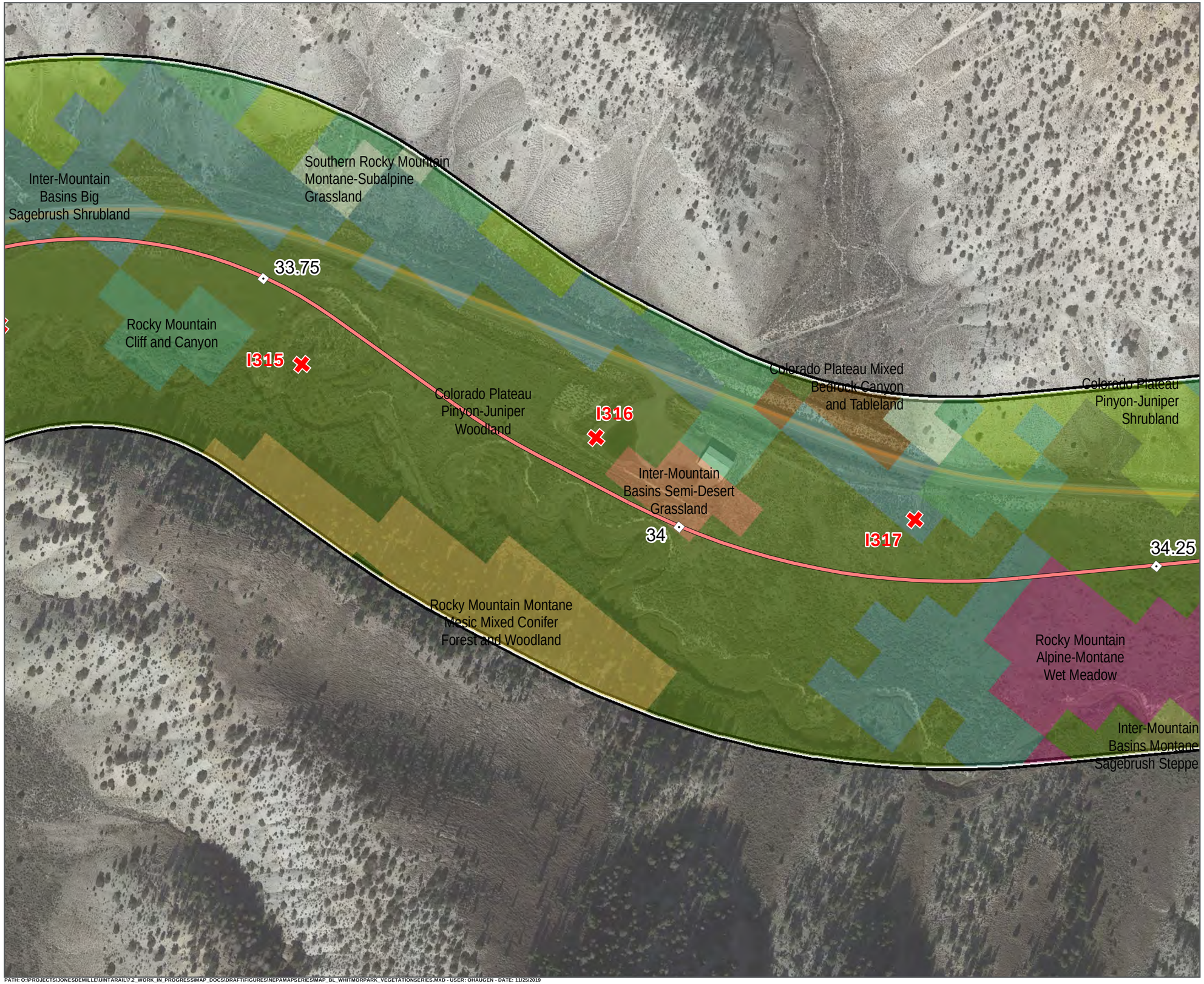

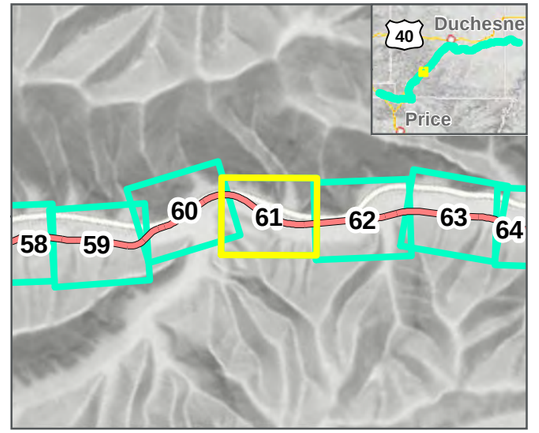

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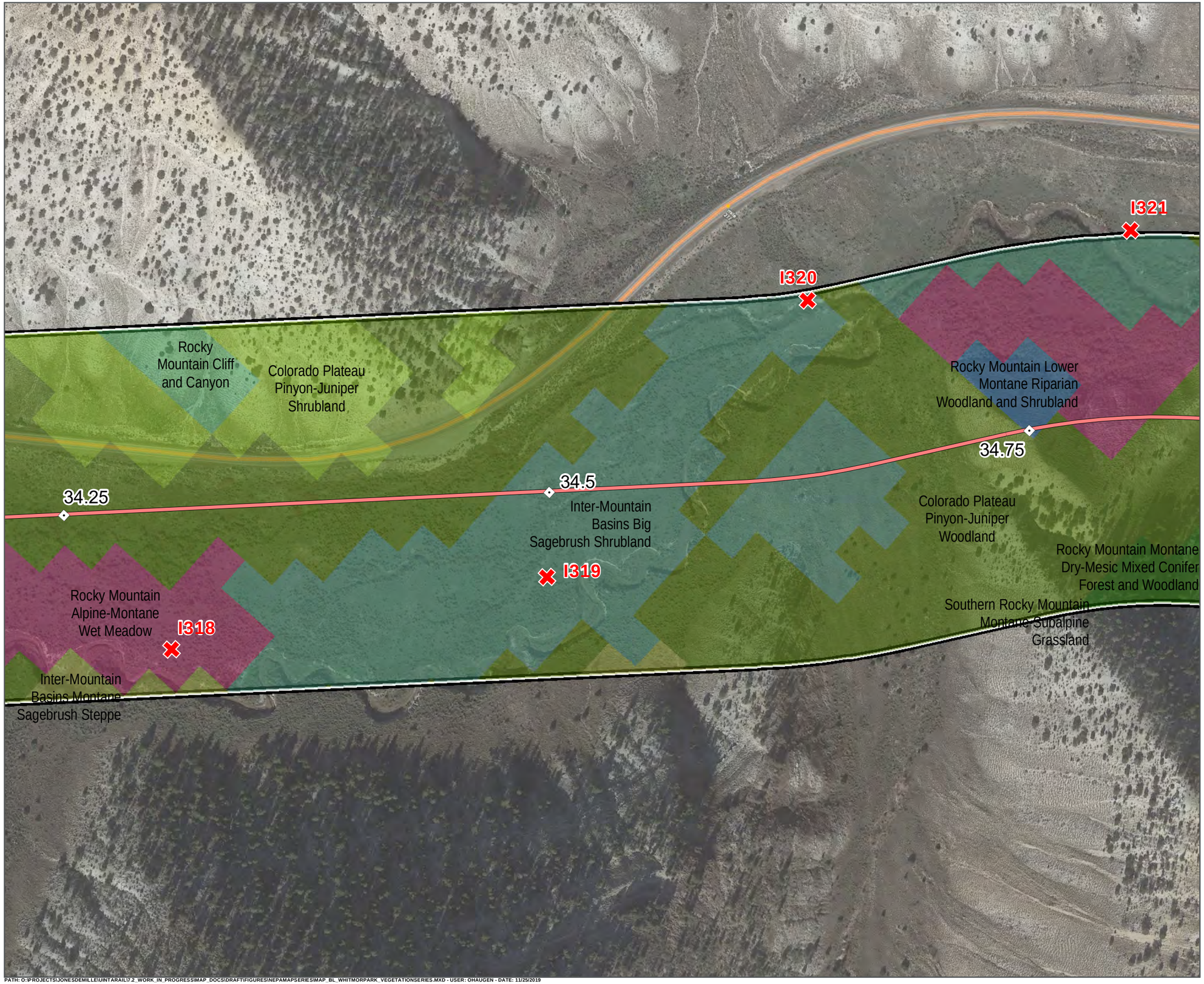

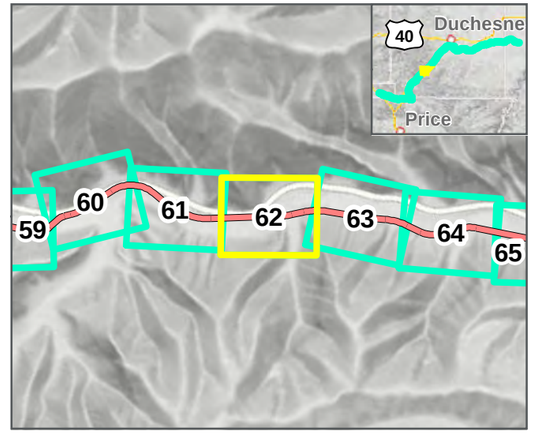

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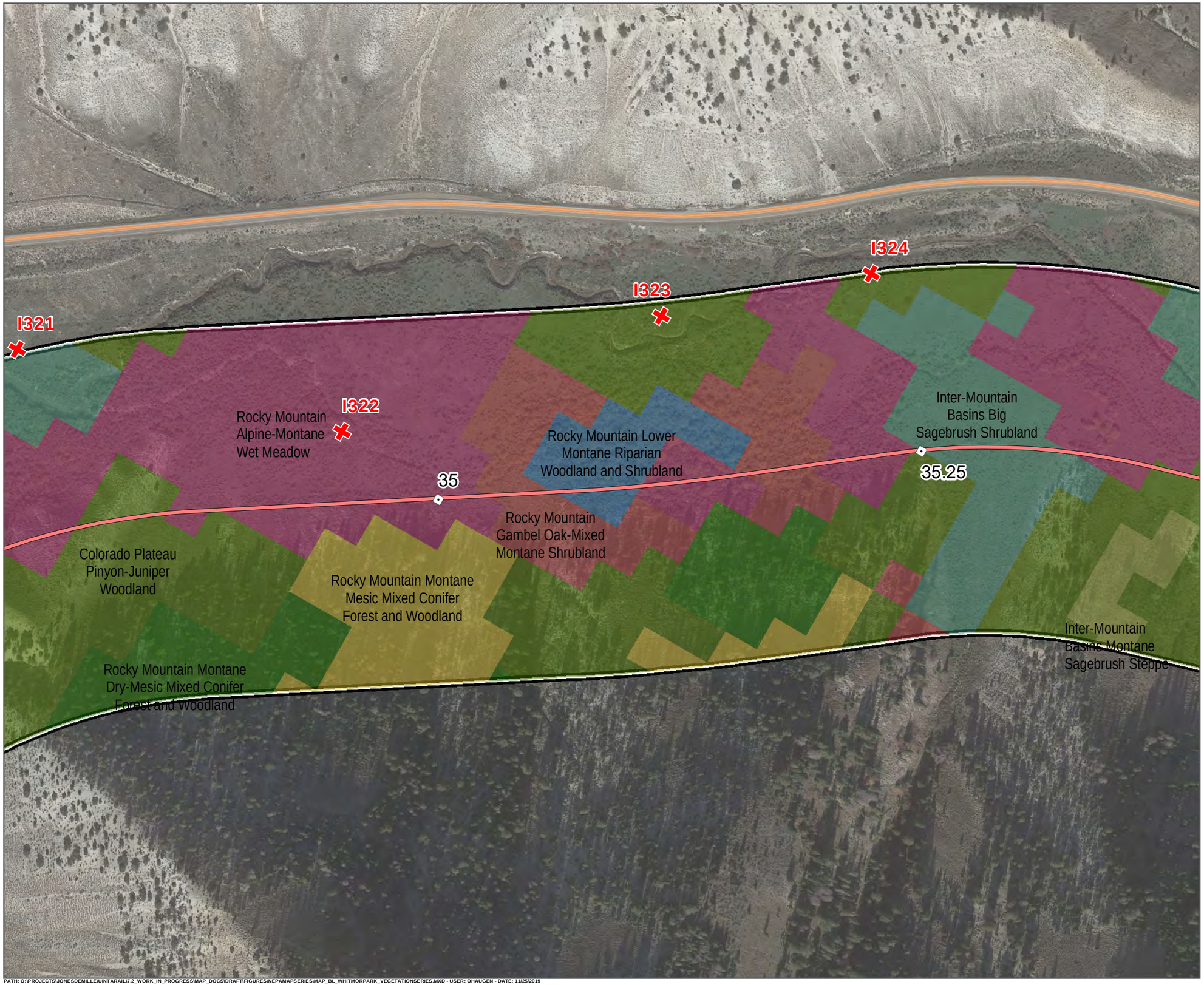

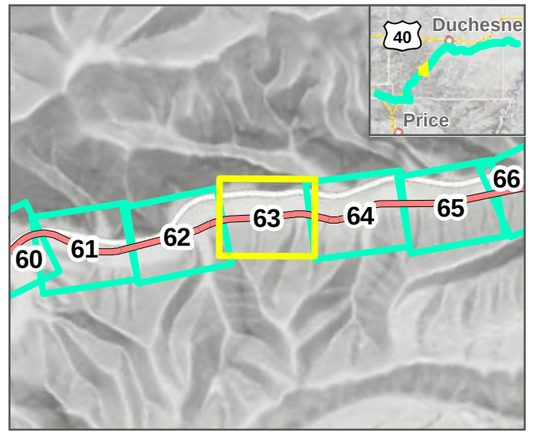

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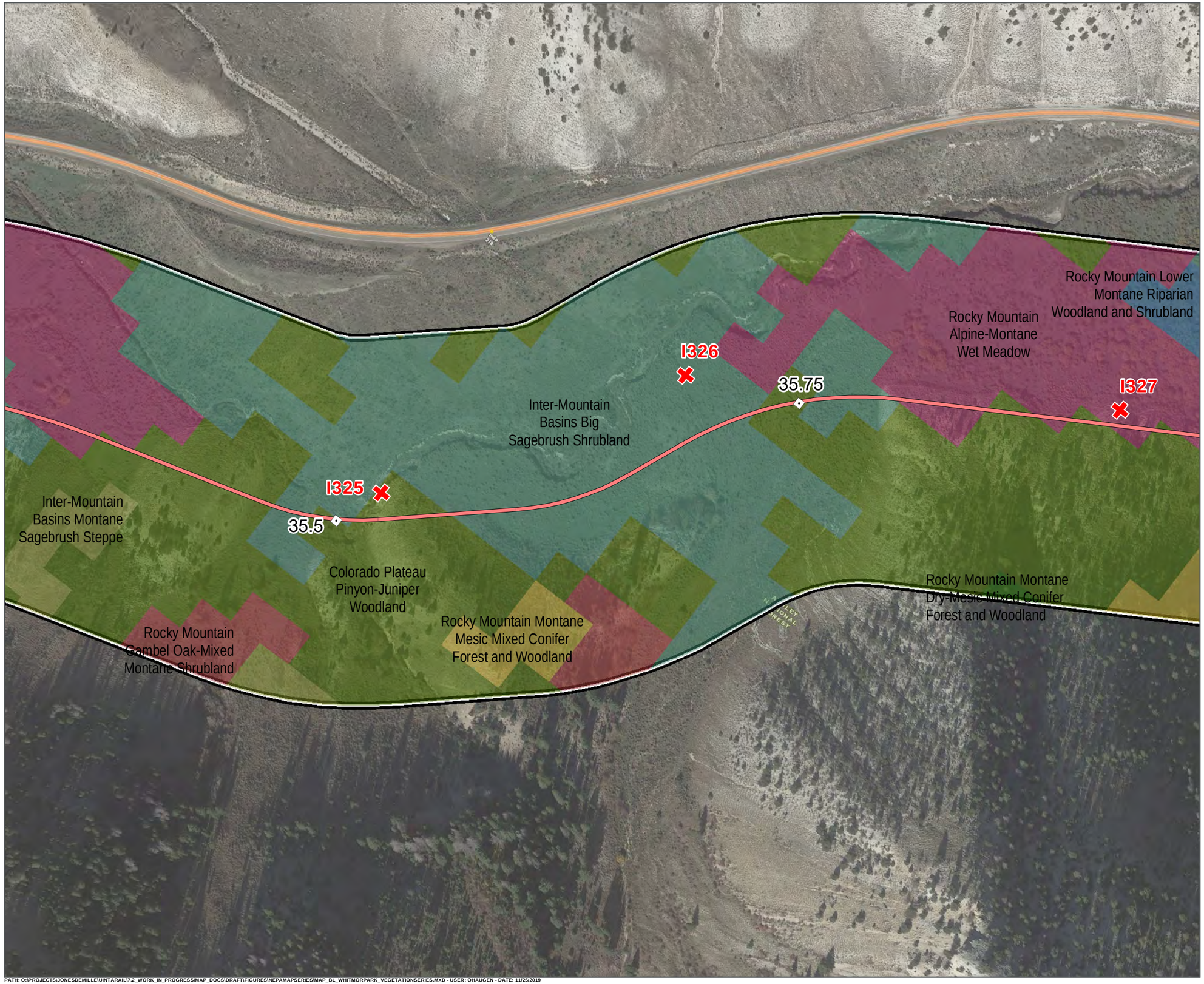

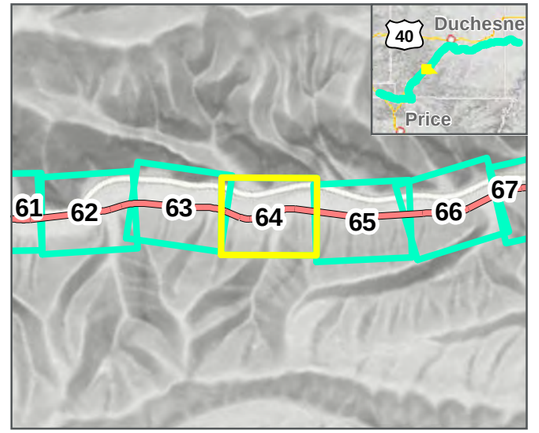

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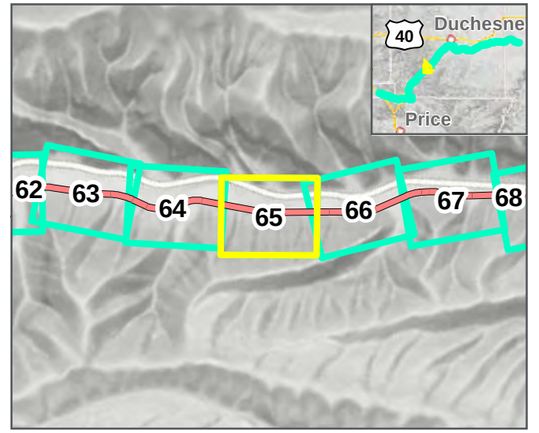

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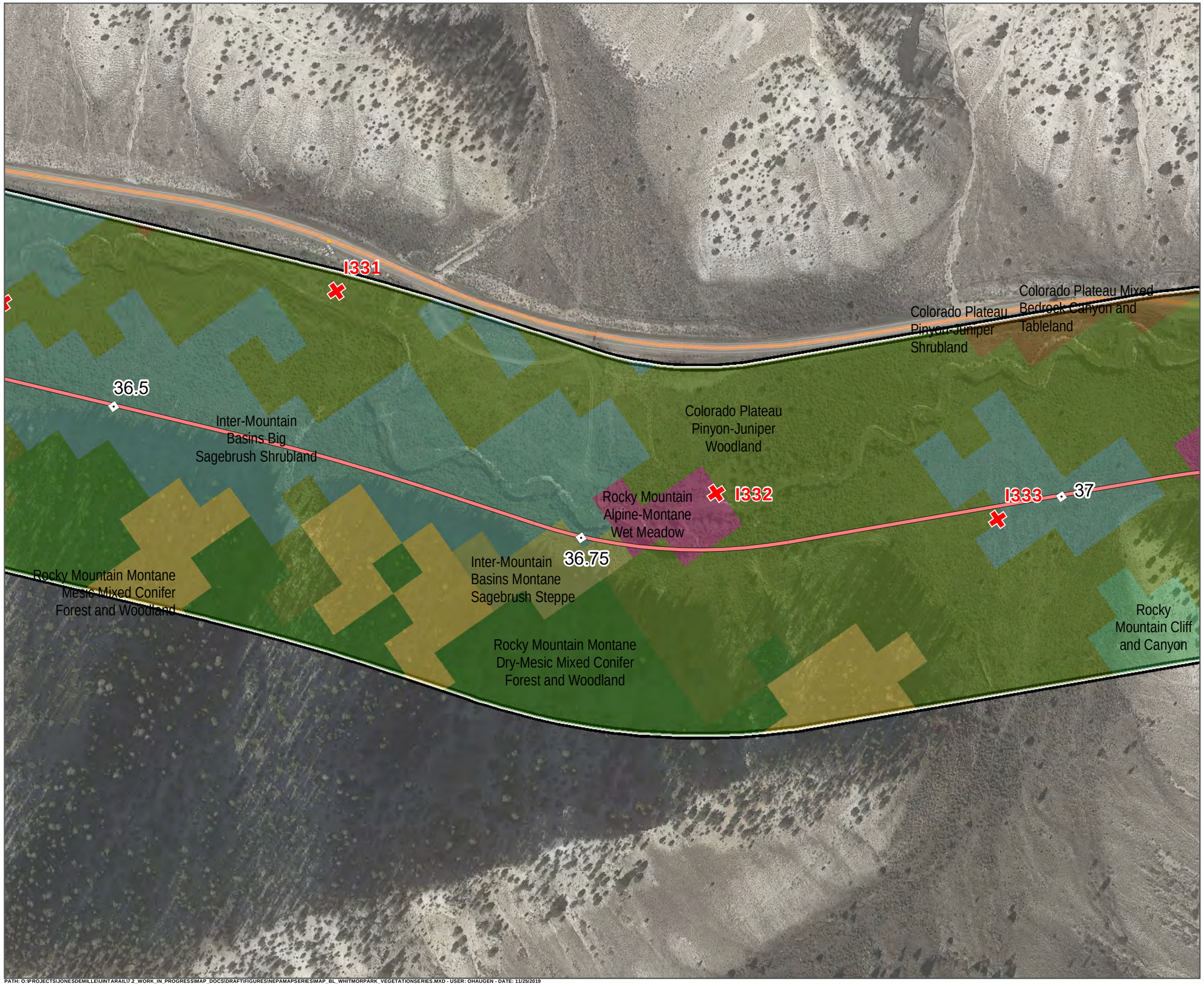

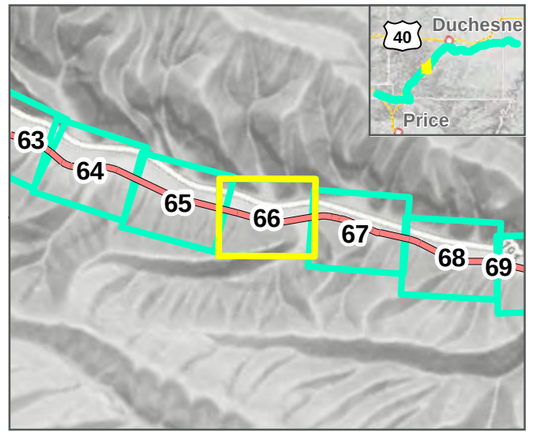

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Vegetation Communities

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Colorado Plateau
Pinyon-Juniper
Shrubland

Rocky Mountain
Alpine-Montane
Wet Meadow

I334

37.25

Inter-Mountain
Basins Big
Sagebrush Shrubland

I335

Colorado Plateau
Pinyon-Juniper
Woodland

Colorado Plateau
Mixed Bedrock
Canyon and Tableland

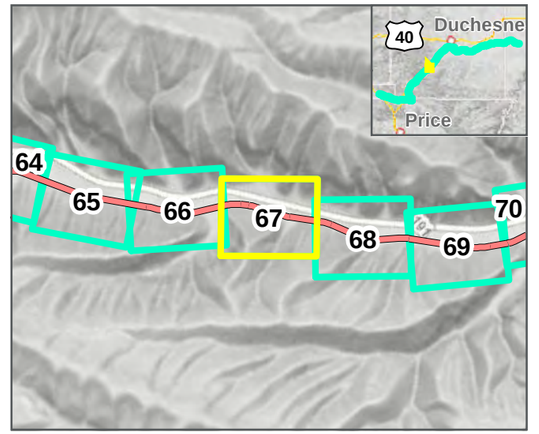
I336

37.5

Rocky Mountain
Cliff and Canyon

Rocky Mountain Montane
Dry-Mesic Mixed Conifer
Forest and Woodland

Rocky Mountain Montane
Mesic Mixed Conifer
Forest and Woodland



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Mileposts
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Study Area
Map Extent (current view in yellow)

Vegetation Communities

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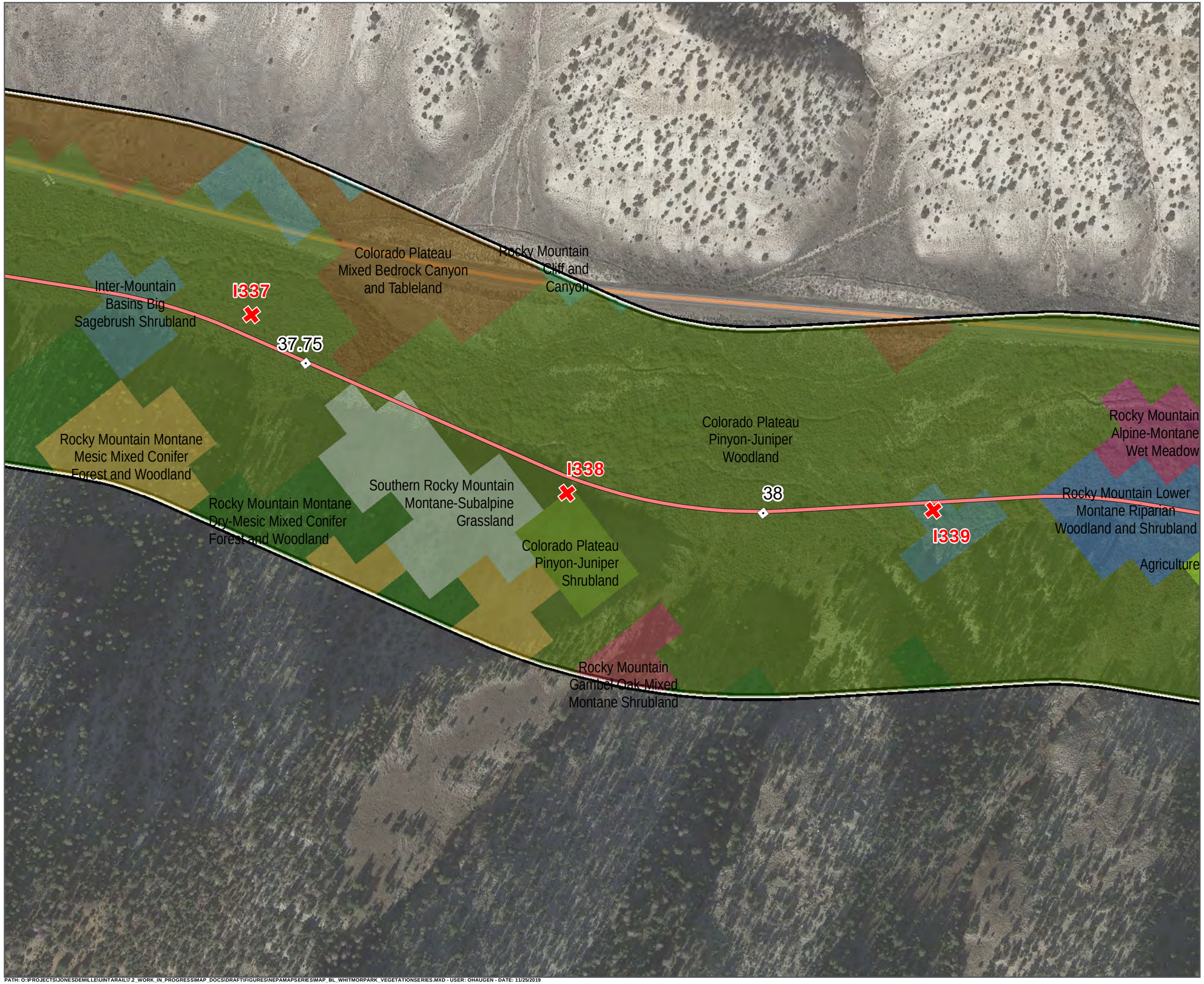

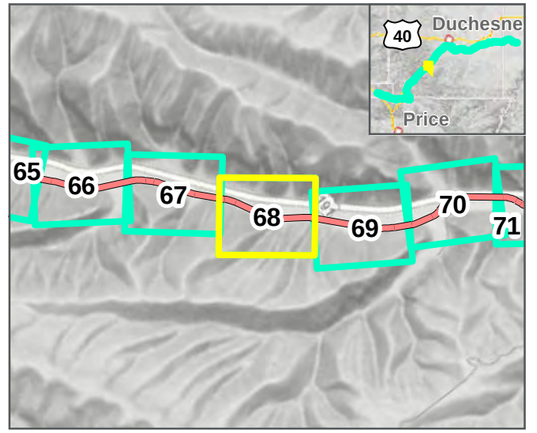

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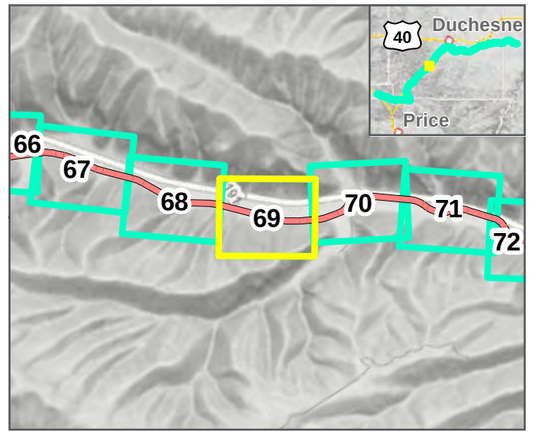

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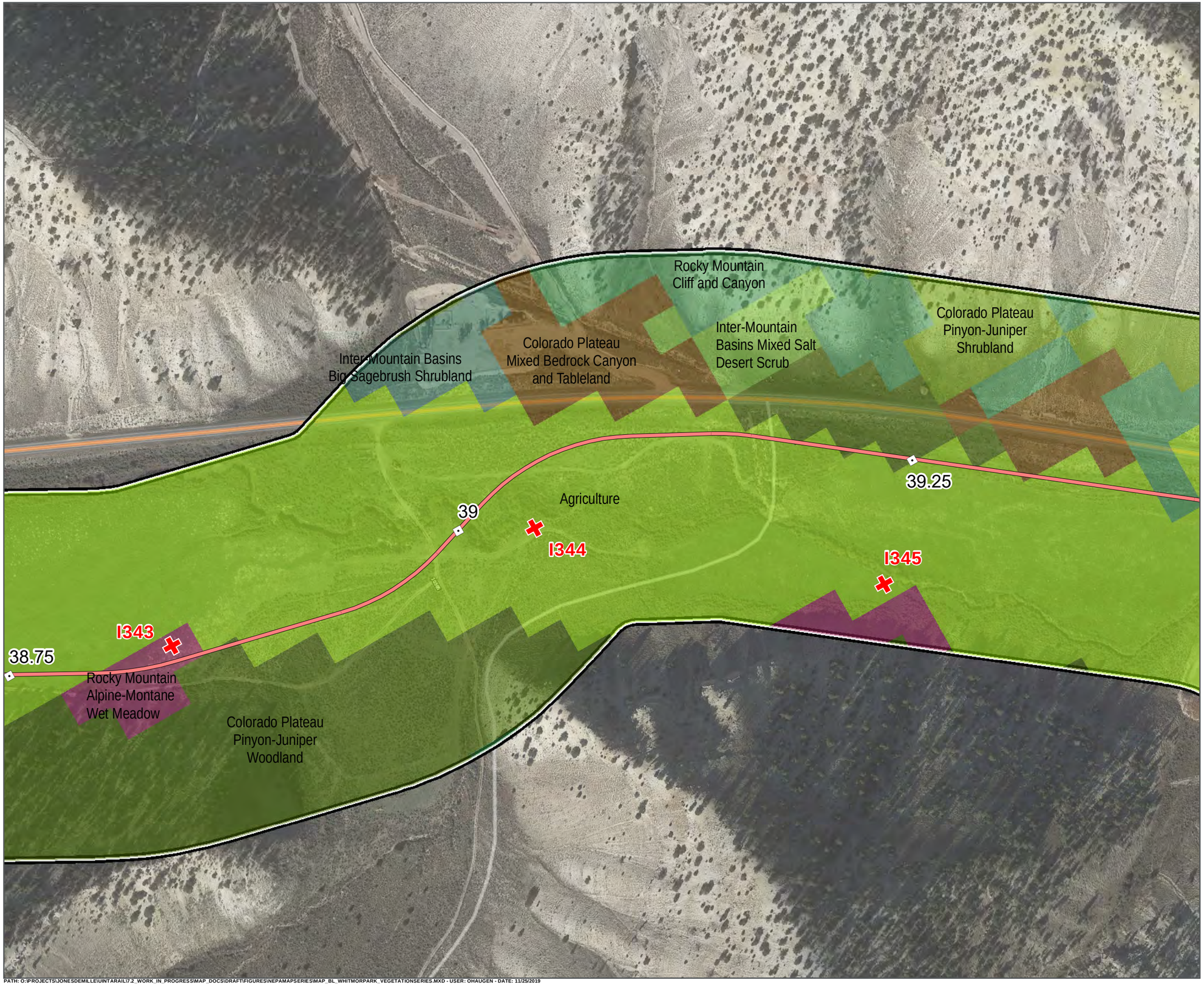

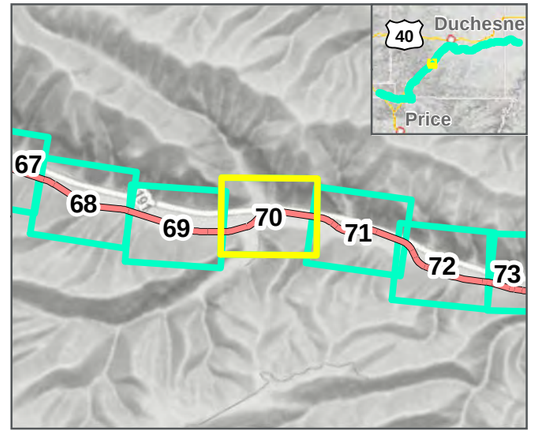

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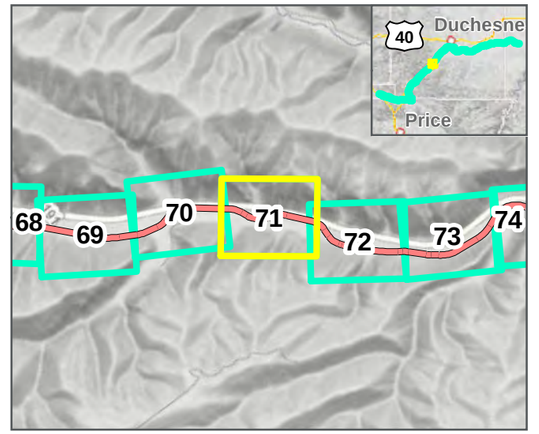

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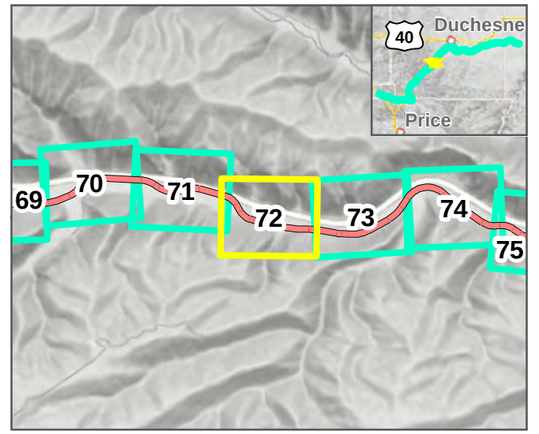

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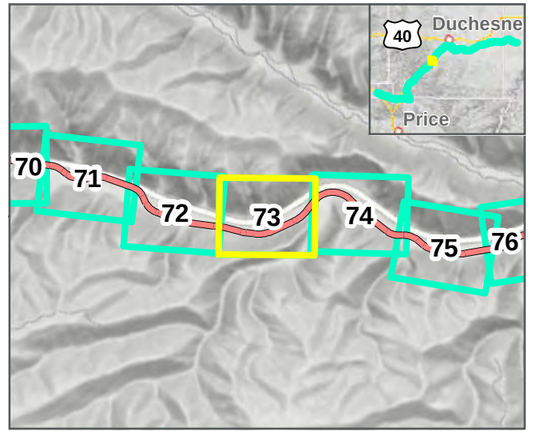

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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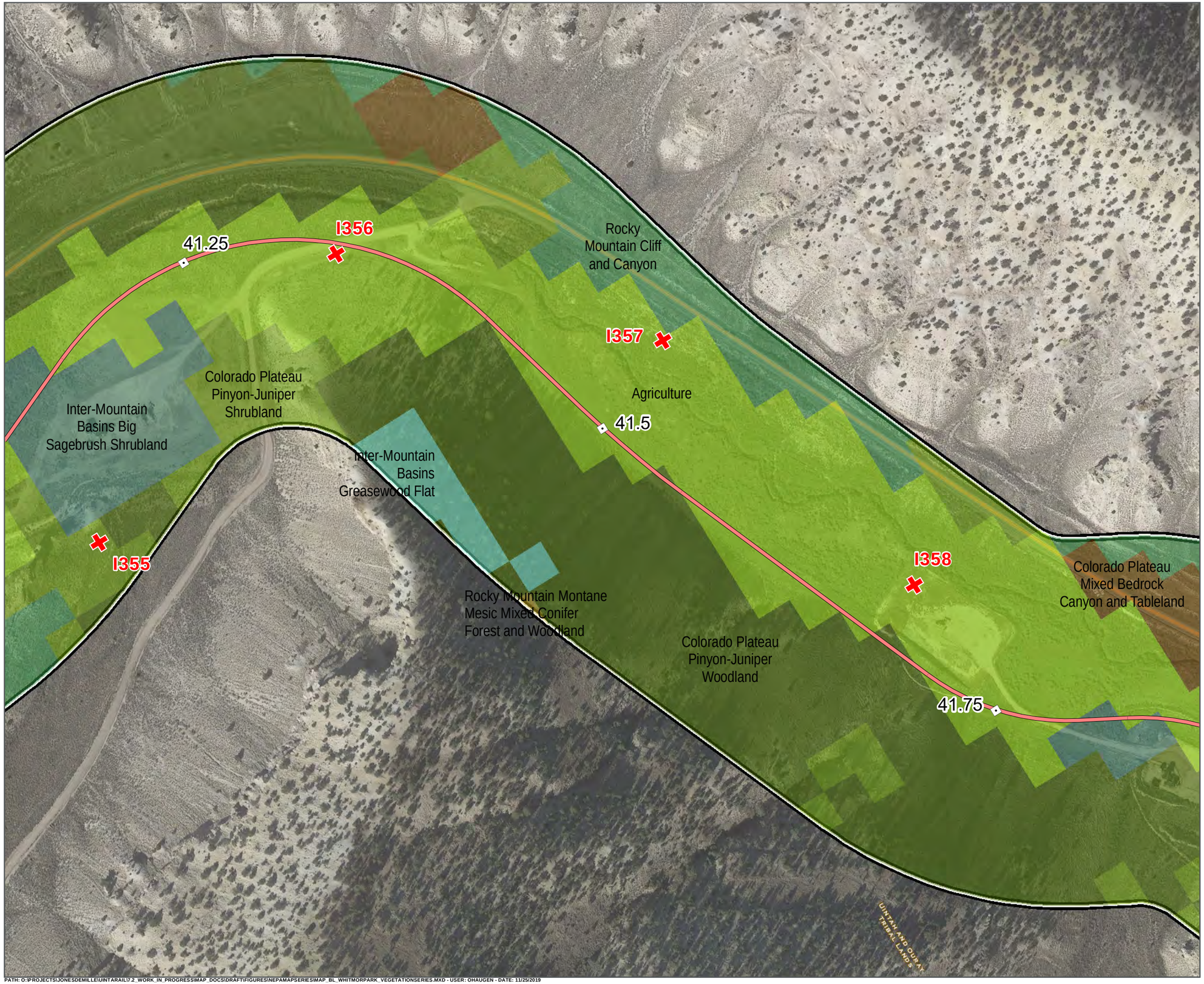

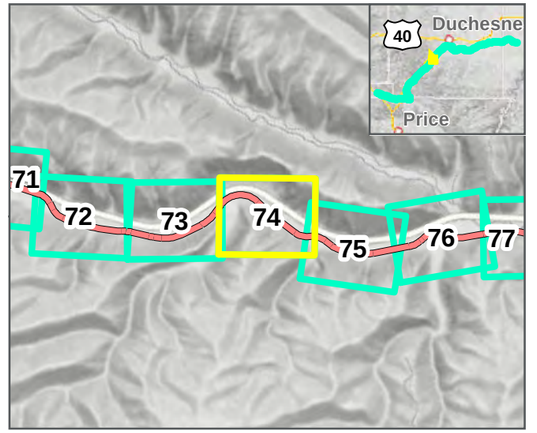

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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DATA SOURCES:
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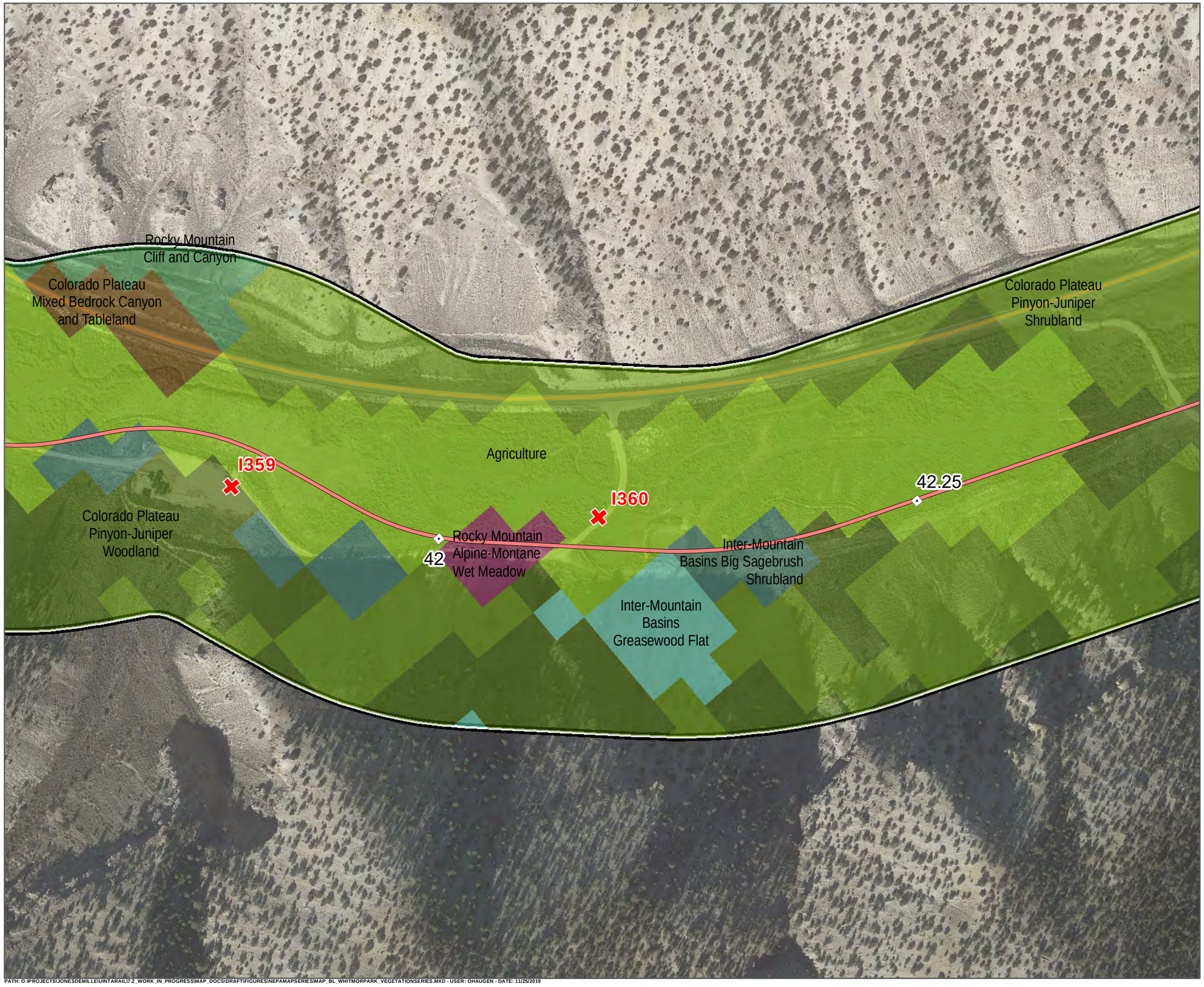

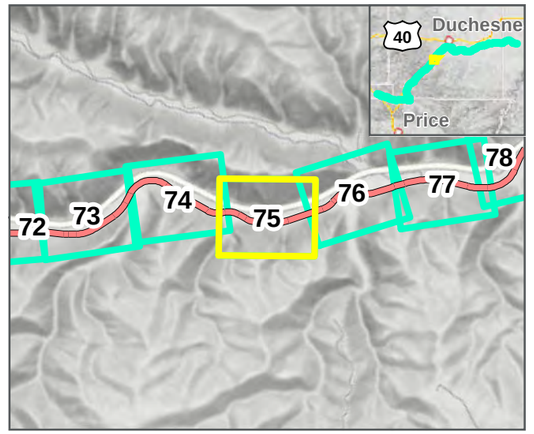

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
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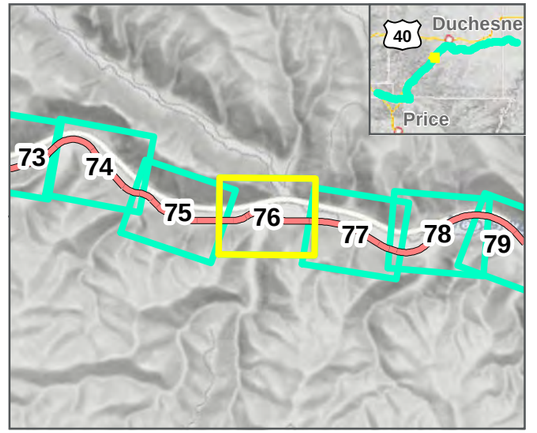

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Rocky Mountain Cliff and Canyon

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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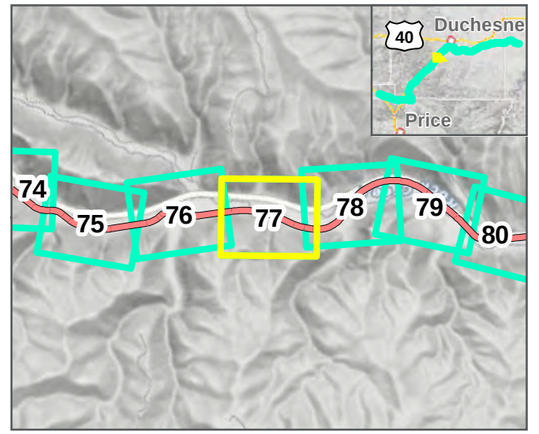

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Developed, Medium - High Intensity
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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SEVEN COUNTY INFRASTRUCTURE COALITION

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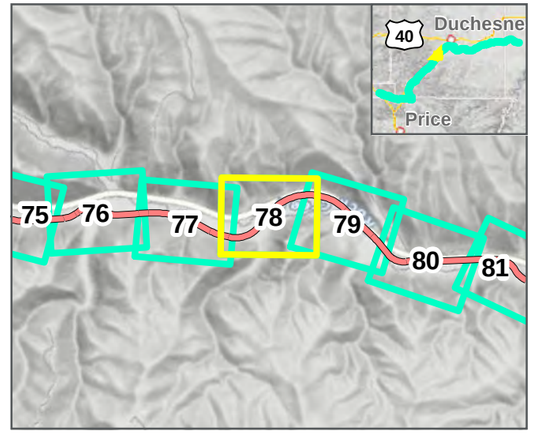

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Semi-Desert Grassland
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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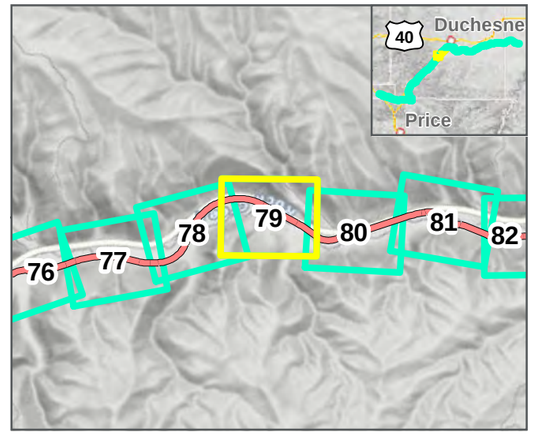

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Cliff and Canyon
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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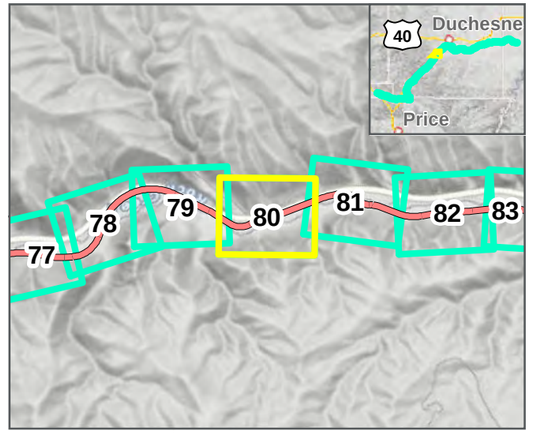

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Open Water
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

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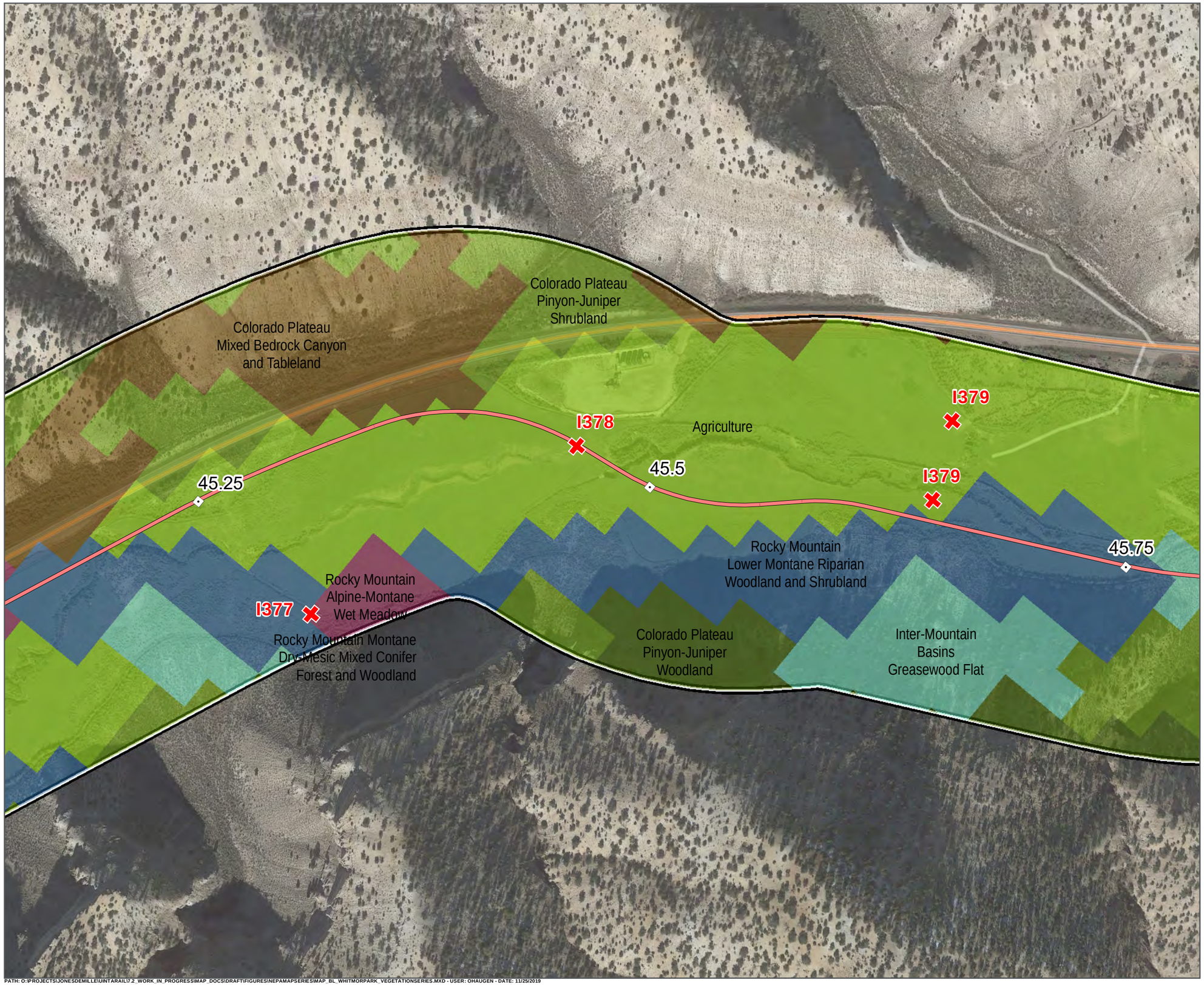

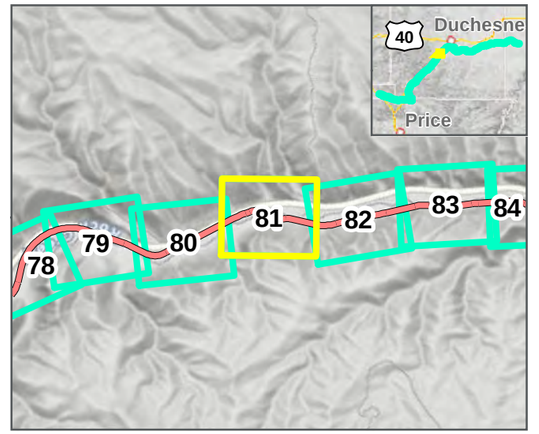

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
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DATA SOURCES:
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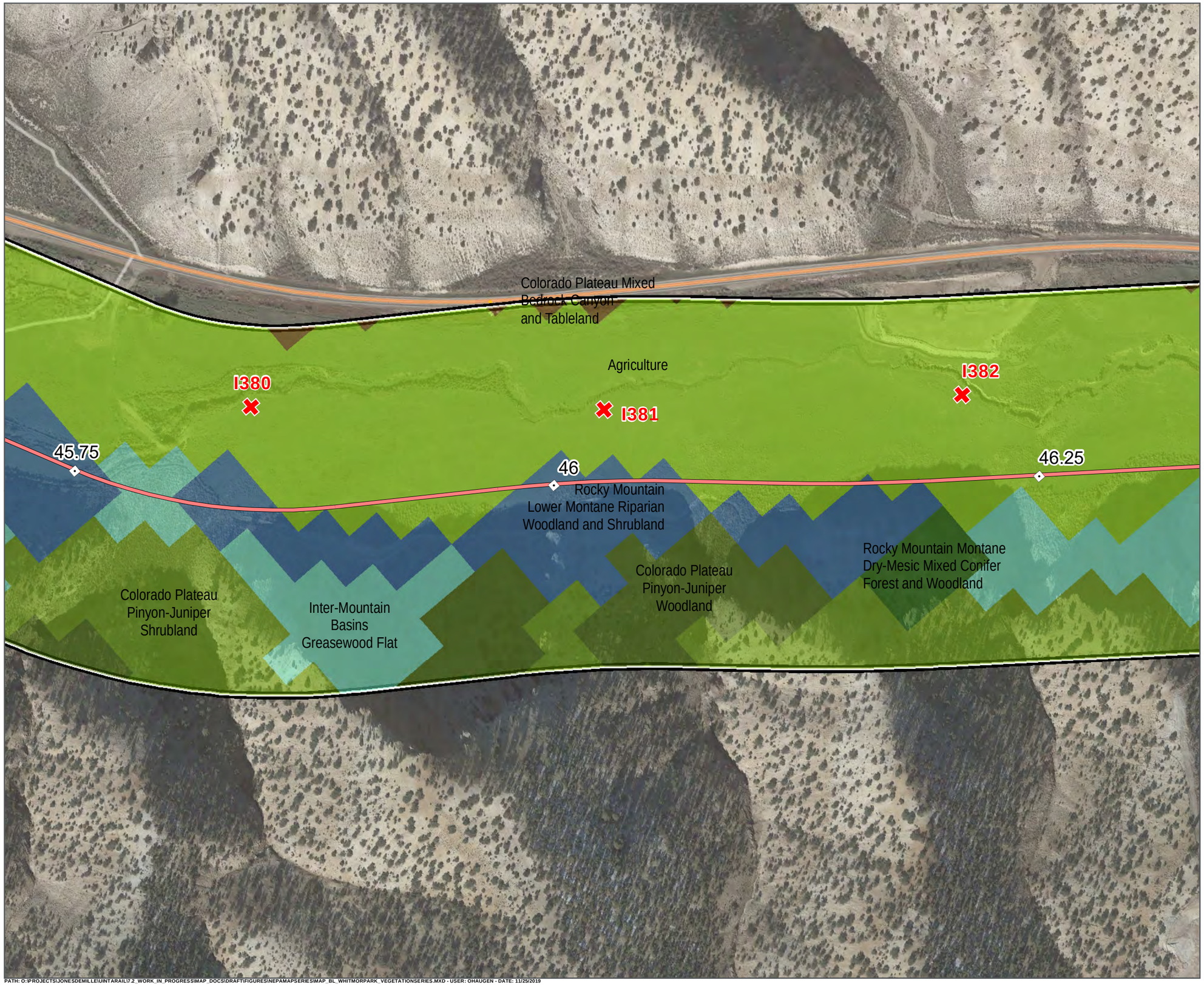

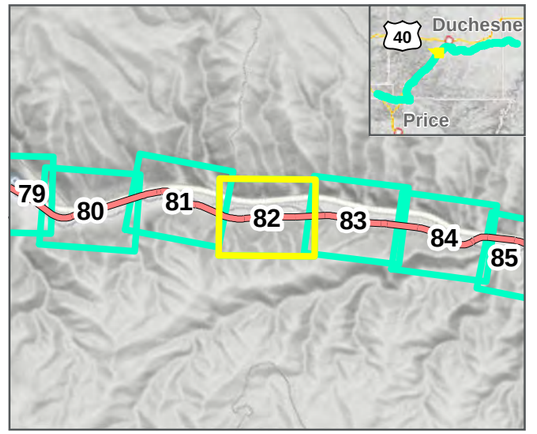

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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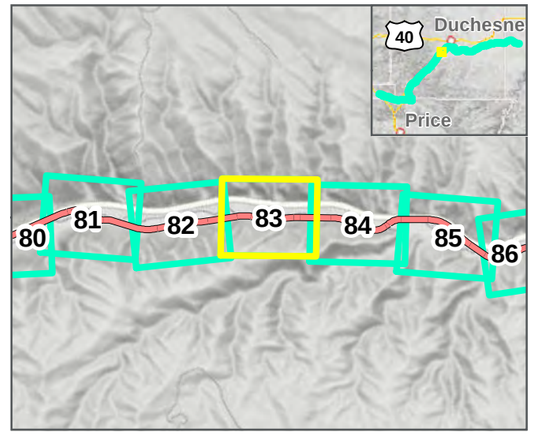

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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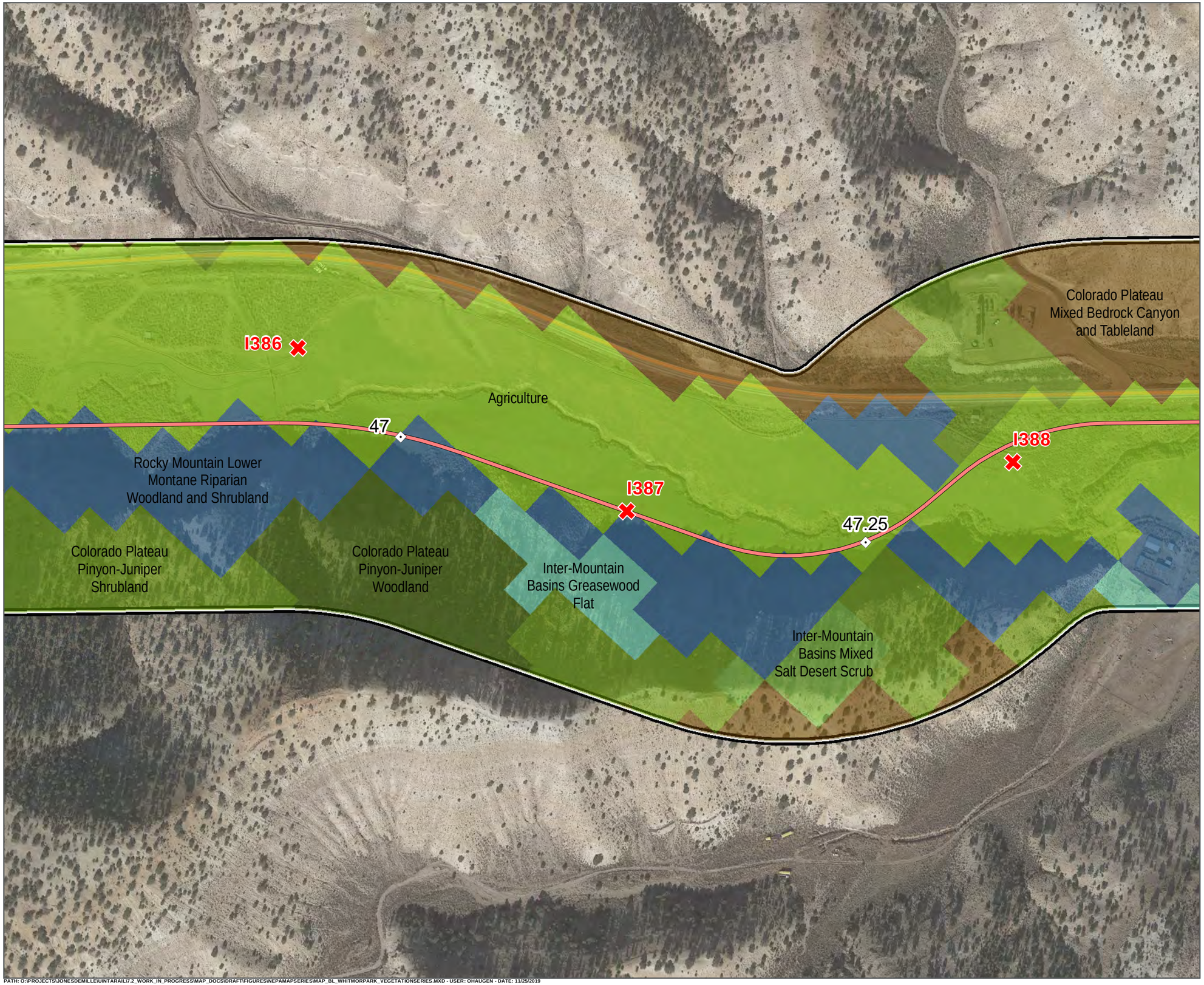

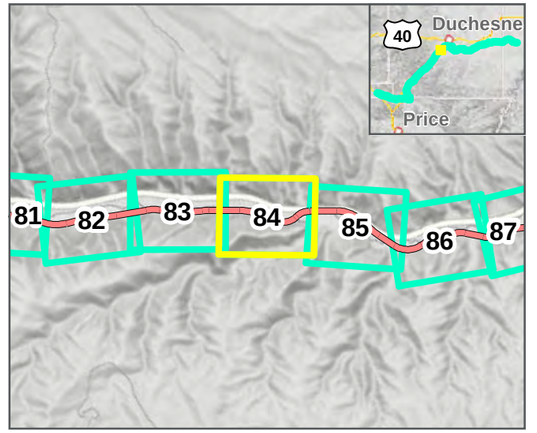

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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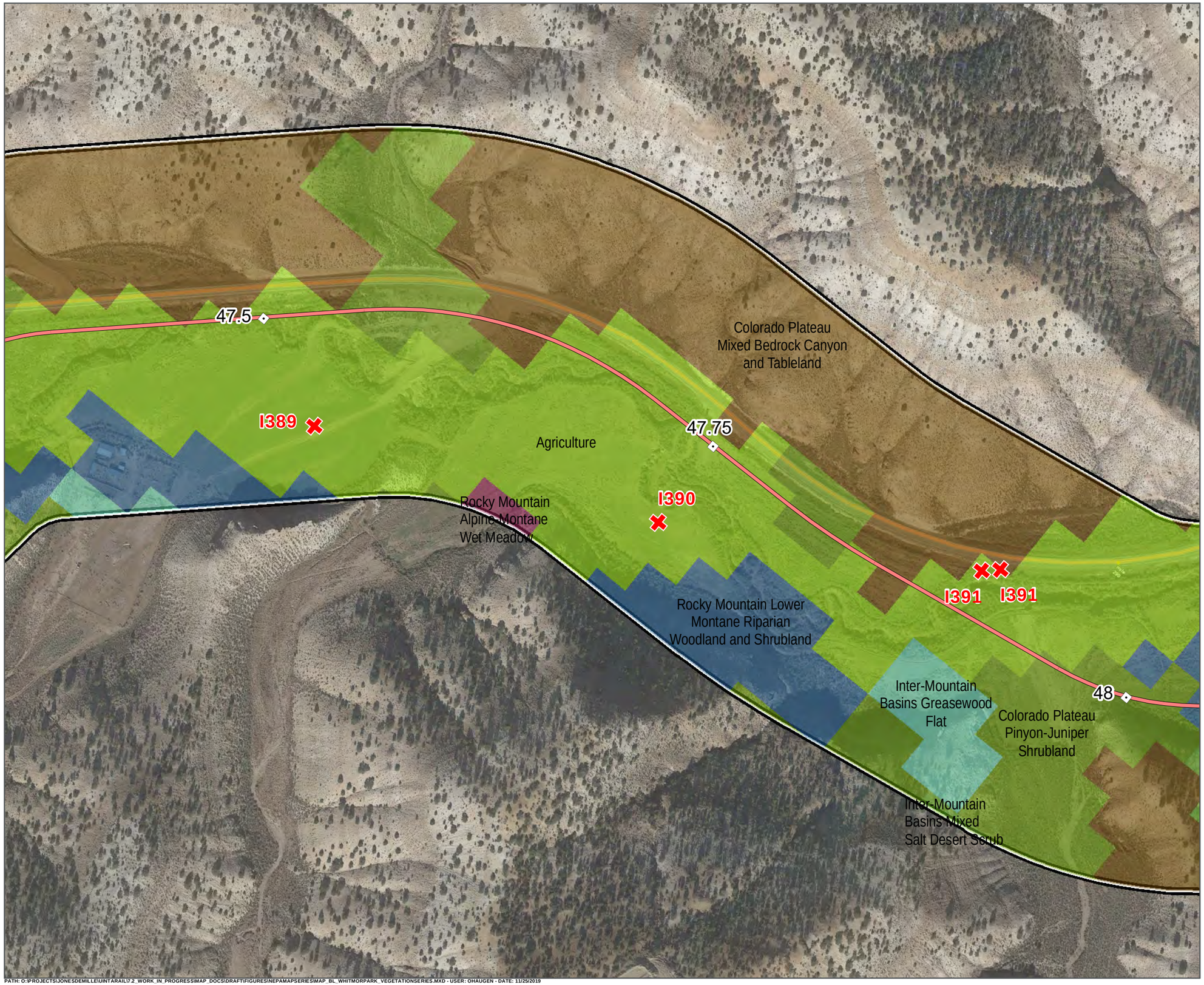

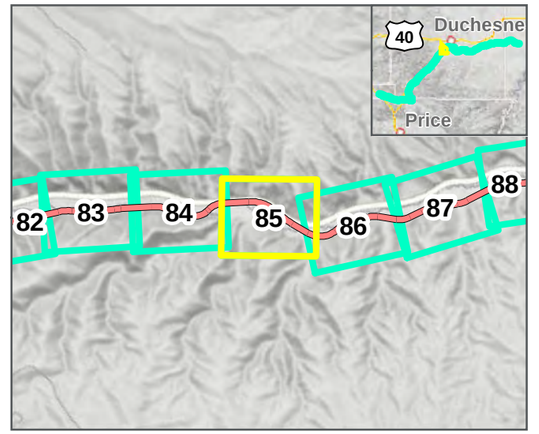

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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Alpine-Montane Wet Meadow
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
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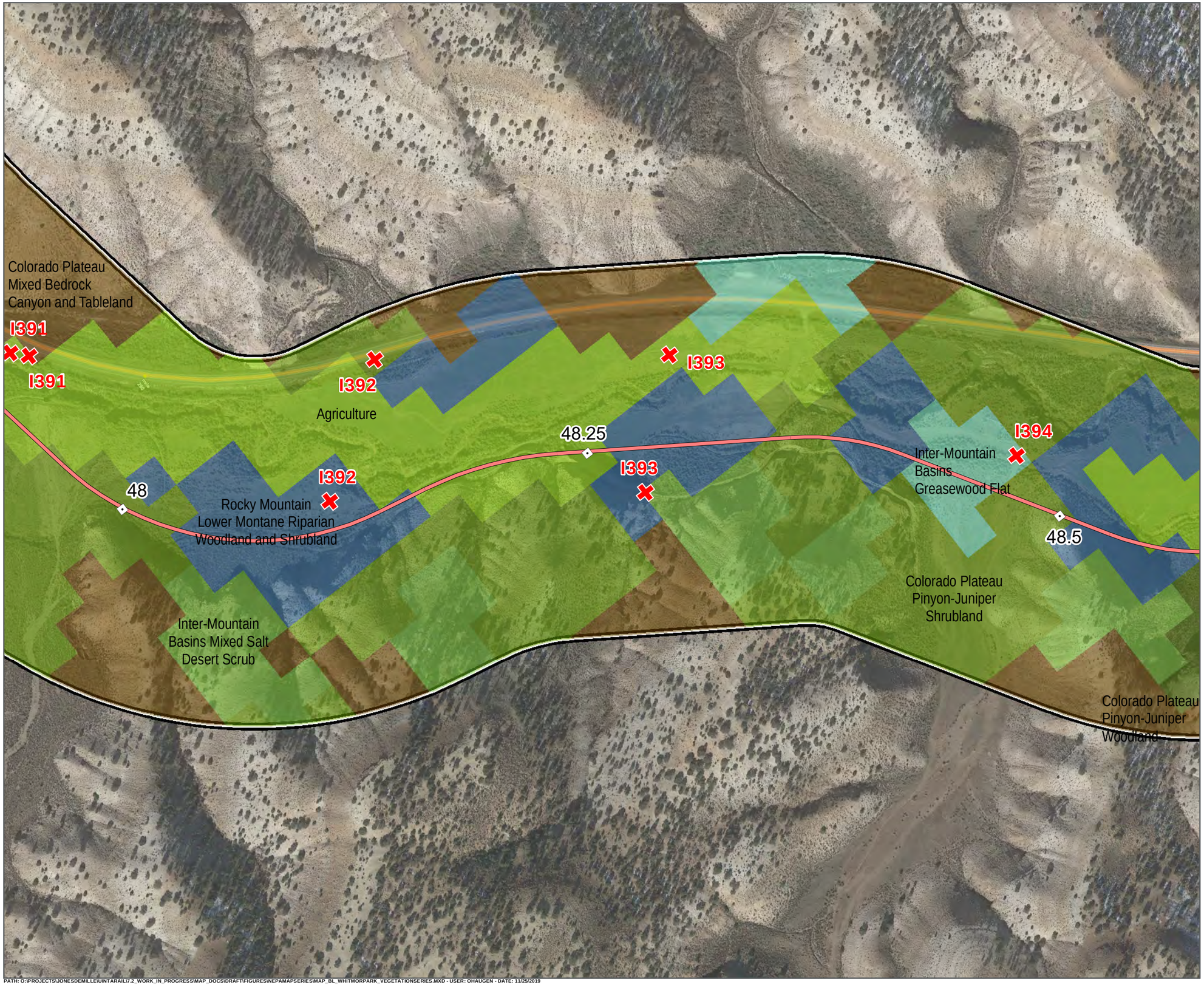

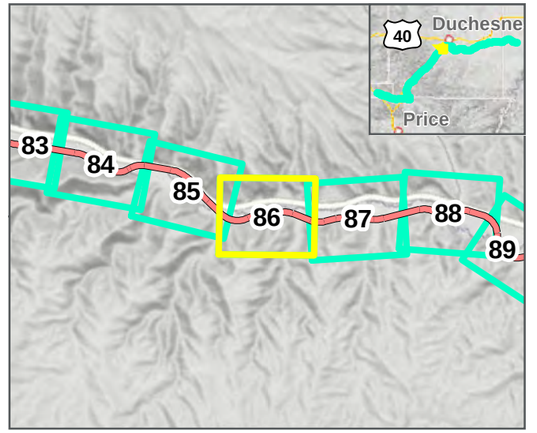

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Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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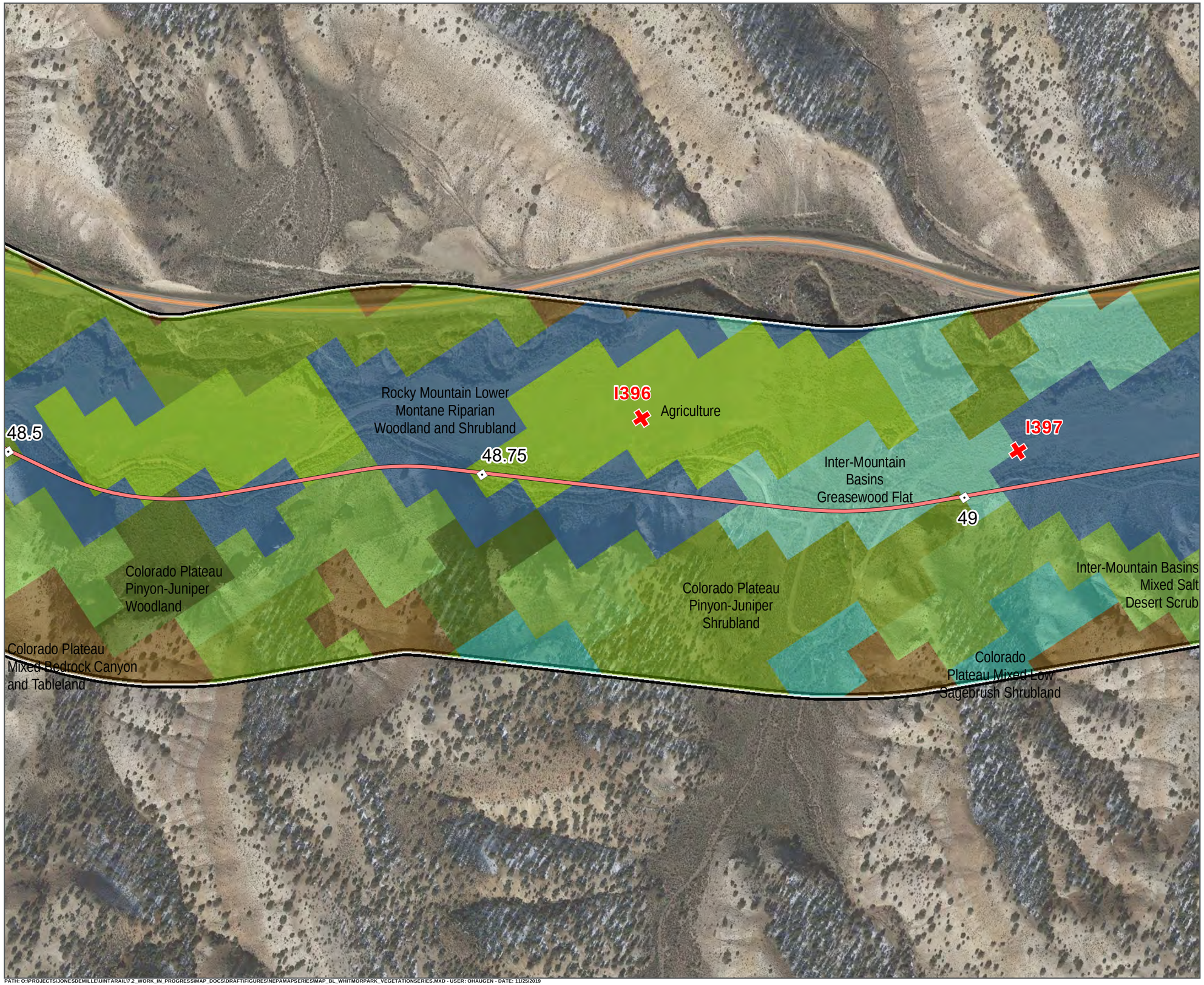


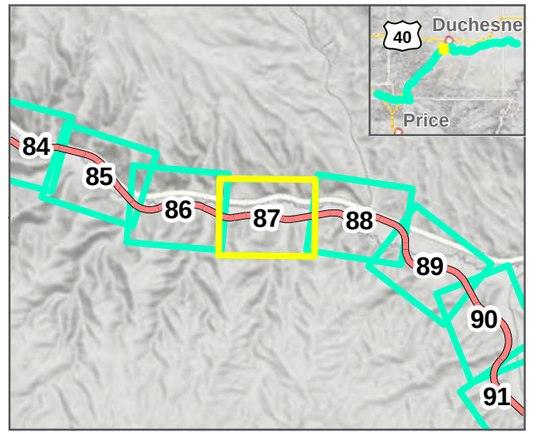


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Colorado Plateau Pinyon-Juniper Woodland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

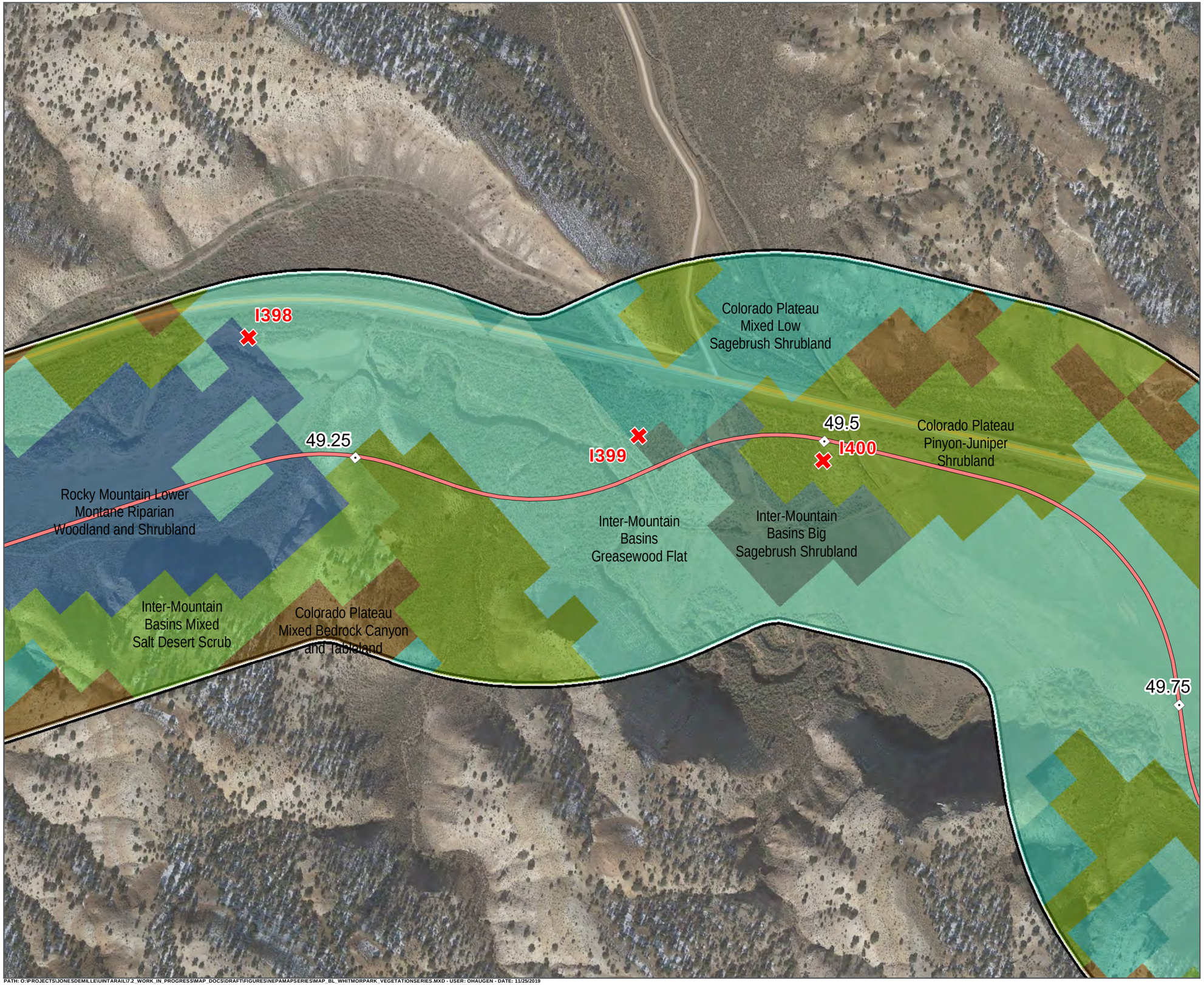
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



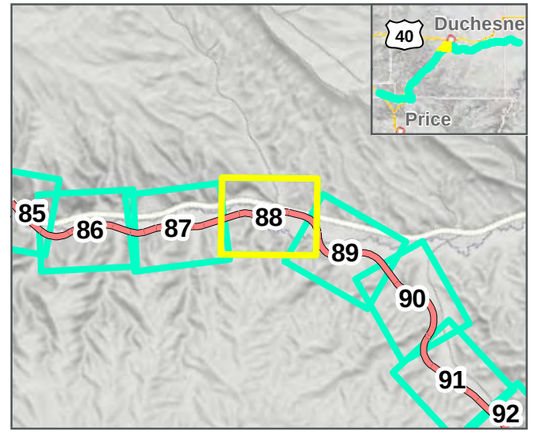


Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet

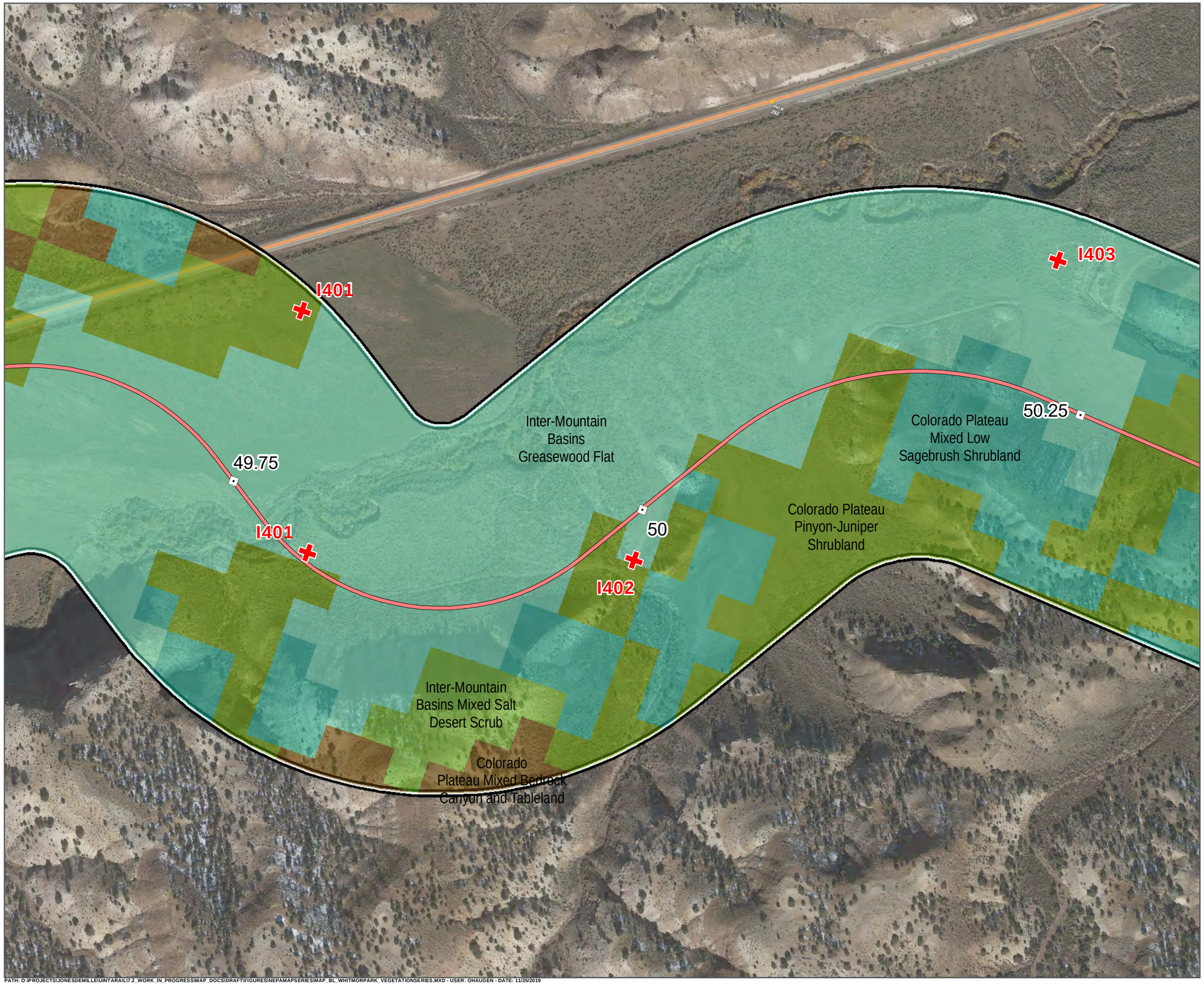
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



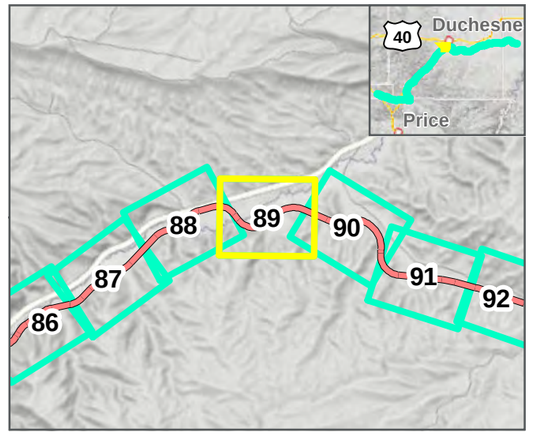


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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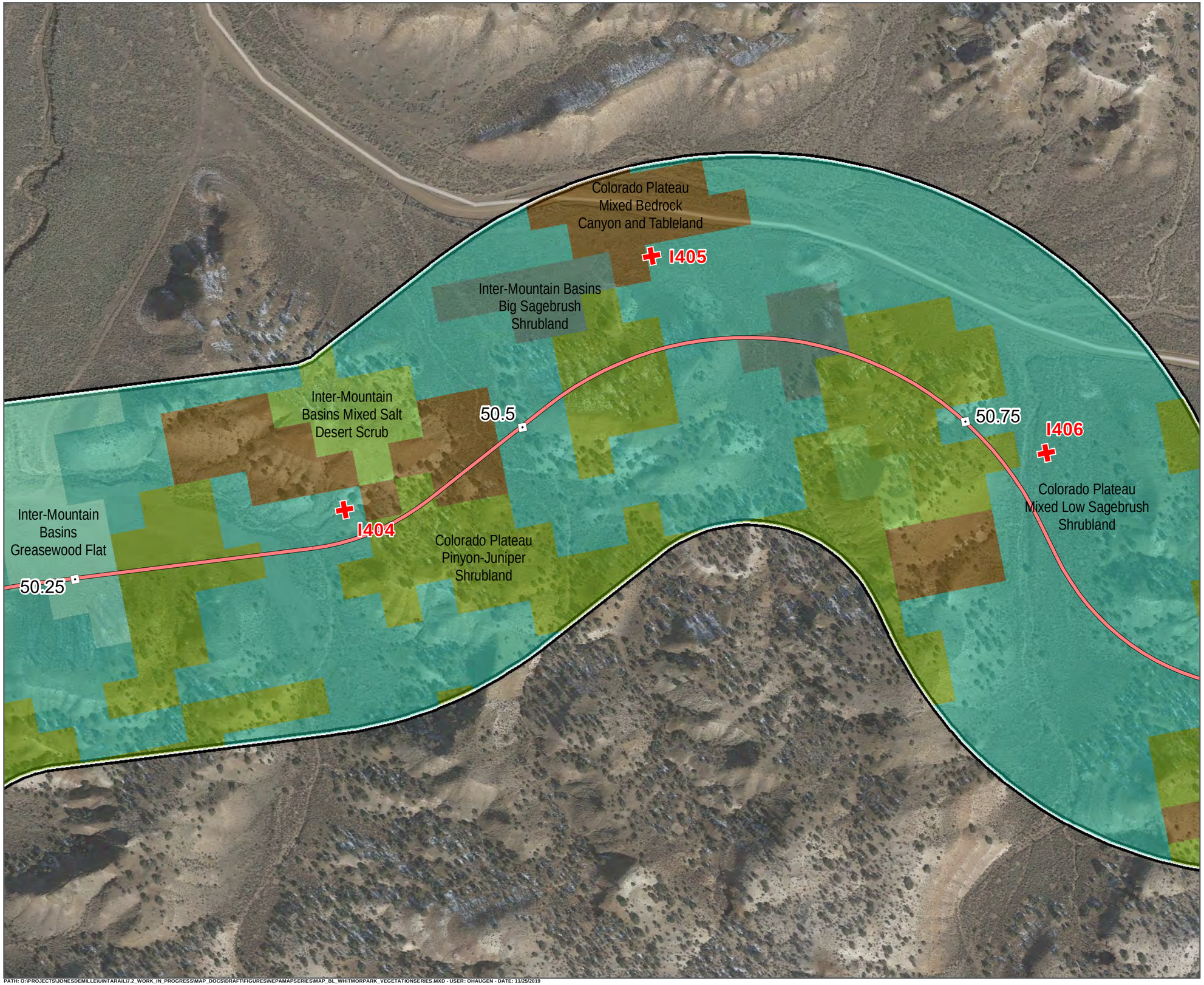

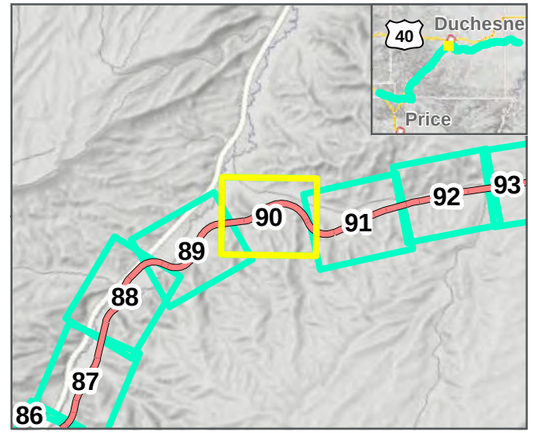

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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COODINATE SYSTEM:
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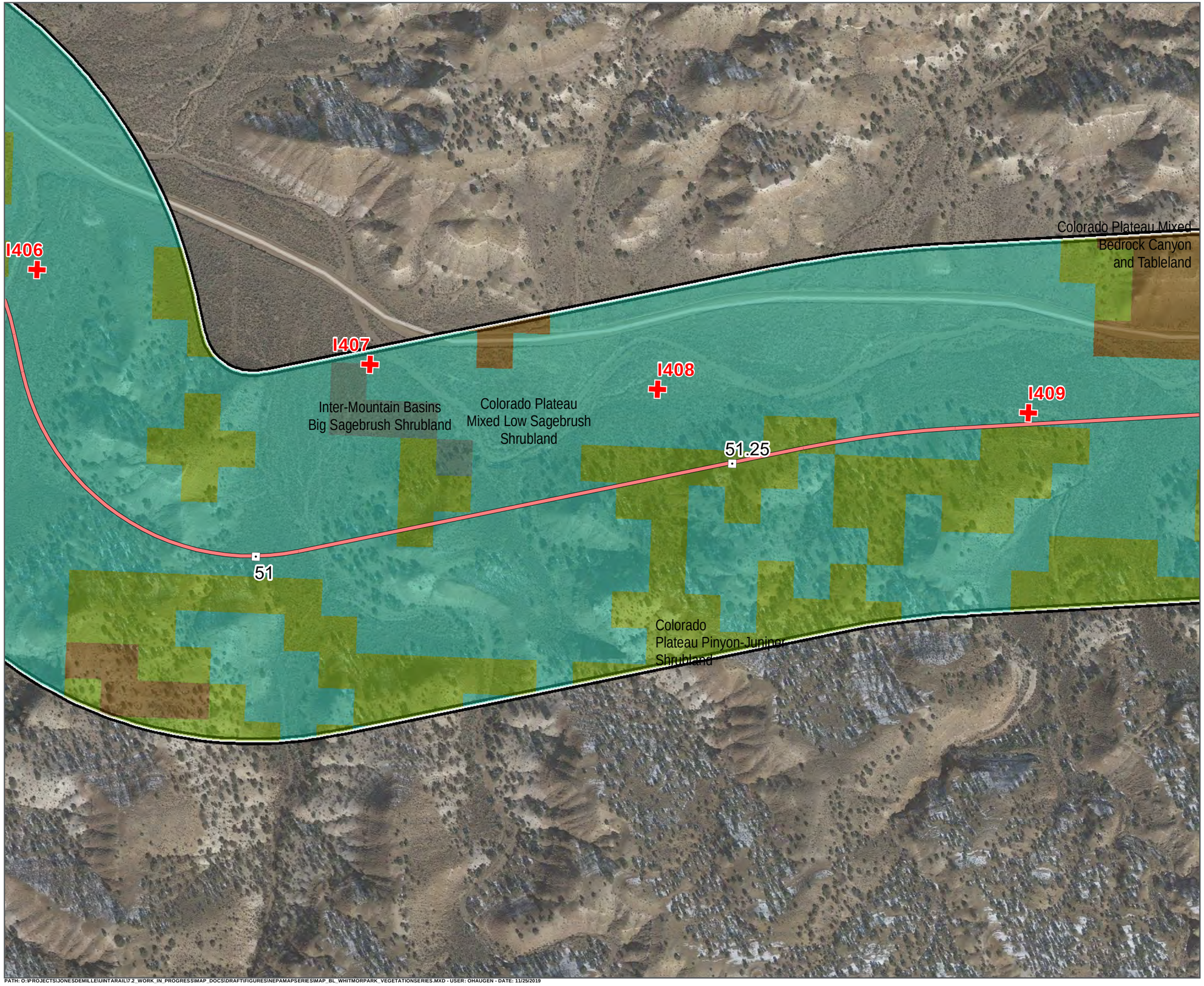

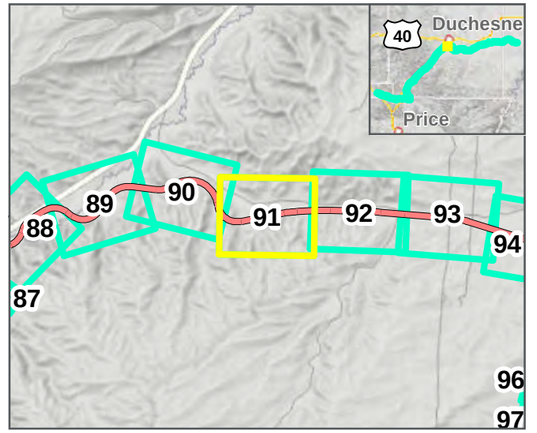

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

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- Colorado Plateau Mixed Low Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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DATA SOURCES:
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COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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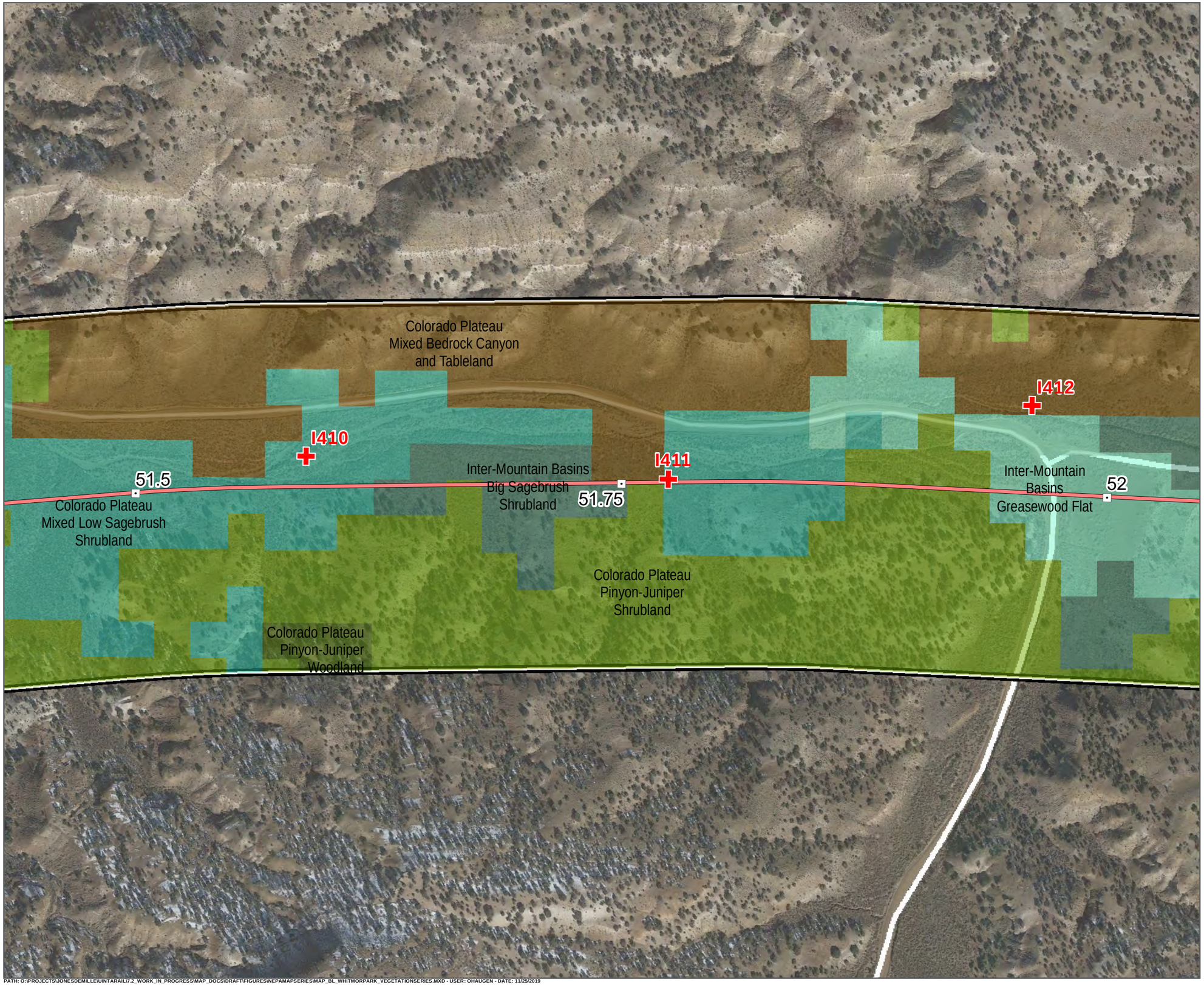

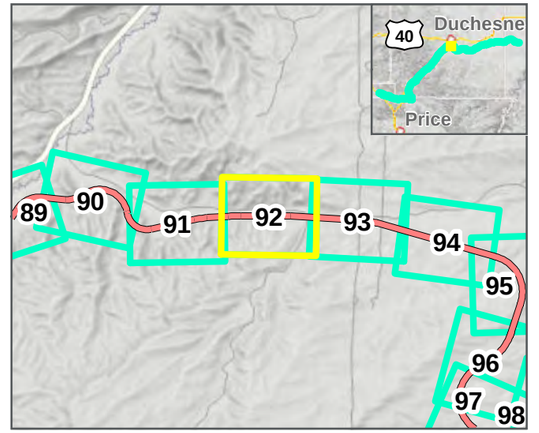

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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DATA SOURCES:
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Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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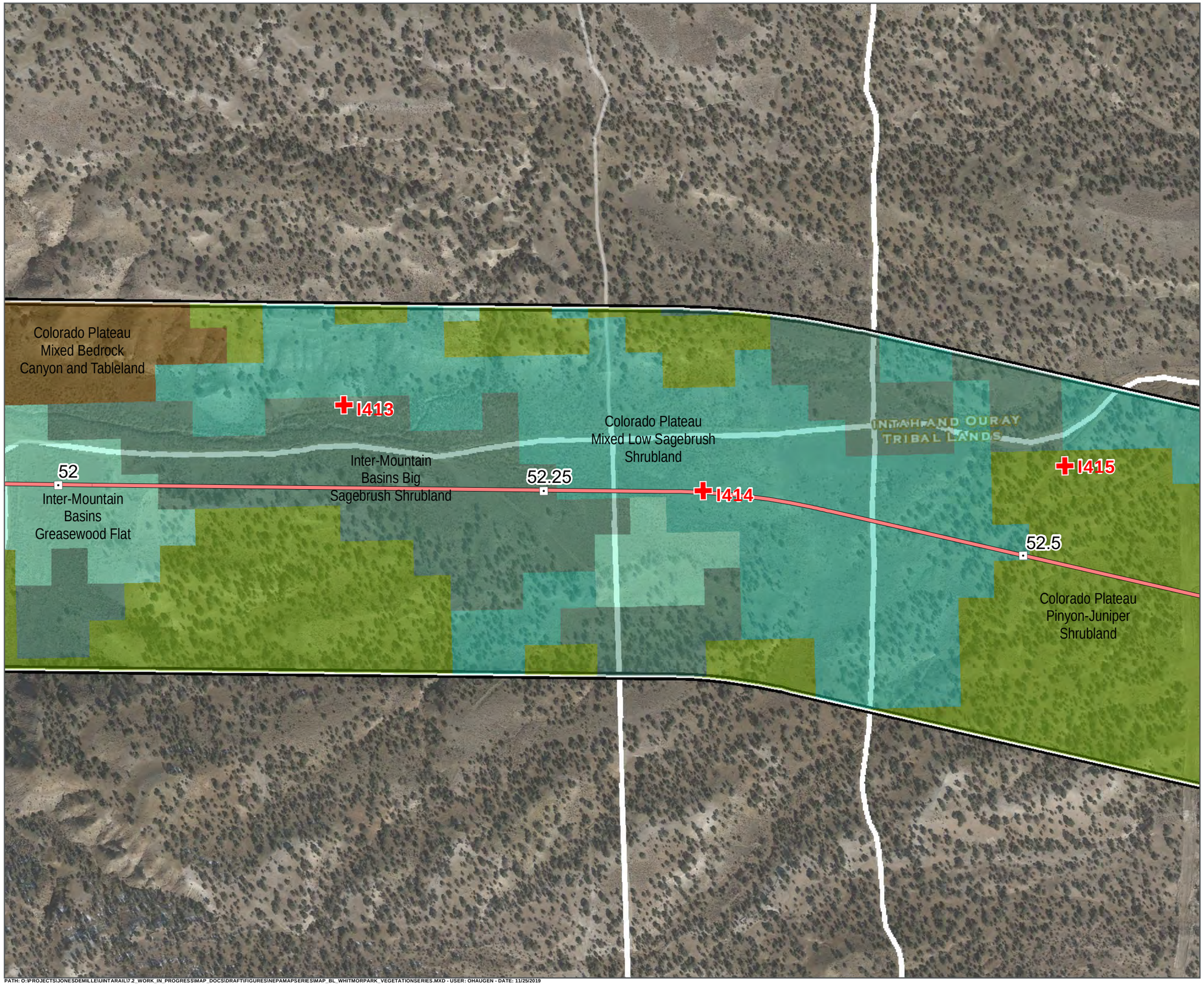

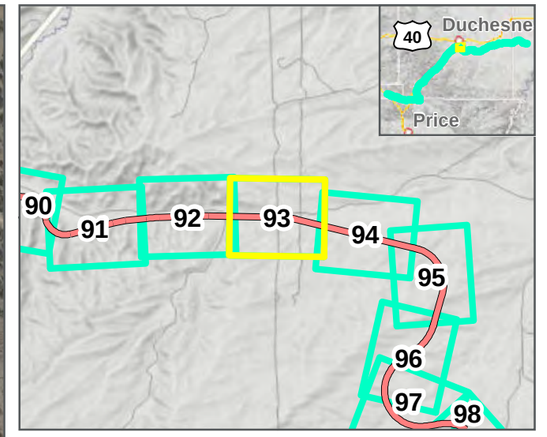

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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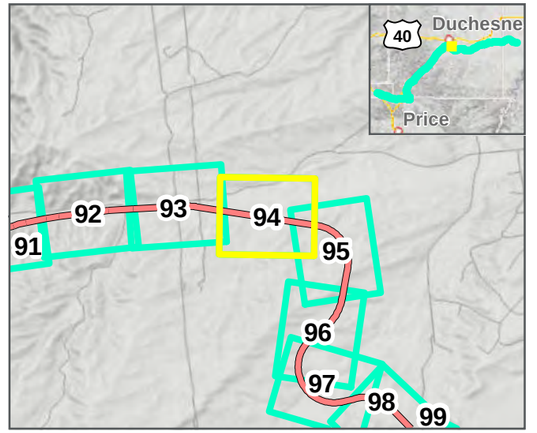

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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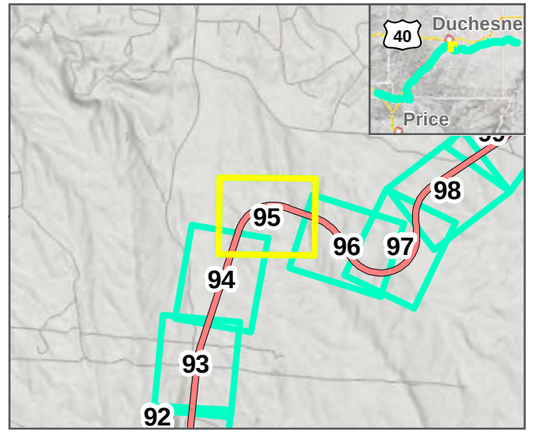

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Semi-Desert Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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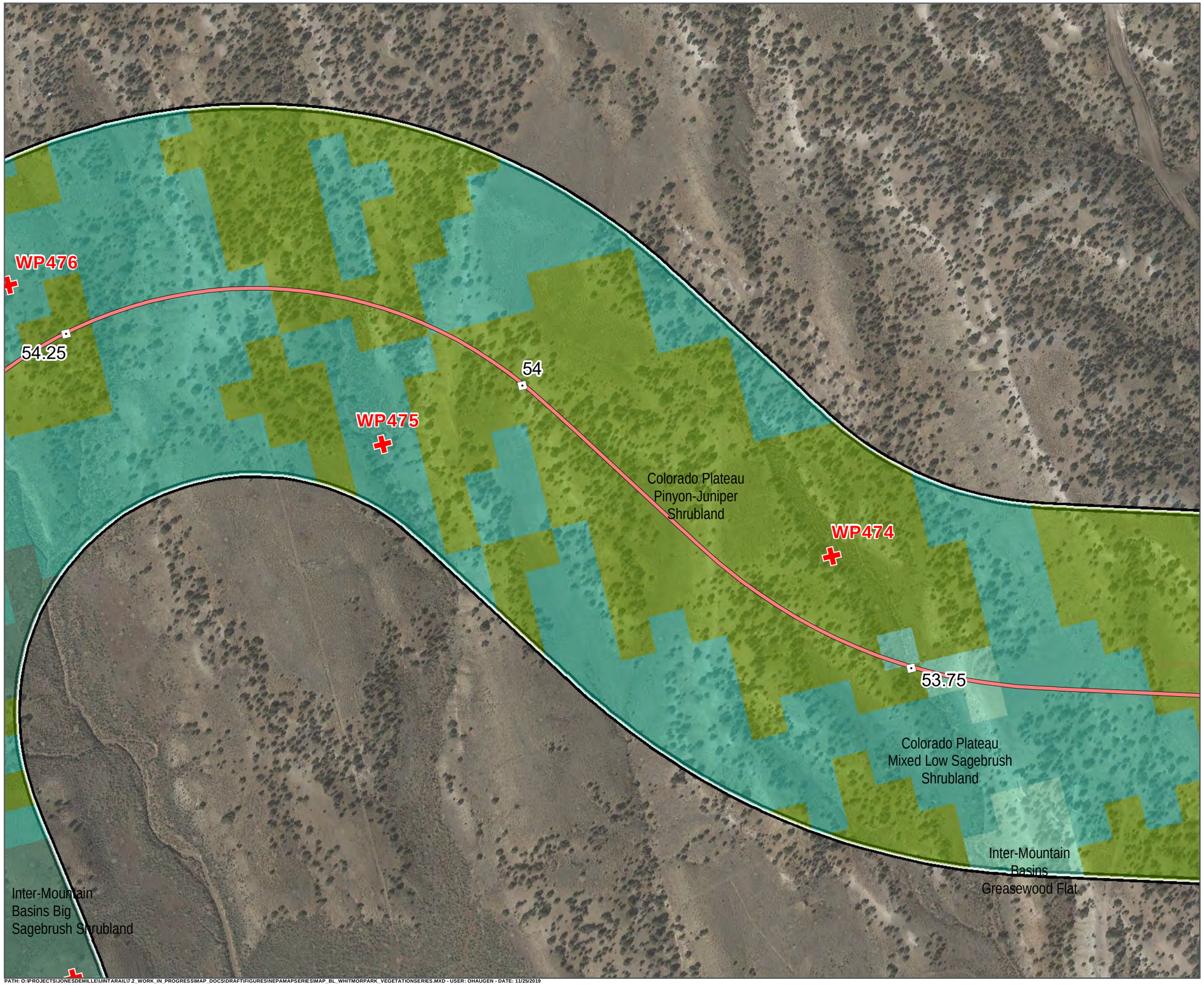

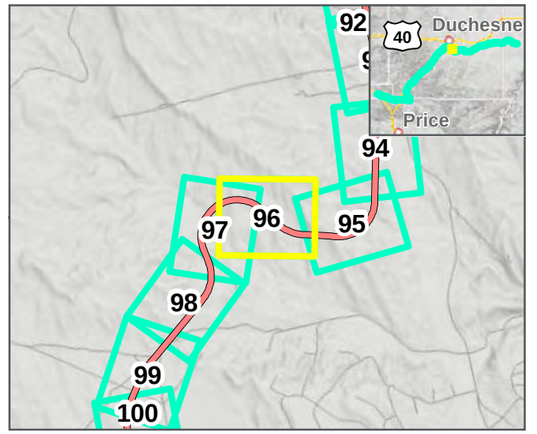

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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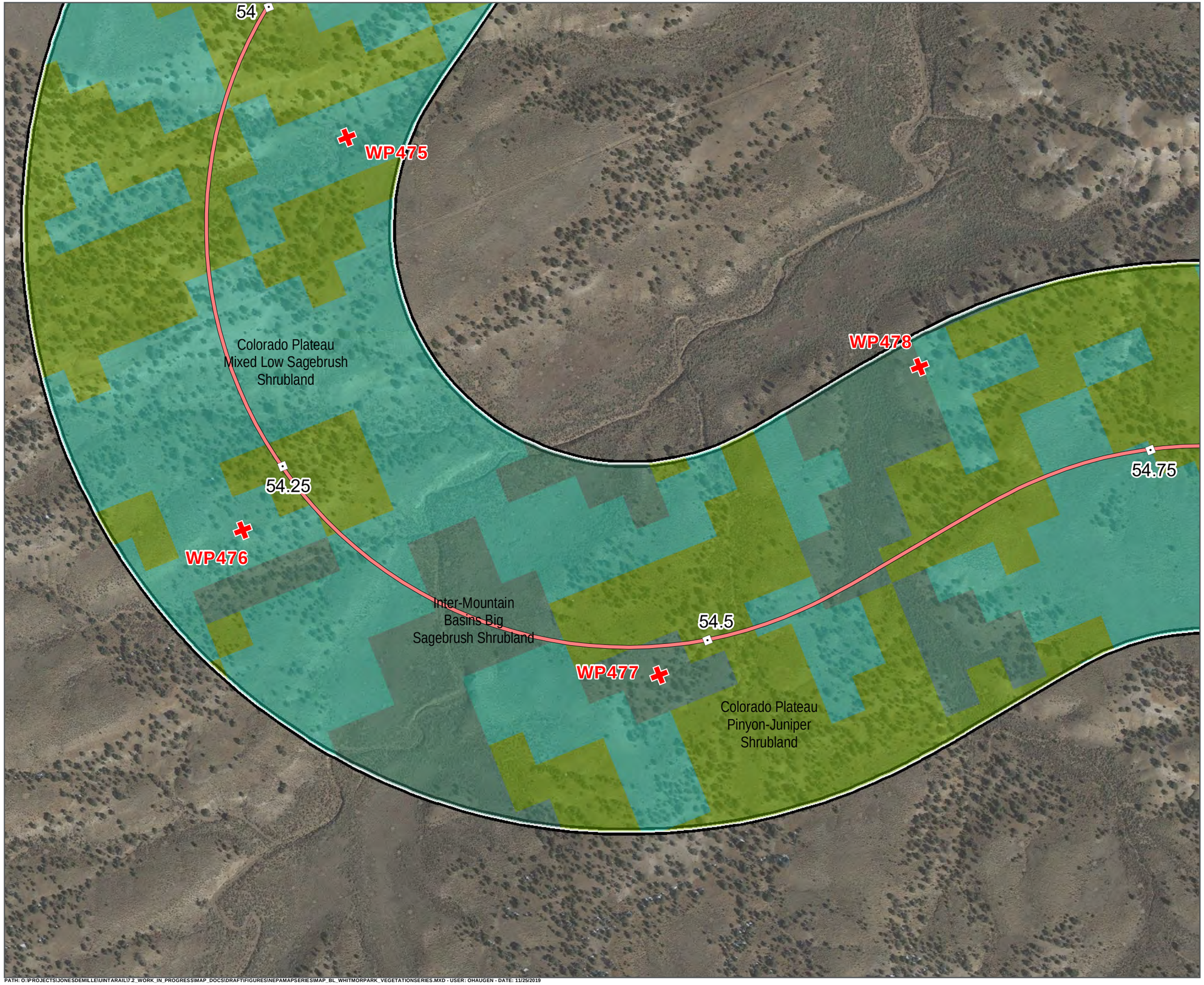


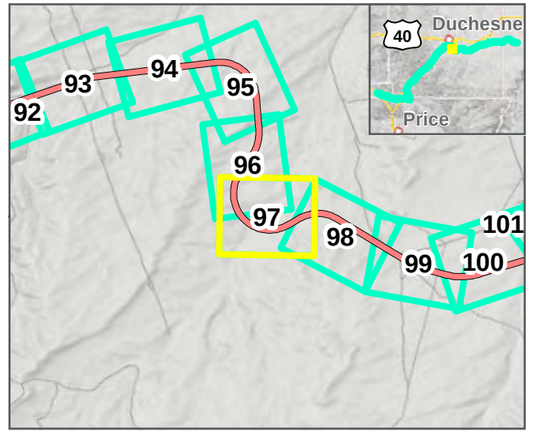


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

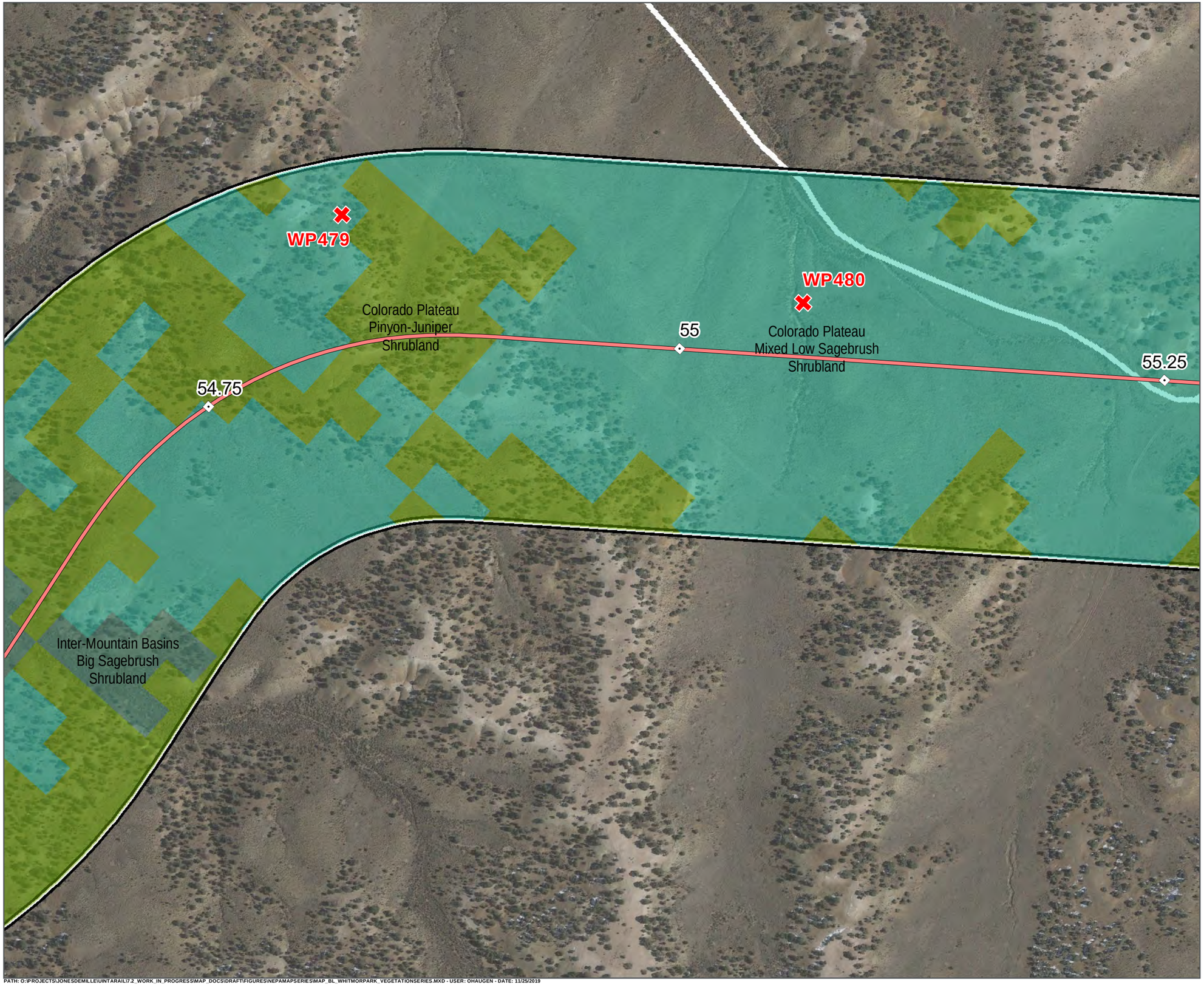
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

Seven County Infrastructure Coalition

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



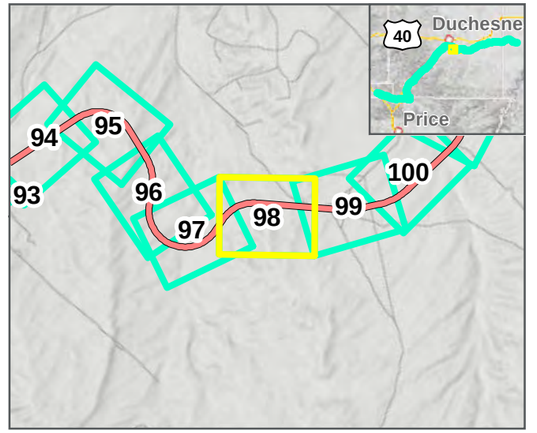


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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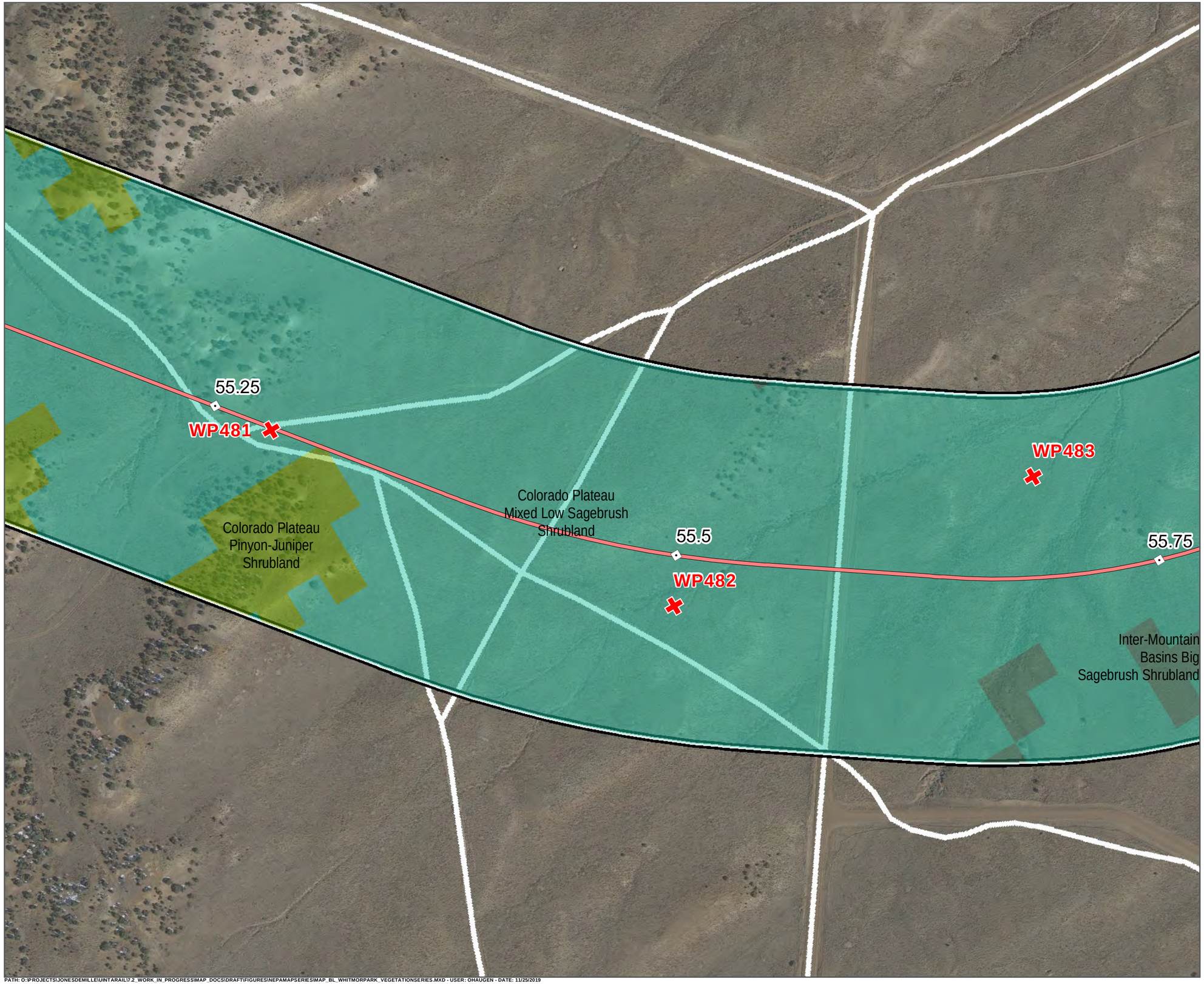

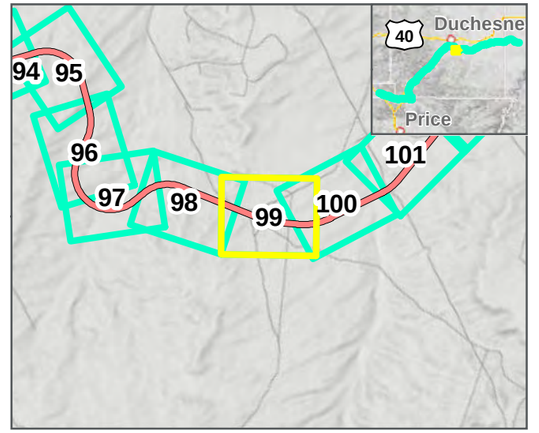

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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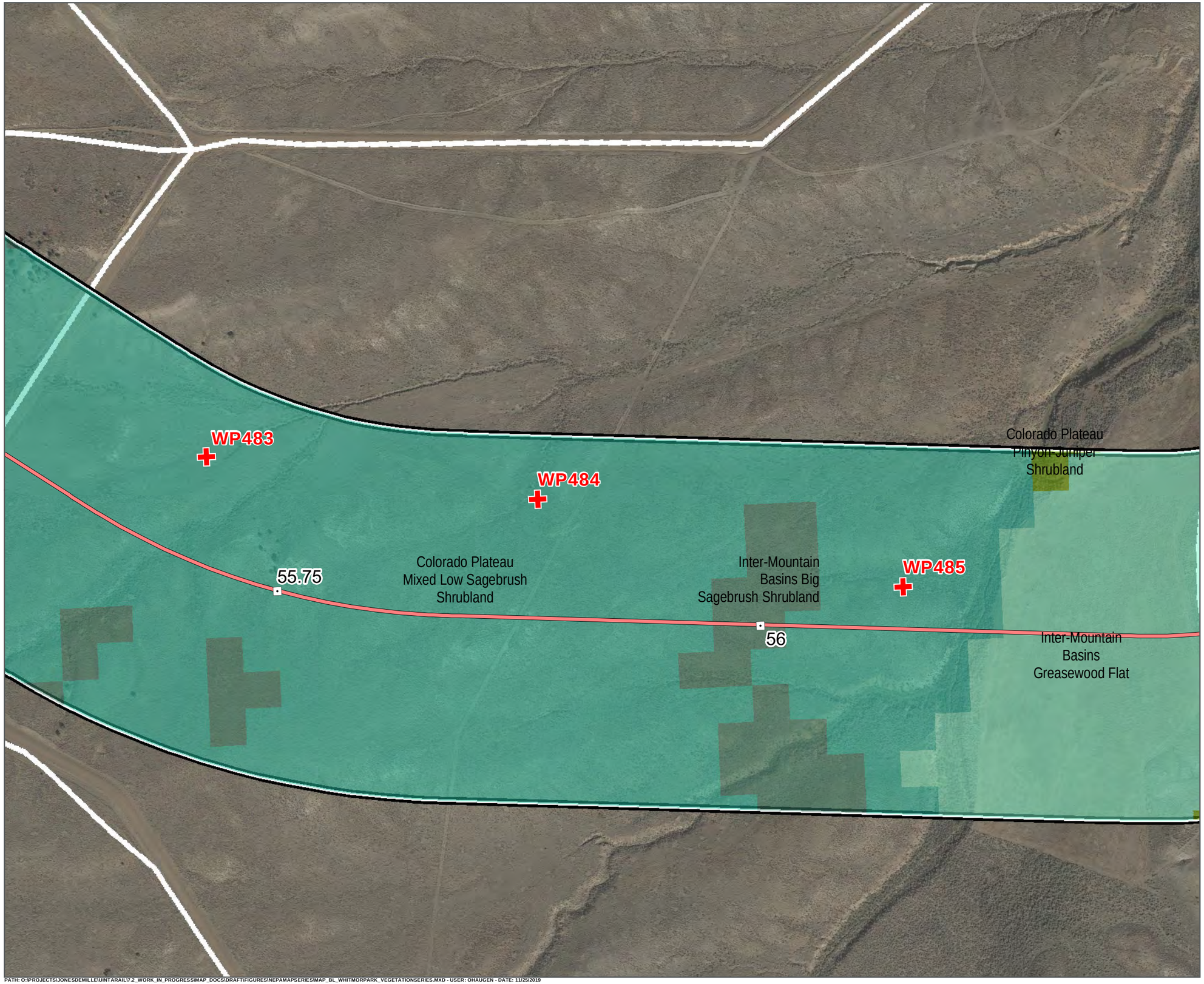

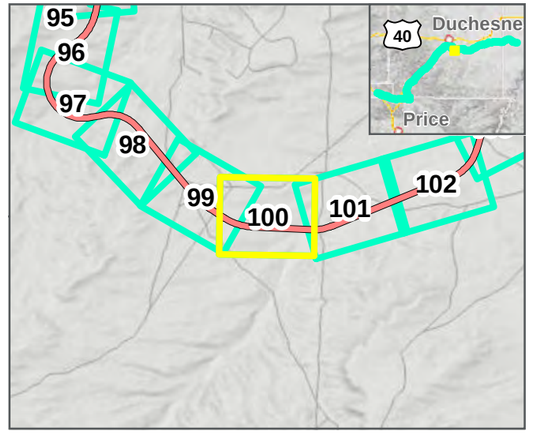

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
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SEVEN COUNTY INFRASTRUCTURE COALITION

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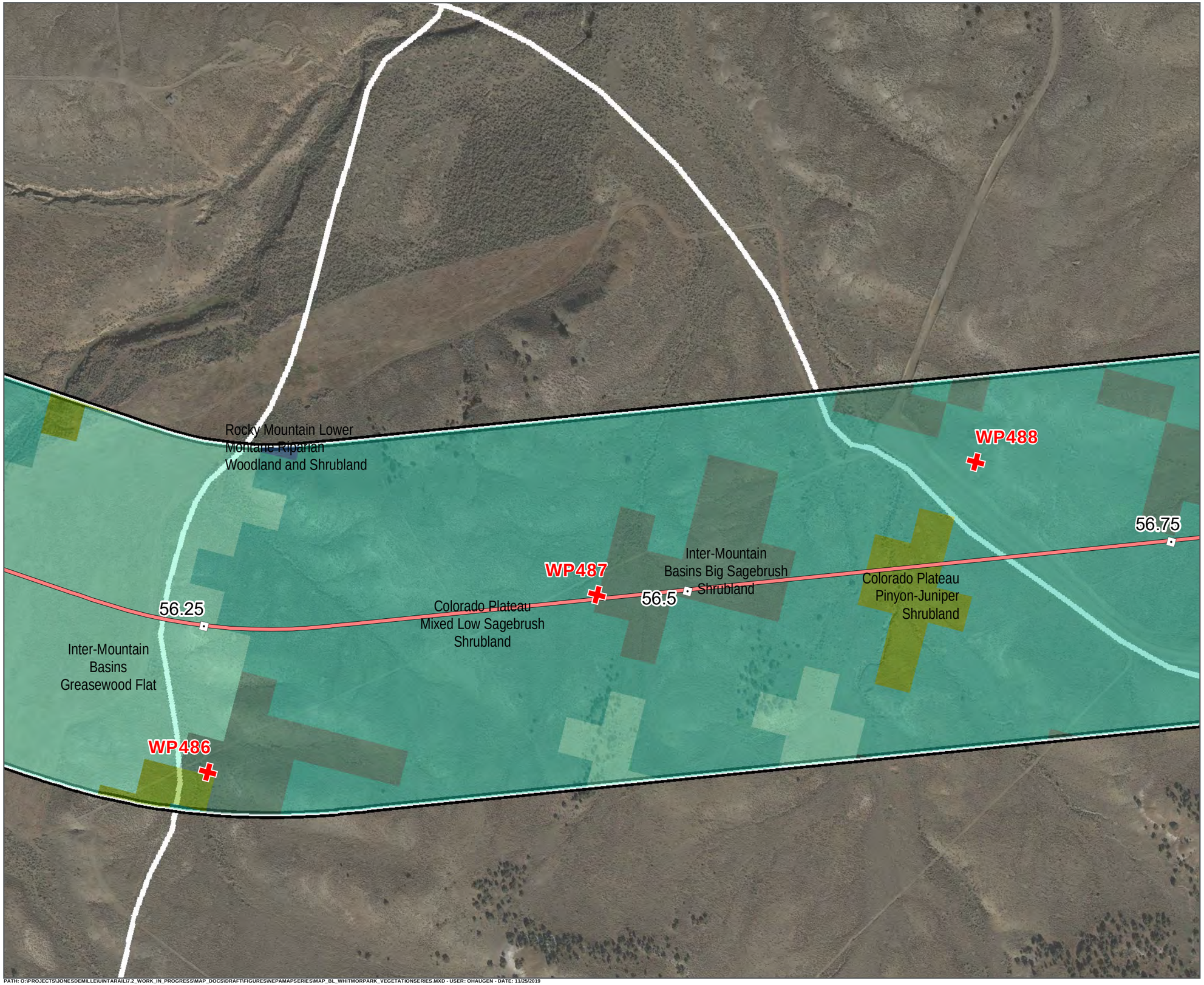

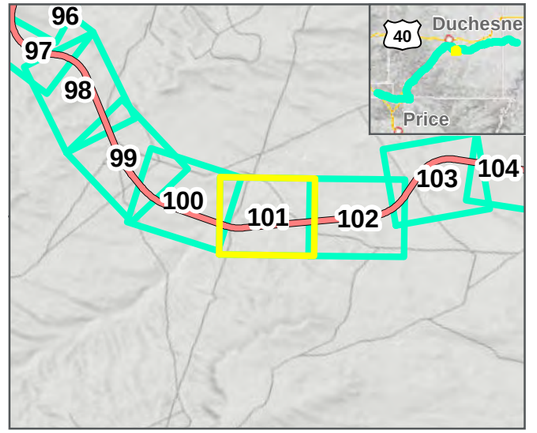

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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DATA SOURCES:
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COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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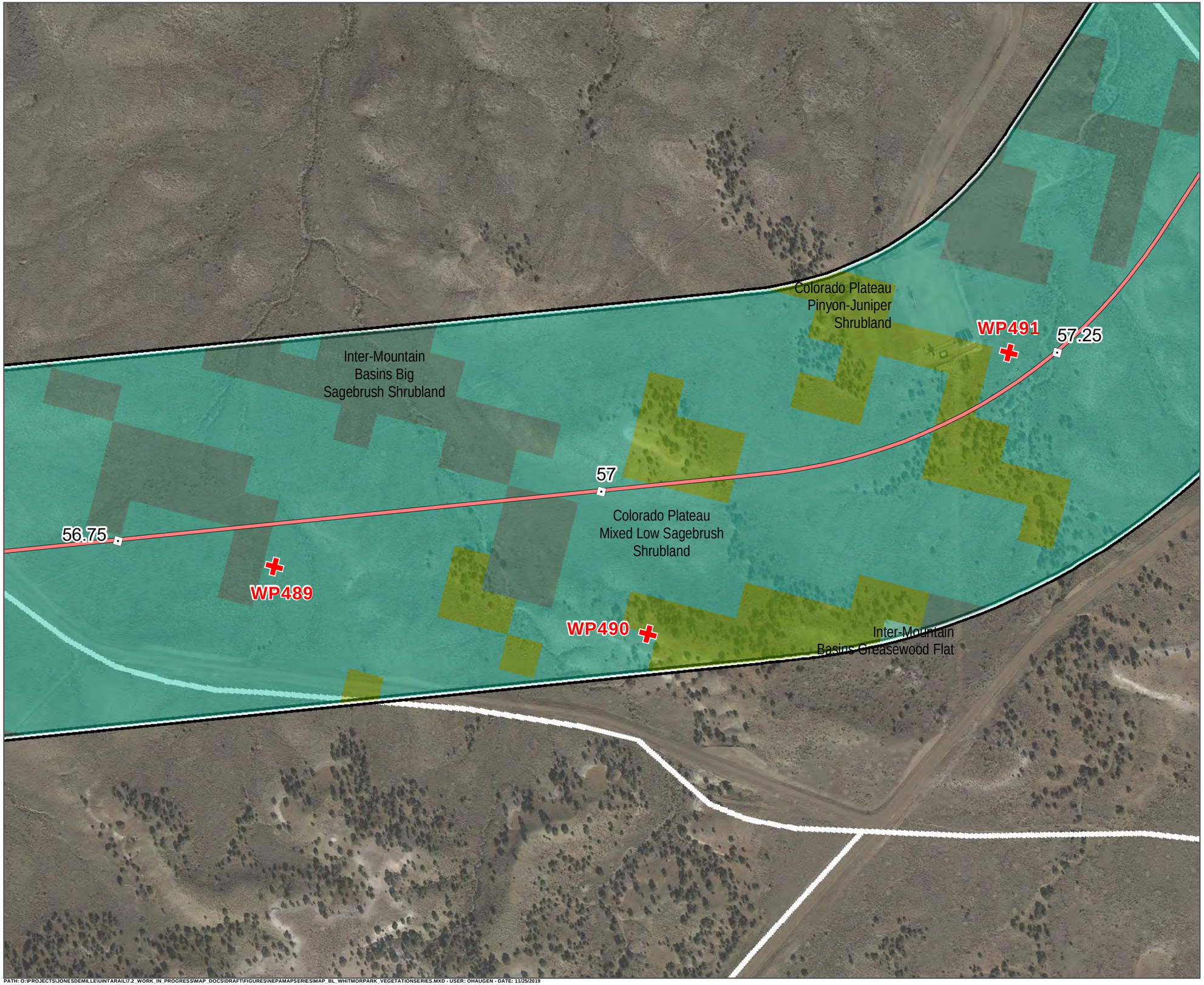

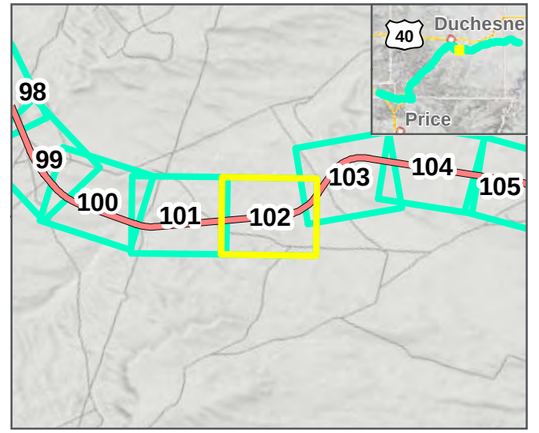

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

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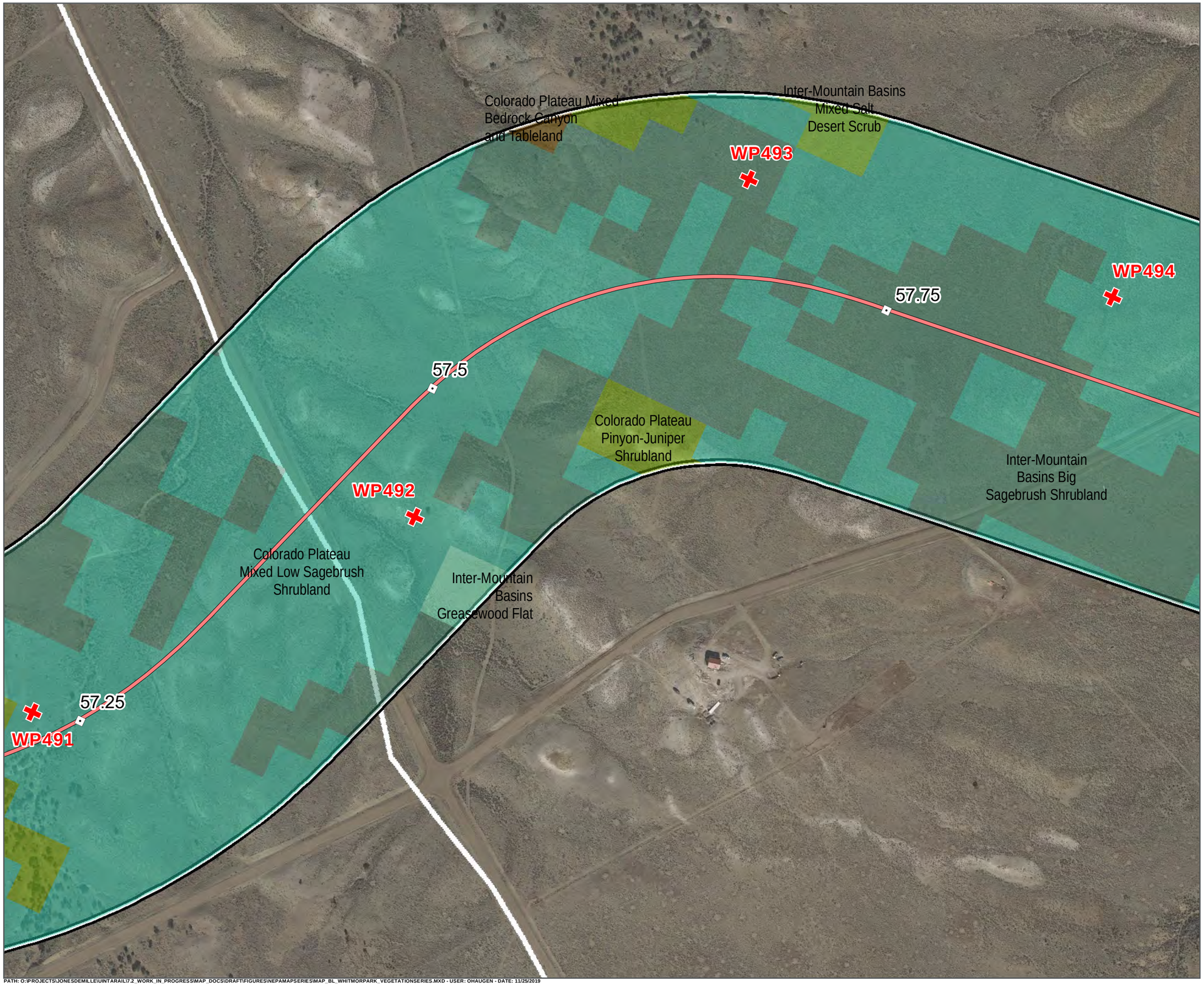

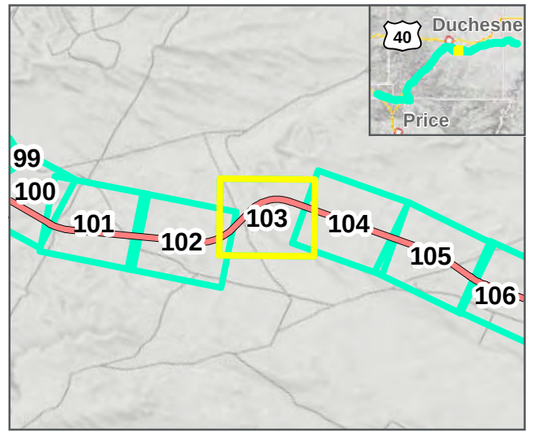

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Study Area
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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1 inch = 250 Feet

DATA SOURCES:
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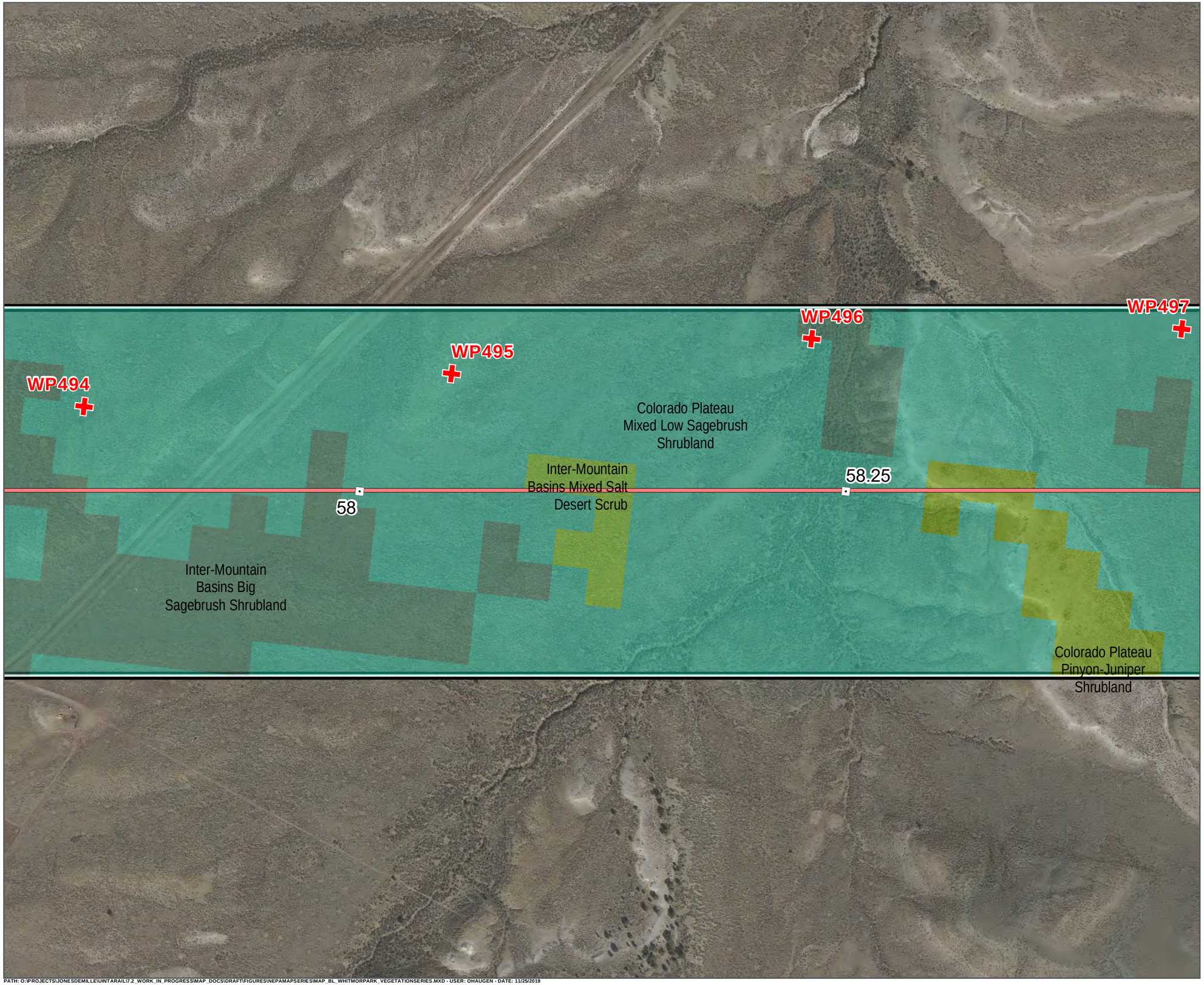

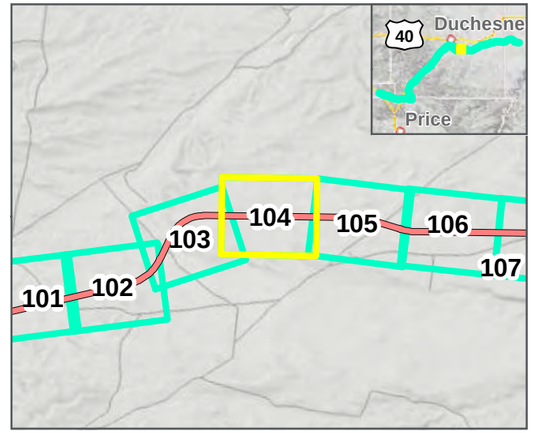

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Study Area
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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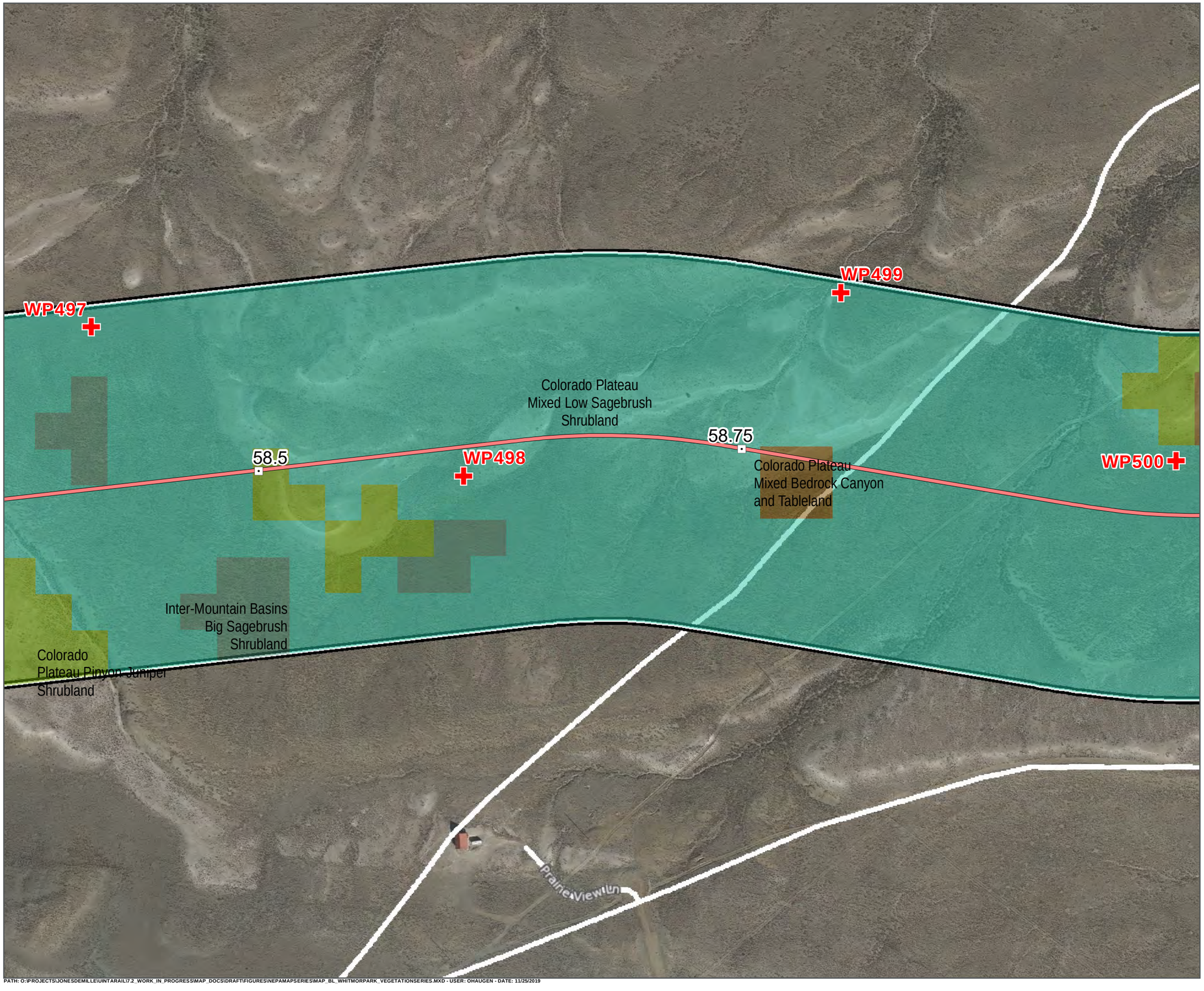

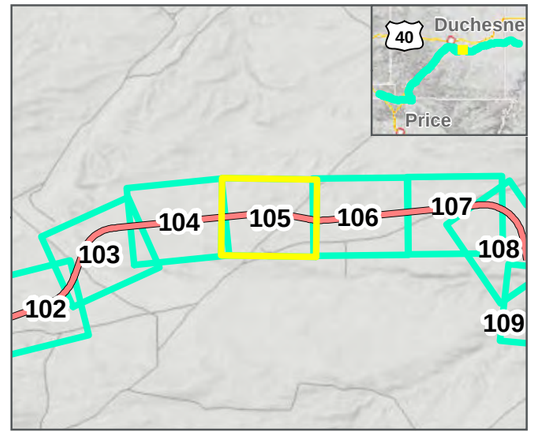

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Whitmore Park Centerline
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WHITMORE PARK ALTERNATIVE: 8/21/2019

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SEPTEMBER 2019

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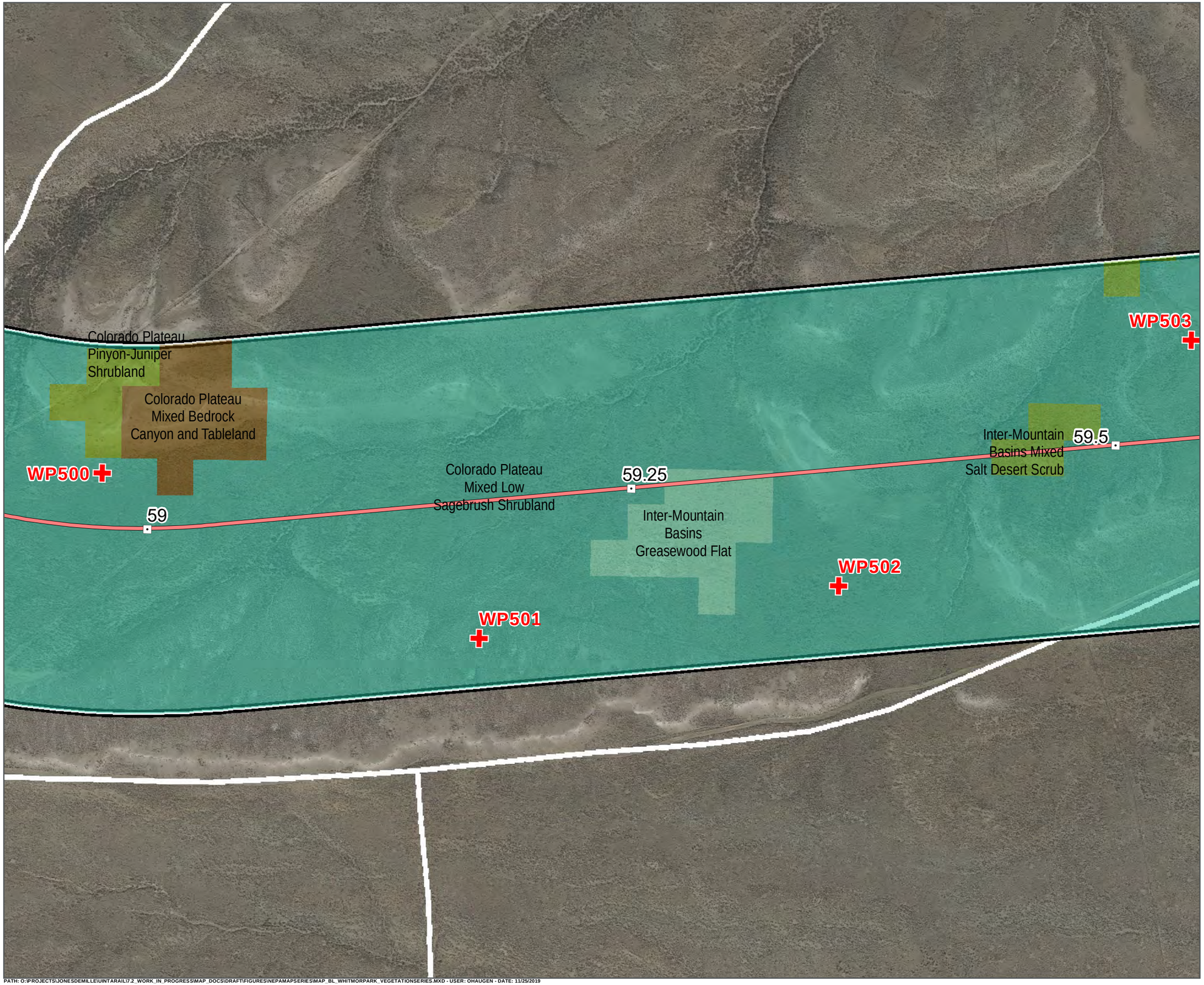

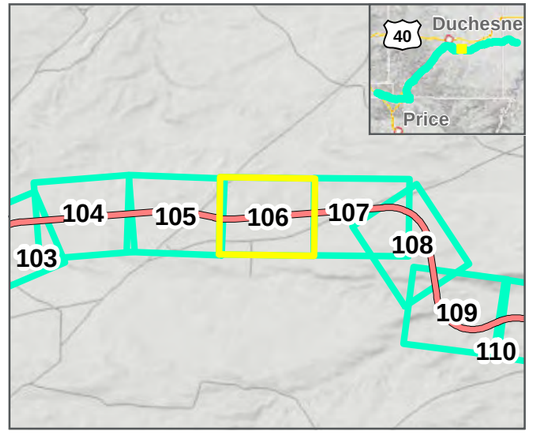

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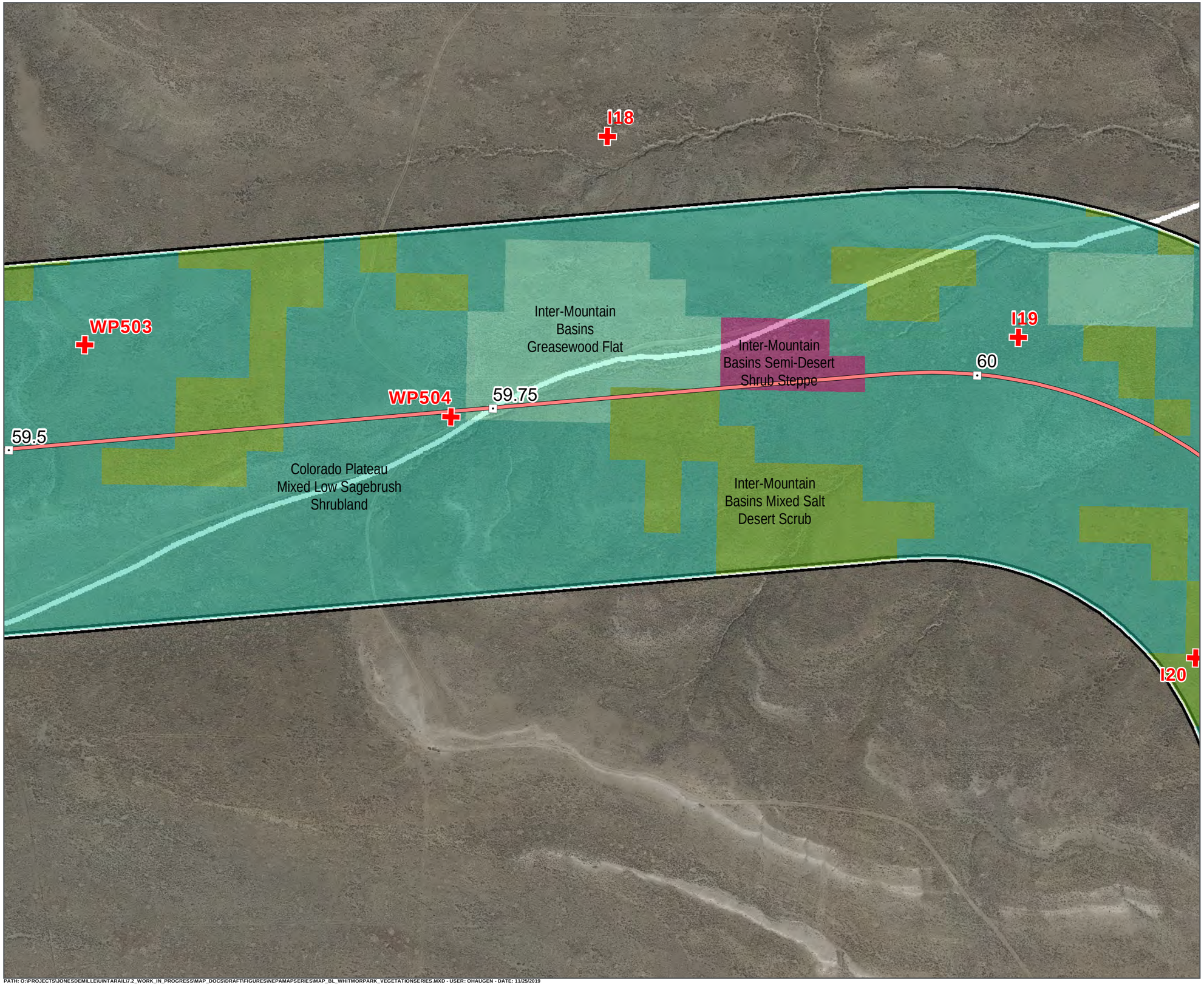

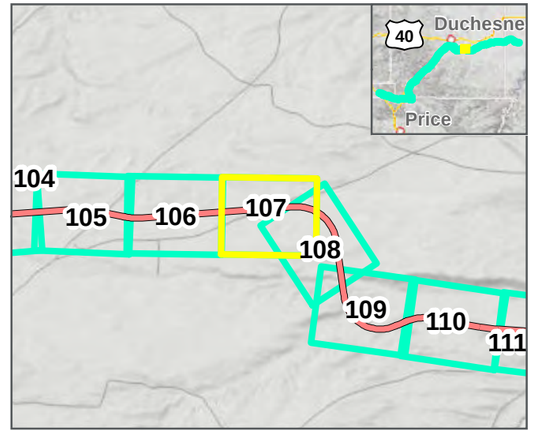

Photo Points
Mileposts
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Study Area
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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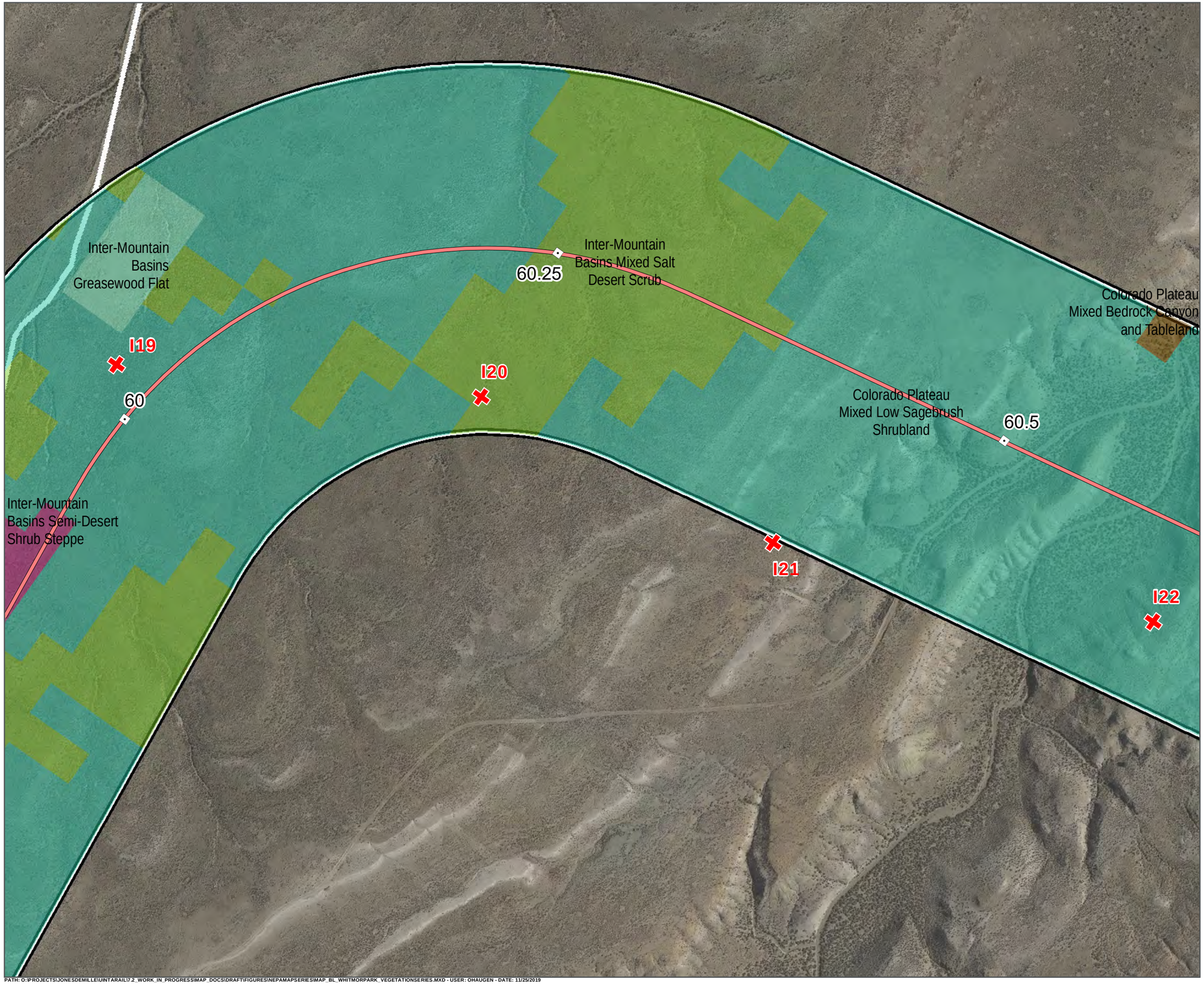

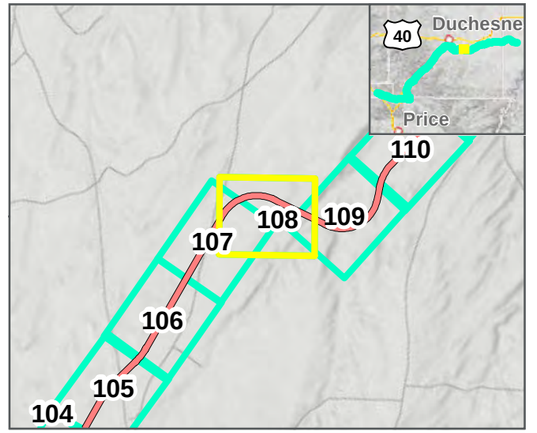

Photo Points

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Whitmore Park Centerline

Study Area

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

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SEPTEMBER 2019

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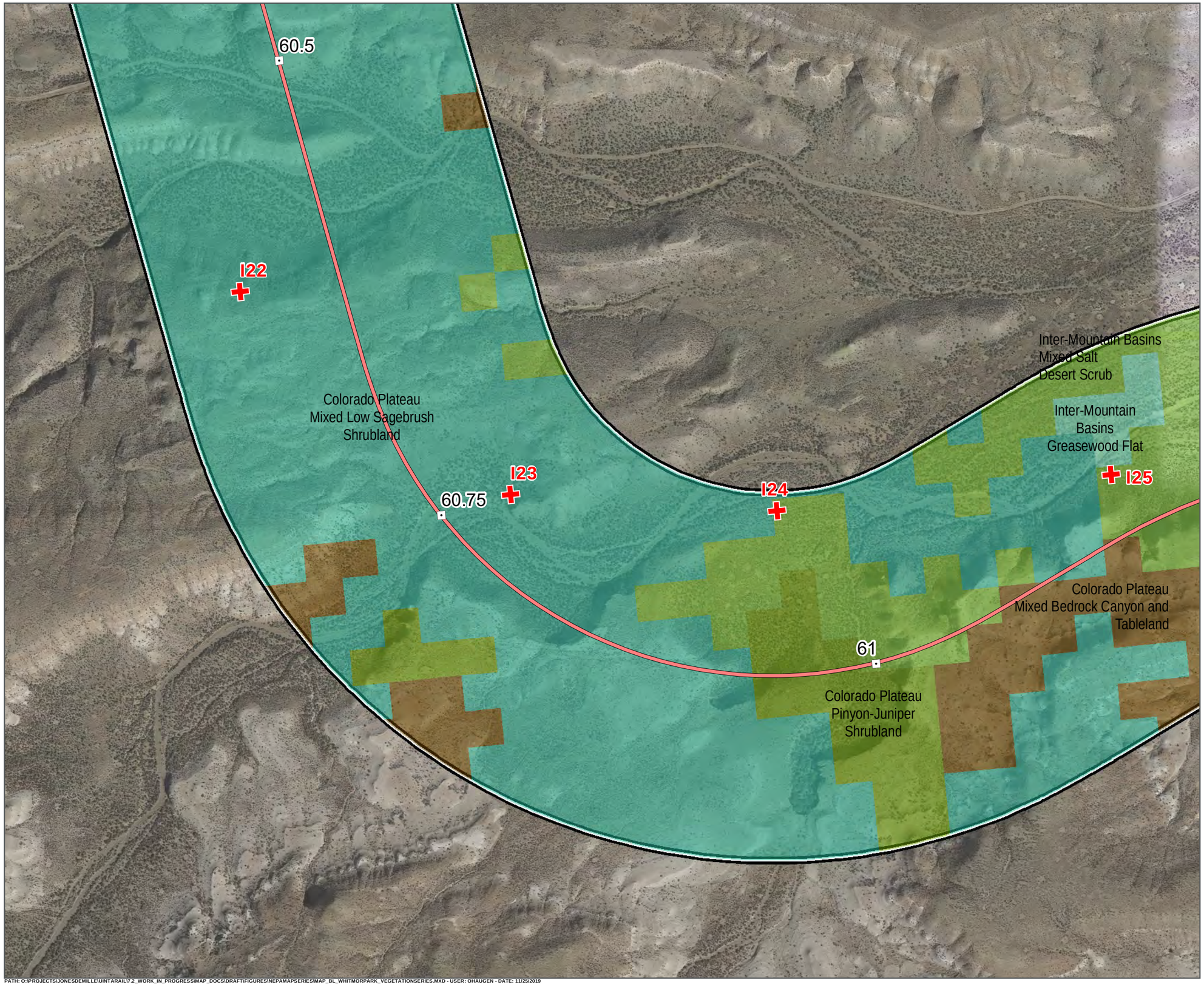

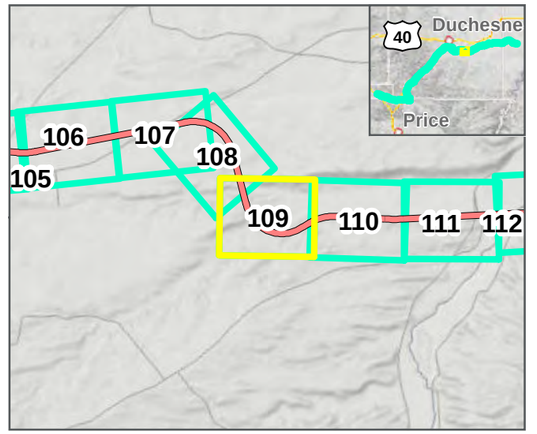

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Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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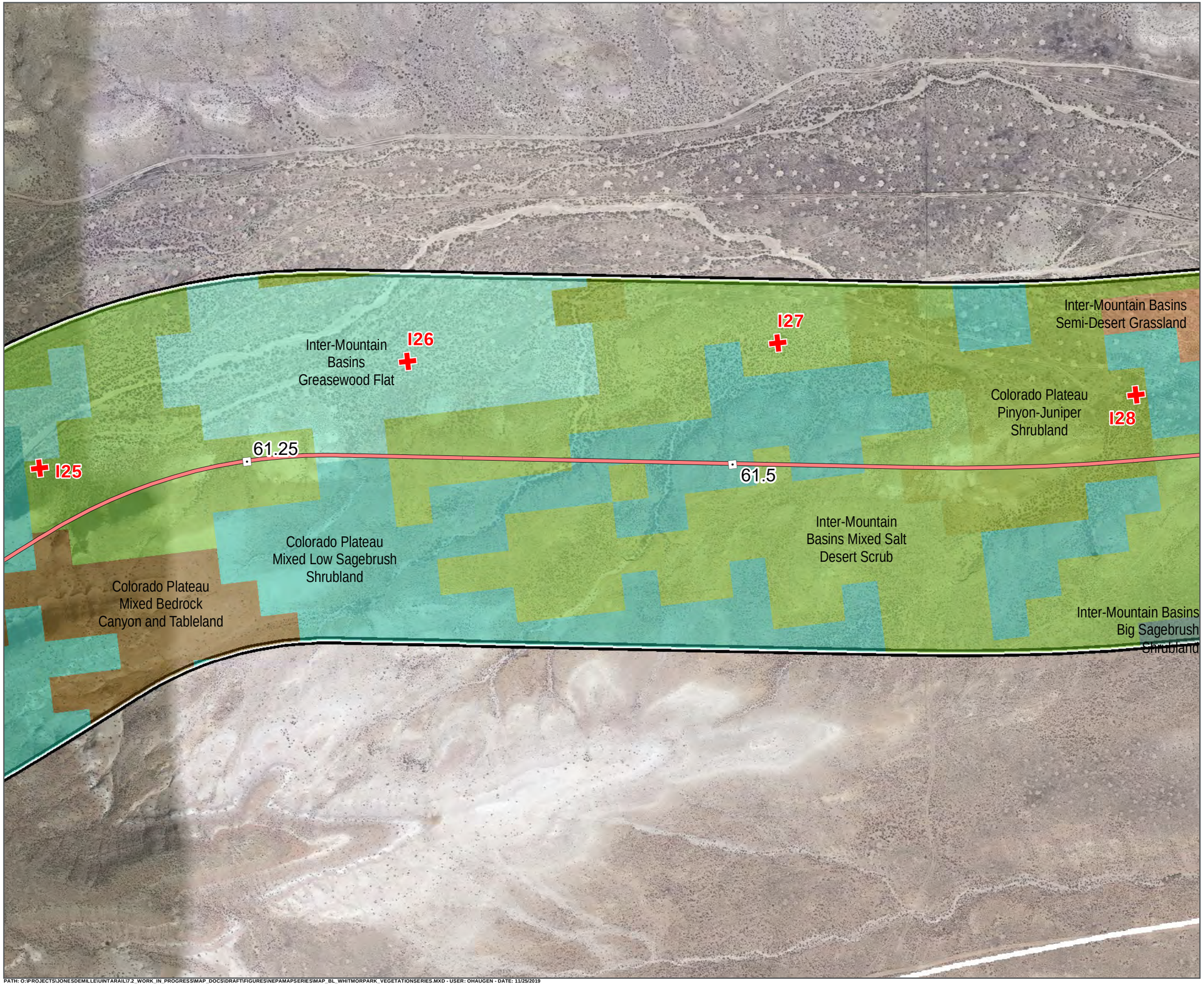

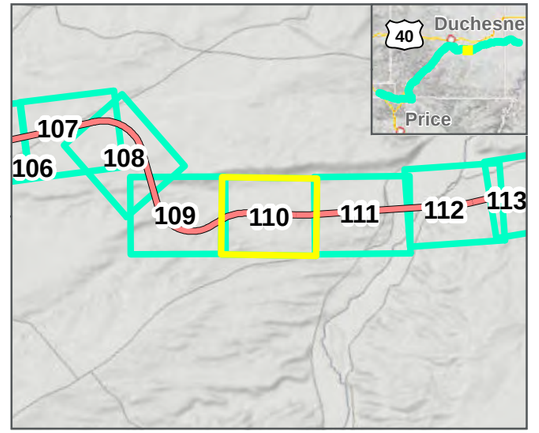

Photo Points
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Vegetation Communities

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VEGETATION COMMUNITIES
SEPTEMBER 2019

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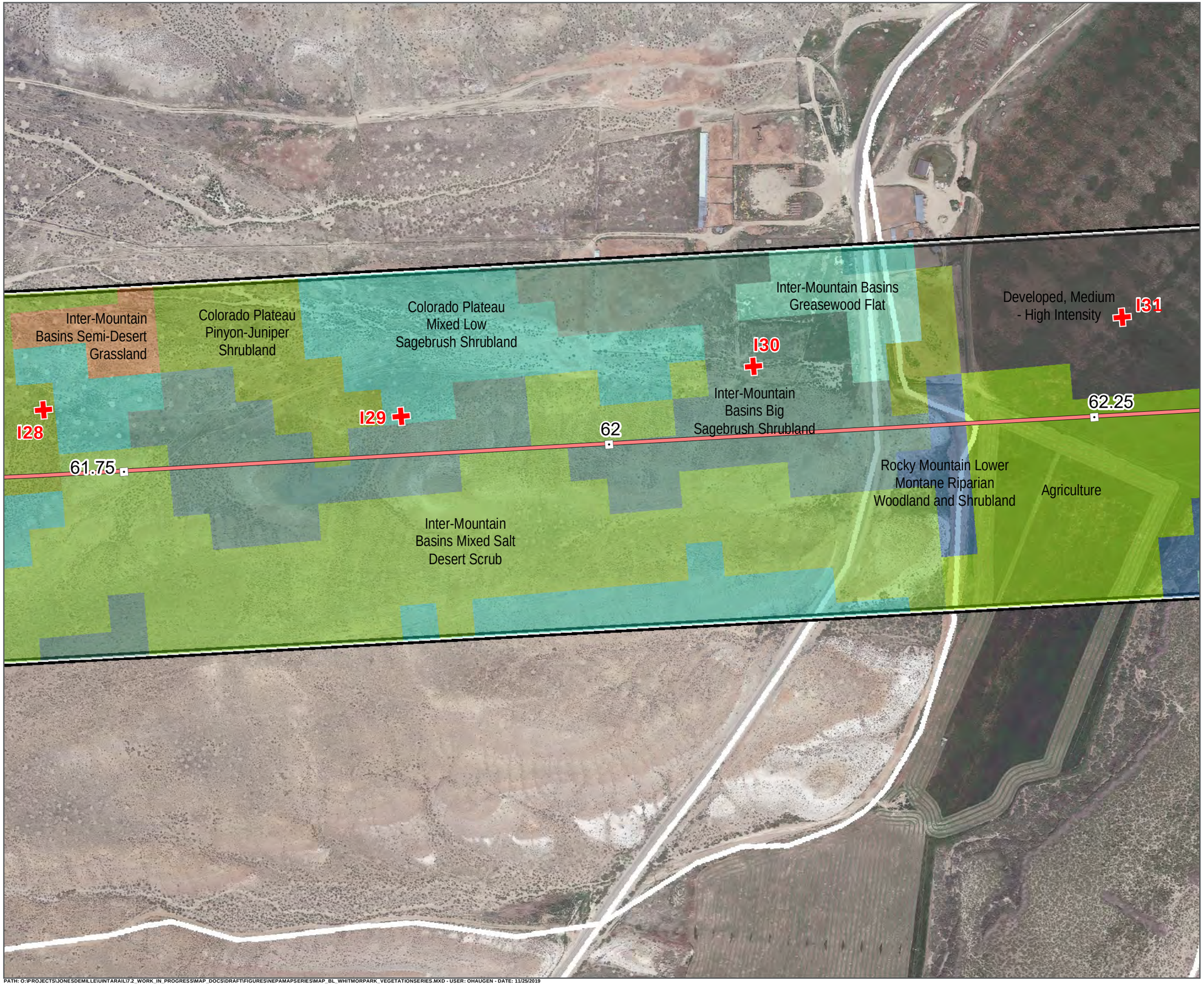

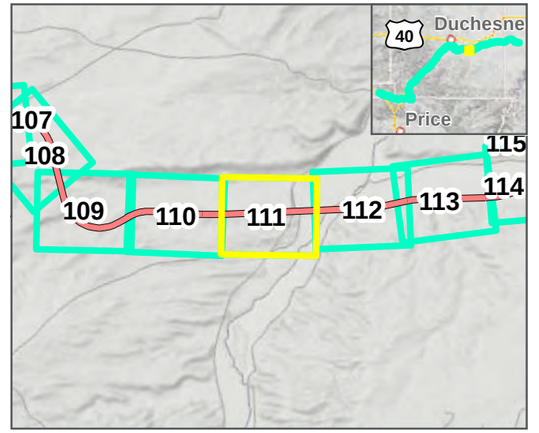

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Developed, Medium - High Intensity
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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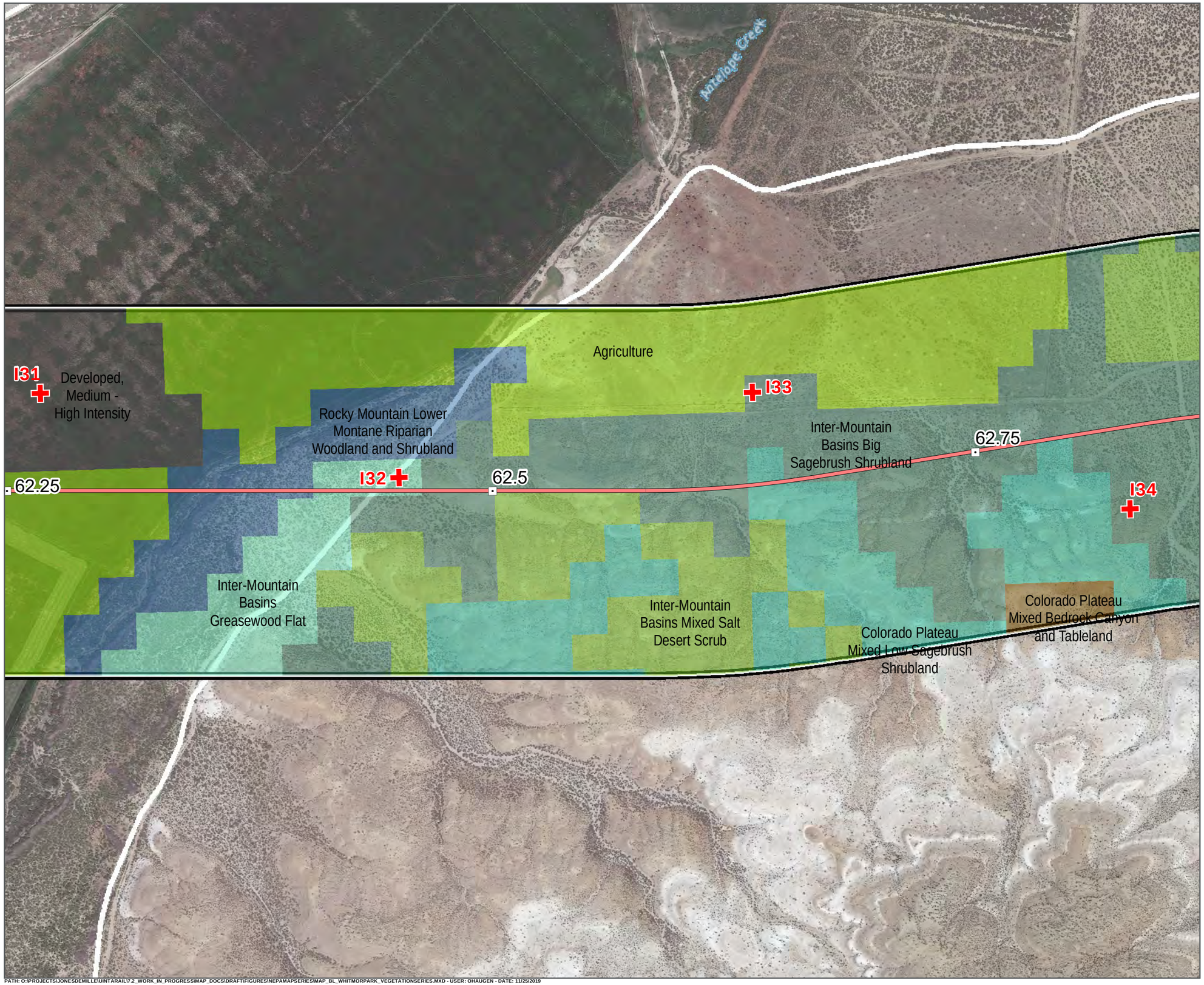

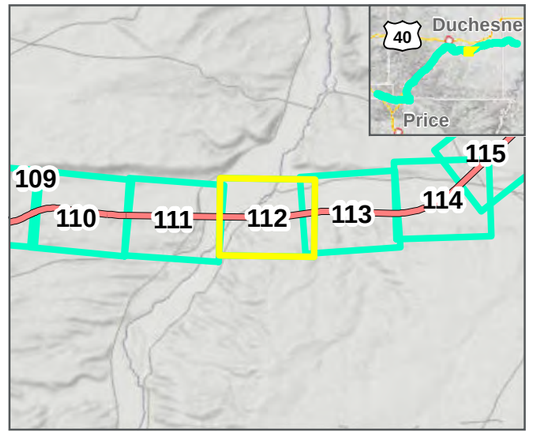

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

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SEPTEMBER 2019

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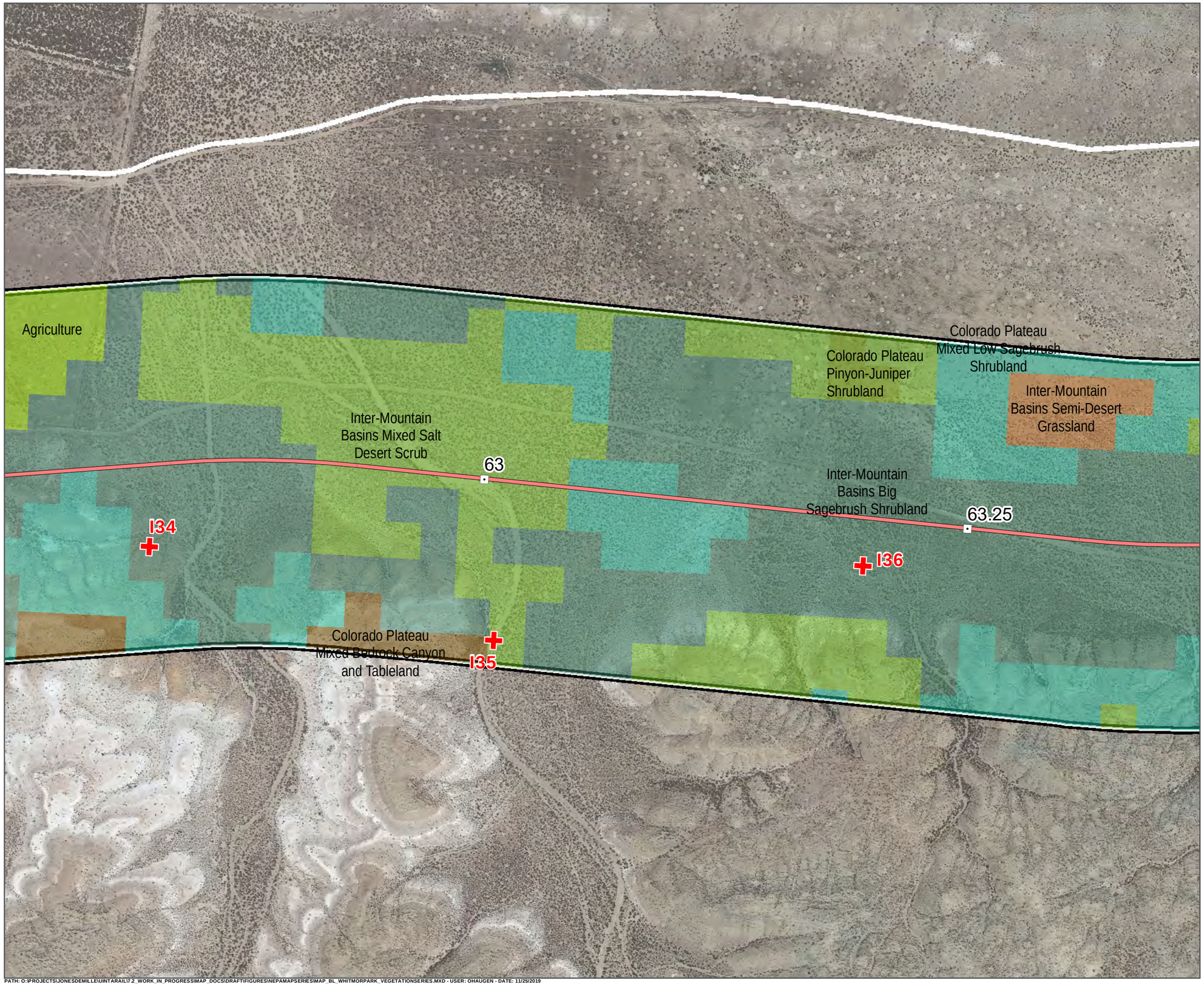

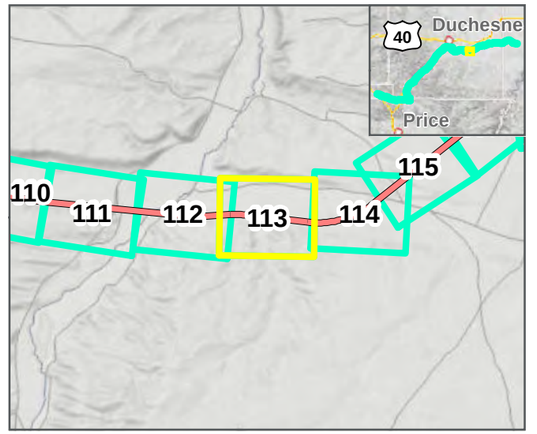

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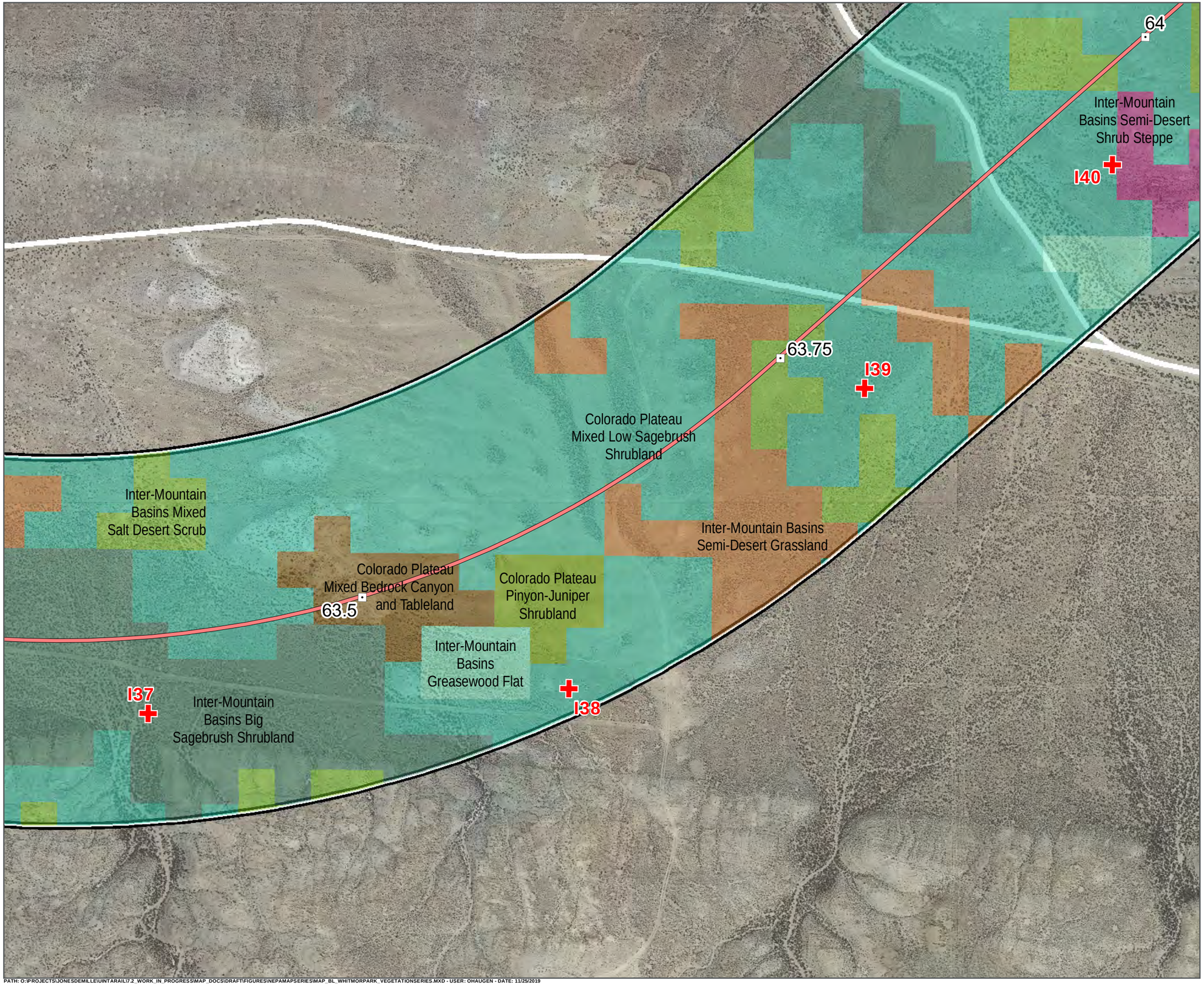

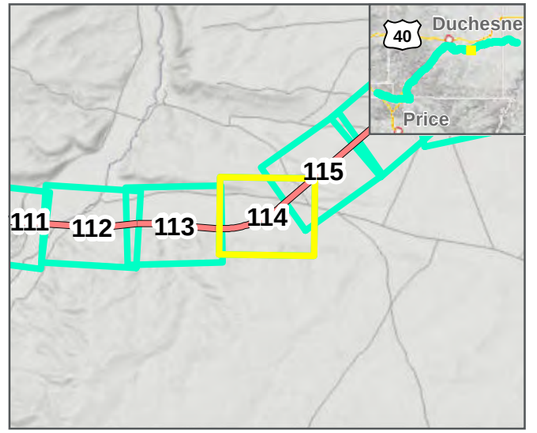

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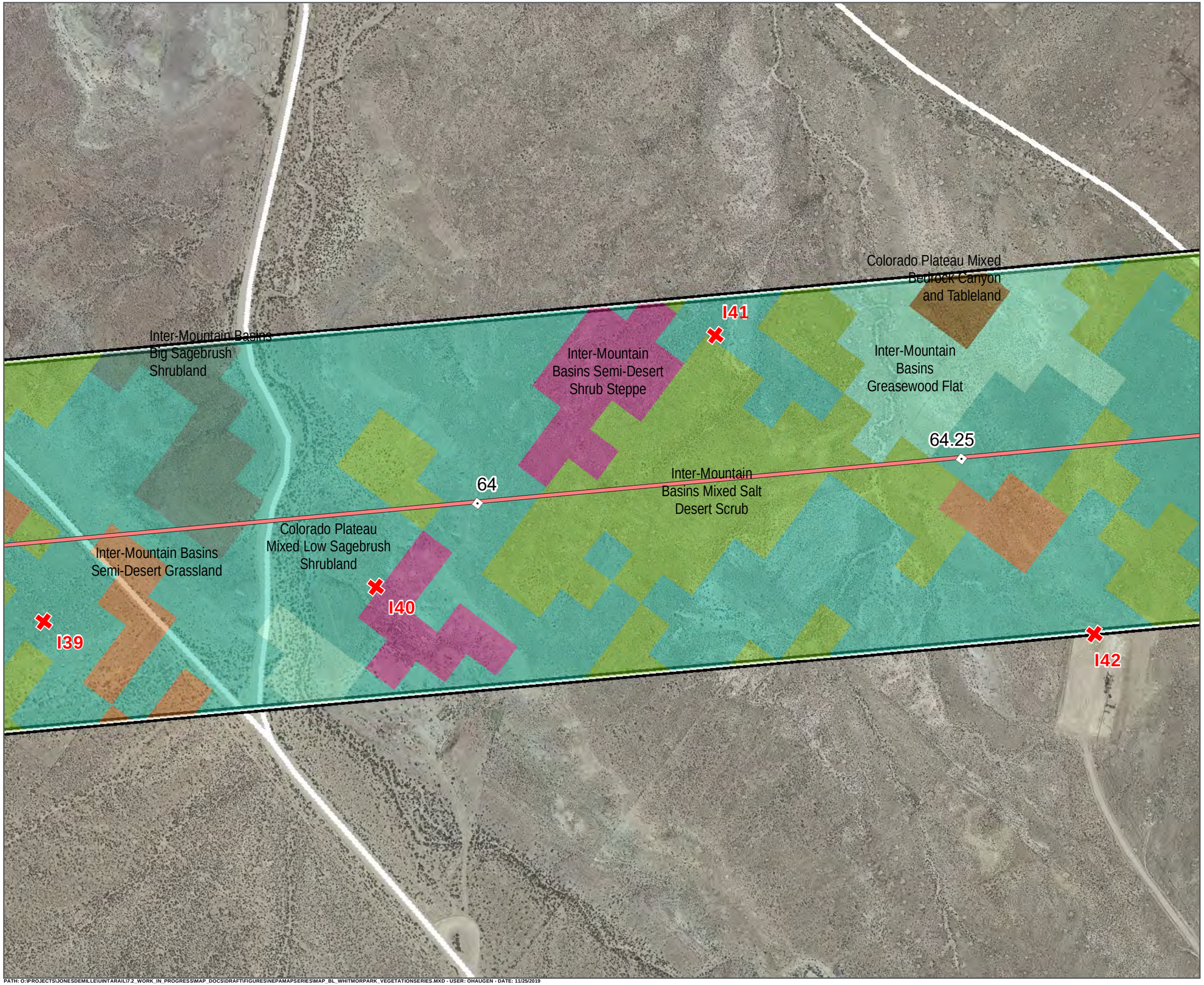

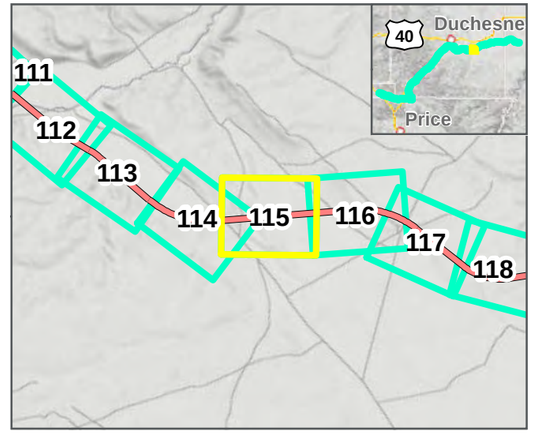

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub Steppe

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019

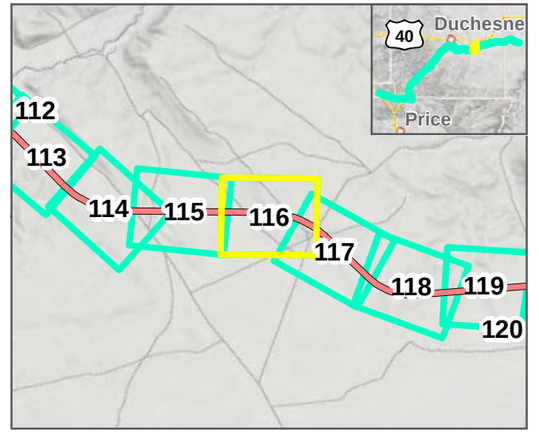

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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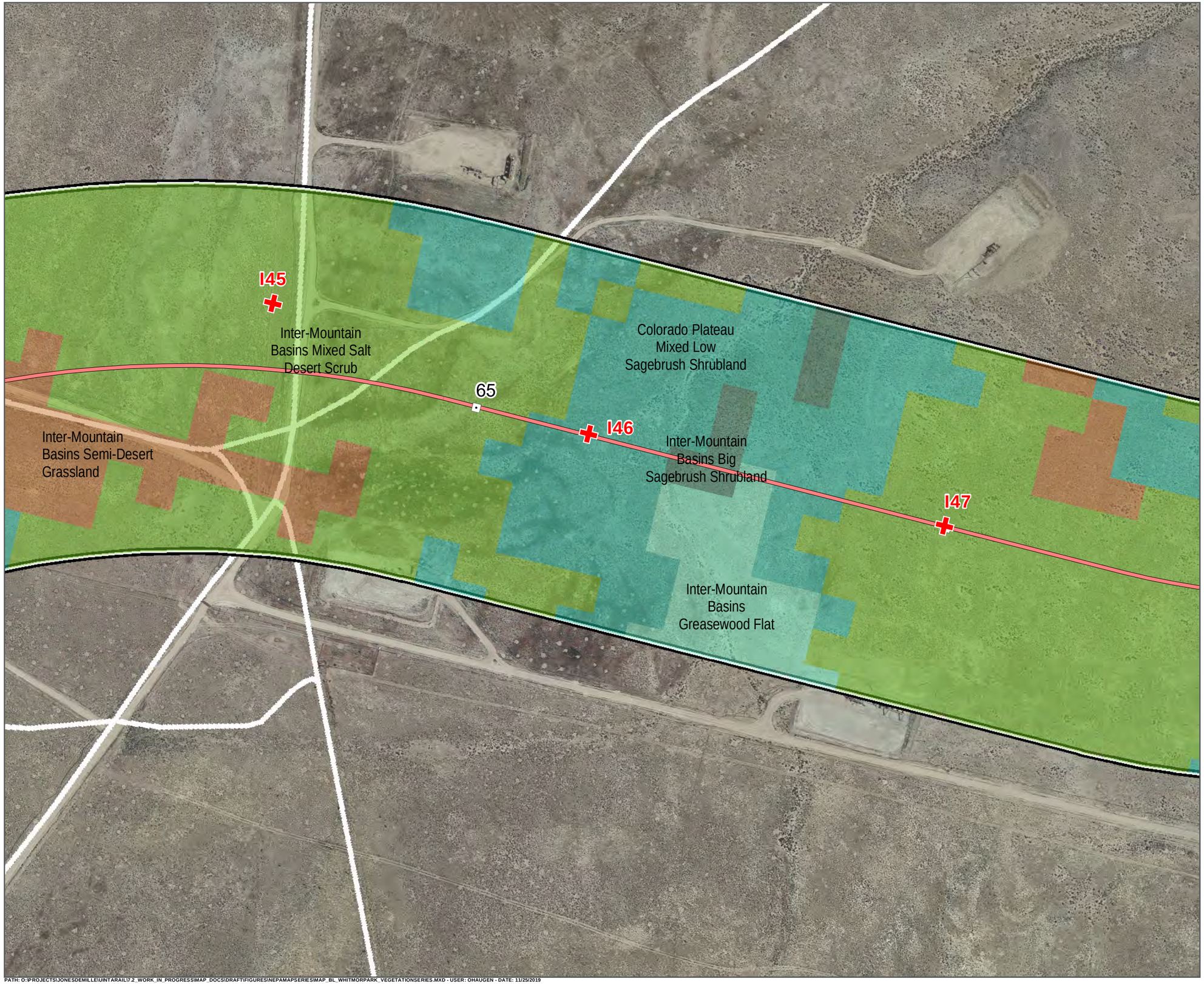

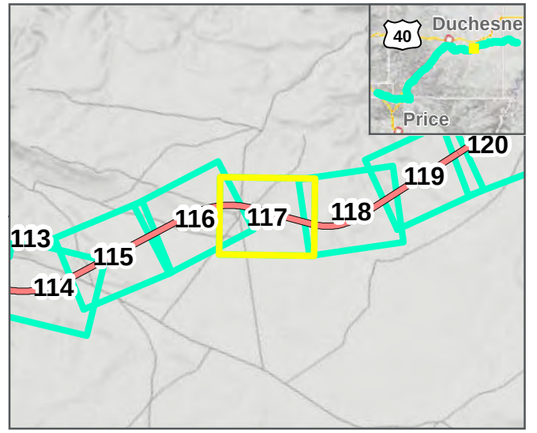

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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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COODINATE SYSTEM:
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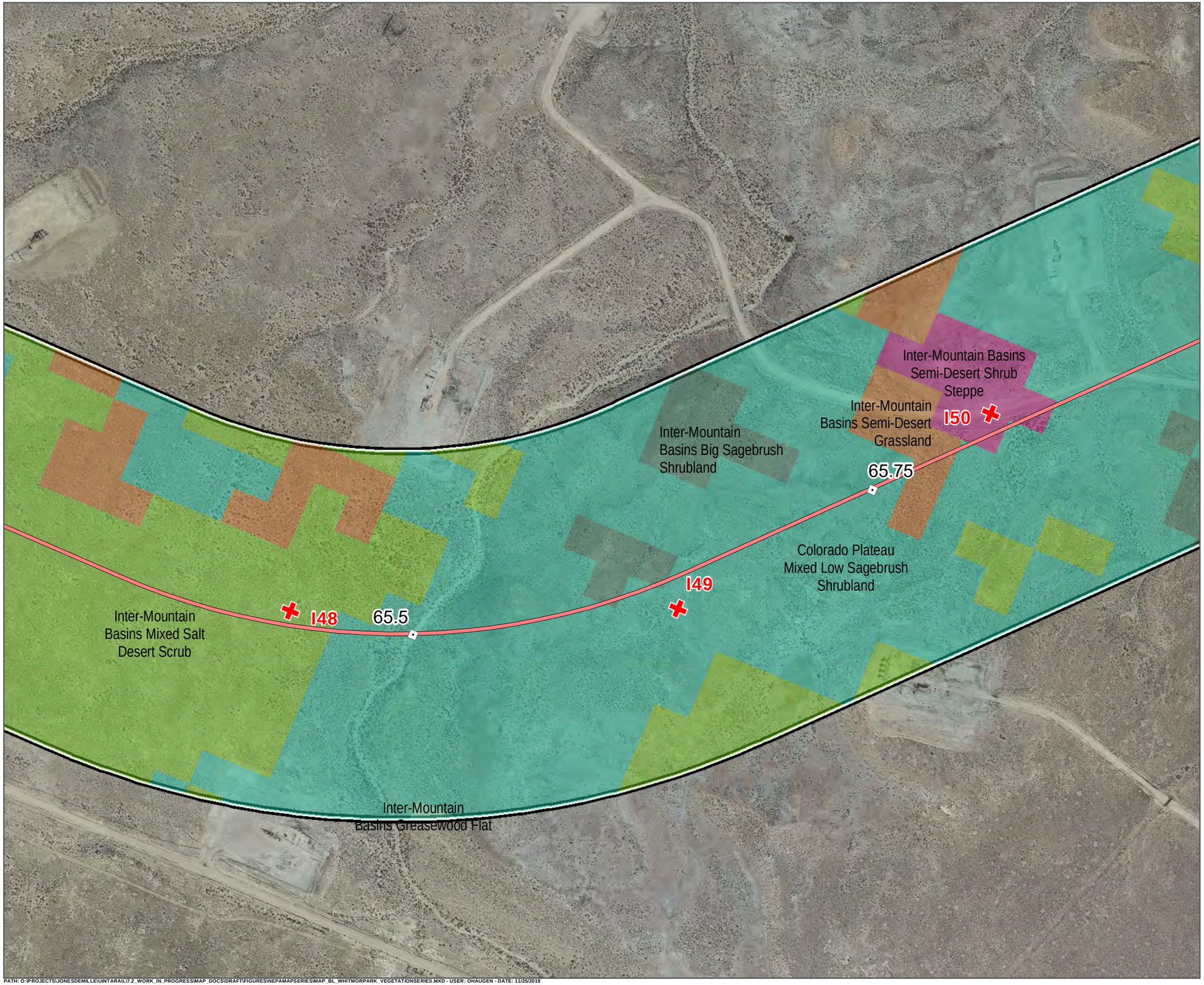

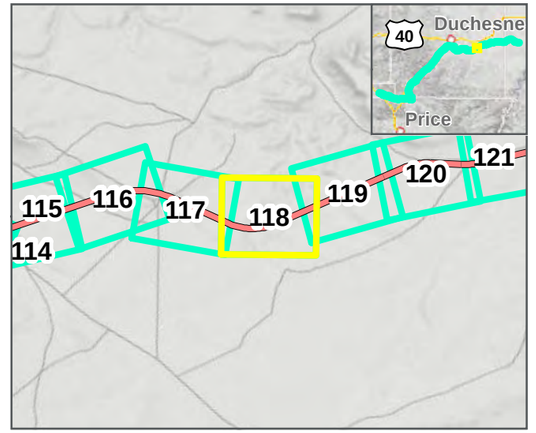

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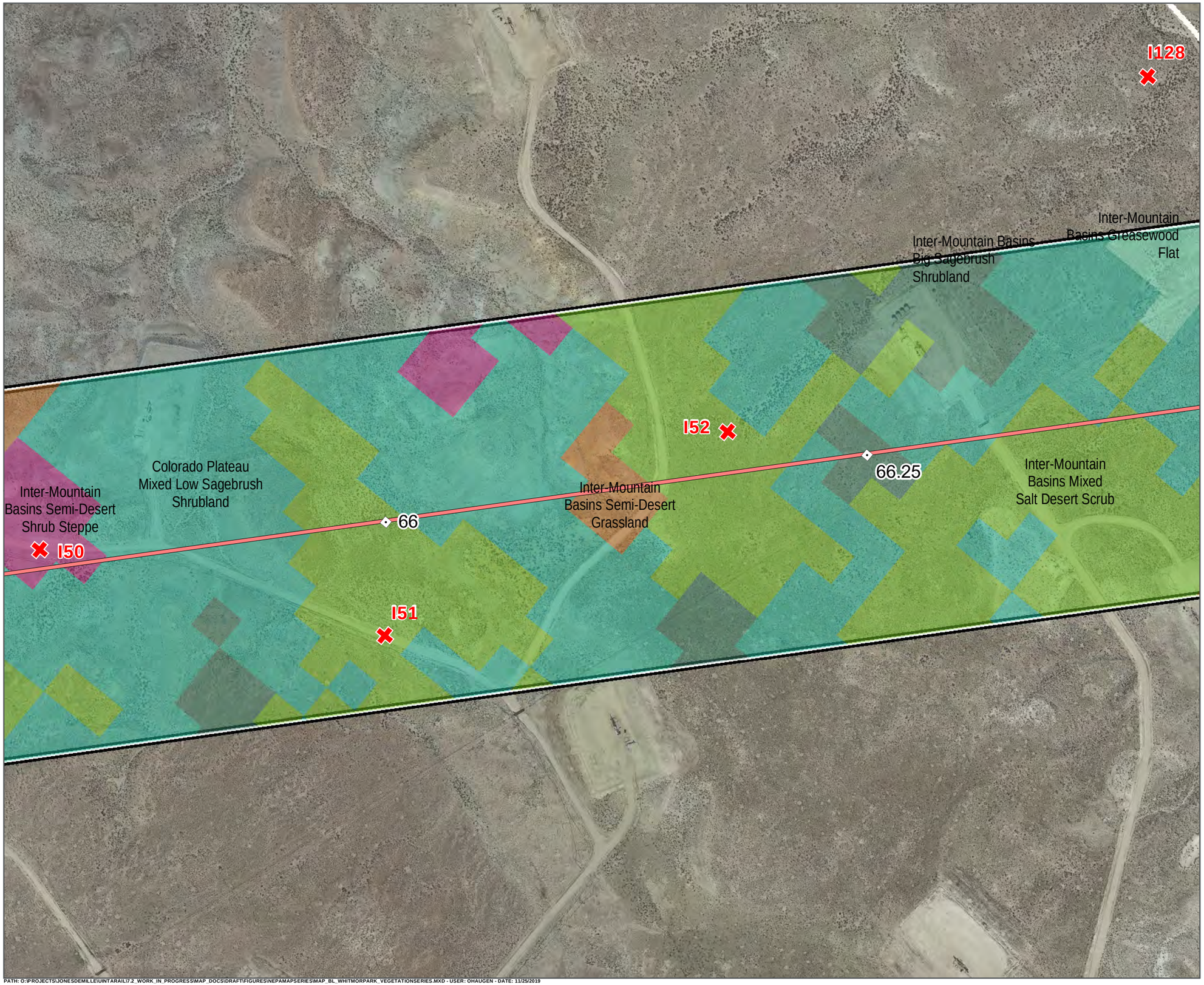

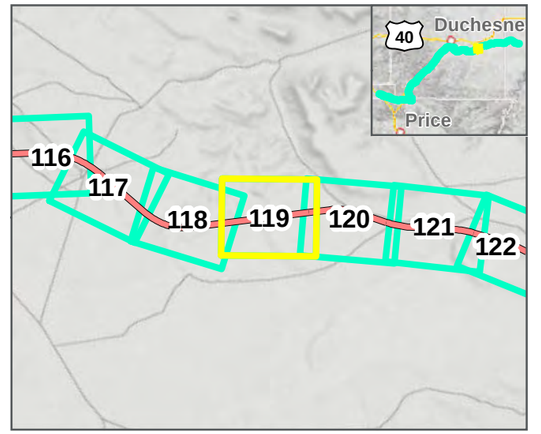

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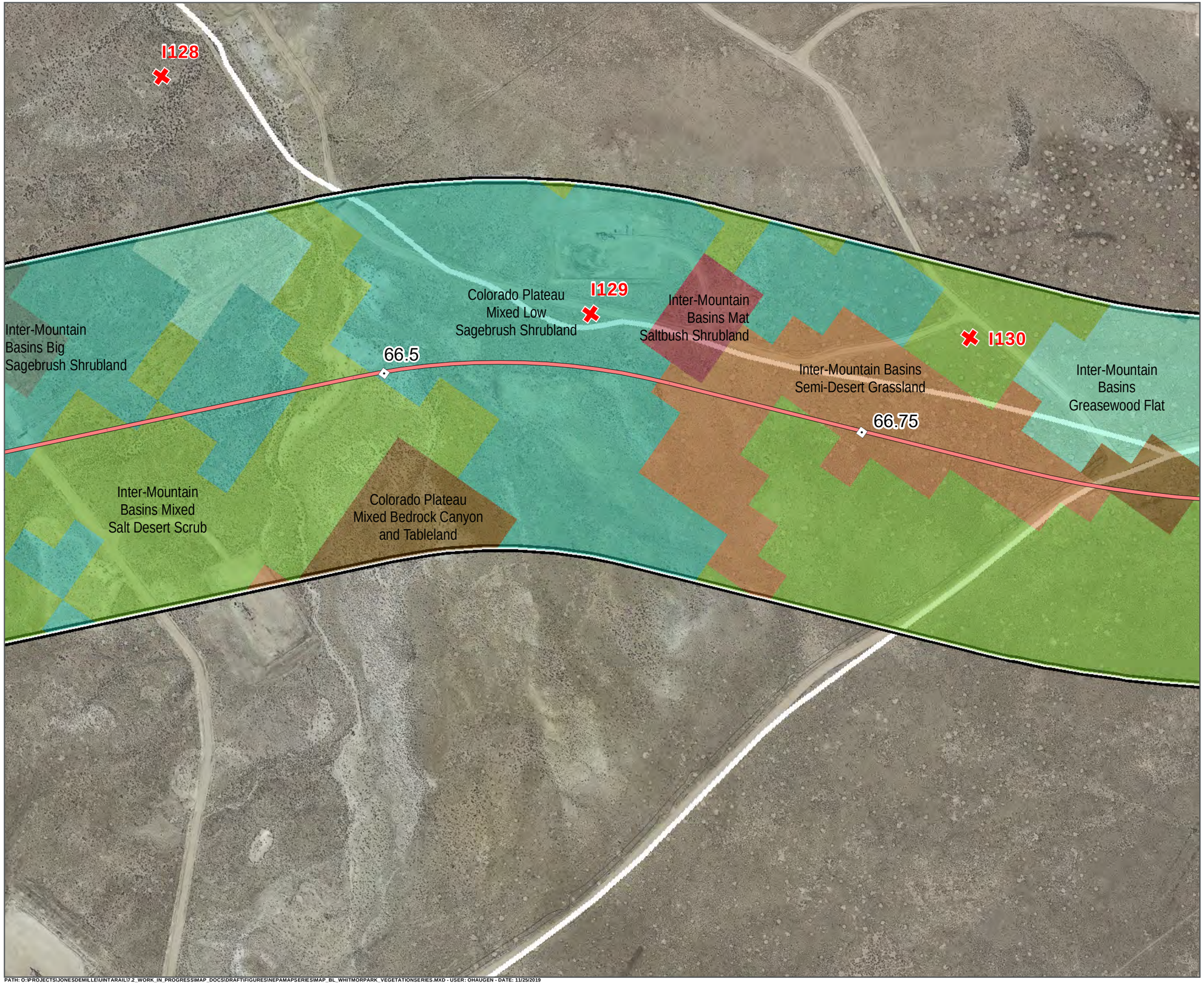

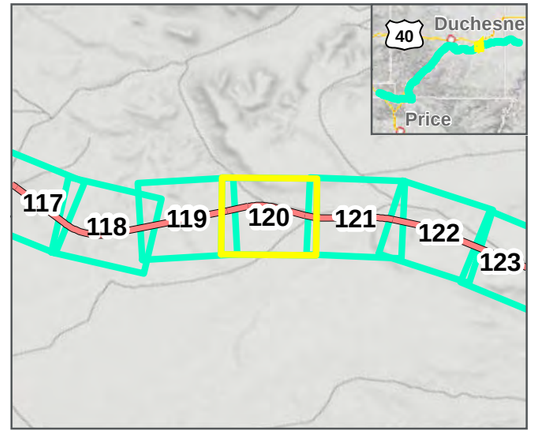

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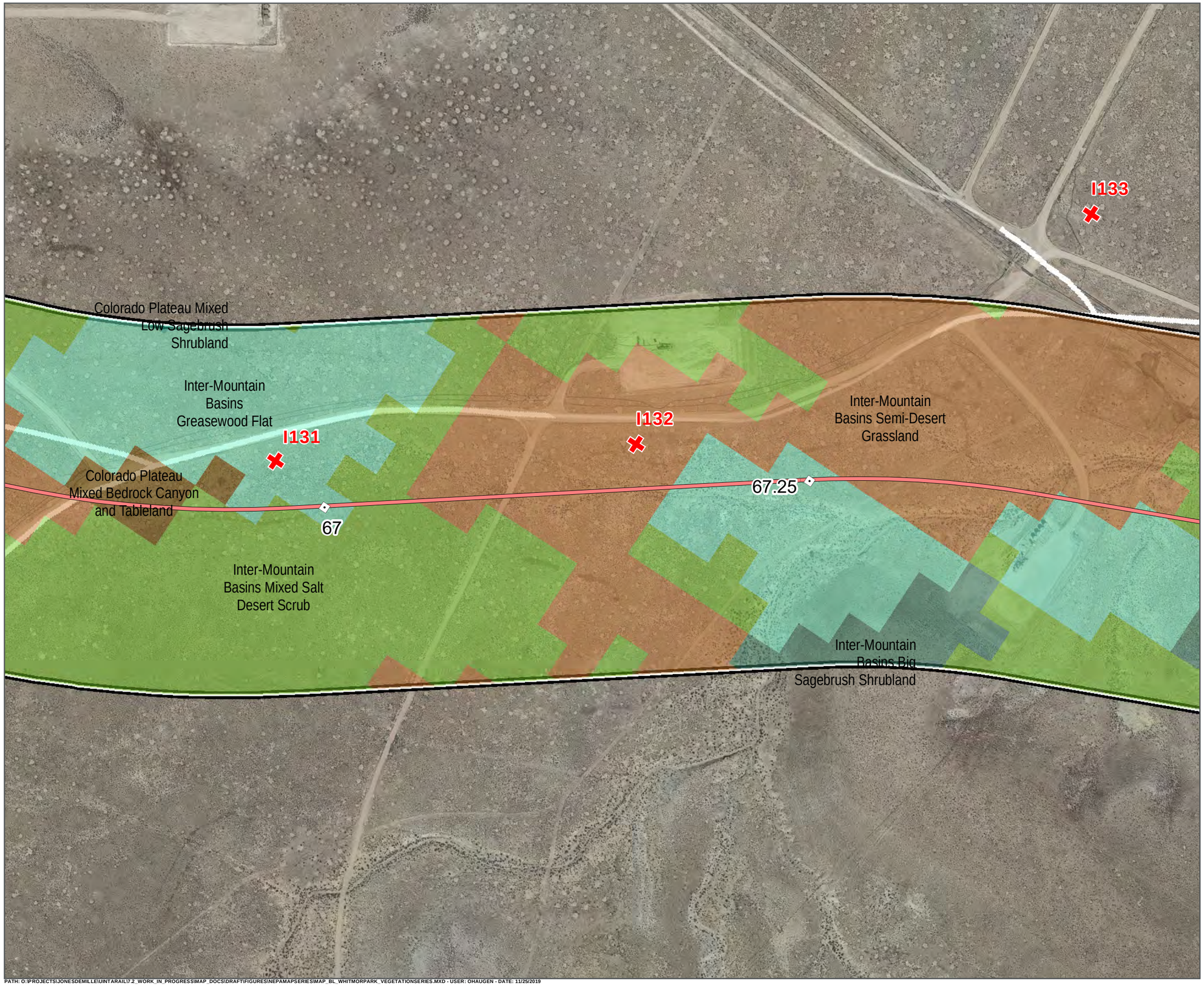

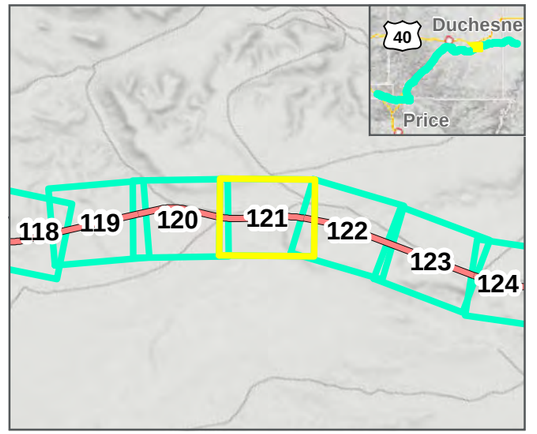

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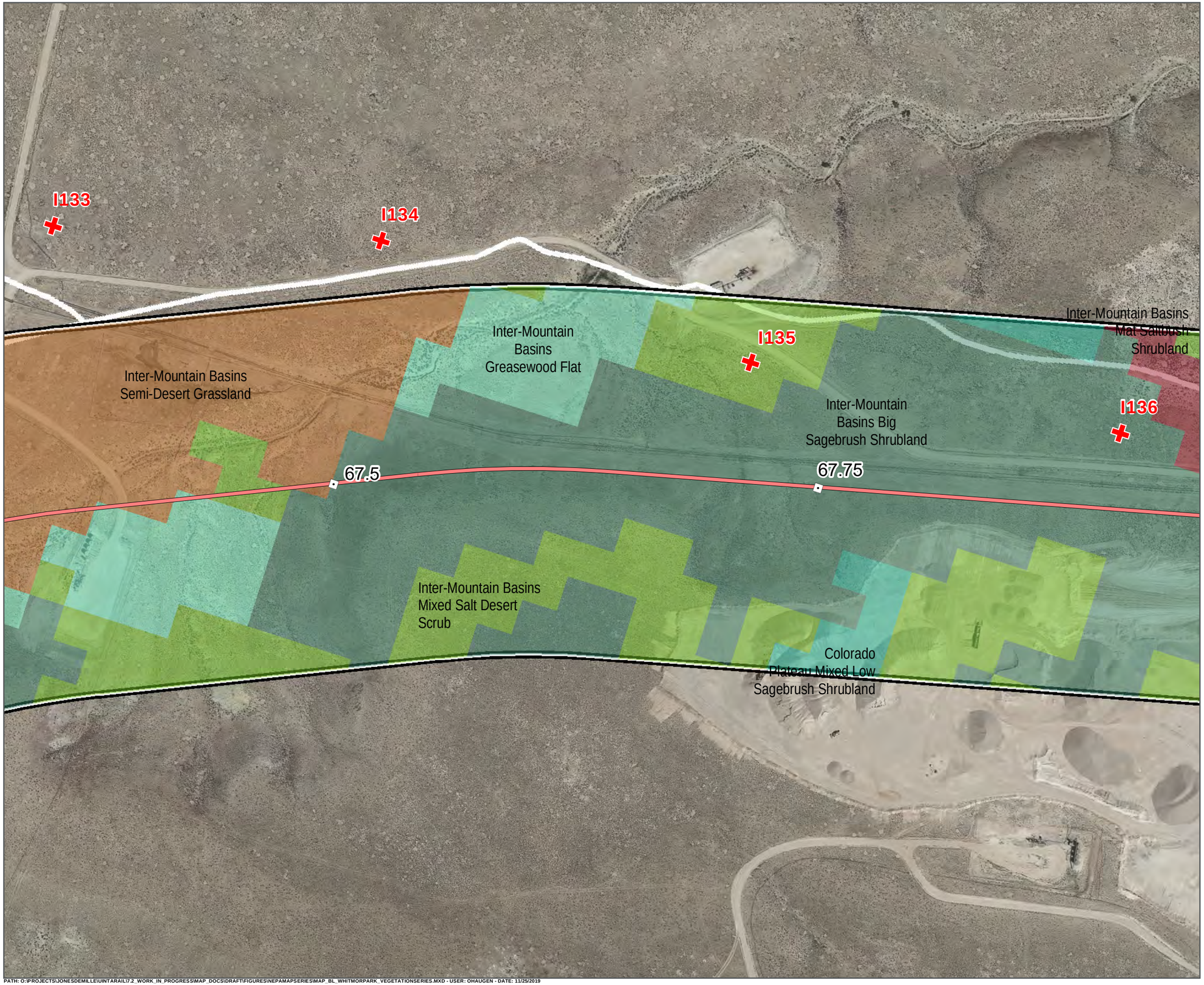

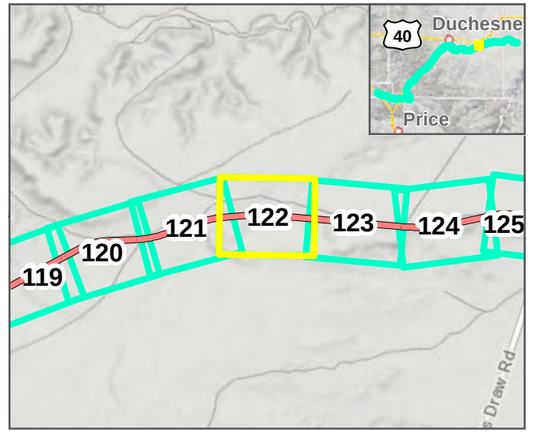

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Whitmore Park Centerline
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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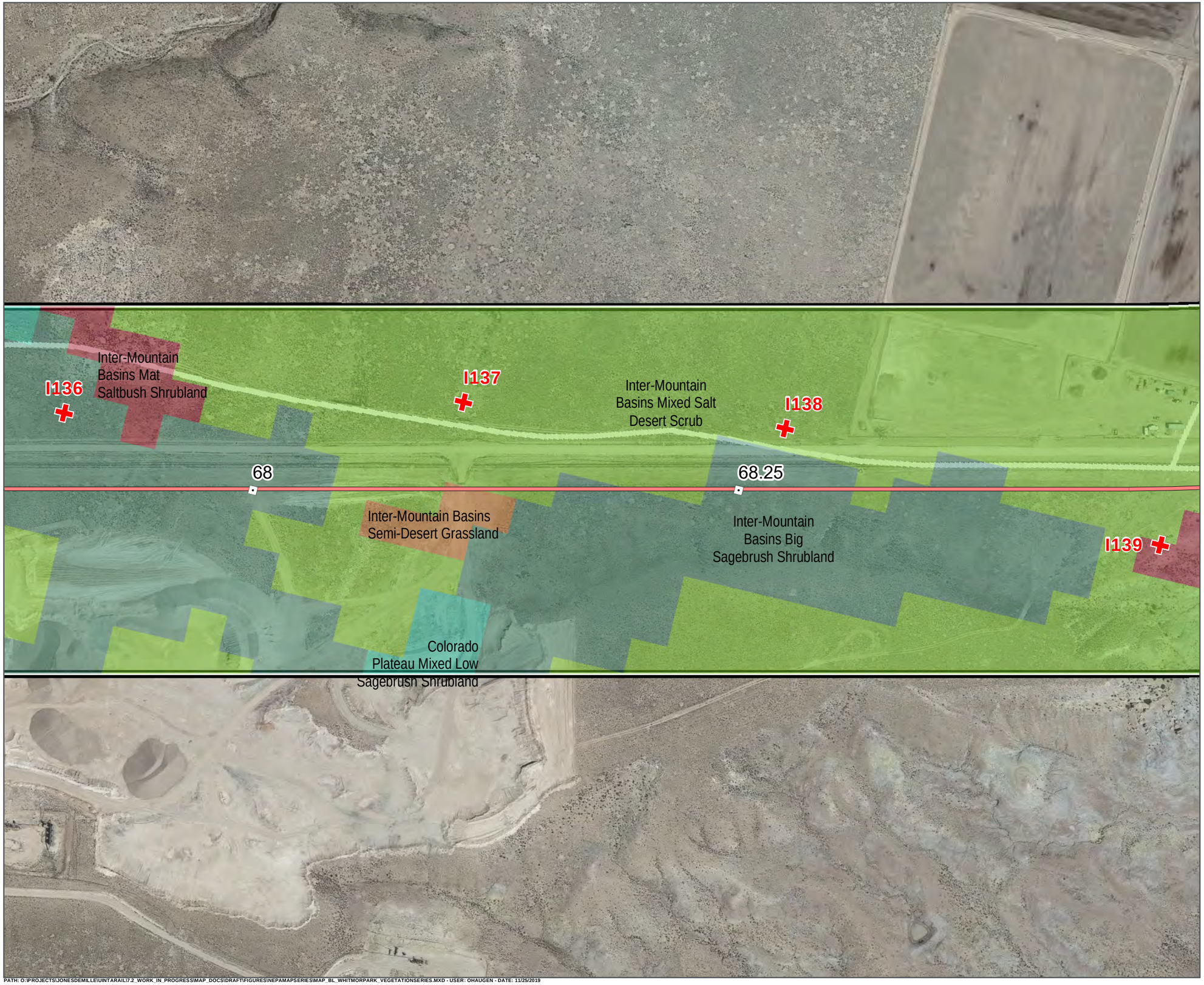

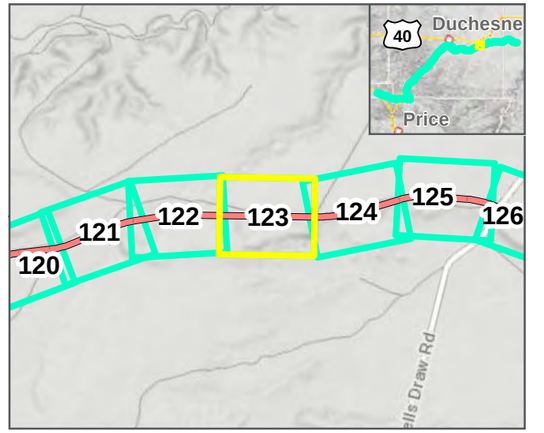

Photo Points

Mileposts

Whitmore Park Centerline

Study

Map Extent (current view in yellow)

Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
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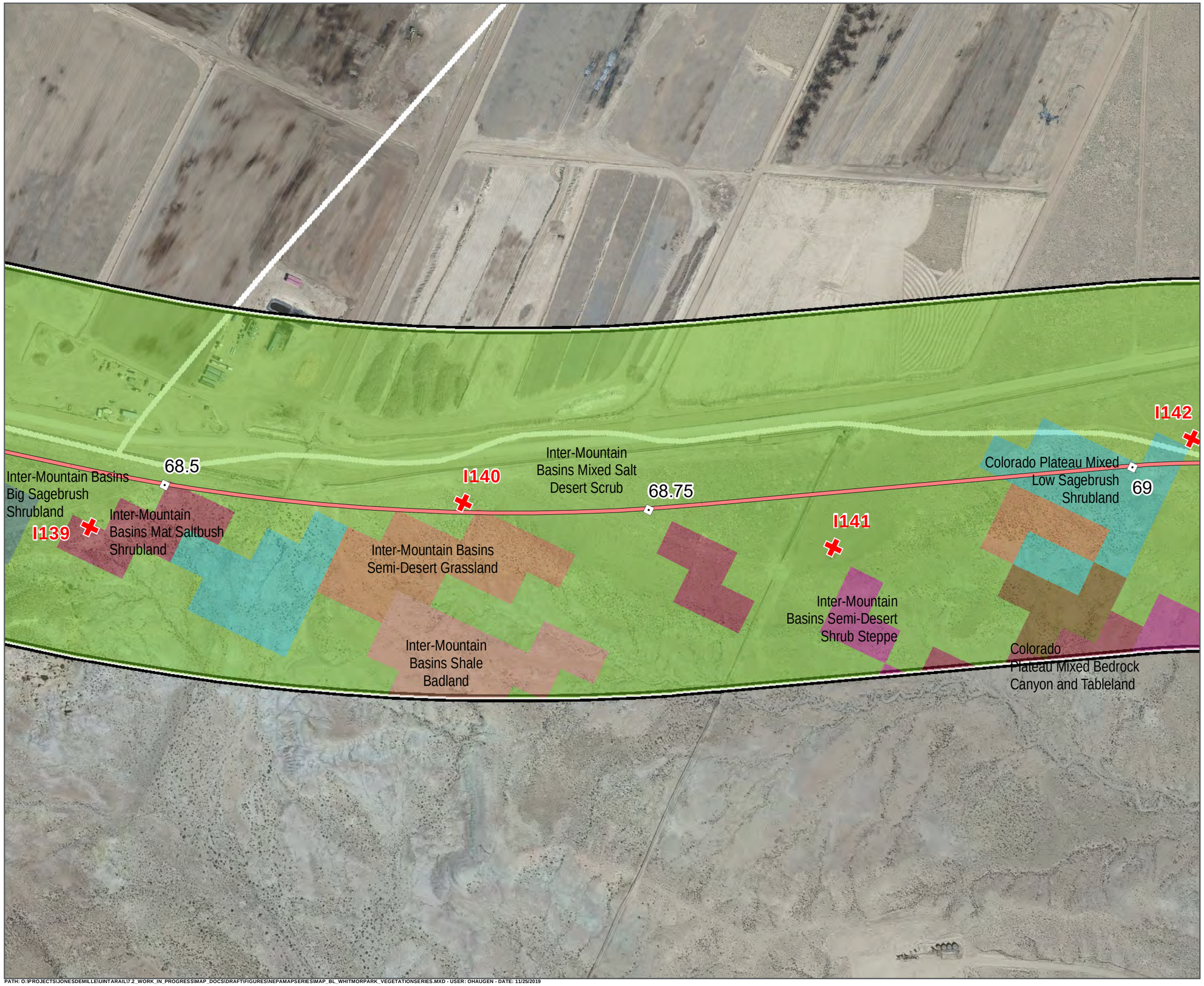

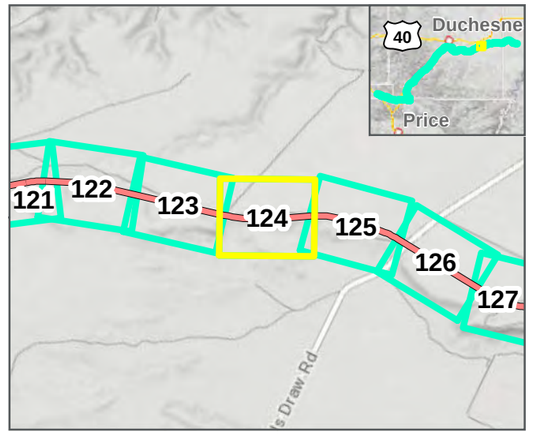

Photo Points
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Vegetation Communities

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- Inter-Mountain Basins Shale Badland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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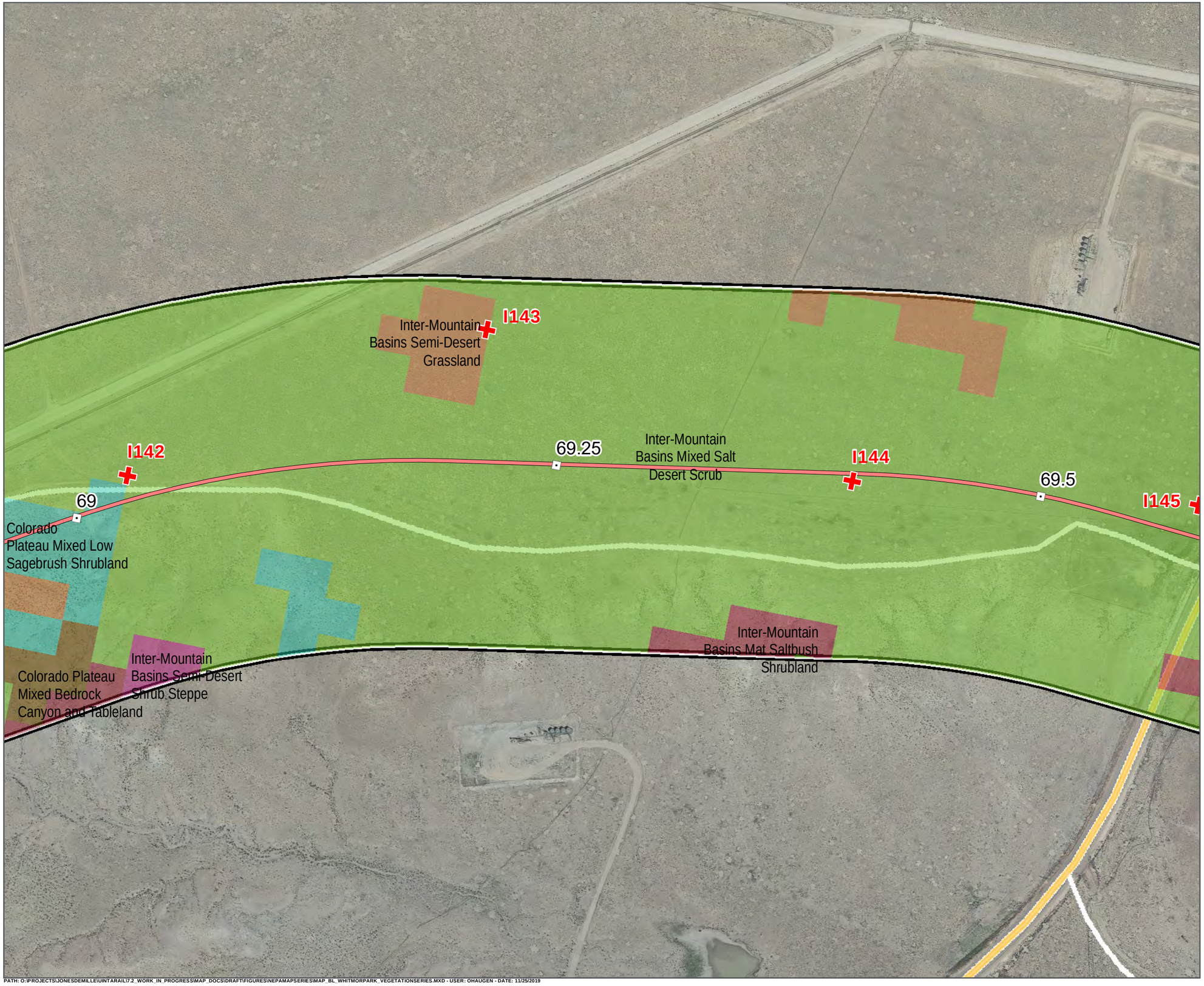

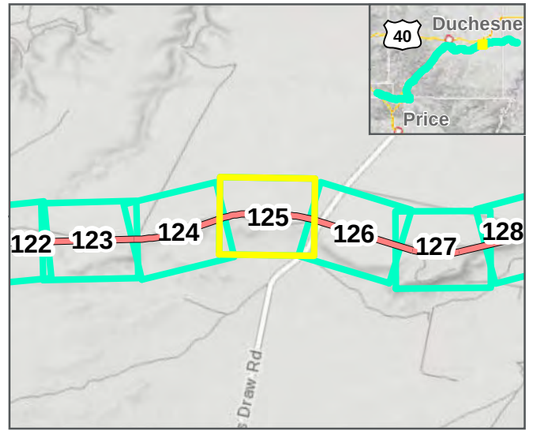

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I147

I145

I146

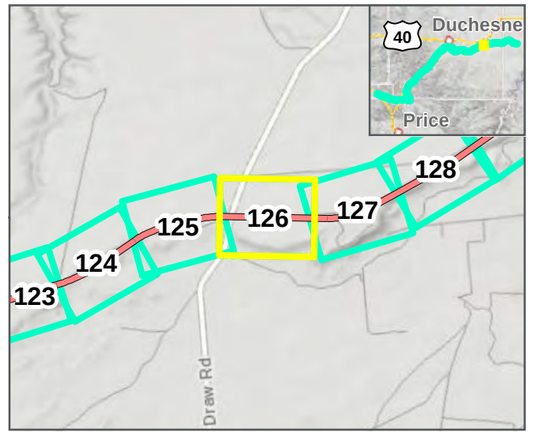
Inter-Mountain Basins Mixed Salt Desert Scrub

Inter-Mountain Basins Mat Saltbush Shrubland

Inter-Mountain Basins Big Sagebrush Shrubland

69.75

70



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Vegetation Communities

Inter-Mountain Basins Big Sagebrush Shrubland

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Inter-Mountain Basins Mixed Salt Desert Scrub

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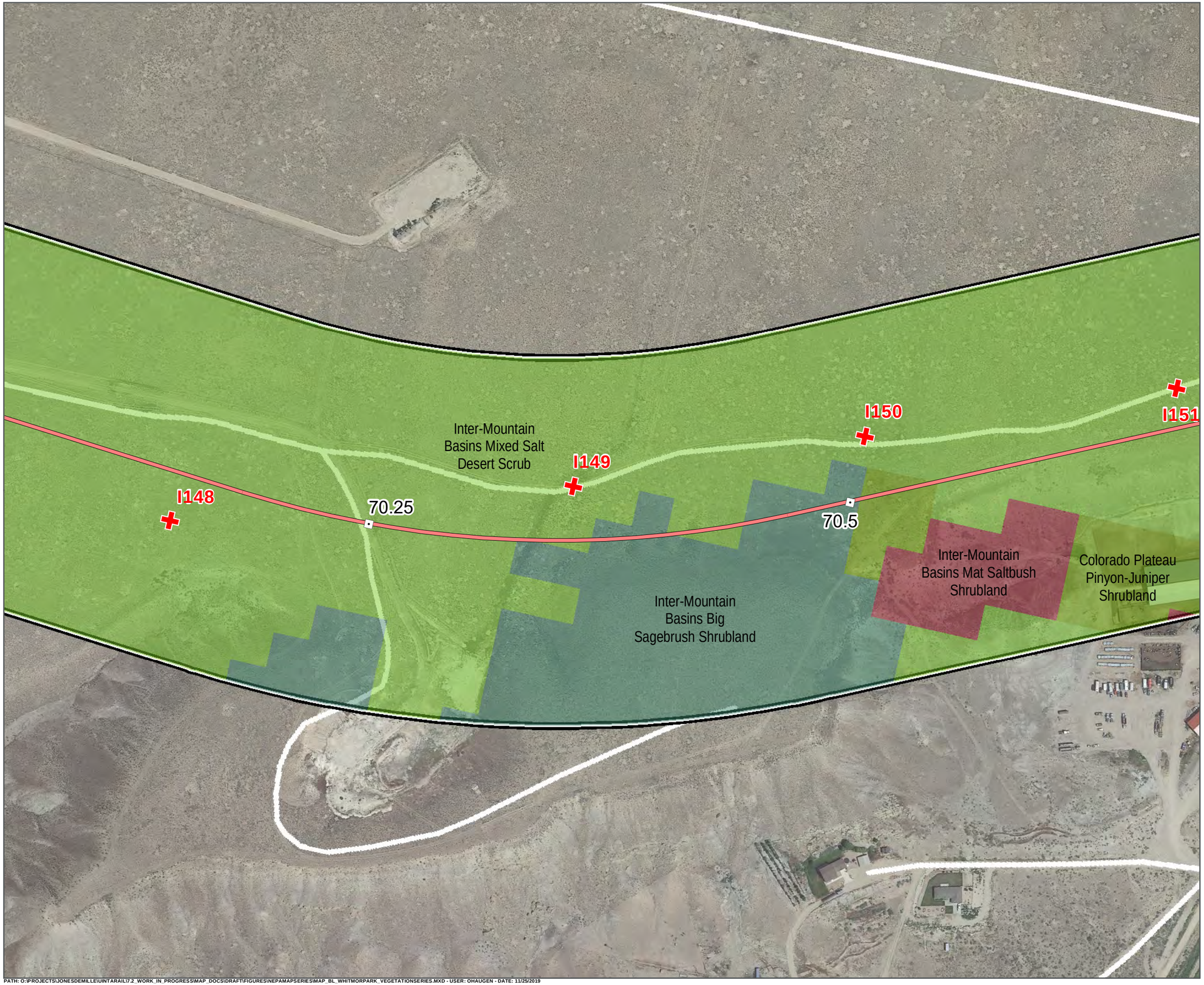

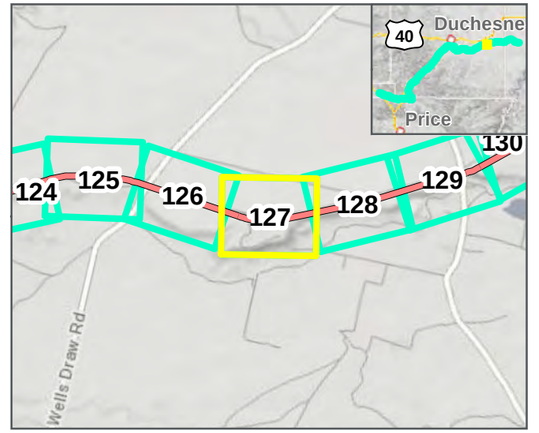

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Vegetation Communities

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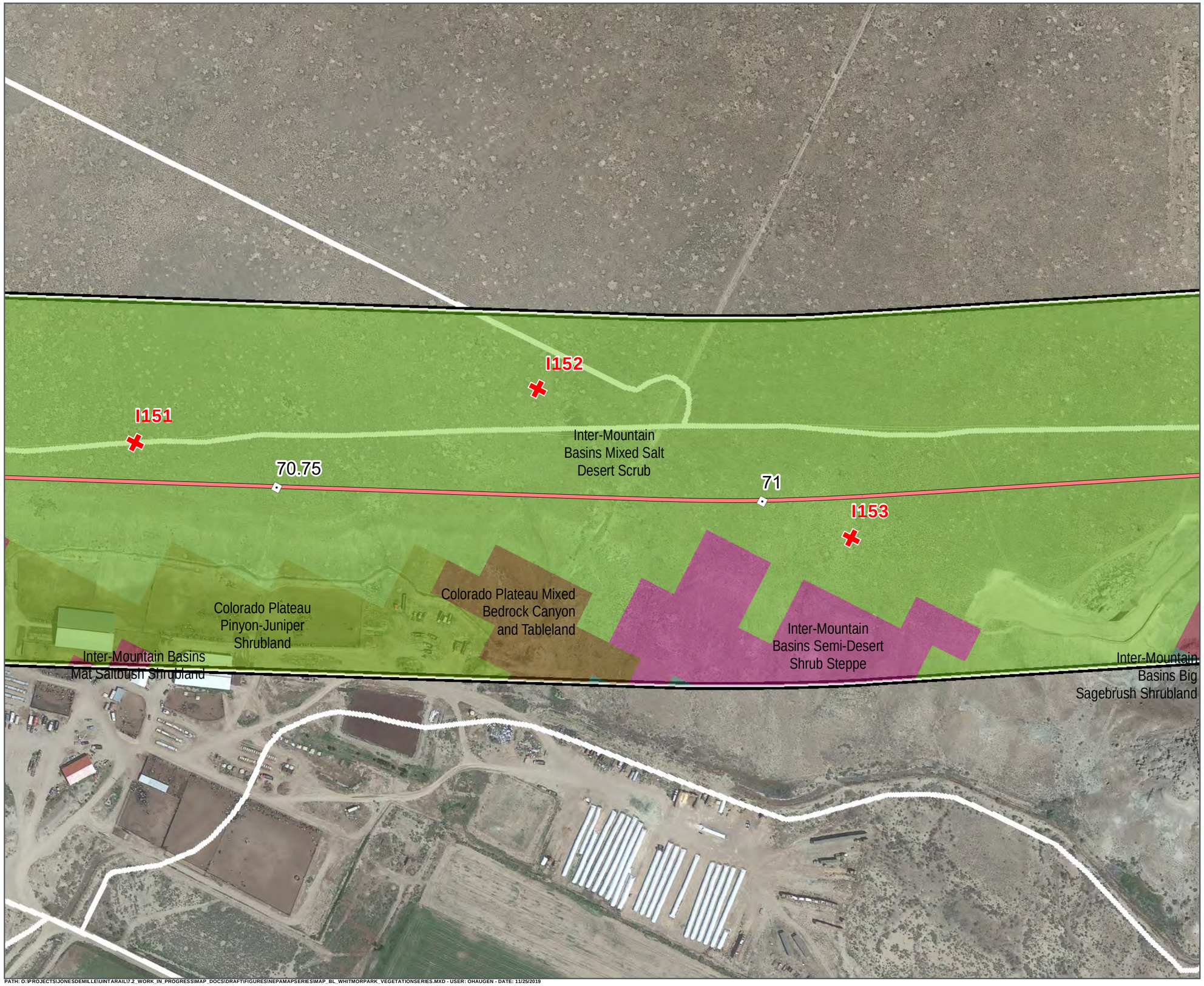

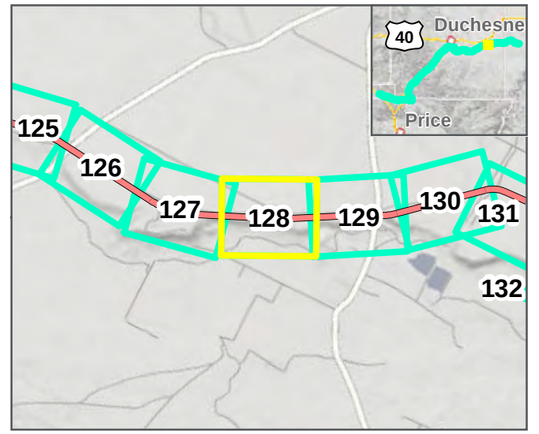

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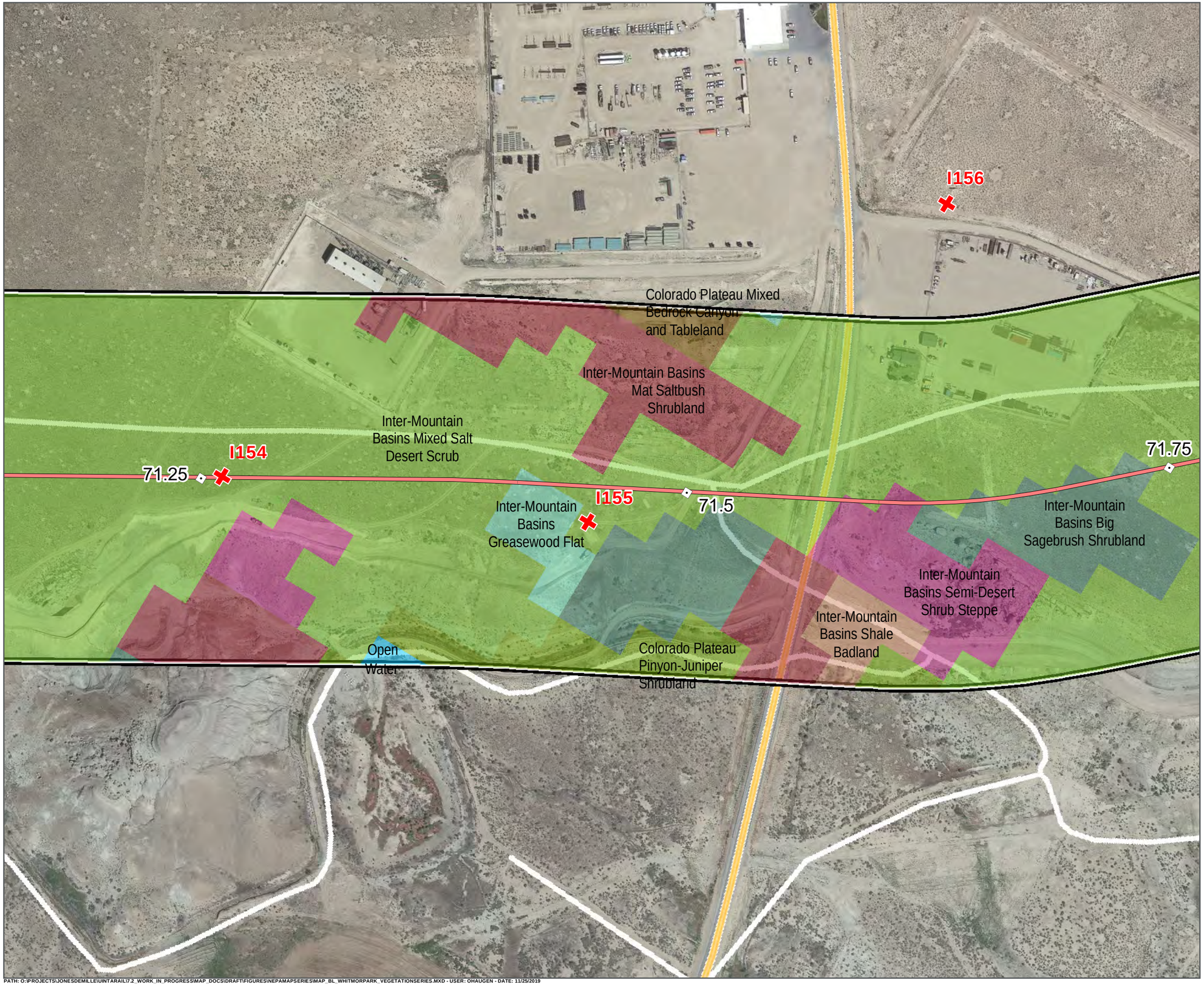
VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



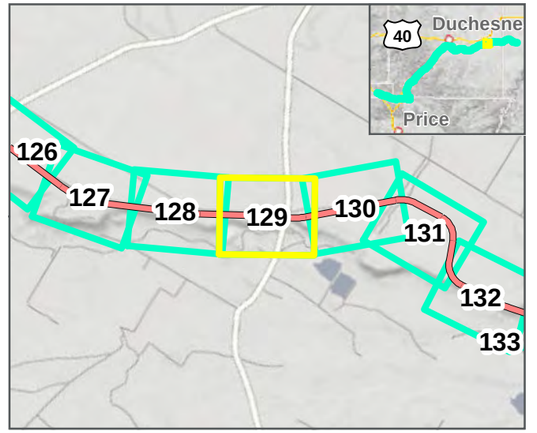


Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Inter-Mountain Basins Shale Badland
- Open Water

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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1 inch = 250 Feet

DATA SOURCES:
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Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

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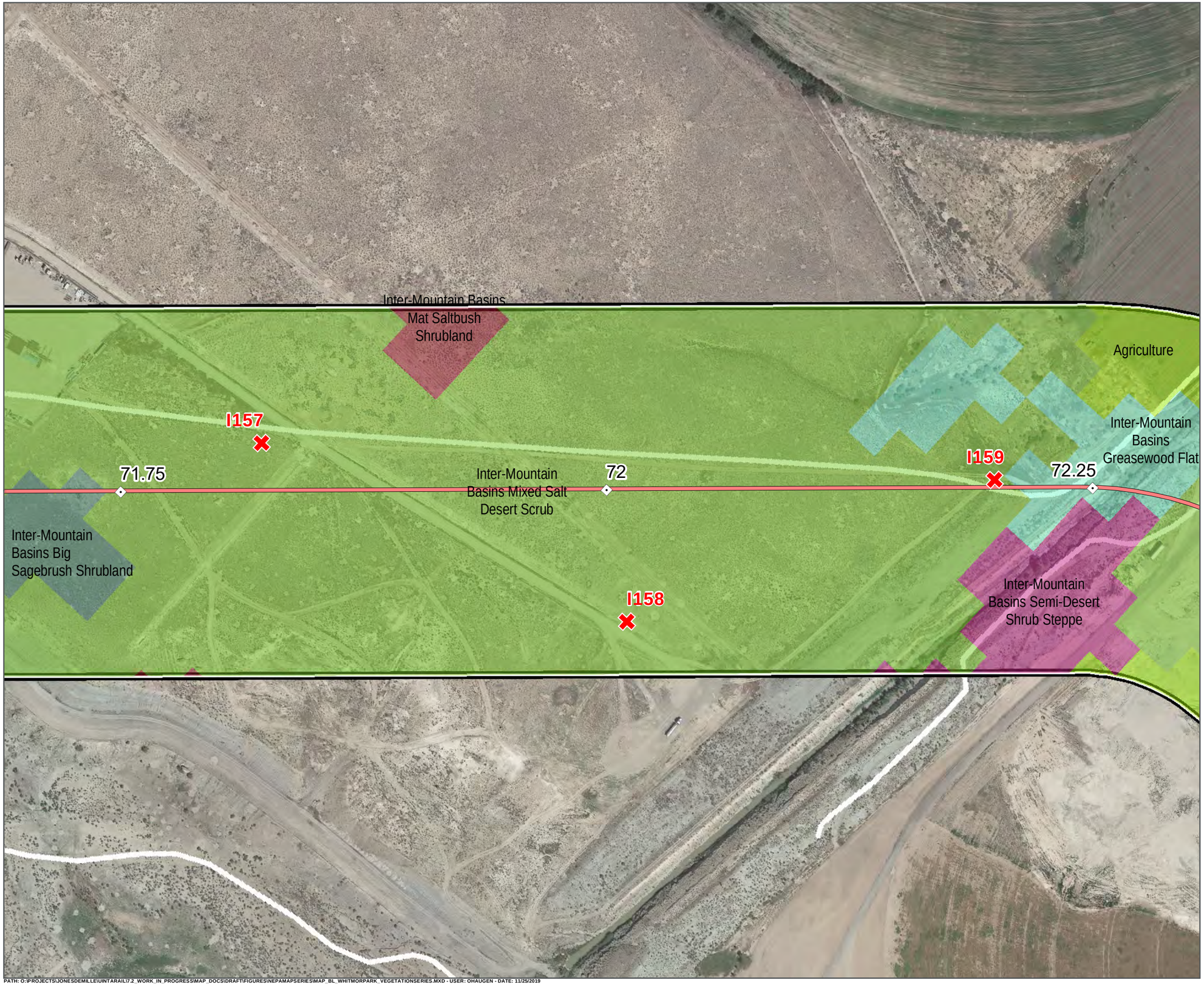

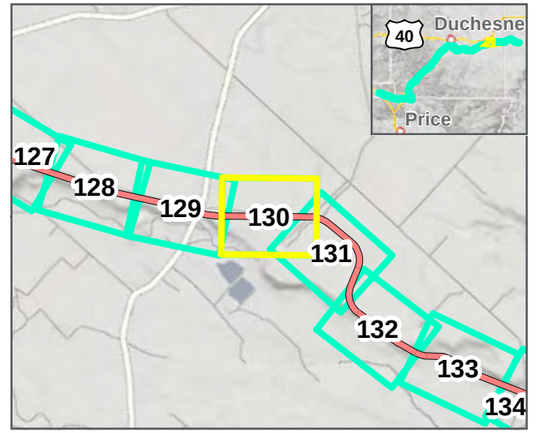

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

HDR

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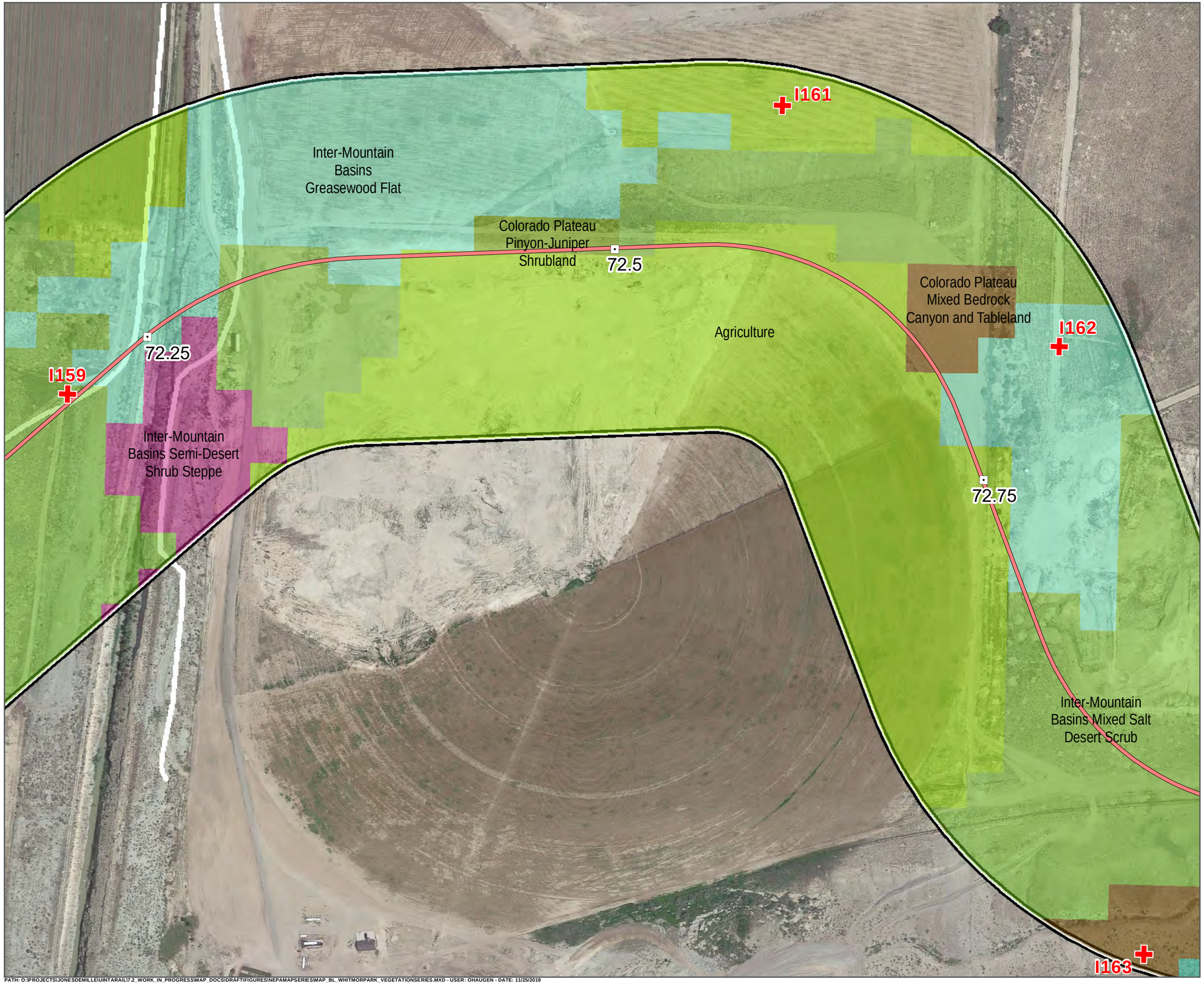

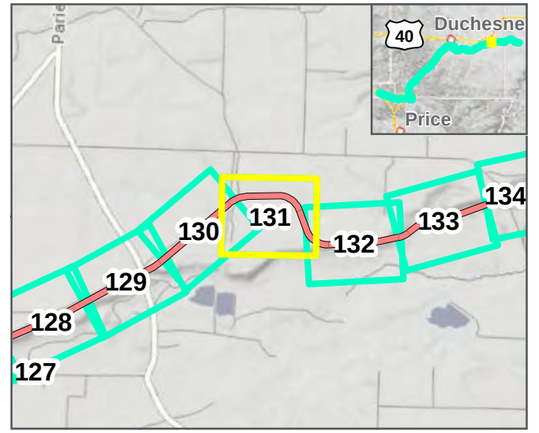

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Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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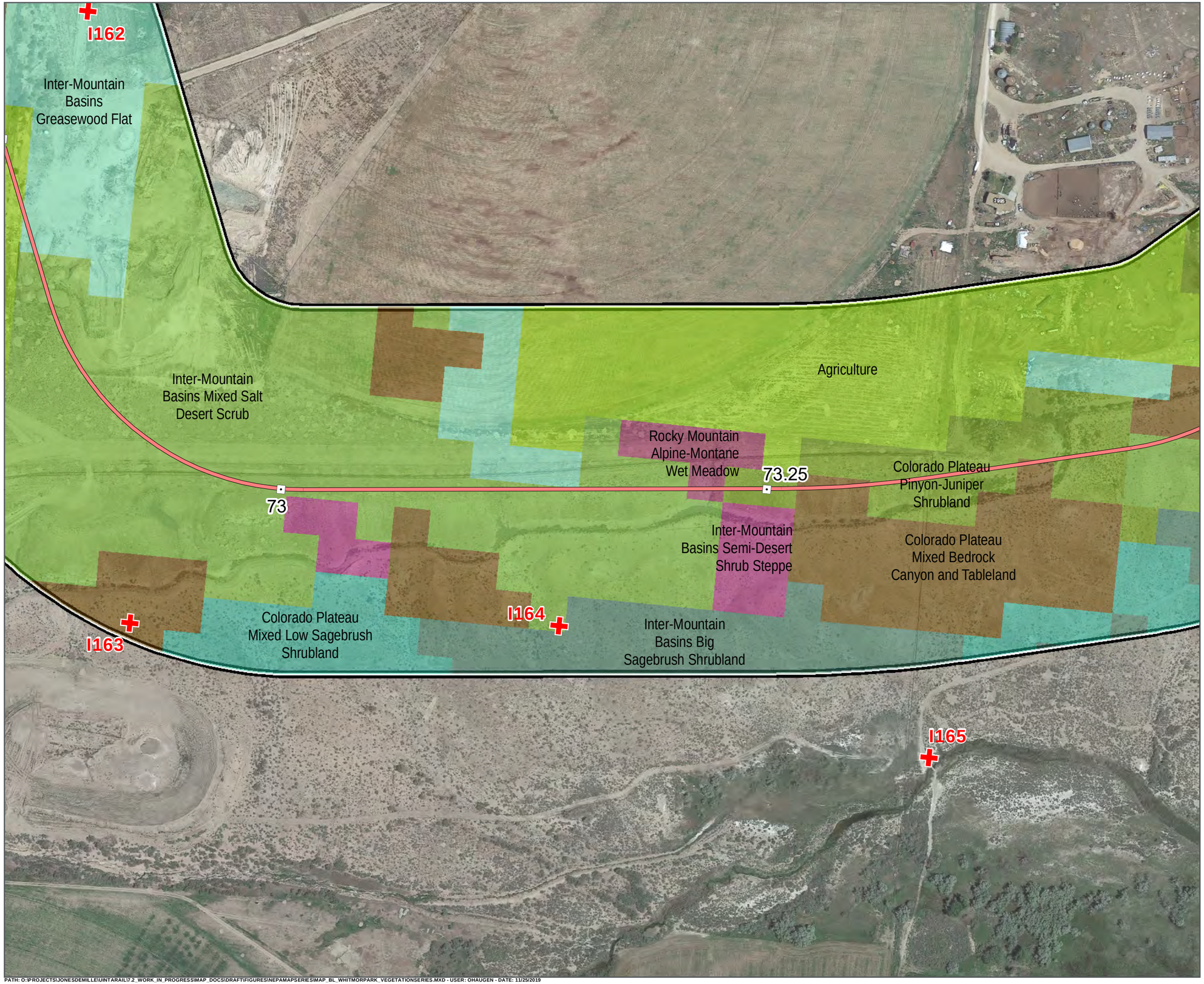

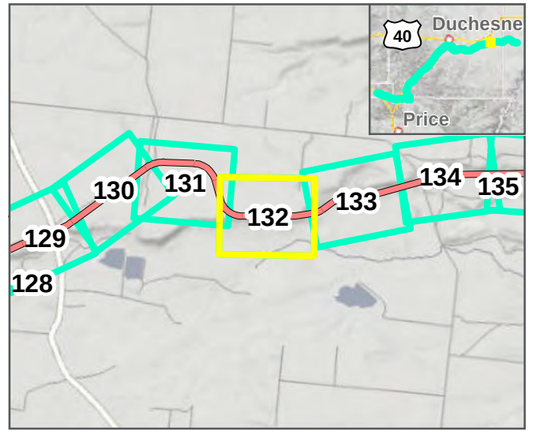

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Mileposts
Whitmore Park Centerline
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Vegetation Communities

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- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Rocky Mountain Alpine-Montane Wet Meadow

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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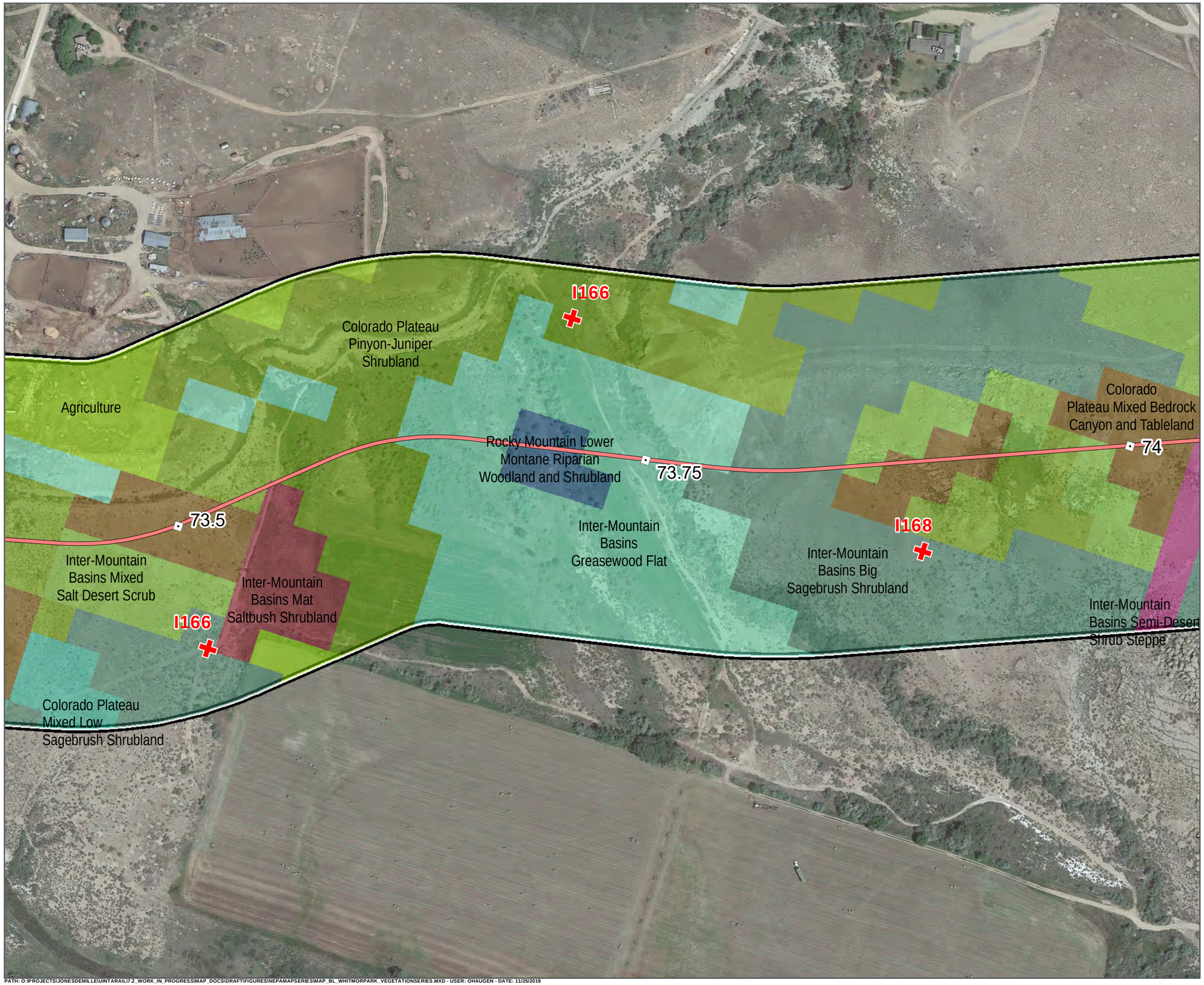

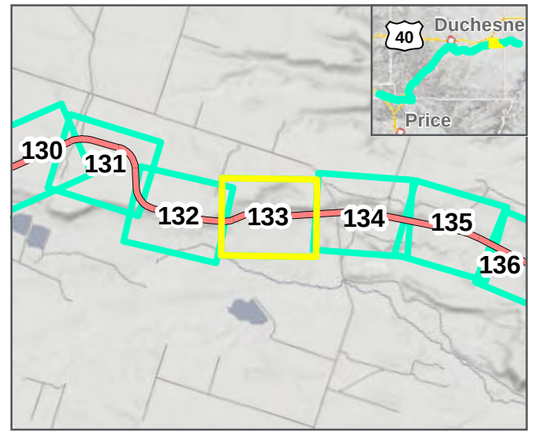

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Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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COODINATE SYSTEM:
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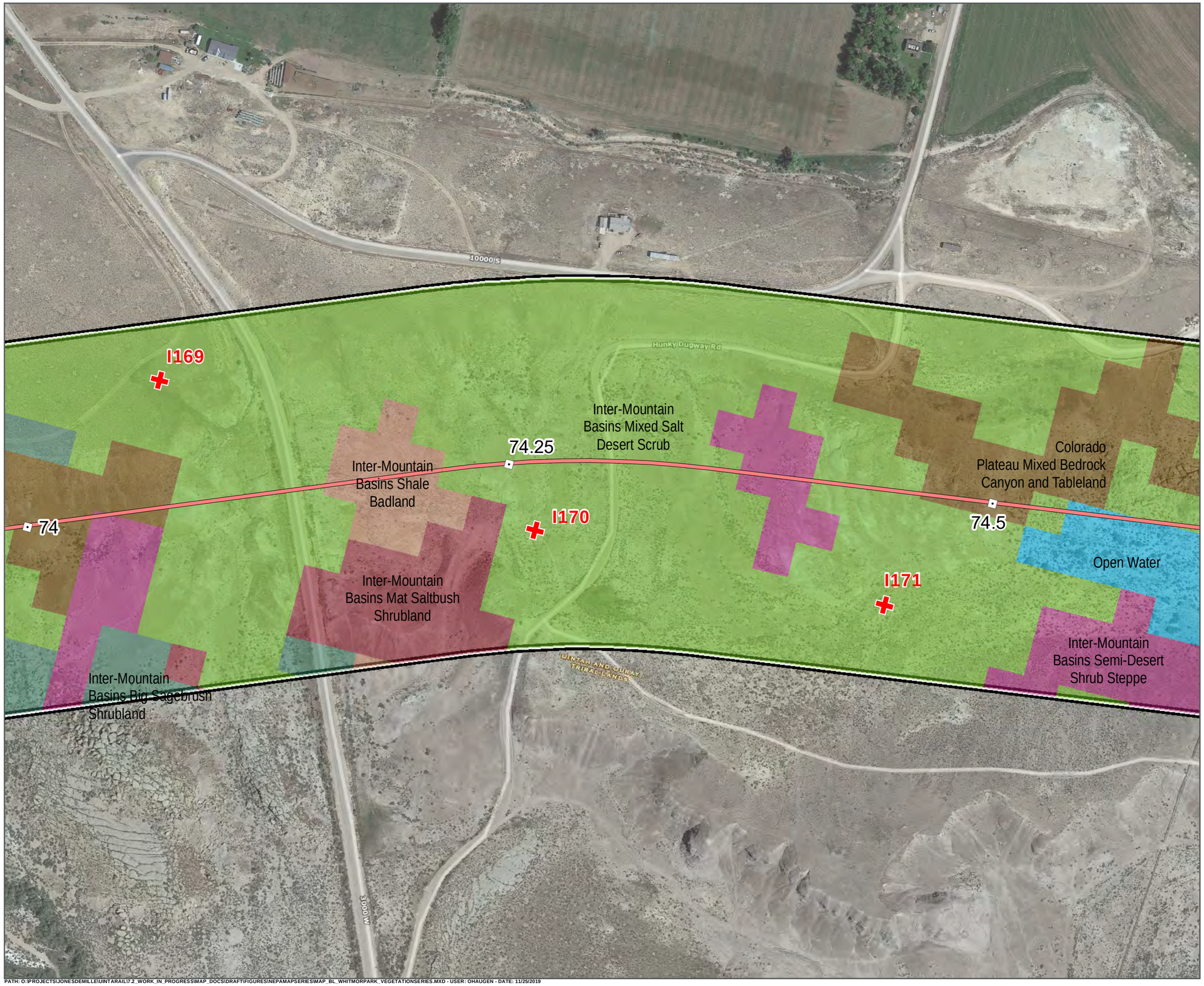

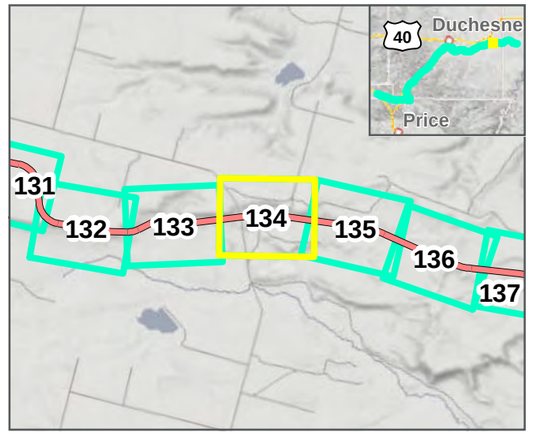

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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Utah State Plane

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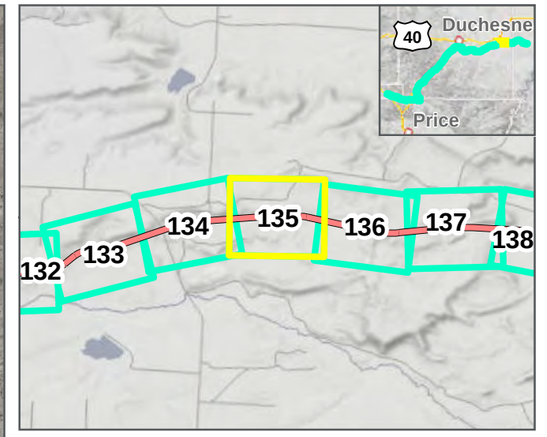

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Agriculture
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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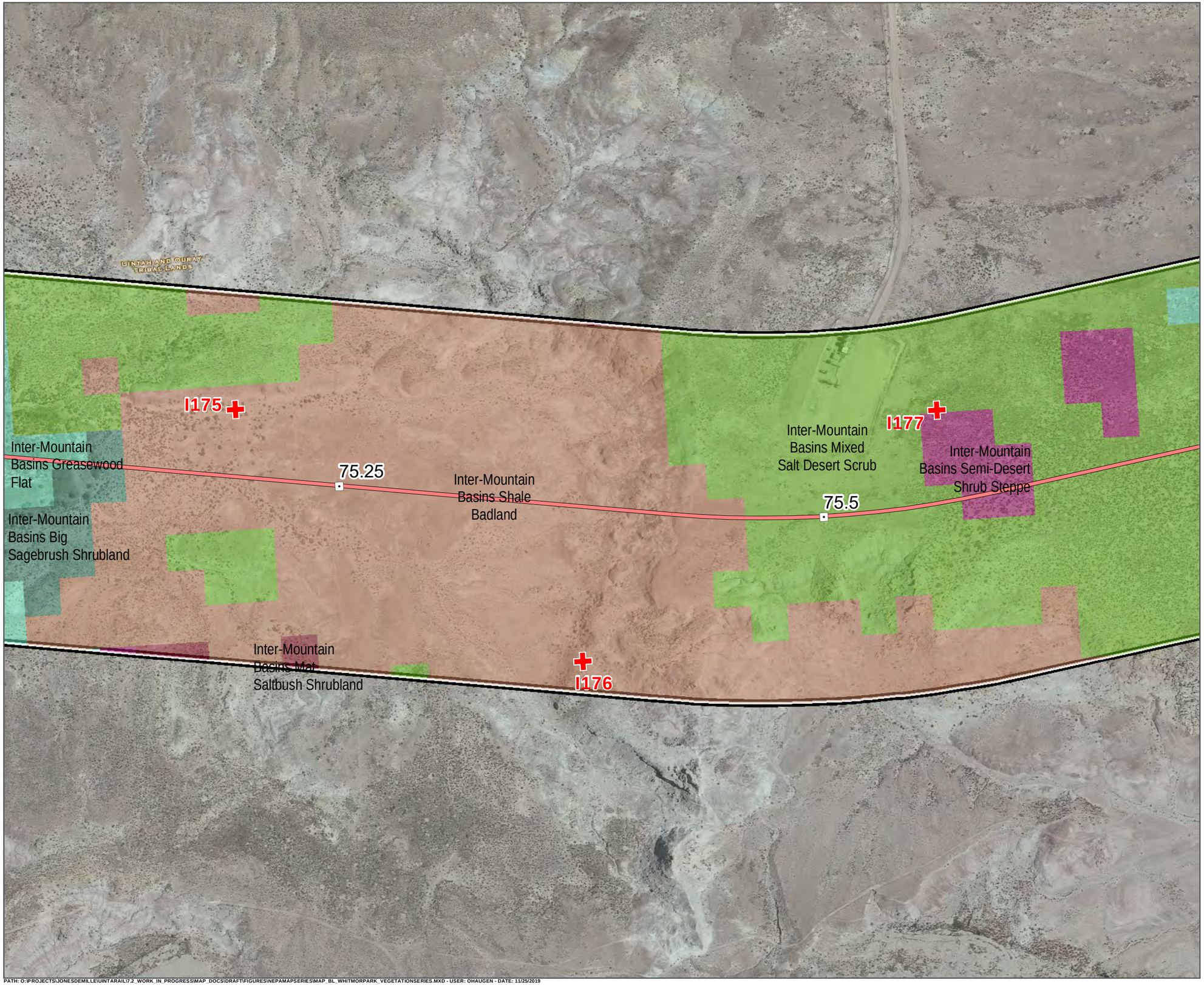

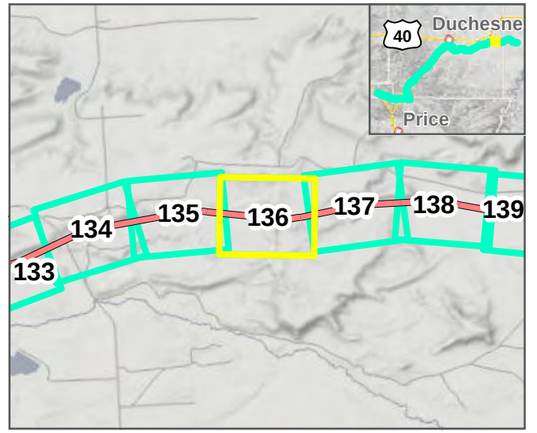

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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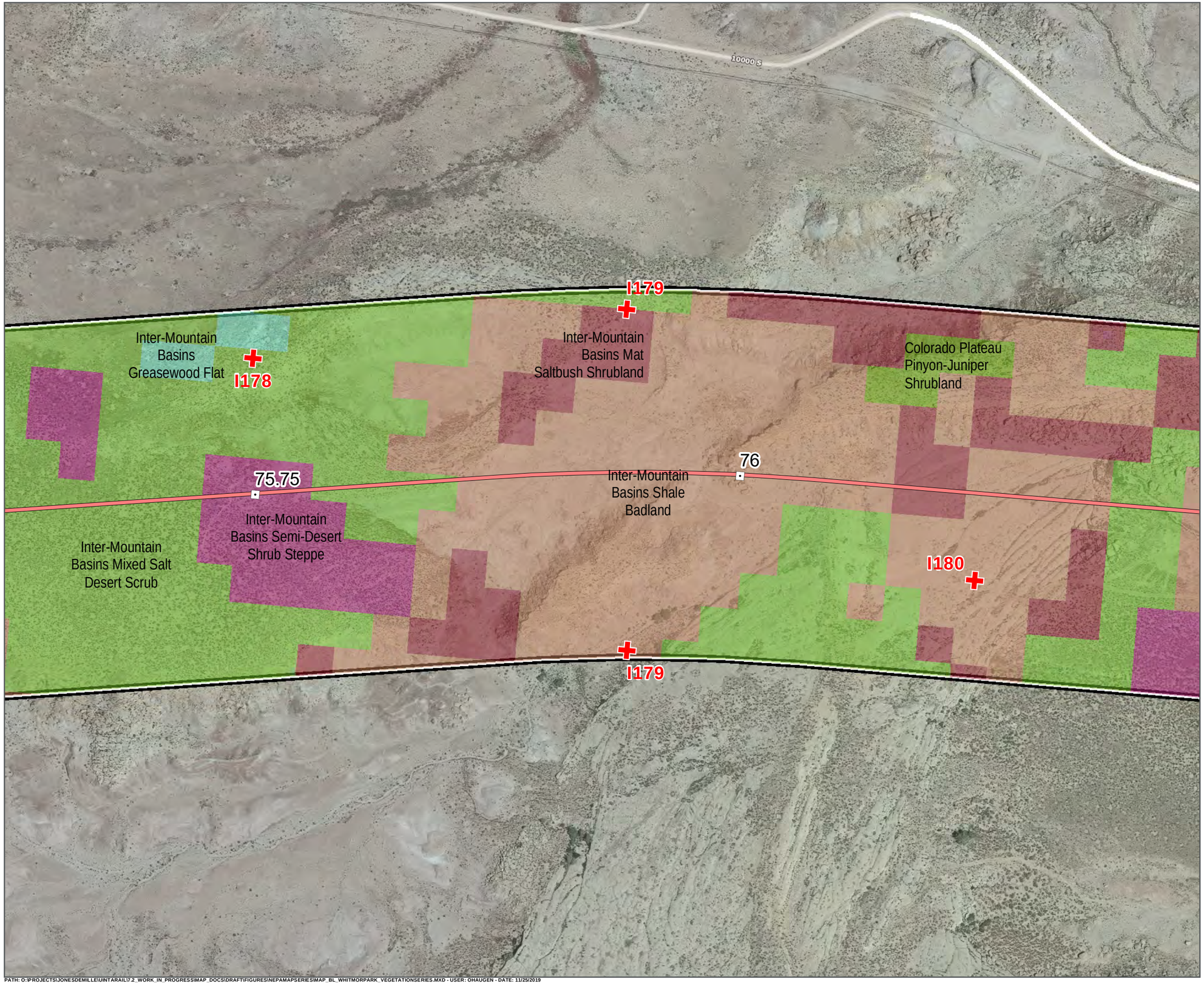

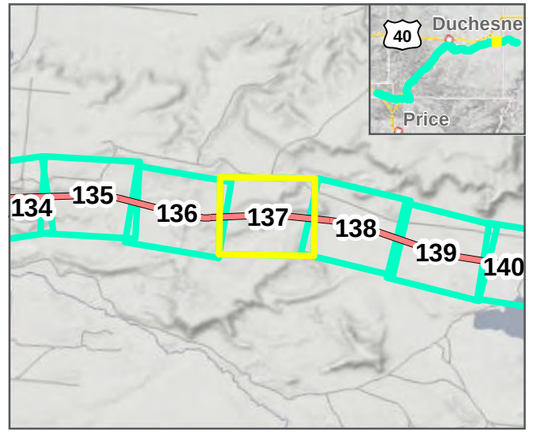

Photo Points

Mileposts

Whitmore Park Centerline

Study Area

Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Greasewood Flat
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WHITMORE PARK ALTERNATIVE: 8/21/2019

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SEPTEMBER 2019

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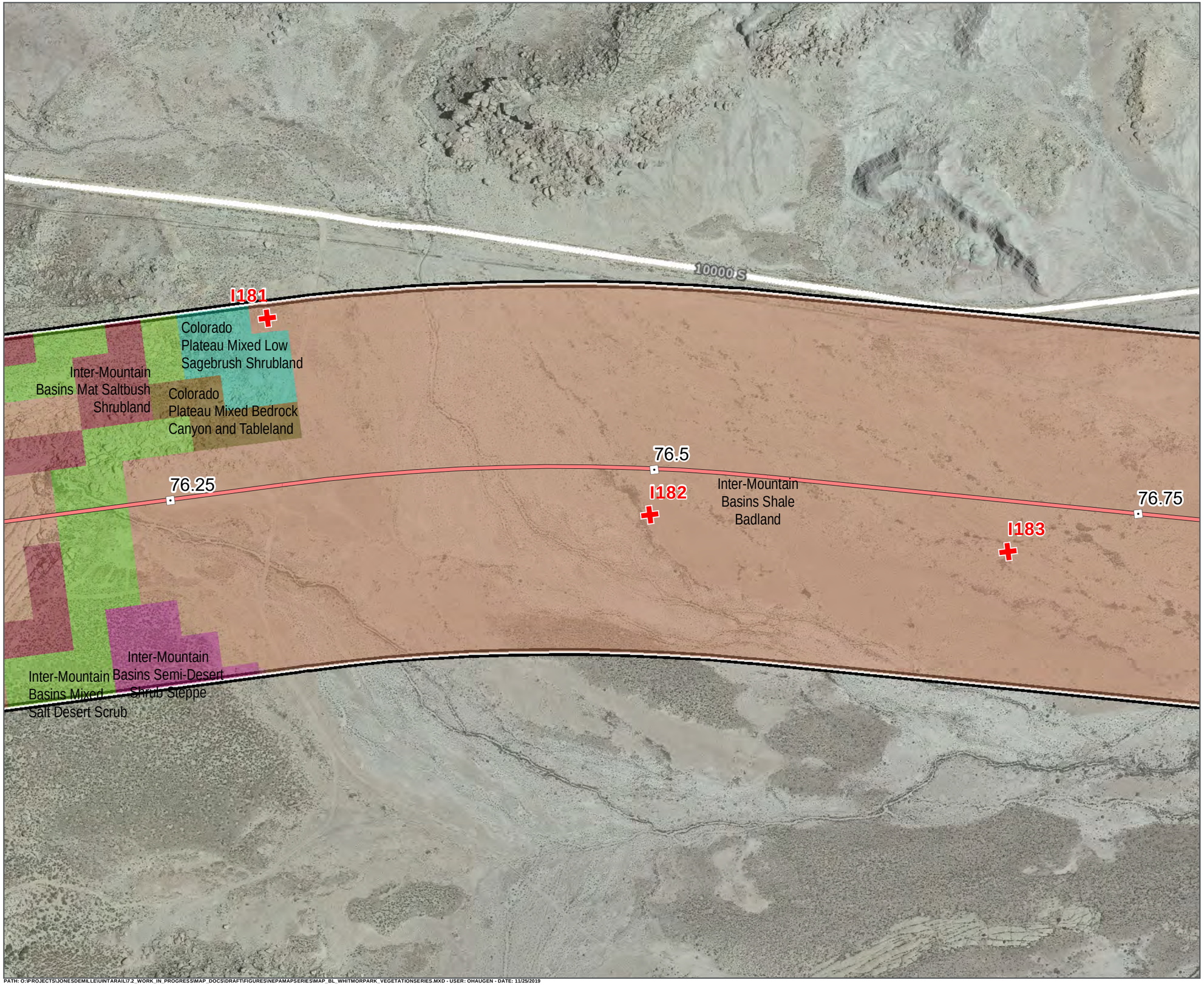

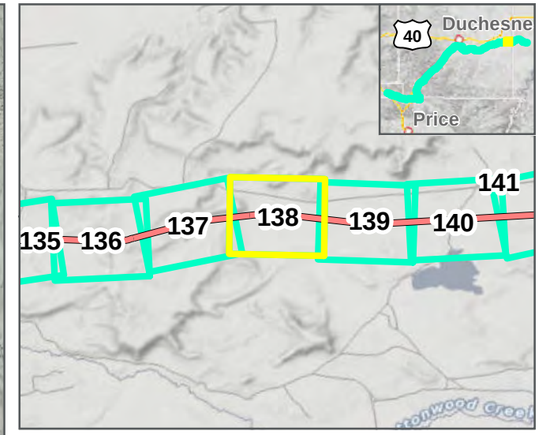

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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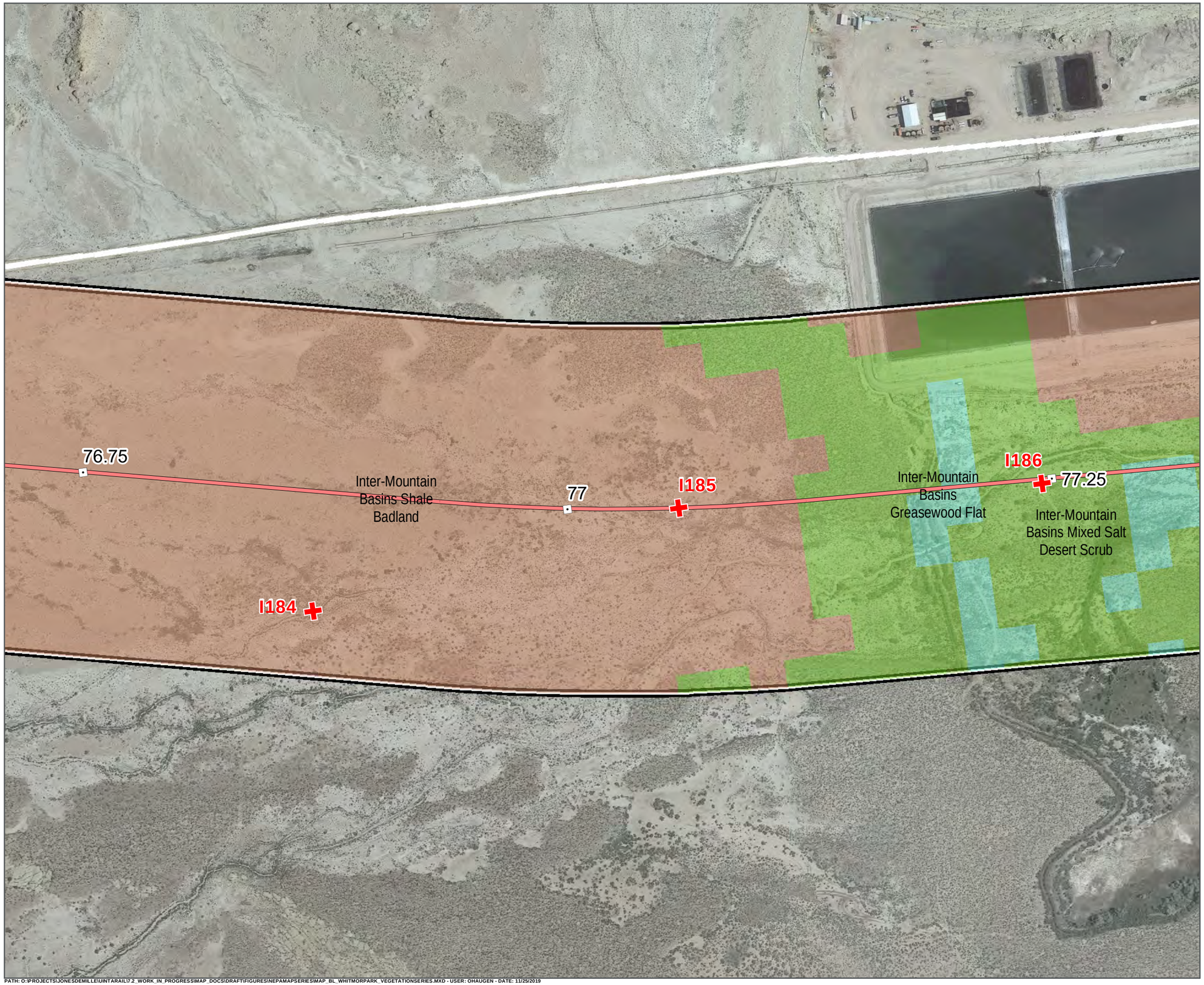

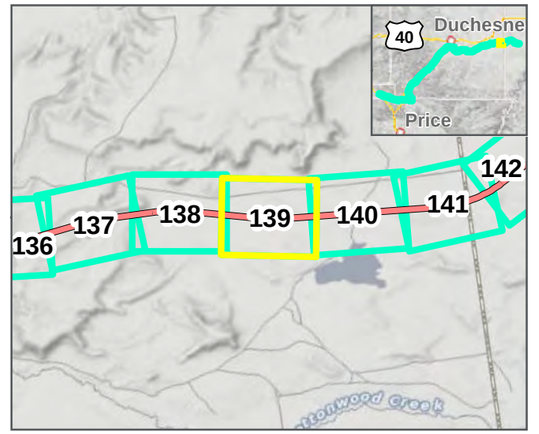

Photo Points
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Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Greasewood Flat
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WHITMORE PARK ALTERNATIVE: 8/21/2019

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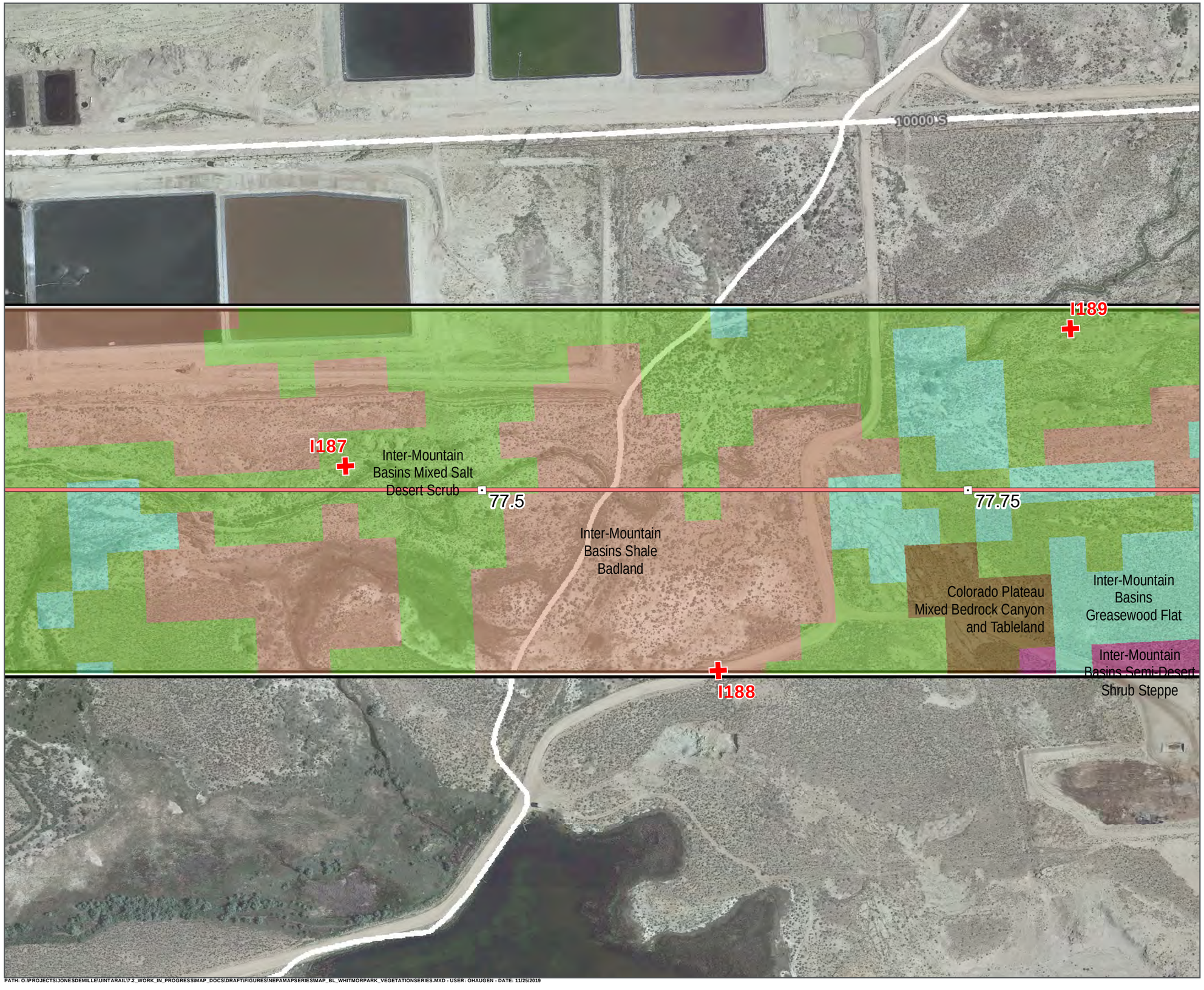

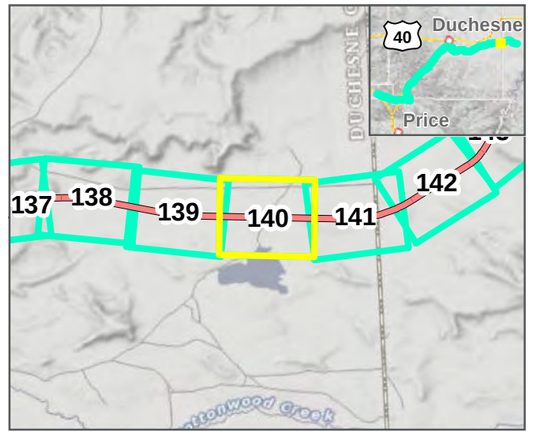

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Vegetation Communities

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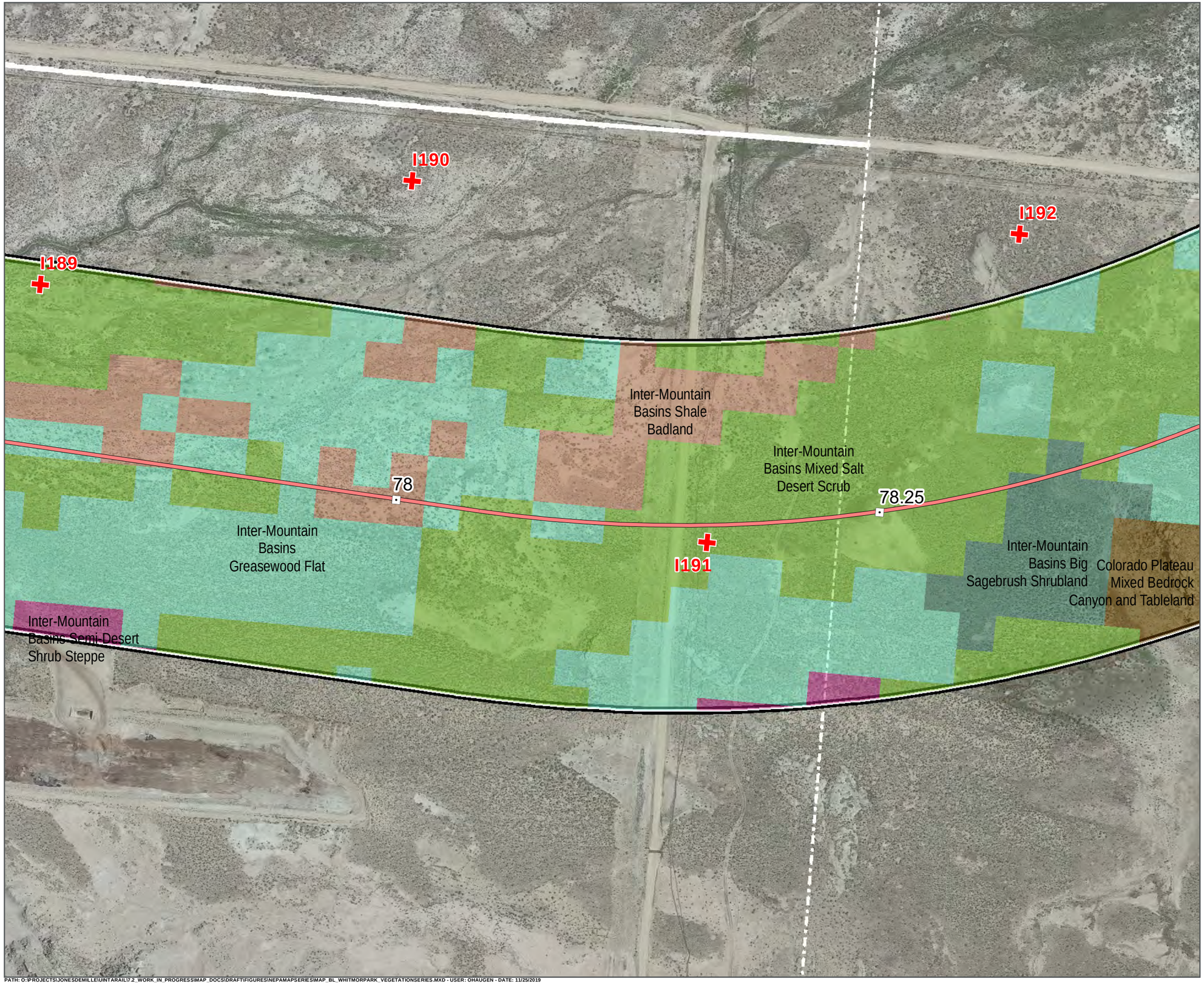

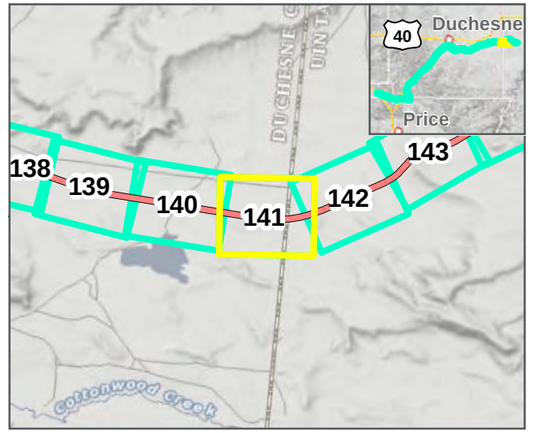

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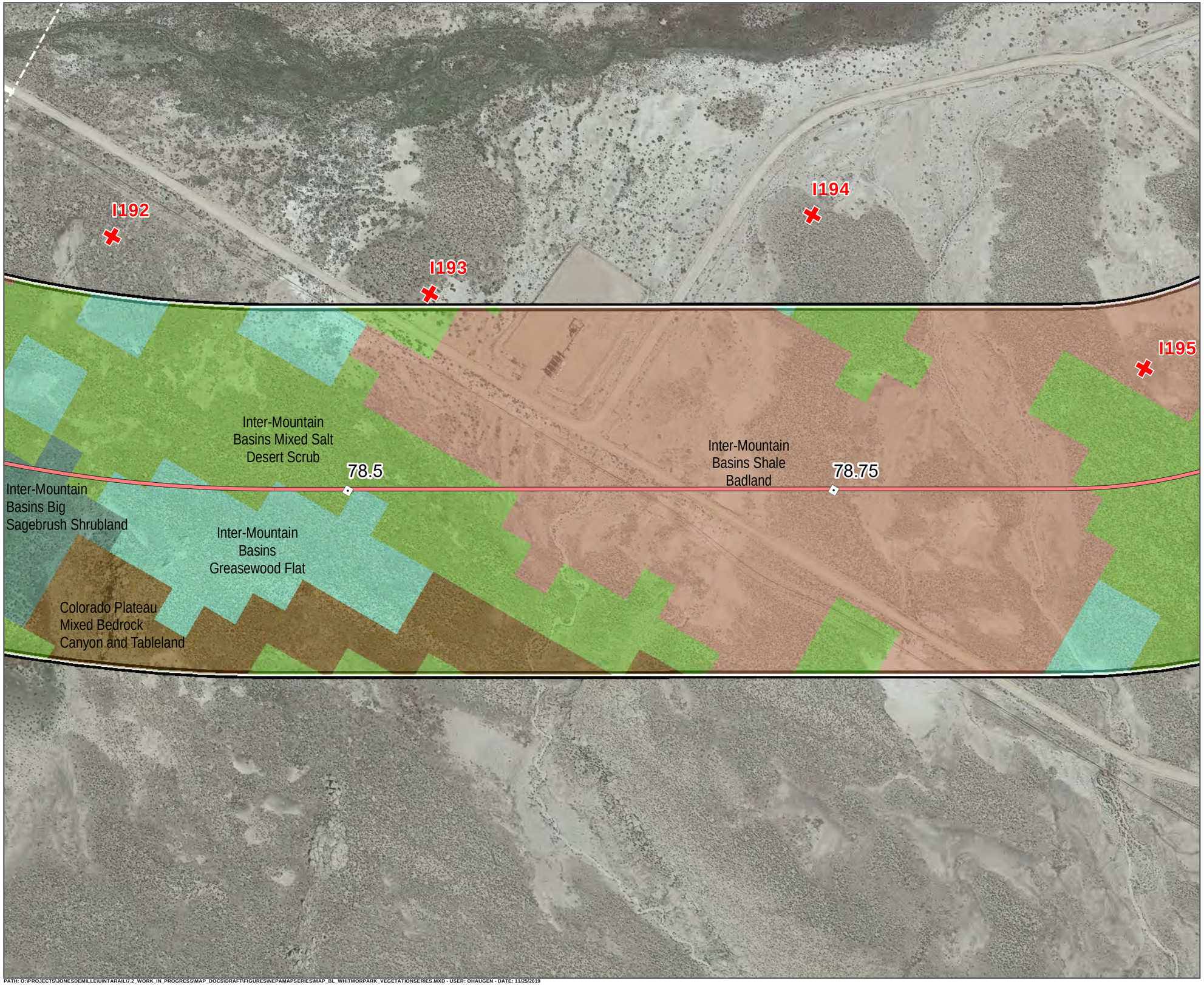


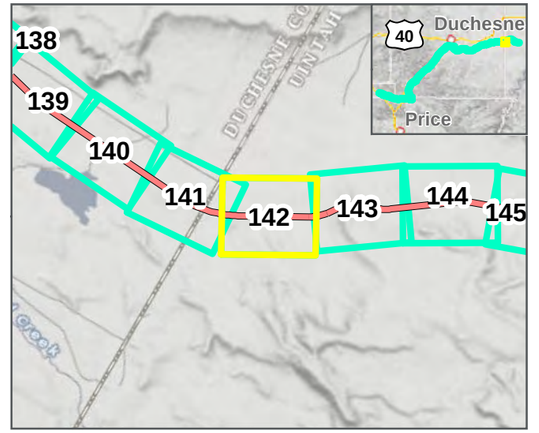


Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Shale Badland

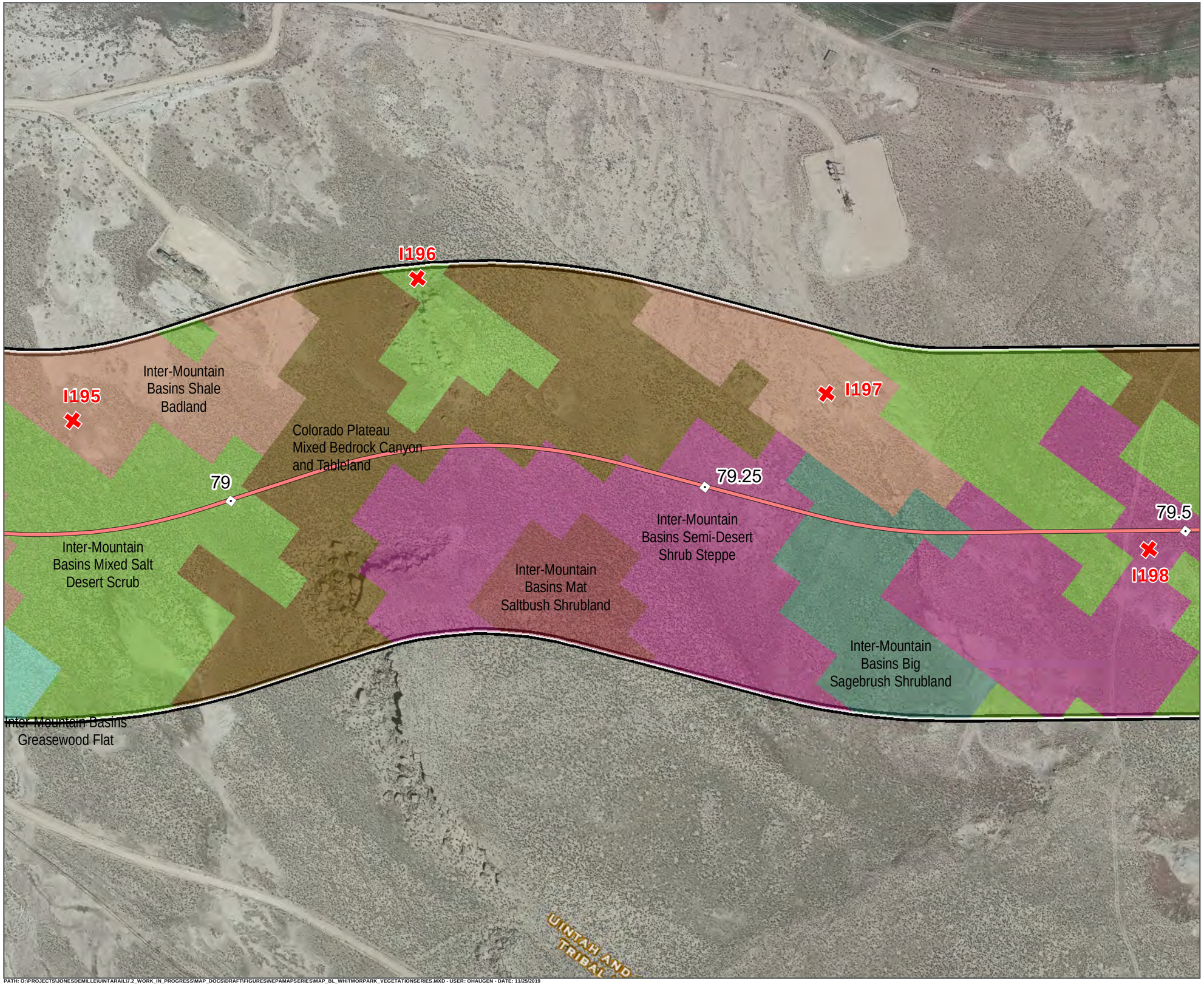
WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

0 100 200 Feet
1 inch = 250 Feet

DATA SOURCES:
SWReGAP Landcover
Utah Google Imagery
Basemap (2013-2015)
COODINATE SYSTEM:
Utah State Plane

PATH: O:\PROJECTS\JONESDEMILLE\UINTARAIL\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\FIGURES\NEPAMAPSERIES\MAP_BL_WHITMORPARK_VEGETATIONSERIES.MXD - USER: OHAUGEN - DATE: 11/25/2019



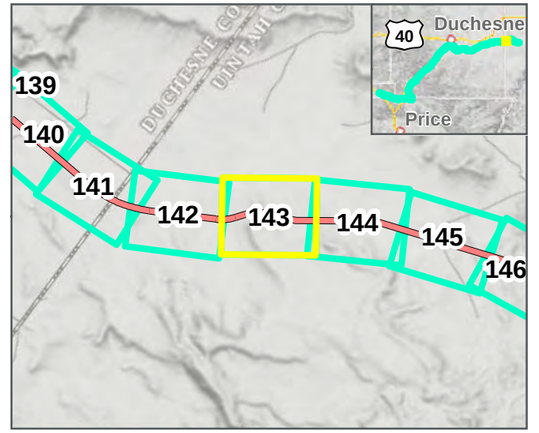


Photo Points
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Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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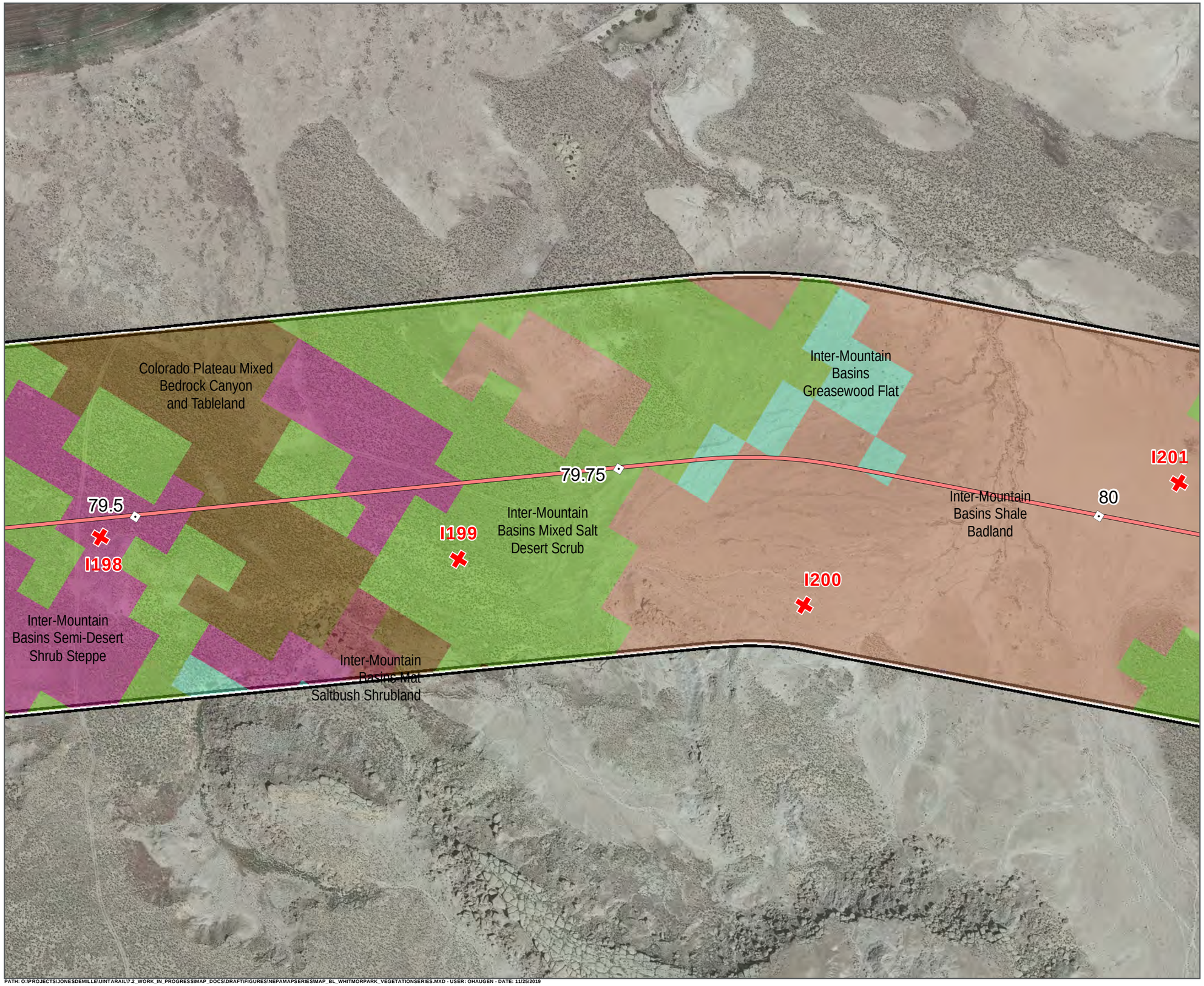

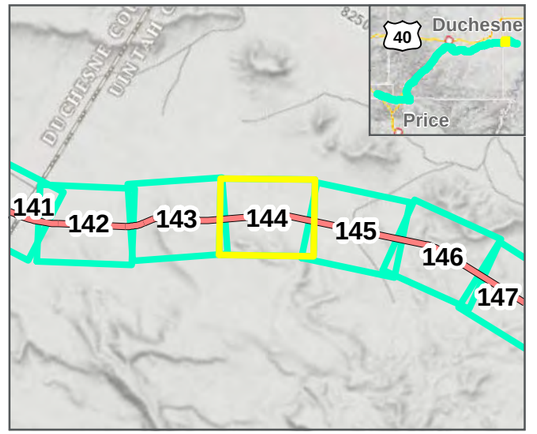

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Study
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

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SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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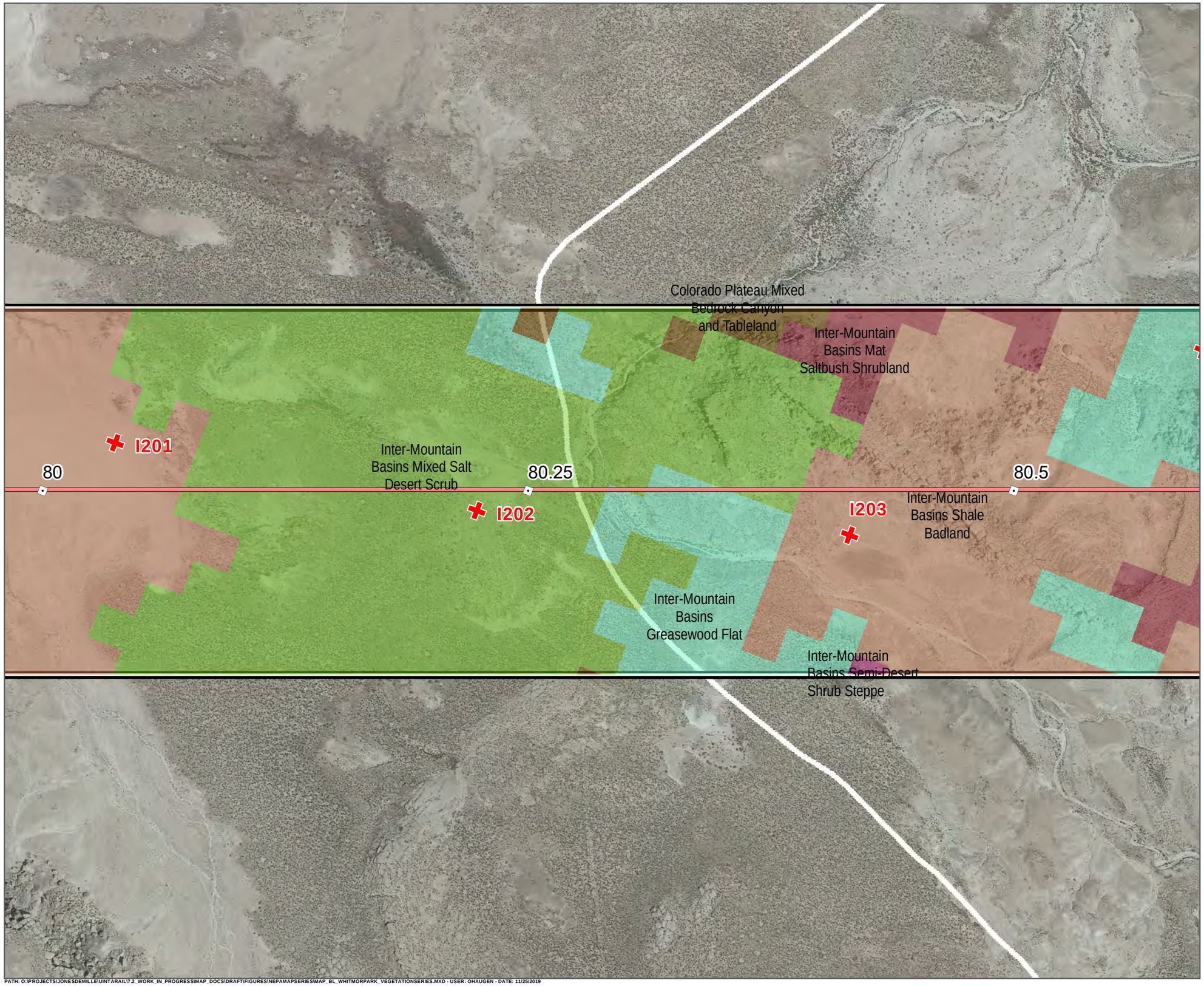

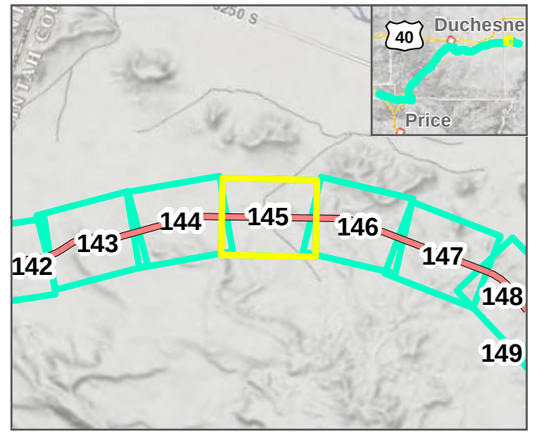

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Mileposts
Whitmore Park Centerline
Study Area
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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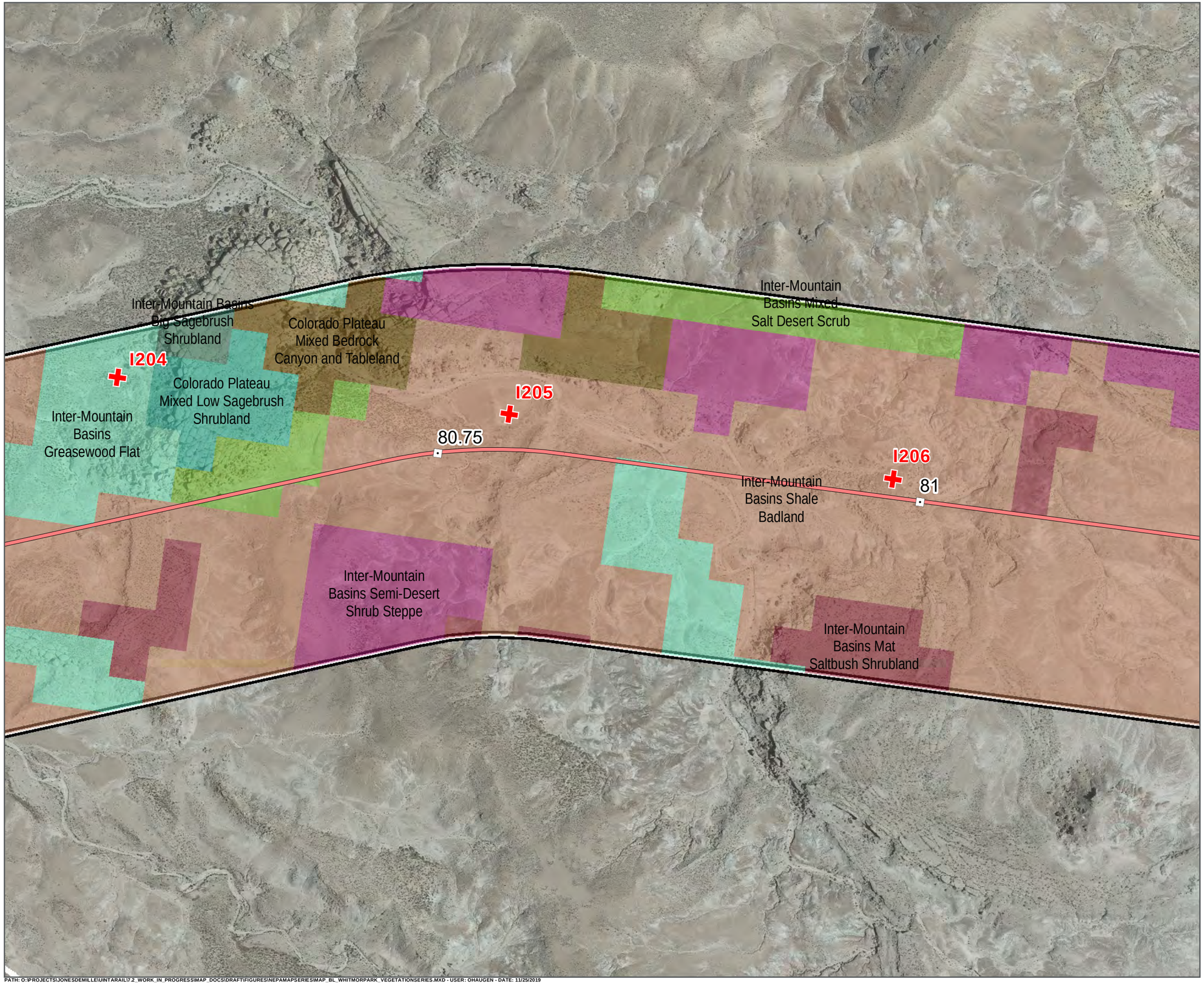

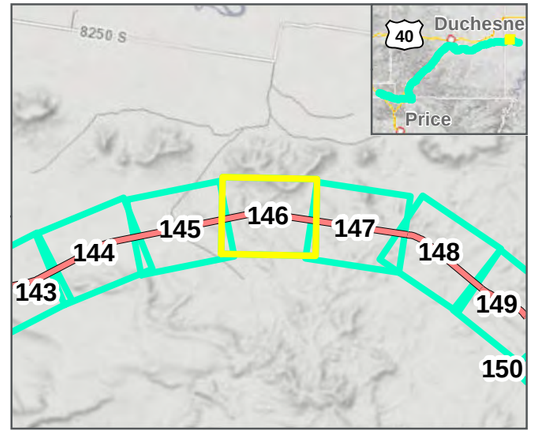

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Study Area
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Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

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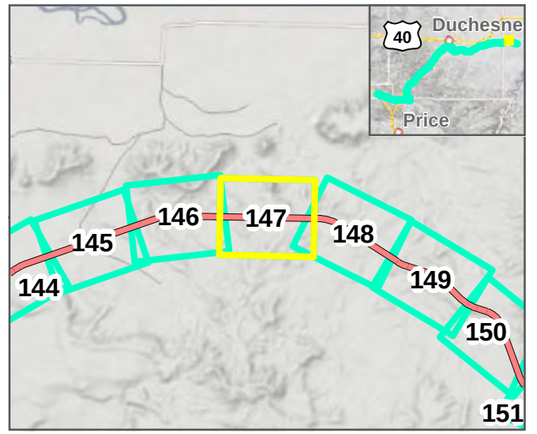

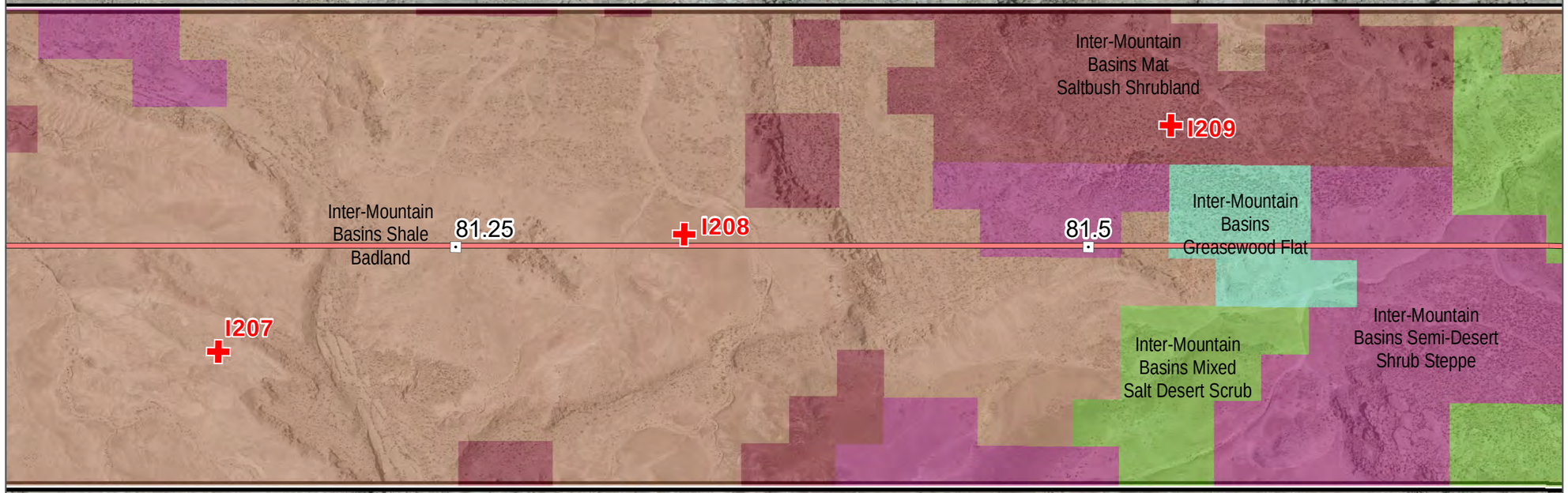

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mat Saltbush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
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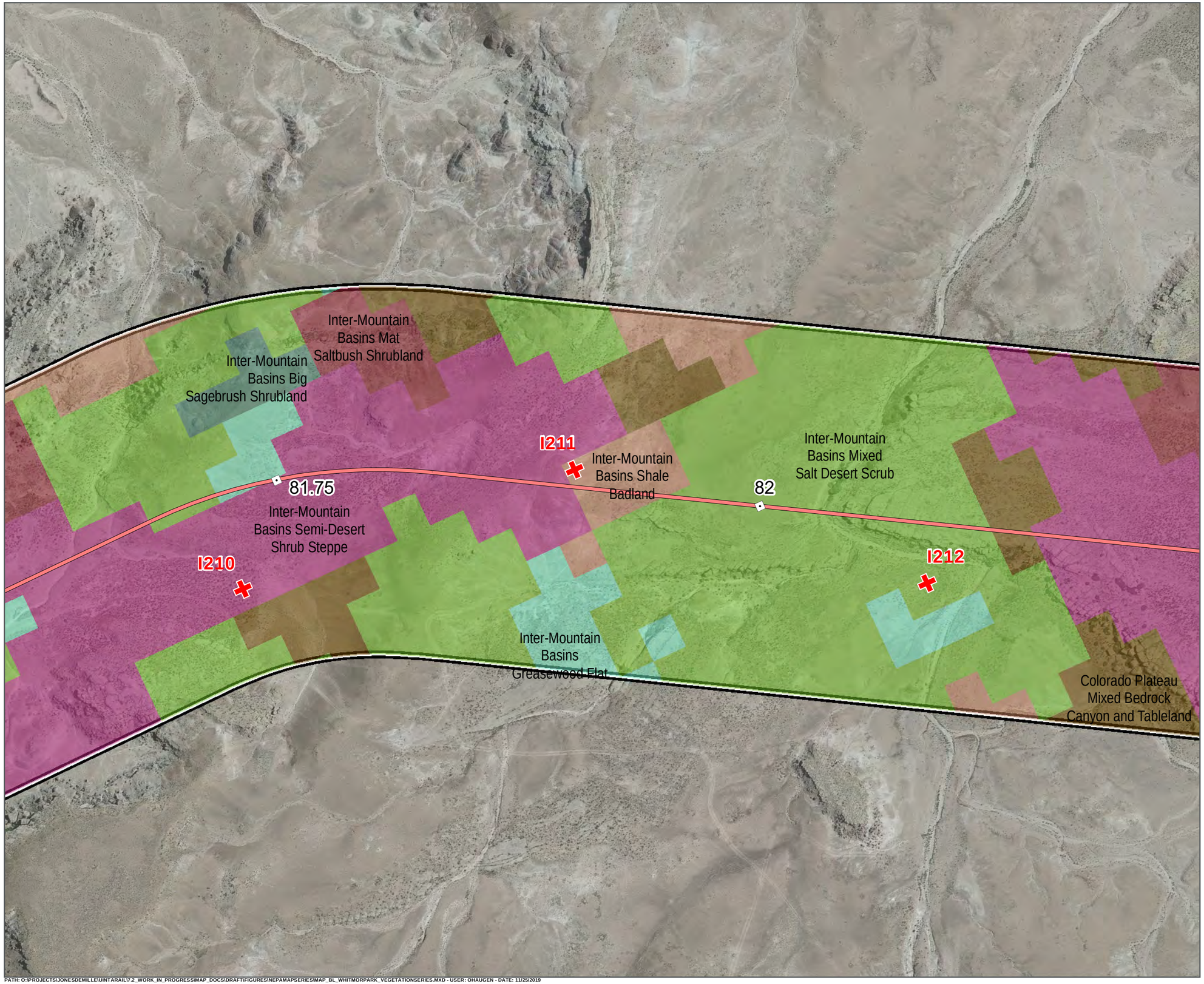

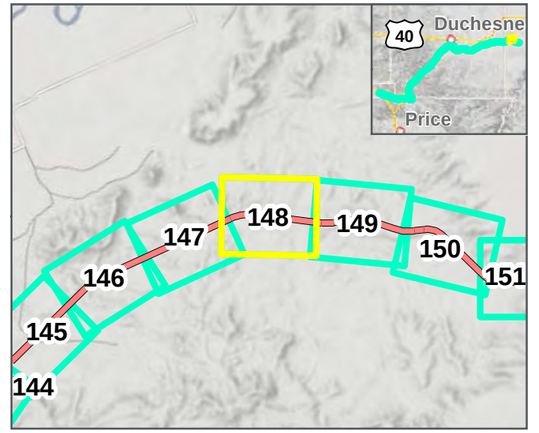

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Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
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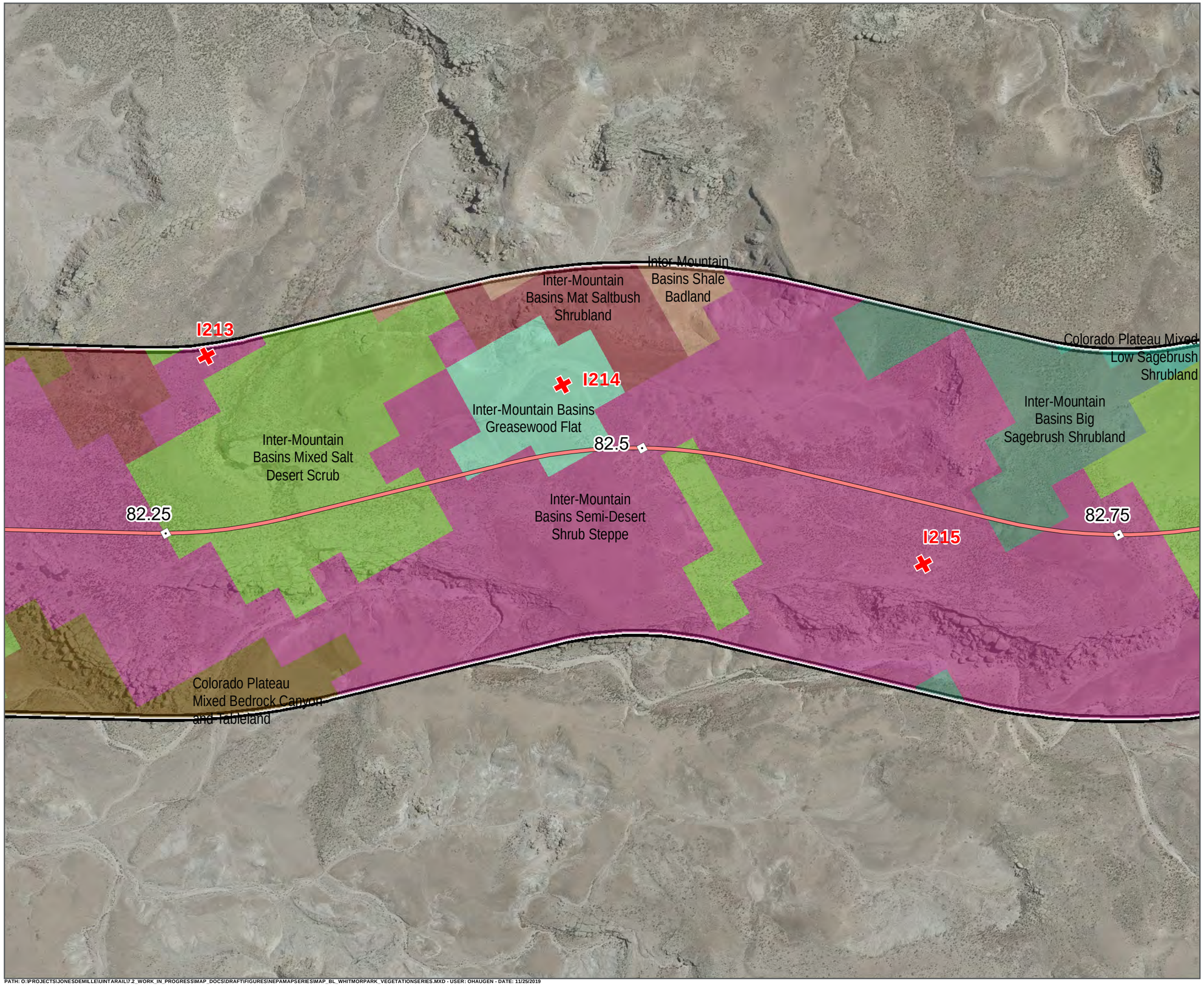

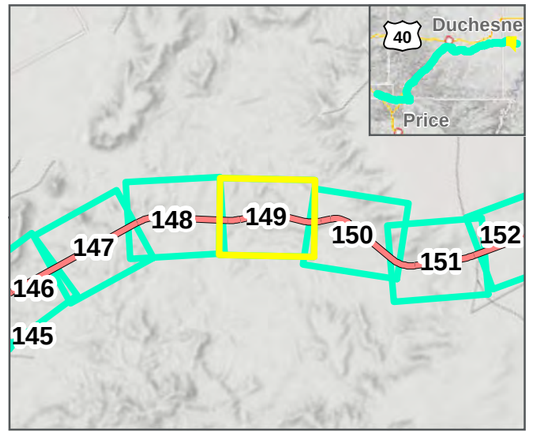

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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DATA SOURCES:
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Utah State Plane

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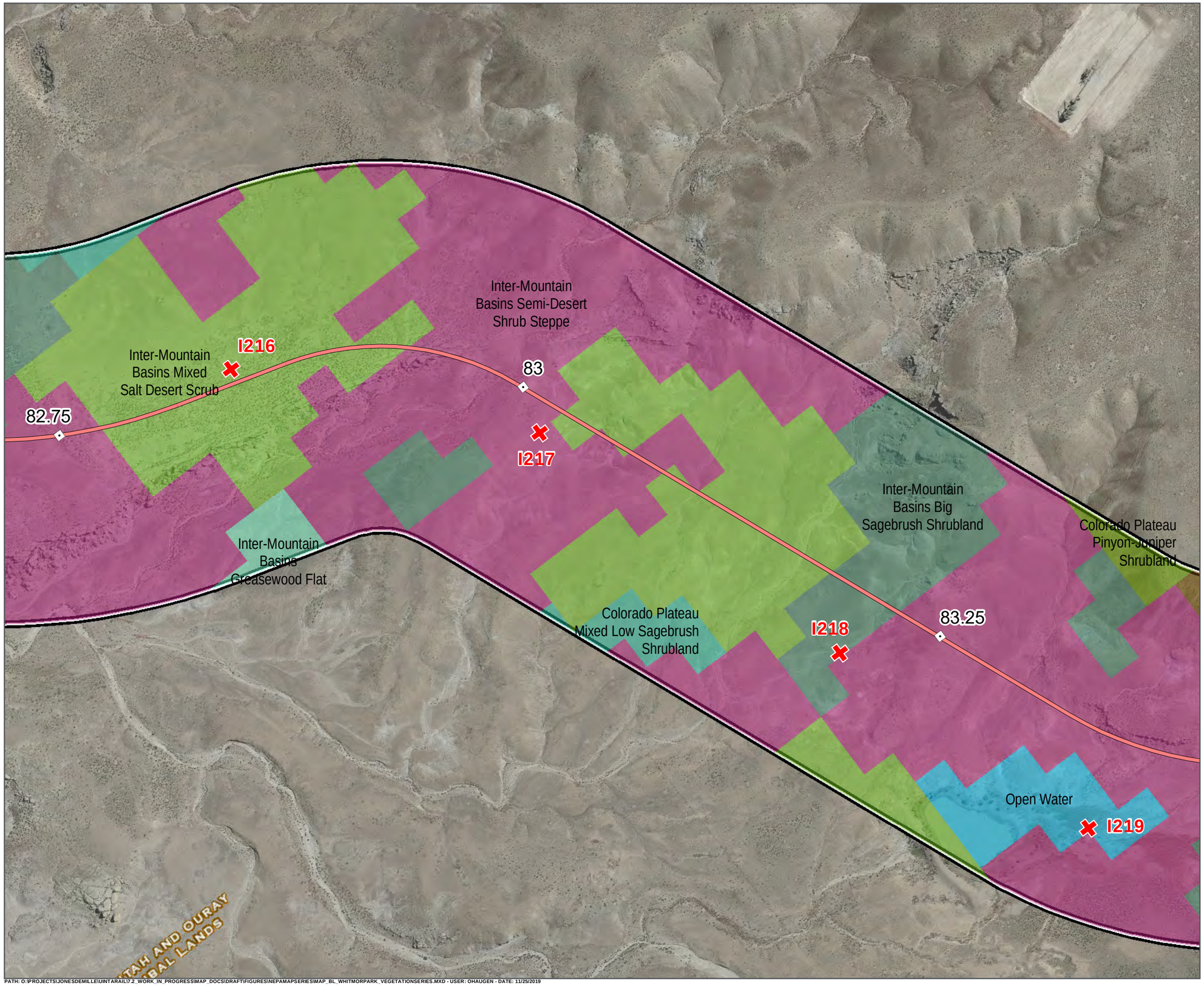

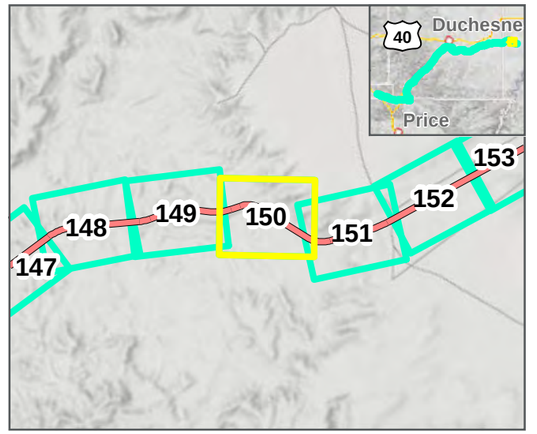

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Bedrock Canyon and Tableland
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Colorado Plateau Pinyon-Juniper Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Open Water

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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SEVEN COUNTY INFRASTRUCTURE COALITION

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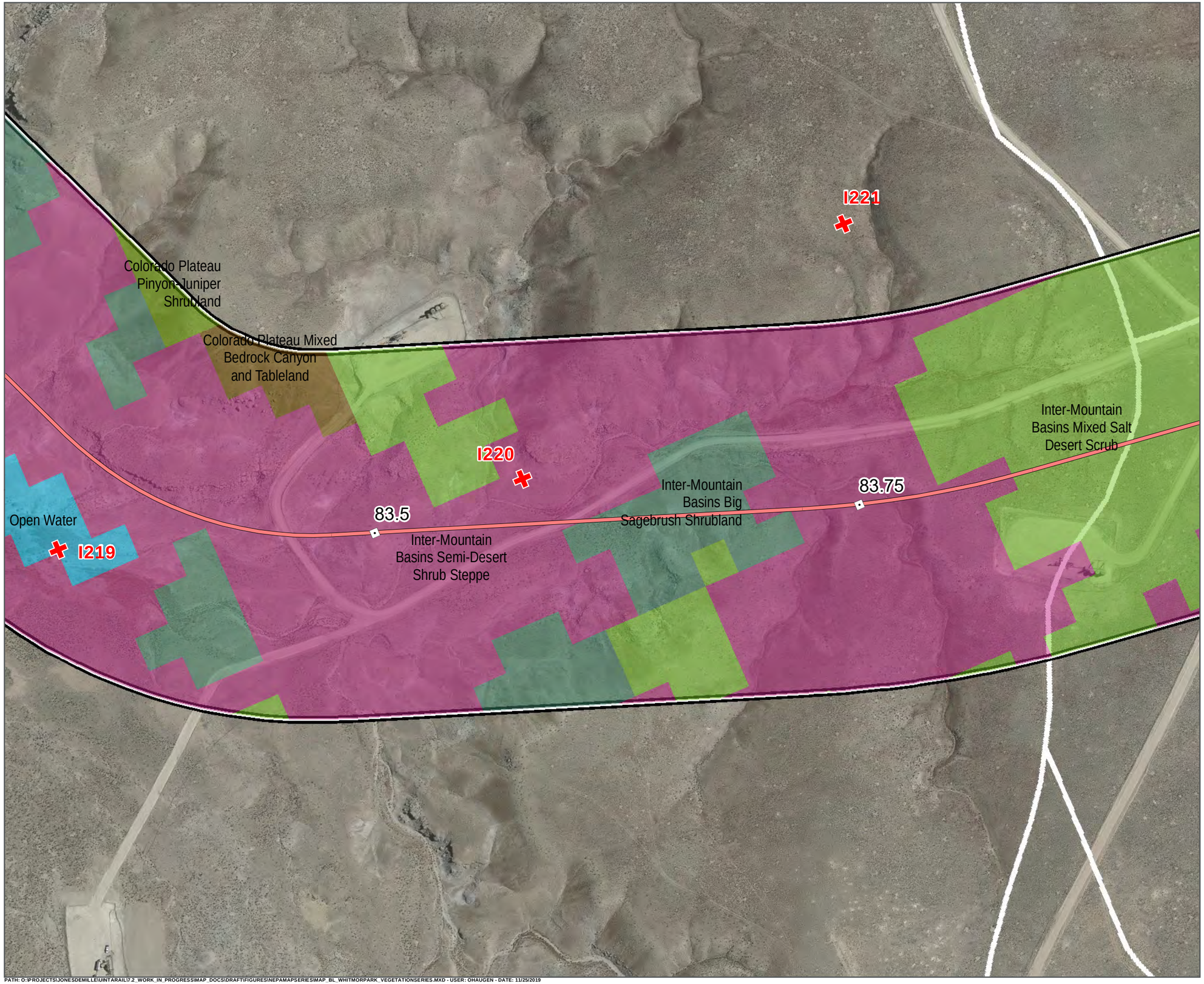

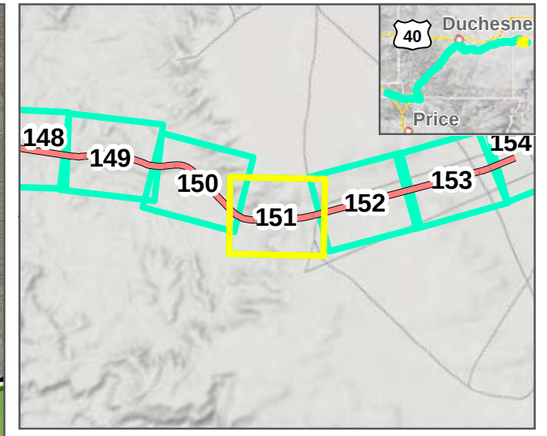

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WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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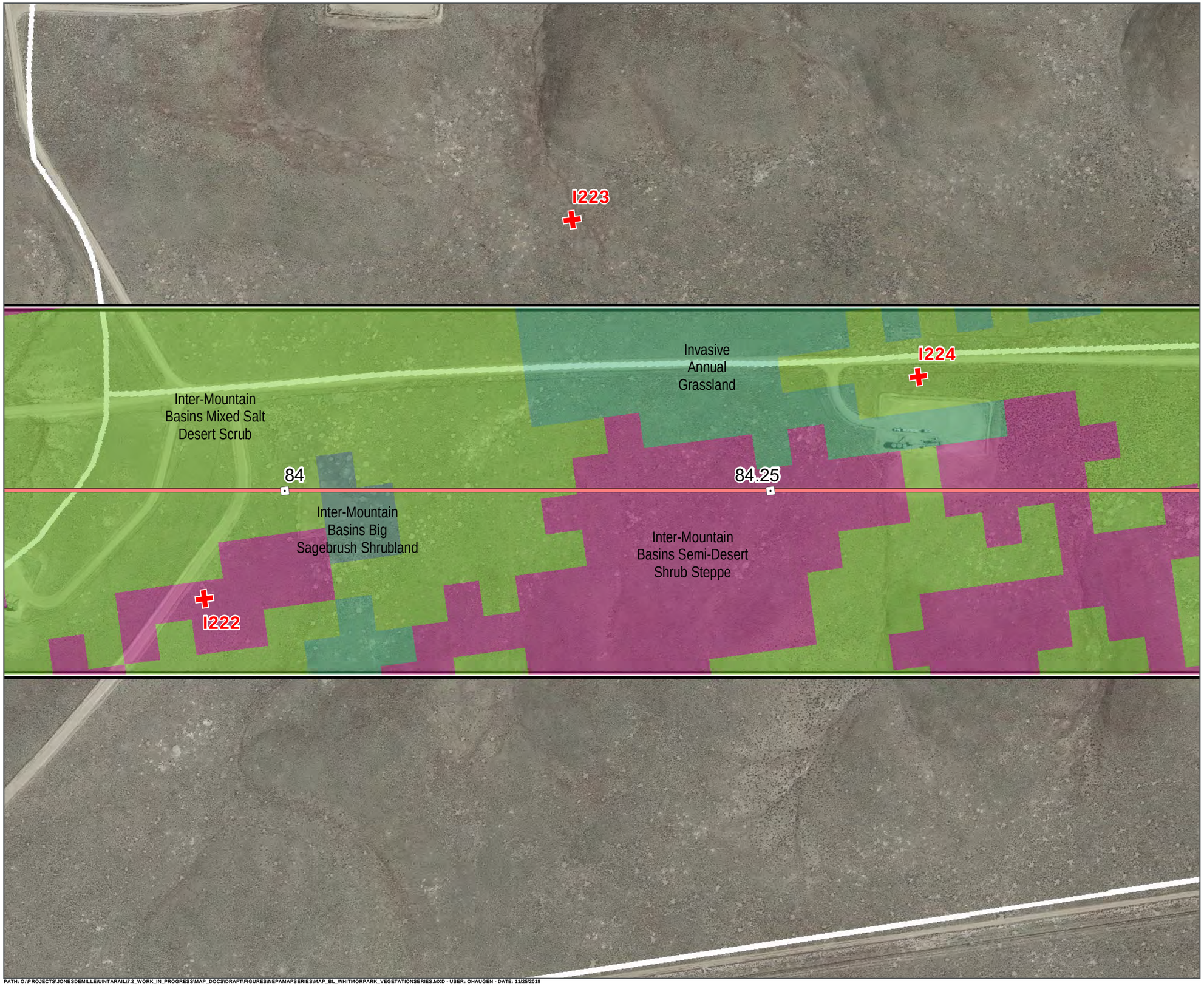

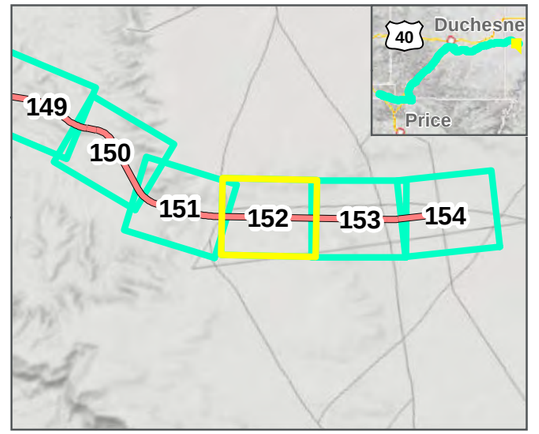

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Mileposts
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Study Area
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Vegetation Communities

- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

1 inch = 250 Feet

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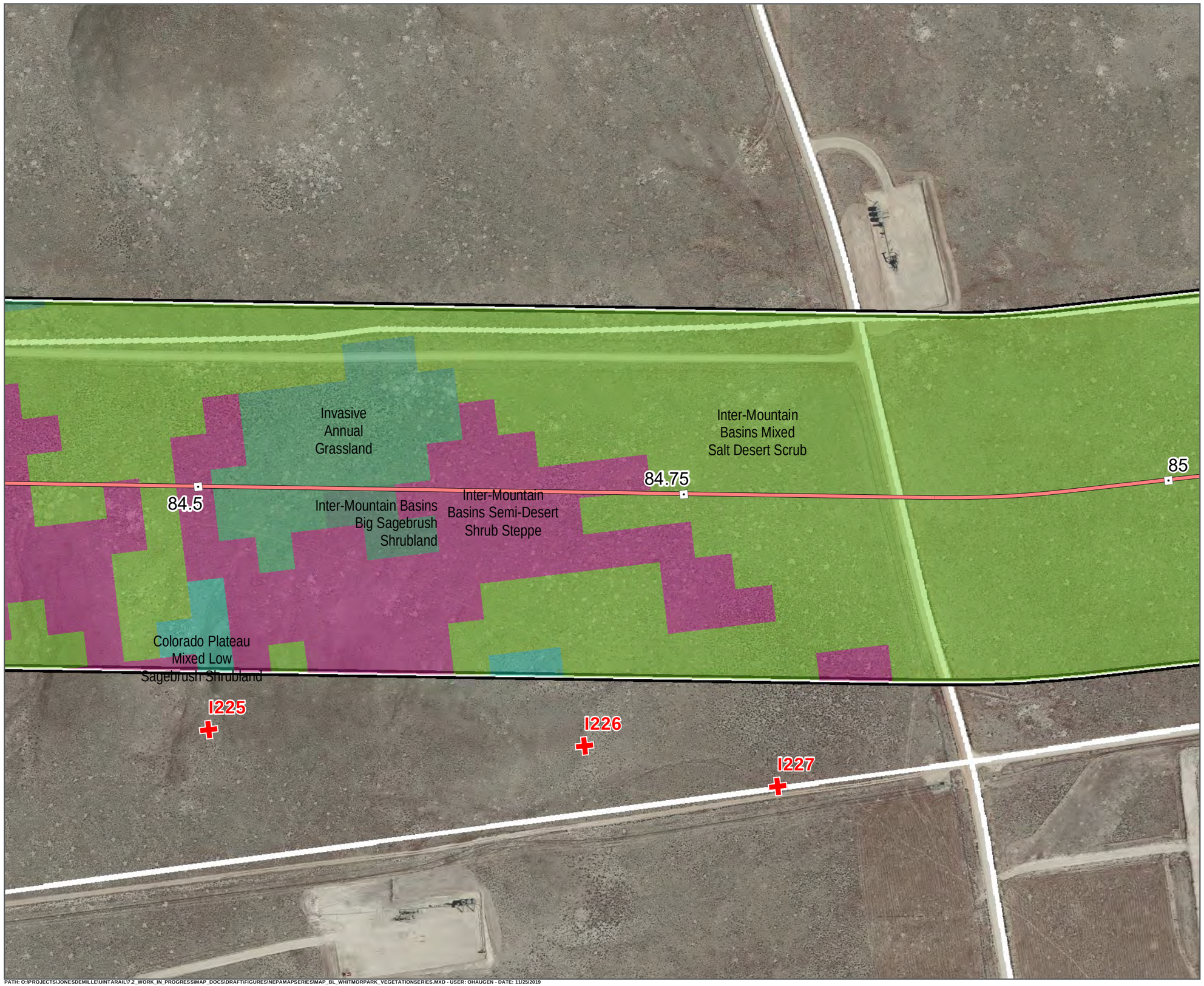

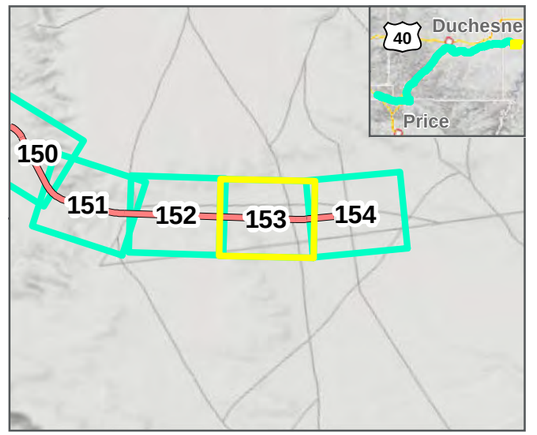

Photo Points
Mileposts
Whitmore Park Centerline
Study Area
Map Extent (current view in yellow)

Vegetation Communities

- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual Grassland

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

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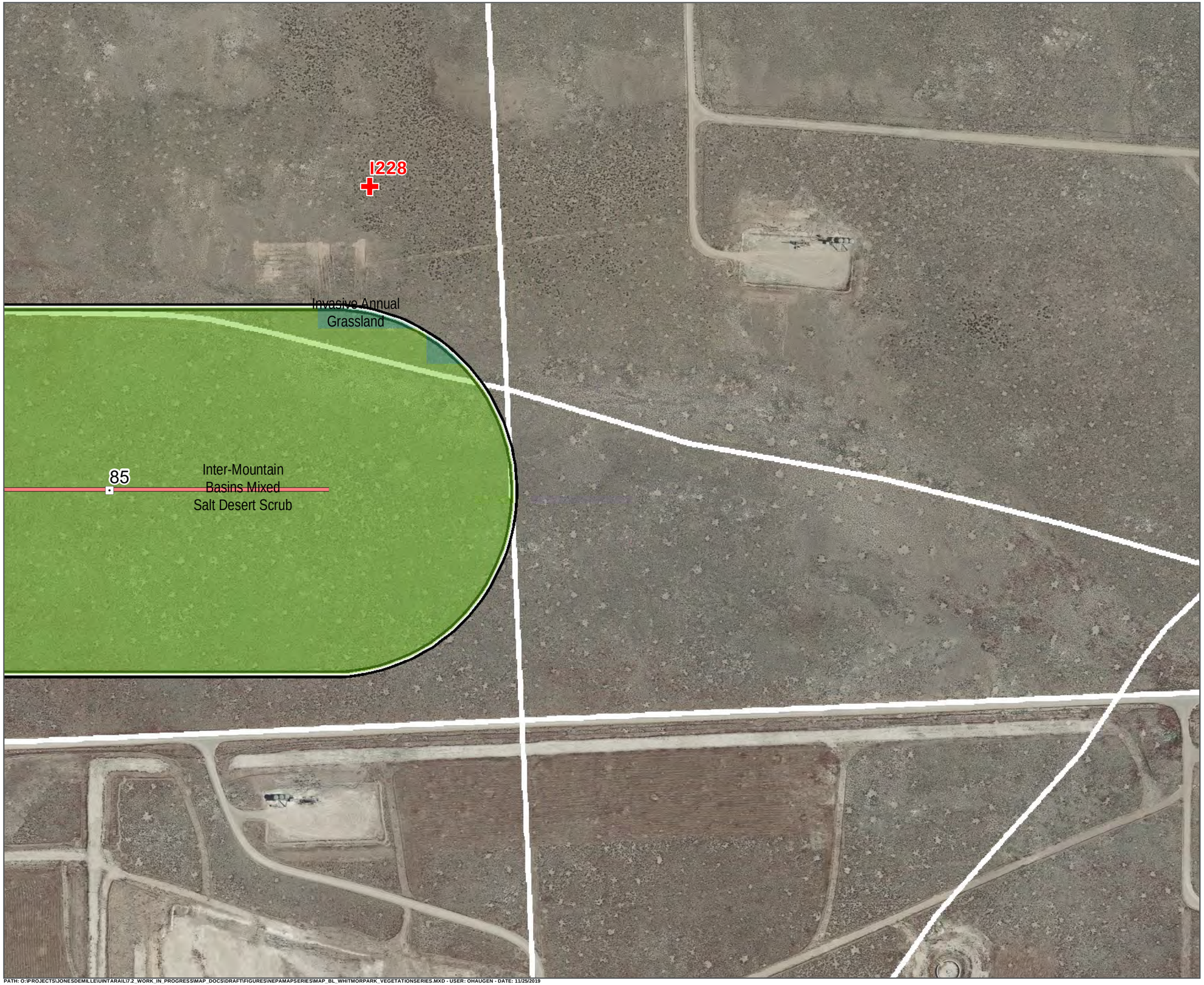

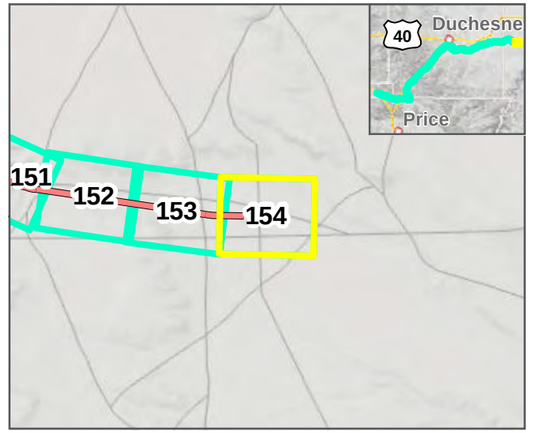

Photo Points
Mileposts
Whitmore Park Centerline
Study
Map Extent (current view in yellow)

Vegetation Communities

Inter-Mountain Basins Mixed Salt Desert Scrub

Invasive Annual

WHITMORE PARK ALTERNATIVE: 8/21/2019

VEGETATION COMMUNITIES
SEPTEMBER 2019

N

0 100 200 Feet

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APPENDIX E

List of Plant Species Observed

Appendix E. List of Plant Species Observed during Field Surveys

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Adoxaceae – Adoxa Family				
Sambucus racemosa	red elderberry	FACU	FACU	Yes
Amaranthaceae – Amaranth Family				
Atriplex canescens var. *canescens*	fourwing saltbush	UPL	UPL	Yes
Atriplex confertifolia	shadscale saltbush	UPL	UPL	Yes
Atriplex corrugata	mat saltbush	UPL	UPL	Yes
Atriplex gardneri	Gardner's saltbush	UPL	UPL	Yes
Bassia hyssopifolia	fivehorn smotherweed	FACU	FACU	No
Chenopodium album	lambsquarters	FACU	FACU	Both
Grayia spinosa	spiny hopsage	UPL	UPL	Yes
Halogeton glomeratus	saltlover	UPL	UPL	No
Krascheninnikovia lanata	winterfat	UPL	UPL	Yes
Monolepis nuttalliana	Nuttall's povertyweed	FAC	FAC	Yes
Salsola tragus	prickly Russian thistle	FACU	FACU	No
Zuckia brandegeei	siltbush	UPL	UPL	Yes
Amaryllidaceae – Amaryllis Family				
Allium textile	textile onion	UPL	UPL	Yes
Apiaceae – Carrot Family				
Cymopterus cf. *purpureus*	purple springparsley	UPL	UPL	Yes
Cymopterus purpurascens	widewing springparsley	UPL	UPL	Yes
Apocynaceae – Dogbane Family				
Asclepias latifolia	broadleaf milkweed	UPL	UPL	Yes
Asclepias speciosa	showy milkweed	FAC	FAC	Yes
Asparagaceae – Asparagus Family				
Triteleia grandiflora	largeflower triteleia	UPL	UPL	Yes
Yucca harrimaniae	Spanish bayonet	UPL	UPL	Yes
Asteraceae – Sunflower Family				
Achillea millefolium	common yarrow	FACU	FACU	Both
Ambrosia artemisiifolia	annual ragweed	FACU	FACU	Both
Antennaria dimorpha	low pussytoes	UPL	UPL	Yes
Antennaria parvifolia	small-leaf pussytoes	UPL	UPL	Yes
Arctium lappa	greater burdock	UPL	UPL	No

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Artemisia arbuscula	little sagebrush	UPL	UPL	Yes
Artemisia cana	silver sagebrush	FACU	FACU	Yes
Artemisia dracunculus	tarragon	UPL	UPL	Yes
Artemisia frigida	prairie sagewort	UPL	UPL	Yes
Artemisia ludoviciana var. *incompta*	white sagebrush	FACU	FACU	Yes
Artemisia nova	black sagebrush	UPL	UPL	Yes
Artemisia spinescens	bud sagebrush	UPL	UPL	Yes
Artemisia tridentata var. *tridentata*	basin big sagebrush	UPL	UPL	Yes
Carduus nutans	nodding plumeless thistle	FACU	UPL	No
Chaetopappa ericoides	rose heath	UPL	UPL	Yes
Chamaechaenactis scaposa	fullstem	UPL	UPL	Yes
Chrysothamnus viscidiflorus var. *lanceolatus*	yellow rabbitbrush	UPL	UPL	Yes
Chrysothamnus viscidiflorus var. *viscidiflorus*	yellow rabbitbrush	UPL	UPL	Yes
Cirsium arvense	Canada thistle	FACU	FAC	No
Cirsium cf. *clavatum*	fish lake thistle	UPL	UPL	Yes
Conyza canadensis	Canadian horseweed	UPL	UPL	Yes
Dieteria canescens var. *canescens*	hoary tansyaster	UPL	FAC	Yes
Ericameria nauseosa var. *salicifolia*	rubber rabbitbrush	UPL	UPL	Yes
Ericameria parryi var. *attenuata*	Parry's rabbitbrush	UPL	UPL	Yes
Erigeron engelmannii	Engelmann's fleabane	UPL	UPL	Yes
Gnaphalium palustre	western marsh cudweed	FACW	FACW	Yes
Gutierrezia sarothrae	broom snakeweed	UPL	UPL	Yes
Hymenopappus filifolius	fineleaf hymenopappus	UPL	UPL	Yes
Iva axillaris	povertyweed	FAC	FAC	Yes
Lactuca serriola	prickly lettuce	FACU	FACU	No
Lorandersonia linifolia	spearleaf rabbitbrush	FAC	FAC	Yes
Malacothrix torreyi	Torrey's desertdandelion	UPL	UPL	Yes
Mulgedium pulchellum	blue lettuce	UPL	UPL	Yes
Parthenium ligulatum	Colorado feverfew	UPL	UPL	Yes
Pyrrocoma lanceolata var. *lanceolata*	lanceleaf goldenweed	FAC	FAC	Yes
Solidago canadensis	Canada goldenrod	FACU	FACU	Yes
Symphyotrichum ascendens	western aster	FAC	FACU	Yes
Symphyotrichum bracteolatum	Eaton's aster	FAC	FAC	Yes
Symphyotrichum eatonii	Eaton's aster	UPL	UPL	Yes
Symphyotrichum spathulatum var. *spathulatum*	western mountain aster	FAC	FAC	Yes
Taraxacum officinale	common dandelion	FACU	FACU	Both
Tetradymia nuttallii	Nuttall's horsebrush	UPL	UPL	Yes

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Tetradymia spinosa	shortspine horsebrush	UPL	UPL	Yes
Tetraneuris acaulis var. *caespitosa*	caespitose four-nerve daisy	UPL	UPL	Yes
Thelesperma subnudum var. *subnudum*	Navajo tea	UPL	UPL	Yes
Townsendia mensana	table Townsend daisy	UPL	UPL	Yes
Townsendia strigosa	hairy Townsend daisy	UPL	UPL	Yes
Viguiera multiflora var. *nevadensis*	Nevada goldeneye	UPL	UPL	Yes
Xanthium strumarium	rough cocklebur	FAC	FAC	Yes
Berberidaceae – Barberry Family				
Berberis repens	creeping barberry	UPL	UPL	Yes
Betulaceae – Birch Family				
Alnus incana	gray alder	FACW	FACW	Yes
Boraginaceae – Borage Family				
Cryptantha flavoculata	roughseed cryptantha	UPL	UPL	Yes
Cryptantha gracilis	narrowstem cryptantha	UPL	UPL	Yes
Cryptantha kelseyana	Kelsey's cryptantha	UPL	UPL	Yes
Cryptantha sericea	silky cryptantha	UPL	UPL	Yes
Cynoglossum officinale	gypsyflower	FACU	FACU	No
Lappula occidentalis	flatspine stickseed	UPL	UPL	Yes
Mertensia lanceolata var. *nivalis*	prairie bluebells	UPL	UPL	Yes
Nama densum	leafy nama	UPL	UPL	Yes
Phacelia crenulata var. *corrugata*	cleftleaf wildheliotrope	UPL	UPL	Yes
Brassicaceae – Mustard Family				
Alyssum desertorum	desert madwort	UPL	UPL	No
Boechera pinetorum	Holboell rockcress	UPL	UPL	Yes
Capsella bursa-pastoris	shepherd's purse	FACU	FACU	No
Caulanthus crassicaulis	thickstem wild cabbage	UPL	UPL	Yes
Chorispora tenella	crossflower	UPL	UPL	No
Descurainia pinnata var. *nelsonii*	Nelson's tansymustard	UPL	UPL	Yes
Lepidium draba	whitetop	UPL	UPL	No
Lepidium latifolium	broadleaved pepperweed	FAC	FAC	No
Lepidium perfoliatum	clasping pepperweed	FACU	FACU	No
Lepidium virginicum	Virginia pepperweed	FACU	FACU	Yes
Physaria acutifolia var. *acutifolia*	sharpleaf twinpod	UPL	UPL	Yes
Physaria intermedia	mid bladderpod	UPL	UPL	Yes
Schoenocrambe linifolia	flaxleaf plainsmustard	UPL	UPL	Yes
Sisymbrium altissimum	tall tumblemustard	FACU	FACU	No
Sisymbrium irio	London rocket	UPL	UPL	No

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Stanleya viridiflora	green princesplume	UPL	UPL	Yes
Streptanthella longirostris	longbeak streptanthella	UPL	UPL	Yes
Streptanthus cordatus	heartleaf twistflower	UPL	UPL	Yes
Thelypodiopsis elegans	Westwater tumblemustard	UPL	UPL	Yes
Cactaceae – Cactus Family				
Echinocereus engelmannii	Engelmann's hedgehog cactus	UPL	UPL	Yes
Opuntia fragilis	brittle pricklypear	UPL	UPL	Yes
Opuntia polyacantha var. *polyacantha*	hairspine pricklypear	UPL	UPL	Yes
Pediocactus simpsonii	mountain ball cactus	UPL	UPL	Yes
Sclerocactus brevispinus	Pariette cactus	UPL	UPL	Yes
Caprifoliaceae – Honeysuckle Family				
Symphoricarpos occidentalis	western snowberry	FAC	FAC	Yes
Caryophyllaceae – Pink Family				
Eremogone eastwoodiae var. *eastwoodiae*	Eastwood's sandwort	UPL	UPL	Yes
Chenopodiaceae – Goosefoot Family				
Suaeda calceoliformis	Pursh seepweed	FACW	FACW	Yes
Cupressaceae – Cypress Family				
Juniperus communis	common juniper	FACU	UPL	Yes
Juniperus osteosperma	Utah juniper	UPL	UPL	Yes
Cyperaceae – Sedge Family				
Bolboschoenus cf. *fluviatilis*	river bulrush	UPL	UPL	Yes
Carex cf. *occidentalis*	western sedge	UPL	UPL	Yes
Carex nebrascensis	Nebraska sedge	OBL	OBL	Yes
Carex parryana	Parry's sedge	FAC	FACW	Yes
Carex utriculata	Northwest Territory sedge	OBL	OBL	Yes
Eleocharis palustris	common spikerush	OBL	OBL	Yes
Schoenoplectus acutus	hardstem bulrush	OBL	OBL	Yes
Schoenoplectus americanus	chairmaker's bulrush	OBL	OBL	Yes
Elaeagnaceae – Oleaster Family				
Elaeagnus angustifolia	Russian olive	FAC	FAC	No
Ephedraceae – Ephedra Family				
Ephedra torreyana	Torrey's jointfir	UPL	UPL	Yes
Ephedra viridis	mormon tea	UPL	UPL	Yes
Equisetaceae – Horsetail Family				
Equisetum arvense	field horsetail	FAC	FAC	Yes
Equisetum hyemale	scouringrush horsetail	FACW	FACW	Yes

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Equisetum laevigatum	smooth horsetail	FACW	FACW	Yes
Euphorbiaceae – Spurge Family				
Euphorbia cf. *brachycera*	horned spurge	UPL	UPL	Yes
Fabaceae – Legume Family				
Astragalus australis	Indian milkvetch	UPL	UPL	Yes
Astragalus bisulcatus var. *major*	twogrooved milkvetch	UPL	UPL	Yes
Astragalus cf. *duchesnensis*	Duchesne milkvetch	UPL	UPL	Yes
Astragalus cf. *megacarpus*	great bladdery milkvetch	UPL	UPL	Yes
Astragalus chamaeleuce	cicada milkvetch	UPL	UPL	Yes
Astragalus convallarius var. *convallarius*	lesser rushy milkvetch	UPL	UPL	Yes
Astragalus pubentissimus var. *peabodianus*	Green River milkvetch	UPL	UPL	Yes
Glycyrrhiza lepidota	American licorice	FAC	FAC	Yes
Hedysarum boreale var. *boreale*	Utah sweetvetch	UPL	UPL	Yes
Lupinus argenteus var. *argentatus*	silvery lupine	UPL	UPL	Yes
Melilotus officinalis	sweetclover	FACU	FACU	No
Oxytropis sericea	white locoweed	UPL	UPL	Yes
Gentianaceae – Gentian Family				
Gentiana affinis	pleated gentian	FACU	FACU	Yes
Gentiana parryi	Parry's gentian	FAC	FAC	Yes
Gentianella amarella	autumn dwarf gentian	UPL	UPL	Yes
Grossulariaceae – Gooseberry Family				
Ribes aureum	golden currant	FAC	FAC	Yes
Ribes cereum	wax currant	UPL	UPL	Yes
Iridaceae – Iris Family				
Iris missouriensis	Rocky Mountain iris	UPL	UPL	Yes
Sisyrinchium cf. *idahoense*	Idaho blue-eyed grass	FACW	FACW	Yes
Juncaceae – Rush Family				
Juncus balticus	mountain rush	FACW	FACW	Yes
Juncus bufonius	toad rush	FACW	FACW	Yes
Juncus longistylis	longstyle rush	FACW	FACW	Yes
Juncaginaceae – Arrow–Grass Family				
Triglochin maritima	seaside arrowgrass	OBL	OBL	Yes
Lamiaceae – Mint Family				
Mentha arvensis	wild mint	FACW	FACW	Yes
Liliaceae – Lily Family				
Calochortus nuttallii	sego lily	UPL	UPL	Yes

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Linaceae – Flax Family				
Linum perenne	blue flax	UPL	UPL	No
Loasaceae – Loasa Family				
Mentzelia albicaulis	whitestem blazingstar	UPL	UPL	Yes
Malvaceae – Mallow Family				
Sidalcea cf. *neomexicana*	salt spring checkerbloom	FACW	FACW	Yes
Sphaeralcea ambigua	desert globemallow	UPL	UPL	Yes
Sphaeralcea coccinea	scarlet globemallow	UPL	UPL	Yes
Nyctaginaceae – Four O'clock Family				
Abronia fragrans	snowball sand verbena	UPL	UPL	Yes
Onagraceae – Evening Primrose Family				
Chylismia scapoidea var. *scapoidea*	Paiute suncup	UPL	UPL	Yes
Epilobium glaberrimum	glaucus wilowherb	FACW	FACW	Yes
Oenothera caespitosa var. *marginata*	tufted evening primrose	UPL	UPL	Yes
Oenothera pallida	pale evening primrose	UPL	UPL	Yes
Orobanchaceae – Broomrape Family				
Castilleja chromosa	northwestern Indian paintbrush	UPL	UPL	Yes
Castilleja flava	yellow Indian paintbrush	UPL	UPL	Yes
Cordylanthus kingii var. *densiflorus*	King's bird-beak	UPL	UPL	Yes
Orthocarpus luteus	yellow owl's-clover	FACU	FACU	Yes
Orthocarpus tolmiei	Tolmie's owl's-clover	UPL	UPL	Yes
Pedicularis centranthera	dwarf lousewort	UPL	UPL	Yes
Pinaceae – Pine Family				
Picea pungens	blue spruce	FAC	FAC	Yes
Pinus edulis	twoneedle pinyon	UPL	UPL	Yes
Pseudotsuga menziesii	Douglas-fir	FACU	FACU	Yes
Plantaginaceae – Plantain Family				
Penstemon pachyphyllus var. *pachyphyllus*	thickleaf beardtongue	UPL	UPL	Yes
Plantago patagonica	woolly plantain	UPL	UPL	Yes
Poaceae – Grass Family				
Agropyron cristatum	crested wheatgrass	UPL	UPL	No
Agrostis gigantea	redtop	FACW	FAC	No
Agrostis stolonifera	creeping bentgrass	FACW	FAC	No
Alopecurus pratensis	meadow foxtail	FACW	FAC	No
Bouteloua gracilis	blue grama	UPL	UPL	Yes
Bromus inermis	smooth brome	FACU	UPL	Both

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Bromus tectorum	cheatgrass	UPL	UPL	No
Dactylis glomerata	orchardgrass	FACU	FACU	No
Diplachne fusca ssp. fascicularis	Malabar sprangletop	FACW	FACW	Yes
Distichlis spicata	saltgrass	FAC	FACW	Yes
Elymus elymoides	squirreltail	FACU	FACU	Yes
Elymus lanceolatus	thickspike wheatgrass	UPL	FACU	Yes
Eragrostis cf. *pectinacea*	tufted lovegrass	FAC	FAC	Yes
Eremopyrum triticeum	annual wheatgrass	UPL	UPL	No
Festuca cf. *ovina*	sheep fescue	FACU	UPL	No
Festuca pratensis	meadow fescue	FACU	FACU	No
Hilaria jamesii	James' galleta	UPL	UPL	Yes
Hordeum brachyantherum	meadow barley	FACW	FACW	Yes
Hordeum jubatum	foxtail barley	FAC	FAC	Yes
Hordeum pusillum	little barley	FACU	FACU	Yes
Leymus cinereus	basin wildrye	FAC	FAC	Yes
Phalaris arundinacea	reed canarygrass	FACW	FACW	Yes
Phleum pratense	timothy	FACU	FAC	No
Phragmites australis	common reed	FACW	FACW	Both
Poa annua	annual bluegrass	FAC	FAC	No
Poa bulbosa	bulbous bluegrass	FACU	FACU	No
Poa cf. *abrreviatta* var. *pattersonii*	Patterson's bluegrass	FACU	FACU	Yes
Poa fendleriana	muttongrass	UPL	UPL	Yes
Poa palustris	fowl bluegrass	FAC	FAC	Yes
Poa secunda	Sandberg bluegrass	FACU	FACU	Yes
Polypogon monspeliensis	annual rabbitsfoot grass	FACW	FACW	No
Pseudoroegneria spicata	bluebunch wheatgrass	UPL	UPL	Yes
Puccinellia cf. *nuttalliana*	Nuttall's alkaligrass	FACW	FACW	Yes
Setaria viridis	green bristlegrass	UPL	UPL	No
Sporobolus airoides	alkali sacaton	FAC	FAC	Yes
Stipa comata	needle and thread	UPL	UPL	Yes
Stipa hymenoides	Indian ricegrass	UPL	UPL	Yes
Stipa lettermanii	Letterman's needlegrass	UPL	UPL	Yes
Thinopyrum intermedium	intermediate wheatgrass	UPL	UPL	No
Polemoniaceae – Phlox Family				
Aliciella leptomeria	sand gilia	UPL	UPL	Yes
Eriastrum diffusum	miniature woollystar	UPL	UPL	Yes
Gilia inconspicua	shy gilia	UPL	UPL	Yes

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Ipomopsis congesta var. *congesta*	ballhead ipomopsis	UPL	UPL	Yes
Ipomopsis polycladon	manybranched ipomopsis	UPL	UPL	Yes
Phlox austromontana var. *austromontana*	mountain phlox	UPL	UPL	Yes
Phlox hoodii	spiny phlox	UPL	UPL	Yes
Phlox longifolia	longleaf phlox	UPL	UPL	Yes
Polygonaceae – Buckwheat Family				
Eriogonum alatum	winged buckwheat	UPL	UPL	Yes
Eriogonum batemanii var. *batemanii*	Bateman's buckwheat	UPL	UPL	Yes
Eriogonum brevicaule var. *laxifolium*	shortstem buckwheat	UPL	UPL	Yes
Eriogonum cernuum	nodding buckwheat	UPL	UPL	Yes
Eriogonum corymbosum var. *corymbosum*	crispleaf buckwheat	UPL	UPL	Yes
Eriogonum microthecum var. *simpsonii*	Simpson's buckwheat	UPL	UPL	Yes
Eriogonum ovalifolium	cushion buckwheat	FACU	FACU	Yes
Eriogonum shockleyi	Shockley's buckwheat	UPL	UPL	Yes
Eriogonum umbellatum var. *subaridum*	suplhur-flower buckwheat	UPL	UPL	Yes
Polygonum argyrocoleon	silversheath knotweed	FAC	FAC	No
Polygonum minimum	broadleaf knotweed	FACU	FACU	Yes
Rumex crispus	curly dock	FAC	FAC	No
Rumex occidentalis	western dock	FACW	FACW	Yes
Rumex stenophyllus	narrowleaf dock	FACW	FACW	No
Ranunculaceae – Buttercup Family				
Aquilegia cf. *flavescens*	yellow columbine	UPL	UPL	Yes
Clematis cf. *columbiana*	rock clematis	UPL	UPL	Yes
Ranunculus cf. *acris*	tall buttercup	FACW	FAC	Both
Ranunculus cymbalaria	alkali buttercup	OBL	OBL	Yes
Ranunculus testiculatus	curveseed butterwort	UPL	UPL	No
Rosaceae – Rose Family				
Amelanchier alnifolia	Saskatoon serviceberry	FACU	FACU	Yes
Amelanchier utahensis	Utah serviceberry	FACU	UPL	Yes
Cercocarpus ledifolius	curl-leaf mountain mahoganyq	UPL	UPL	Yes
Cercocarpus montanus	alderleaf mountain mahogany	UPL	UPL	Yes
Dasiphora fruticosa	shrubby cinquefoil	FAC	FAC	Yes
Geum macrophyllum	largeleaf avens	FACW	FAC	Yes
Potentilla cf. *rubricaulis*	RockyMountain cinquefoil	FACU	FACU	Yes
Potentilla gracilis var. *elmeri*	combleaf cinquefoil	FAC	FAC	Yes
Prunus virginiana	chokecherry	FAC	FACU	Yes
Rosa woodsii	Wood's rose	FACU	FACU	Yes

Scientific Name[a]	Common Name[b]	Arid West Wetland Status[c]	Western Mountains Wetland Status[c]	Native to Utah?[d]
Salicaceae – Willow Family				
Populus angustifolia	narrowleaf cottonwood	FACW	FACW	Yes
Populus fremontii	Fremont cottonwood	FAC	FAC	Yes
Salix bebbiana	Bebb willow	FACW	FACW	Yes
Salix cf. *laevigata*	red willow	FACW	FACW	Yes
Salix cf. *lucida*	shining willow	FACW	FACW	Yes
Salix exigua	narrowleaf willow	FACW	FACW	Yes
Sarcobataceae – Greasewood Family				
Sarcobatus vermiculatus	greasewood	FACU	FACU	Yes
Scrophulariaceae – Figwort Family				
Verbascum thapsus	common mullein	FACU	FACU	No
Solanaceae – Nightshade Family				
Lycium torreyi	Torrey wolfberry	FAC	FACU	Yes
Tamaricaceae – Tamarisk Family				
Tamarix cf. *parviflora*	smallflower tamarisk	FAC	FAC	No
Tamarix chinensis	five-stamen tamarisk	FAC	FAC	No
Typhaceae – Cattail Family				
Typha domingensis	southern cattail	OBL	OBL	Yes
Typha latifolia	broadleaf cattail	OBL	OBL	Yes
Urticaceae – Nettle Family				
Urtica dioica	stinging nettle	FAC	FAC	Both
Violaceae – Violet Family				
Viola nuttallii	Nuttall's violet	UPL	UPL	Yes

[a] cf.: cf. describes a specimen that is difficult to identify due to practical difficulties.

[b] Common-name conventions according to USDA NRCS Plants Database (https://plants.usda.gov).

[c] Indicator status as assigned for the *Arid West and Western Mountains, Valleys & Coast in the National Wetland Plant List* (Lichvar and others 2016): FAC = facultative; FACU = facultative upland; FACW = facultative wetland; UPL = upland plants (or not listed species assumed to be upland); OBL = obligate wetland.

[d] Native status according to USDA NRCS Plants Database (https://plants.usda.gov).

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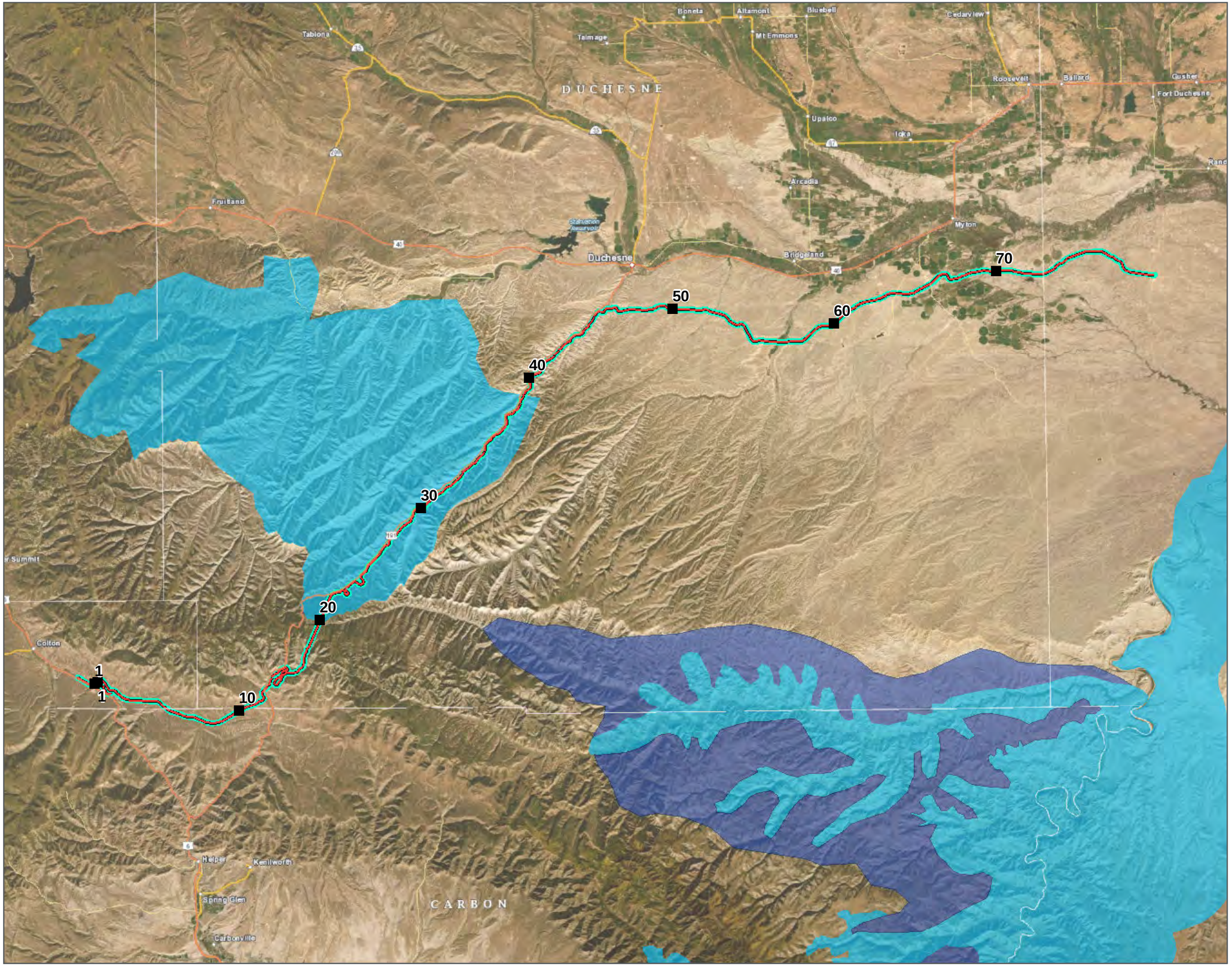
APPENDIX F

Habitat Maps for Big-game Species



LEGEND

- Mileposts
- Indian Canyon Centerline
- Study

Bighorn Sheep Habitat (Ovis canadensis)

- Year-long & crucial
- Year-long & substantial

INDIAN CANYON
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

BIGHORN SHEEP HABITAT

N

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MILES

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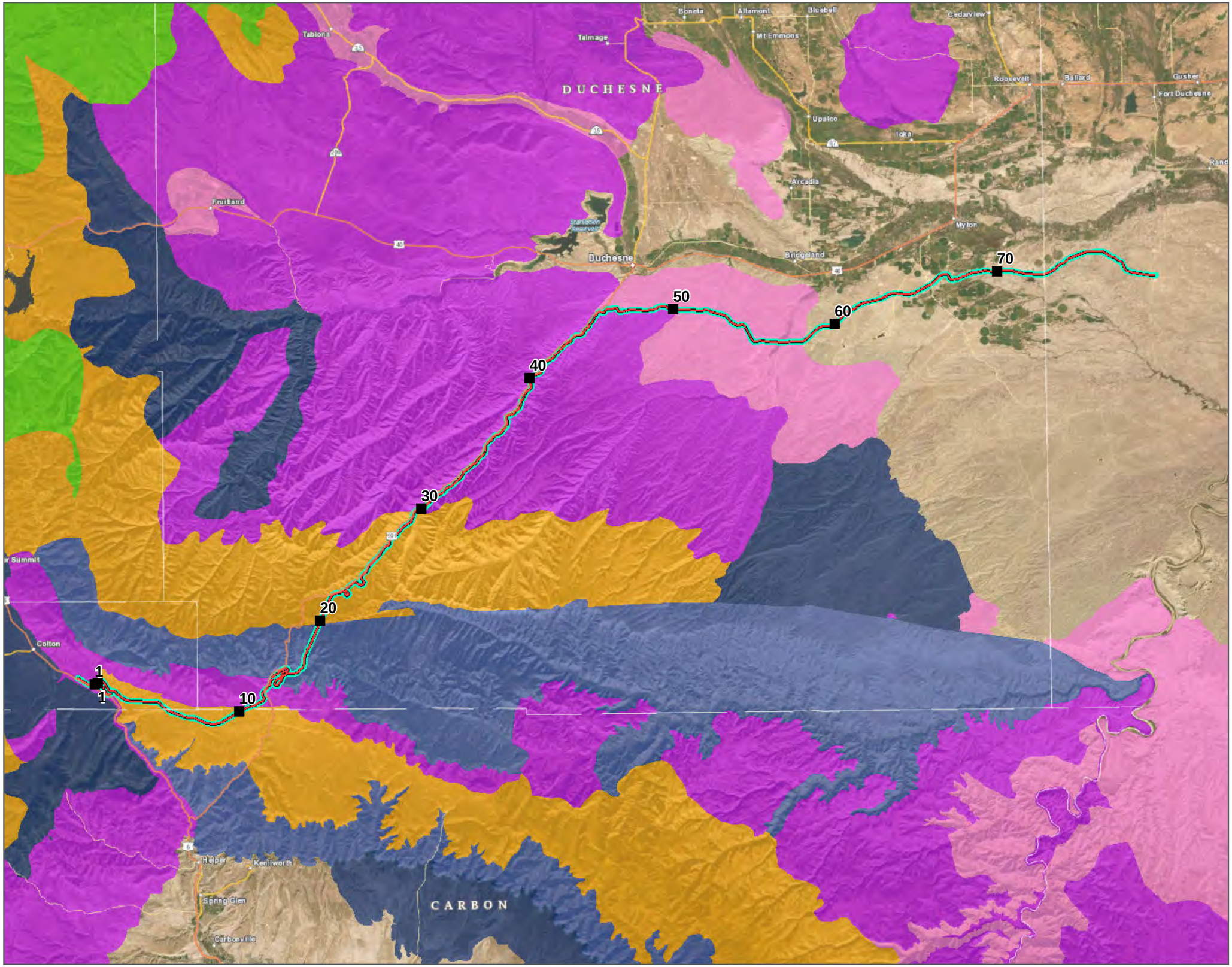

LEGEND

- Mileposts
- Indian Canyon Centerline
- Study Area

Elk Habitat (Cervus canadensis)

- Spring/fall & crucial
- Summer & crucial
- Winter & crucial
- Winter & substantial
- Year-long & crucial
- Year-long & substantial

INDIAN CANYON
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

ELK HABITAT

N

0 10

MILES

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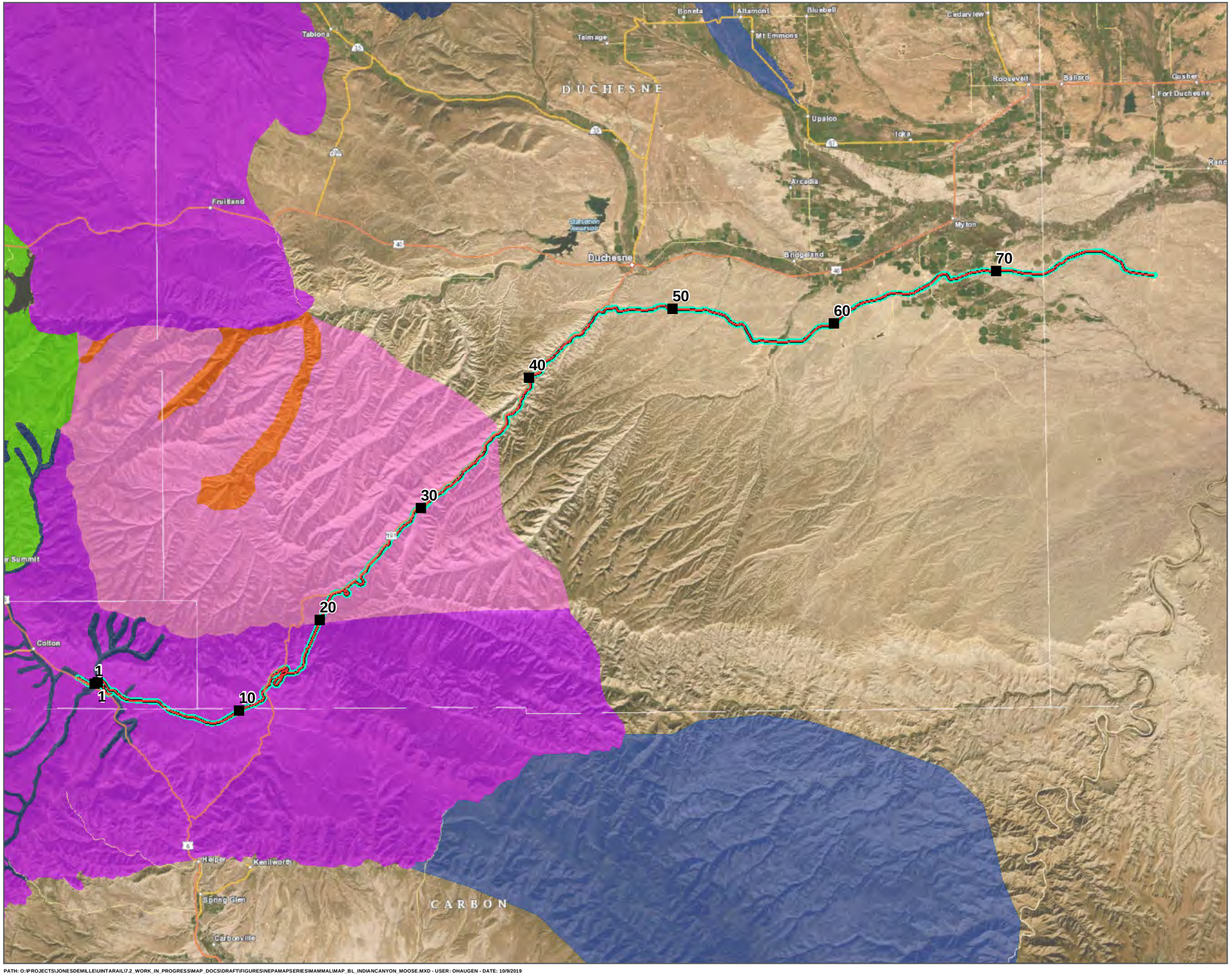

LEGEND

- Mileposts
- Indian Canyon Centerline
- Study Area

Moose Habitat (Alces alces)

- Spring/fall & crucial
- Summer & substantial
- Winter & crucial
- Winter & substantial
- Year-long & crucial
- Year-long & substantial

INDIAN CANYON
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

MOOSE HABITAT

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MILES

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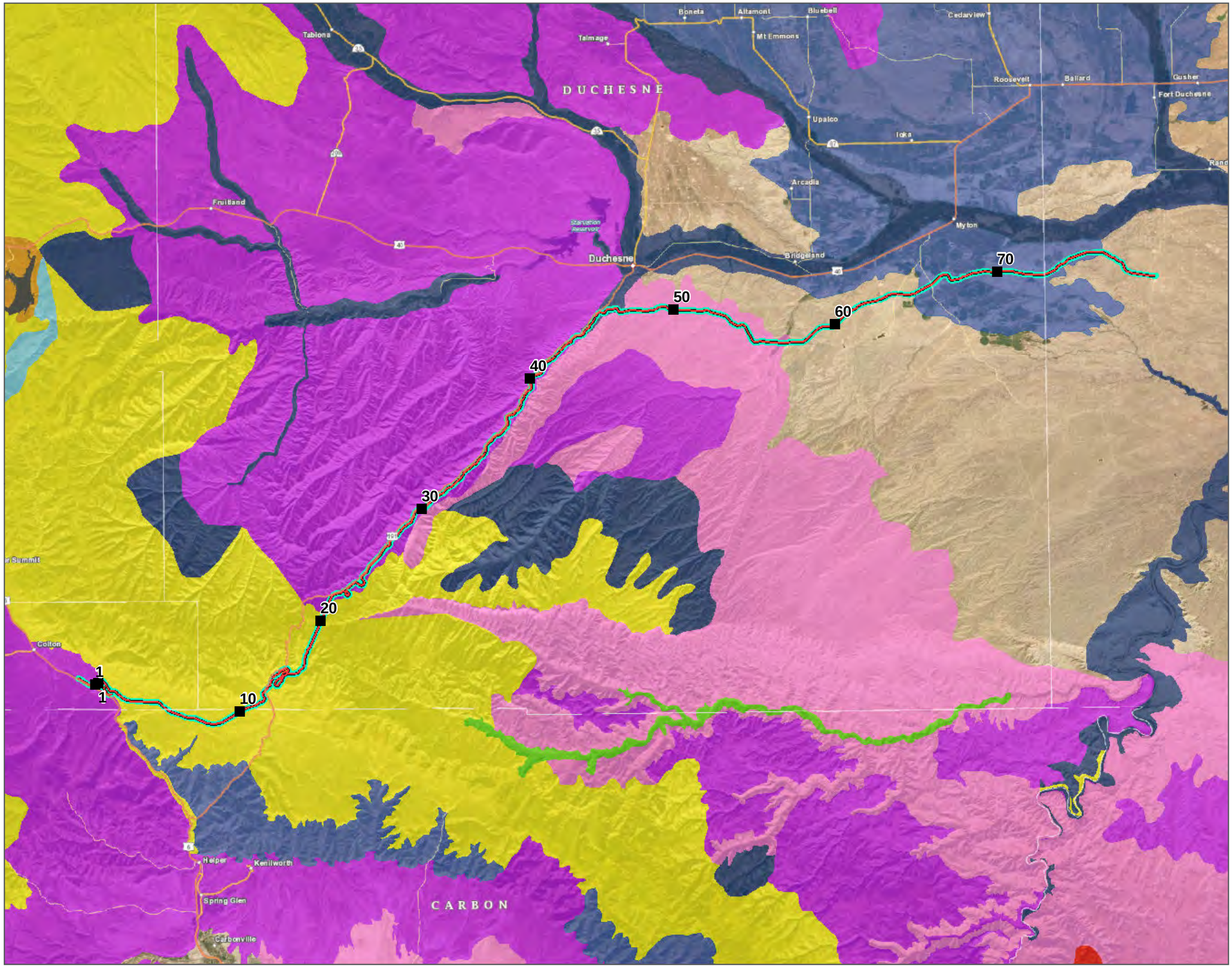

LEGEND

- Mileposts
- Indian Canyon Centerline
- Study Area

Mule Deer Habitat (Odocoileus hemionus)

- Spring/fall & crucial
- Summer & crucial
- Summer & substantial
- Summer/fall & substantial
- Winter & crucial
- Winter & substantial
- Winter/spring & crucial
- Year-long & crucial
- Year-long & substantial

INDIAN CANYON ALTERNATIVE: 5/30/19 SEPTEMBER 2019

MULE DEER HABITAT

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MILES

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LEGEND

- Mileposts
- Indian Canyon Centerline
- Indian Canyon Study

Pronghorn Habitat (Antilocapra Americana)

- Year-long & crucial
- Year-long & substantial

INDIAN CANYON
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

PRONGHORN HABITAT

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MILES

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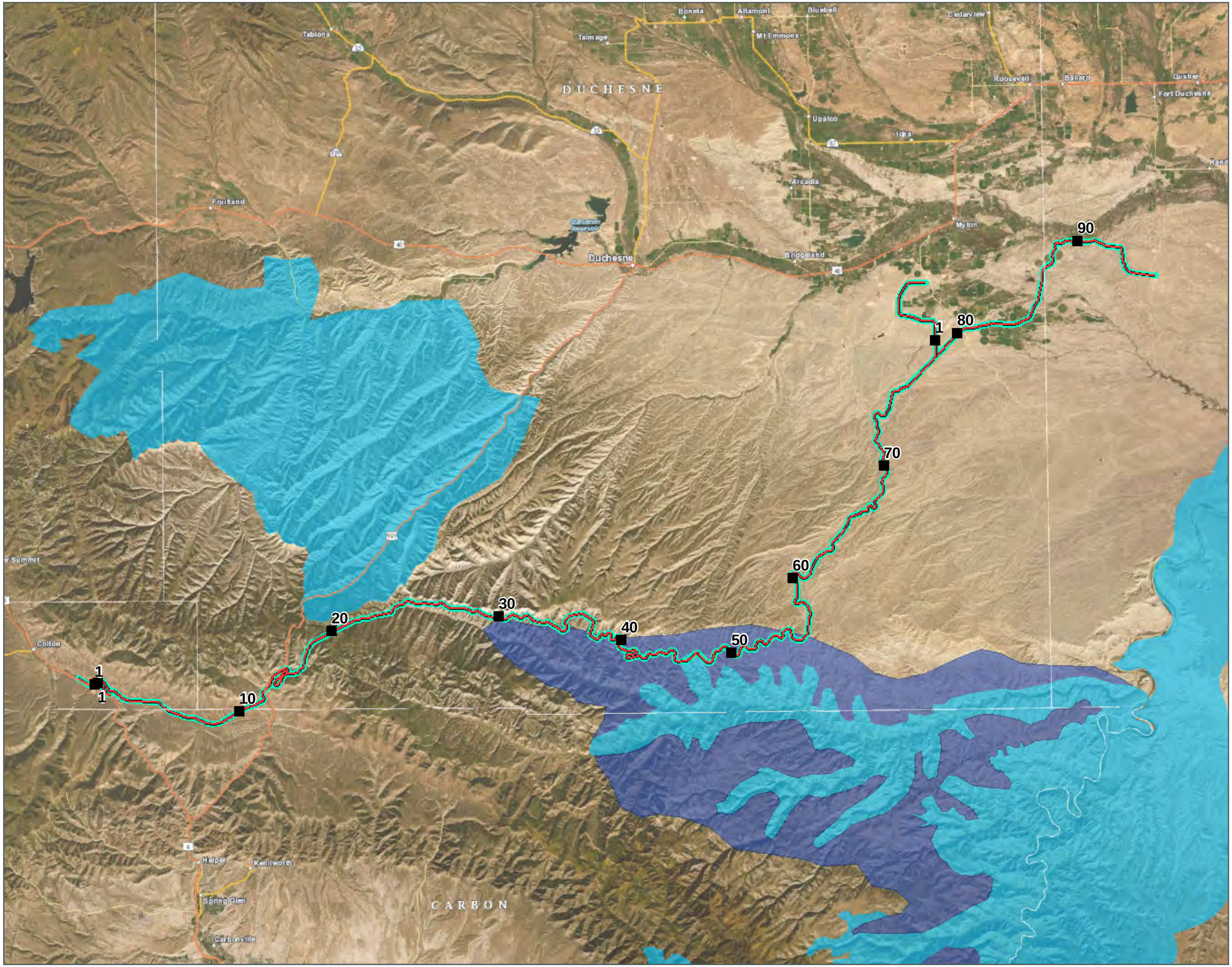

LEGEND

- Mileposts
- Wells Draw Centerline
- Study Area

Bighorn Sheep Habitat (Ovis canadensis)

- Year-long & crucial
- Year-long & substantial

WELLS DRAW
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

BIGHORN SHEEP HABITAT

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MILES

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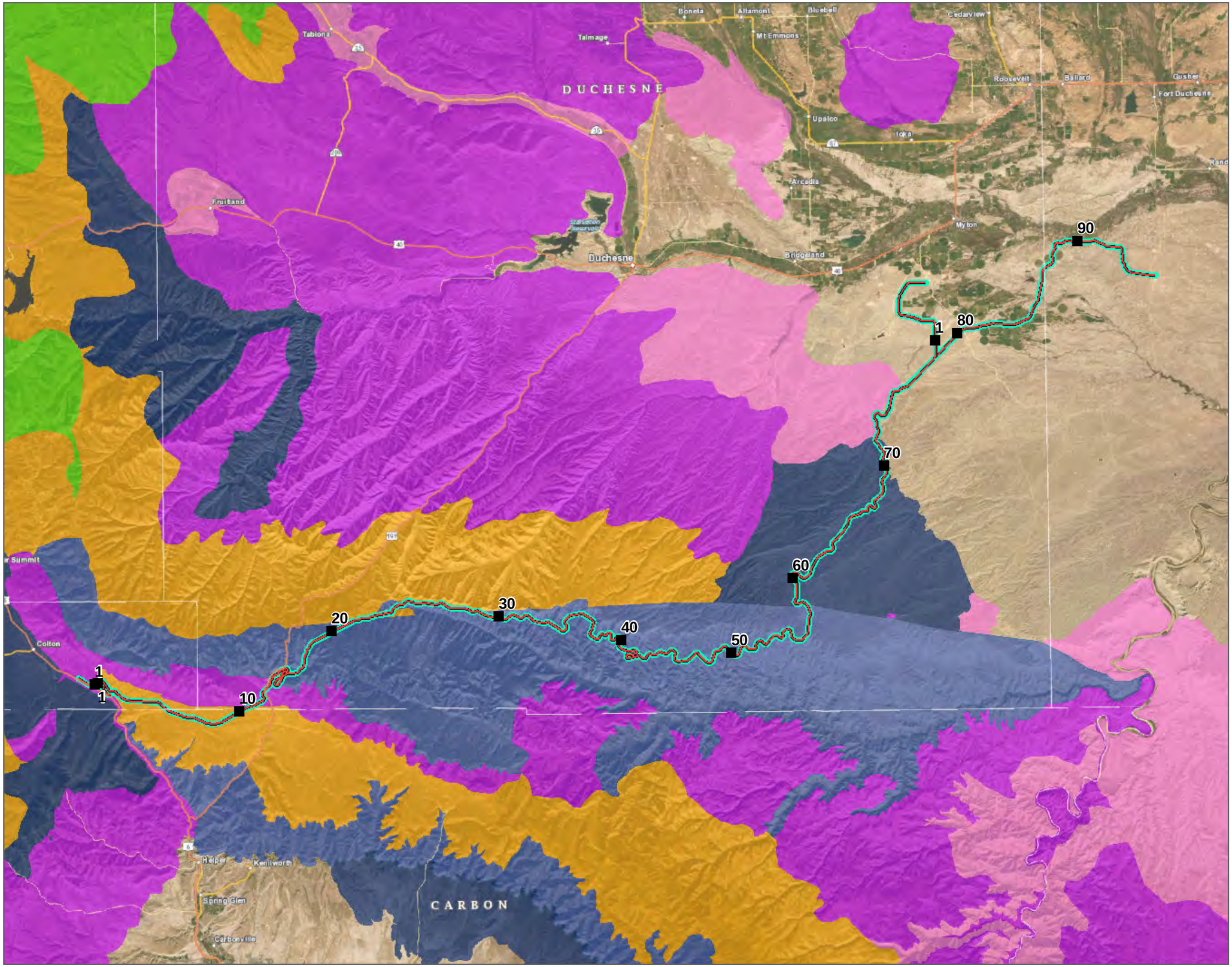

LEGEND

- Mileposts
- Wells Draw Centerline
- Study Area

Elk Habitat (Cervus canadensis)

- Spring/fall & crucial
- Summer & crucial
- Winter & crucial
- Winter & substantial
- Year-long & crucial
- Year-long & substantial

WELLS DRAW
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

ELK HABITAT

N

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MILES

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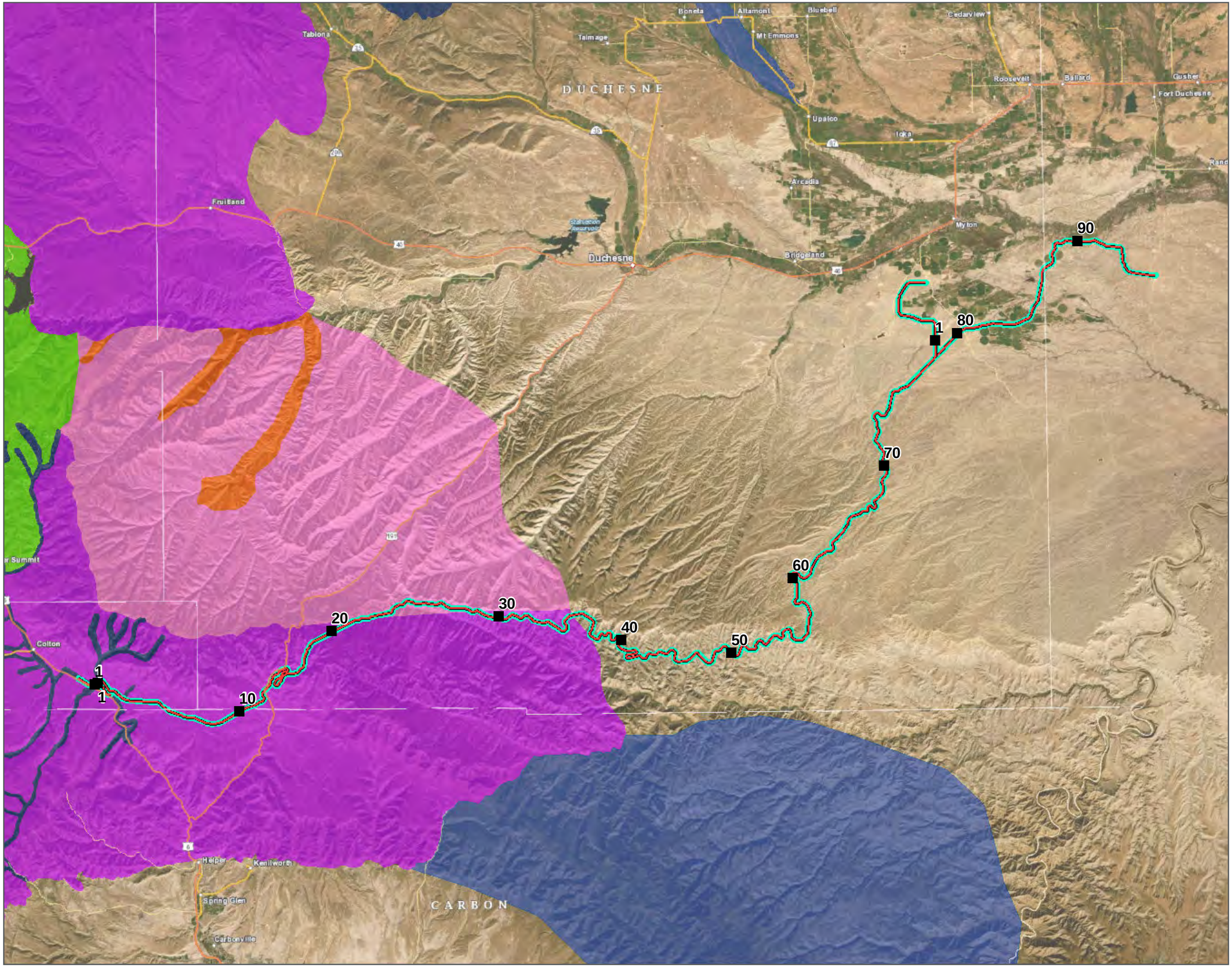

LEGEND

- Mileposts
- Wells Draw Centerline
- Study Area

Moose Habitat (Alces alces)

- Spring/fall & crucial
- Summer & substantial
- Winter & crucial
- Winter & substantial
- Year-long & crucial
- Year-long & substantial

WELLS DRAW
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

MOOSE HABITAT

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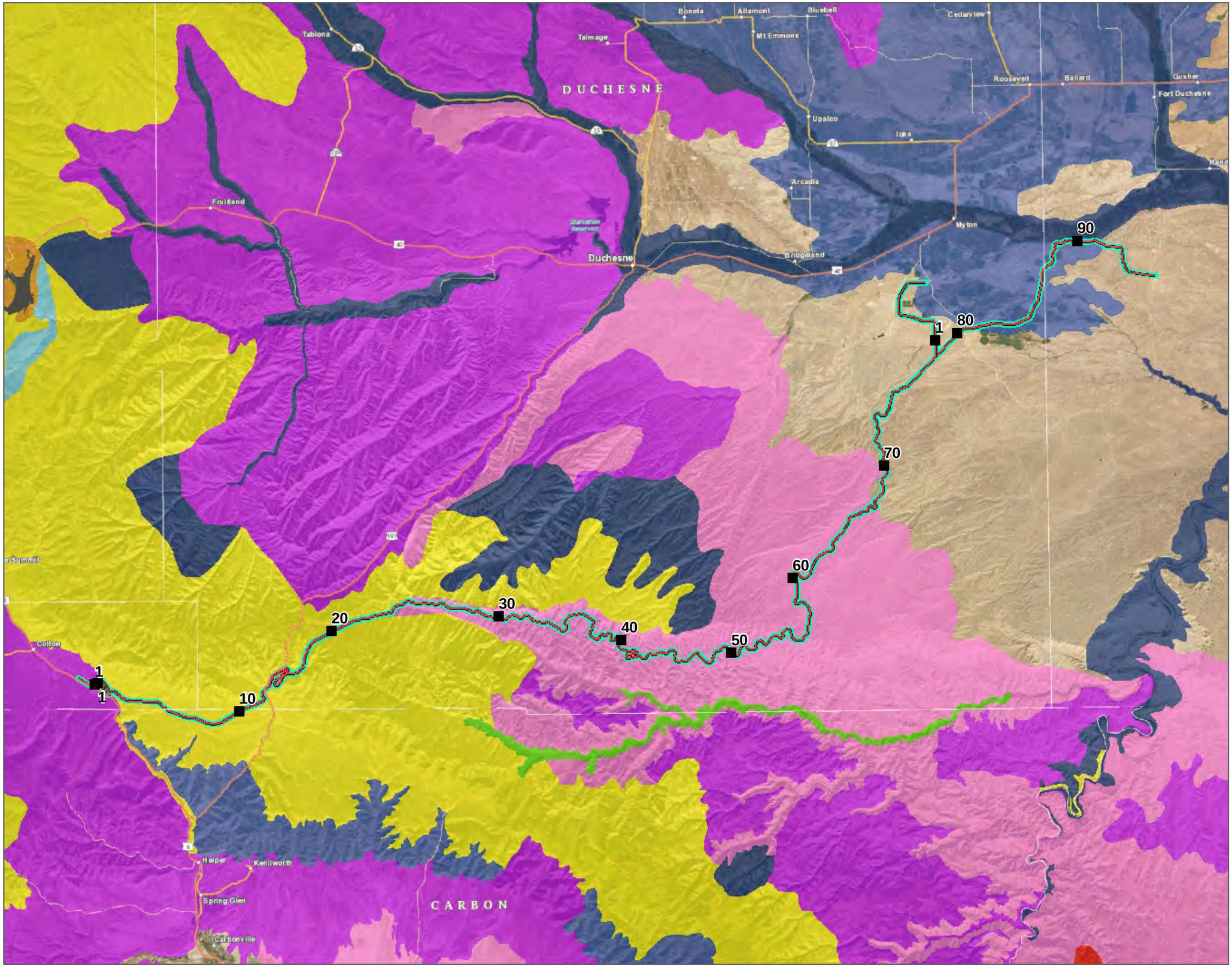

LEGEND

- Mileposts
- Wells Draw Centerline
- Study

Mule Deer Habitat (Odocoileus hemionus)

- Spring/fall & crucial
- Summer & crucial
- Summer & substantial
- Summer/fall & substantial
- Winter & crucial
- Winter & substantial
- Winter/spring & crucial
- Year-long & crucial
- Year-long & substantial

WELLS DRAW
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

MULE DEER HABITAT

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MILES

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LEGEND

- Mileposts
- Wells Draw Centerline
- Study Area

Pronghorn Habitat (Antilocapra Americana)

- Year-long & crucial
- Year-long & substantial

WELLS DRAW
ALTERNATIVE: 5/30/19
SEPTEMBER 2019

PRONGHORN HABITAT

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MILES

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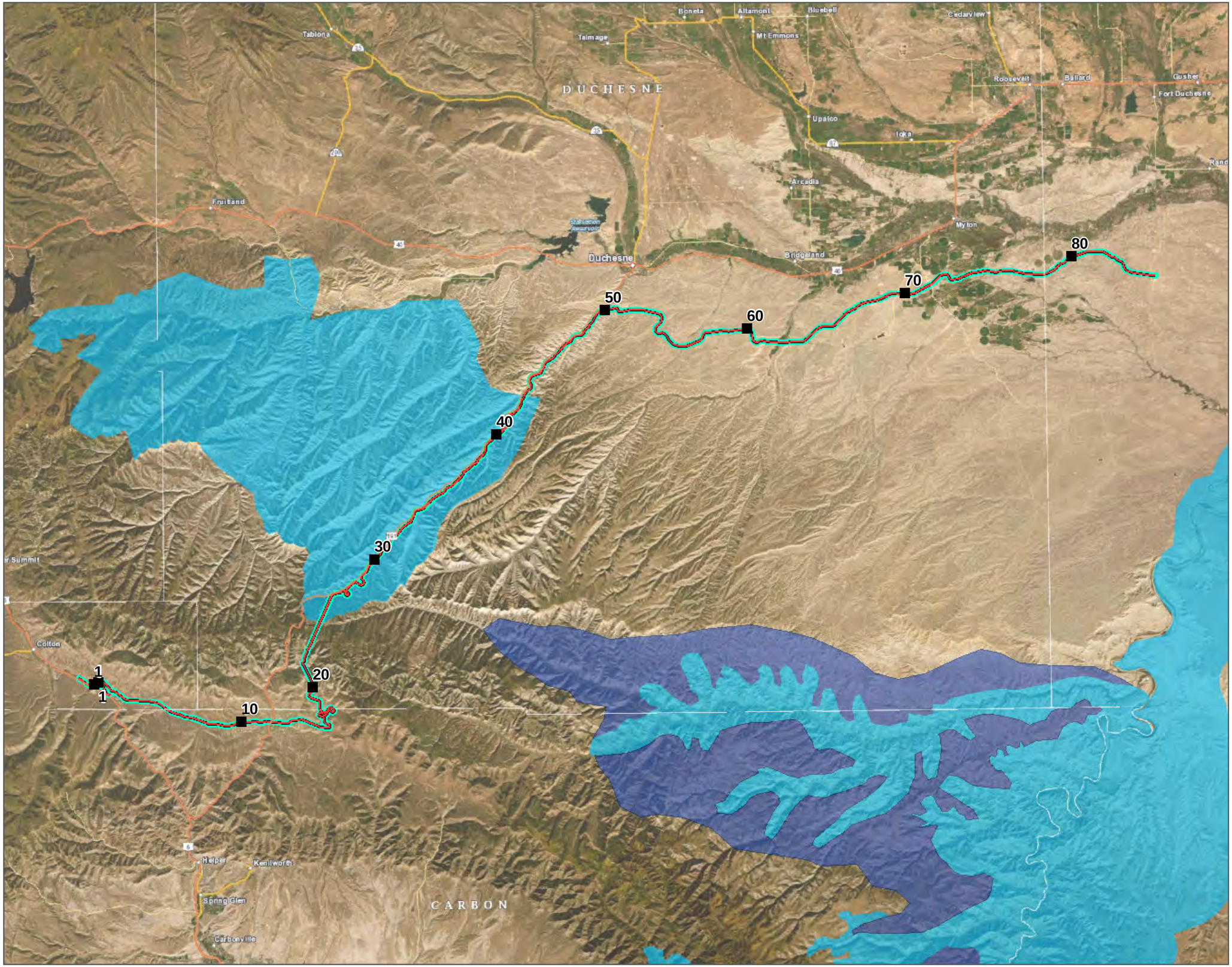

LEGEND

- Mileposts
- Whitmore Park Centerline
- Study Area

Bighorn Sheep Habitat (Ovis canadensis)

- Year-long & crucial
- Year-long & substantial

WHITMORE PARK
ALTERNATIVE: 8/21/19
SEPTEMBER 2019

BIGHORN SHEEP HABITAT

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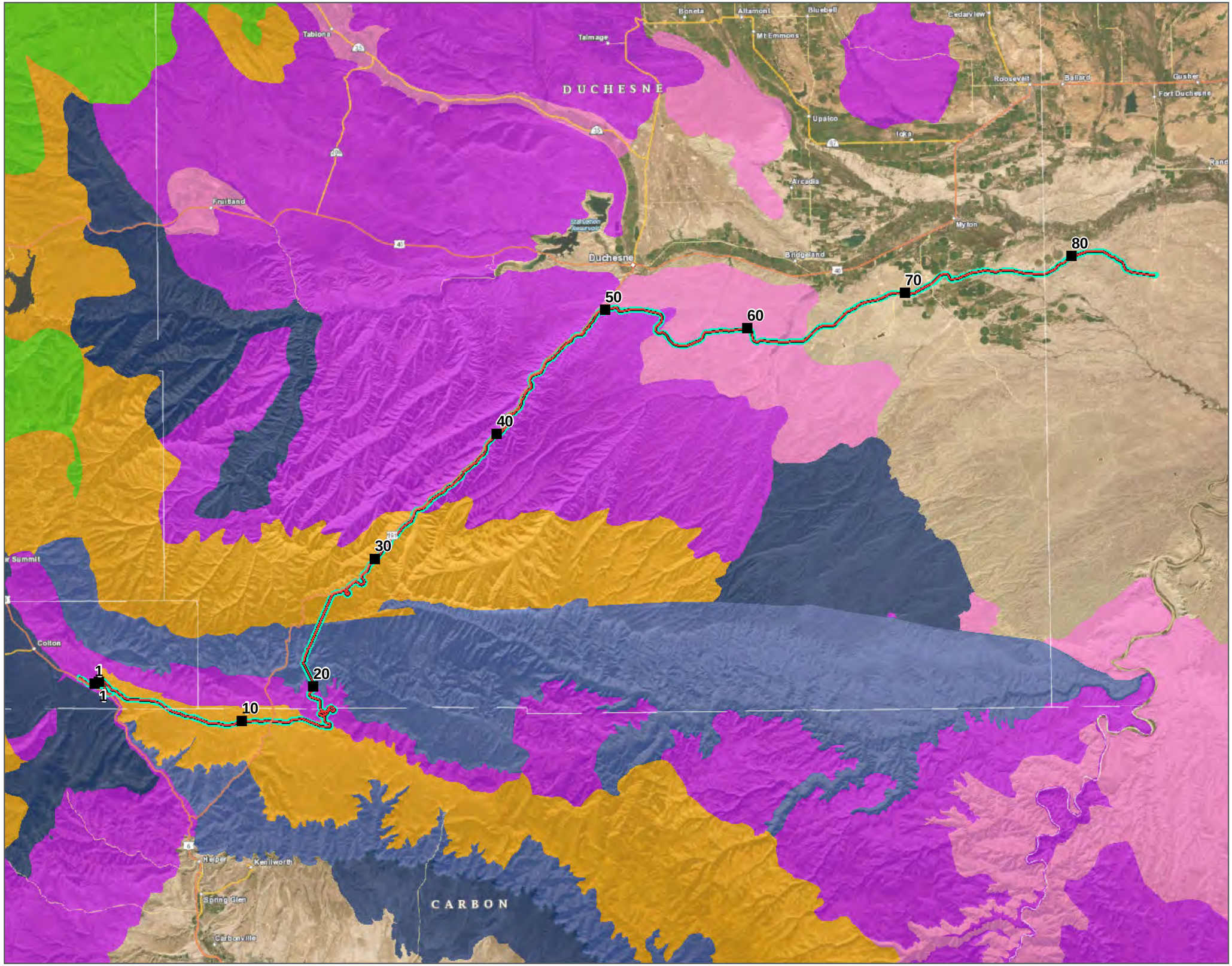

LEGEND

- Mileposts
- Whitmore Park Centerline
- Study Area

Elk Habitat (Cervus canadensis)

- Spring/fall & crucial
- Summer & crucial
- Winter & crucial
- Winter & substantial
- Year-long & crucial
- Year-long & substantial

WHITMORE PARK
ALTERNATIVE: 8/21/19
SEPTEMBER 2019

ELK HABITAT

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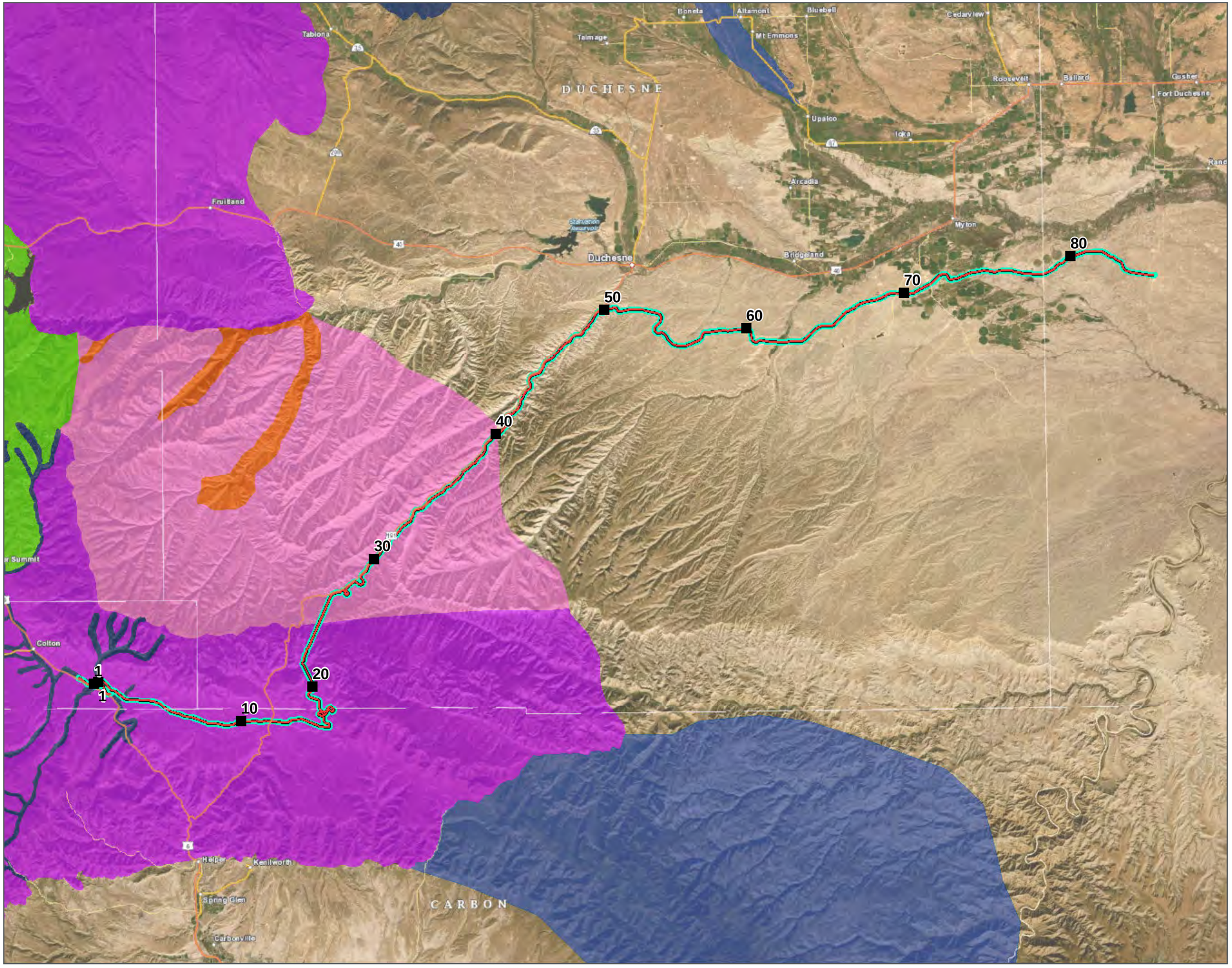

LEGEND

- Mileposts
- Whitmore Park Centerline
- Study Area

Moose Habitat (Alces alces)

- Spring/fall & crucial
- Summer & substantial
- Winter & crucial
- Winter & substantial
- Year-long & crucial
- Year-long & substantial

WHITMORE PARK
ALTERNATIVE: 8/21/19
SEPTEMBER 2019

MOOSE HABITAT

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MILES

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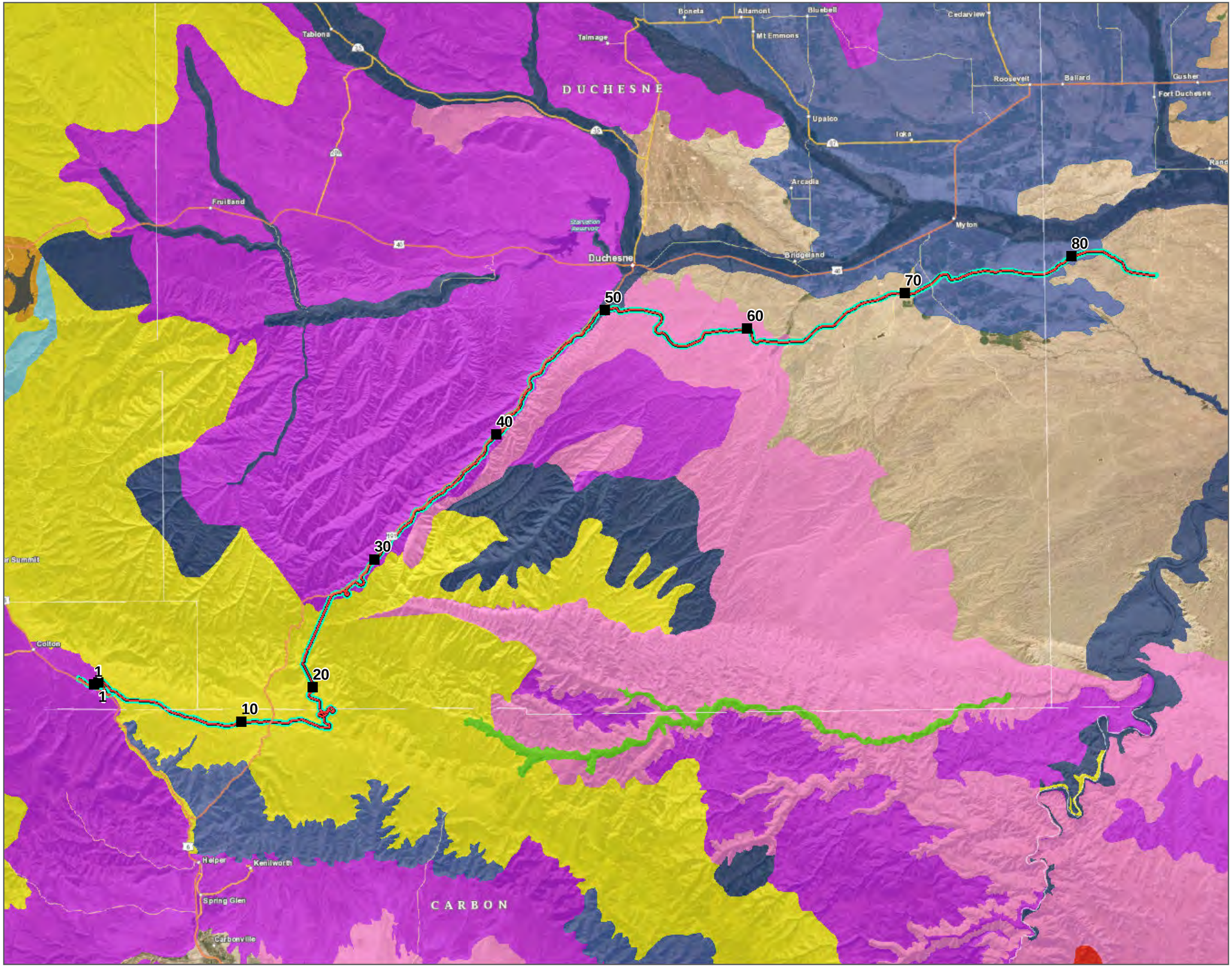

LEGEND

- Mileposts
- Whitmore Park Centerline
- Study Area

Mule Deer Habitat (Odocoileus hemionus)

- Spring/fall & crucial
- Summer & crucial
- Summer & substantial
- Summer/fall & substantial
- Winter & crucial
- Winter & substantial
- Winter/spring & crucial
- Year-long & crucial
- Year-long & substantial

WHITMORE PARK ALTERNATIVE: 8/21/19 SEPTEMBER 2019

MULE DEER HABITAT

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MILES

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LEGEND

- Mileposts
- Whitmore Park
- Study

Pronghorn Habitat (Antilocapra Americana)

- Year-long & crucial
- Year-long & substantial

WHITMORE PARK
ALTERNATIVE: 8/21/19
SEPTEMBER 2019

PRONGHORN HABITAT

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MILES

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