Draft Ute Ladies'-tresses Habitat Evaluation Memorandum

Uinta Basin Railway

Seven County Infrastructure Coalition

July 24, 2020

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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 railway (proposed action) 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 Environmental Impact Statement (EIS) for this railway, which has the potential to cause environmental impacts. STB has identified three railway alternative routes for analysis in the EIS. The Coalition, through its consultant, HDR, is conducting engineering and environmental activities in support of the EIS.

The Endangered Species Act (ESA; 16 United States Code Sections 1531–1544) provides for the conservation of threatened and endangered species and the ecosystems on which they depend. Section 3 of the ESA 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").

Section 7 of the ESA 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.

A Biological Assessment (BA) must be prepared whenever a listed or proposed species and its habitat could be affected by the proposed action. The BA should address the anticipated impacts to all listed and proposed species found in the area. The BA is used to determine whether formal consultation or additional meetings with USFWS are necessary. The contents of a BA are discretionary but generally include results of on-site inspections to determine the presence of listed or proposed species and an analysis of the likely effects of the proposed action on the species or habitat based on biological studies, literature review, and expert opinion.

This memorandum describes the methodology for determining potentially suitable habitat for Ute ladies'-tresses (*Spiranthes diluvialis*), a federally threatened species, in the study areas of the three alternative railway routes:

- Indian Canyon, as defined by a conceptually engineered route dated November 22, 2019;
- Wells Draw, as defined by a conceptually engineered route dated November 22, 2019; and
- Whitmore Park, as defined by a conceptually engineered route dated February 12, 2020.

The study areas are predominantly 1,000 feet wide and encompass about 500 feet on either side of the proposed centerline. They cross Uintah, Duchesne, Carbon, and Utah Counties. However, in some areas, the study areas are wider where the design team anticipates that a wider earthwork footprint might be needed to accommodate design features.

2.0 Ute Ladies'-tresses Biology

2.1 Description

Ute ladies'-tresses are a perennial, terrestrial orchid with erect stems 4 to 23 inches tall arising from tuberous, thickened roots. Basal leaves are narrow and linear and about 11 inches long with leaves becoming progressively smaller up the stem (Fertig et al. 2005; USFWS 1992a). Flowers consist of 3 to 15 small, white or ivory-colored flowers clustered into a 1-to-6-inch spike at the top of the stem. The plants typically bloom from early July through late October (Fertig et al. 2005).

2.2 Status and Trends

Ute ladies'-tresses were listed as threatened under the ESA on January 17, 1992 (57 Federal Register 2048). At the time of listing, the species was reported from 10 existing populations and 7 historic locations known in Colorado, Nevada, and Utah. It was considered vulnerable to extinction from habitat loss and modification, small population size, and low reproductive rate. Since 1992, the known range has expanded to include Idaho, Montana, Nebraska, Washington, and Wyoming and includes nearly 100 different locations (Fertig et al. 2005). A draft recovery plan was written for this species in 1995 but has not been finalized (USFWS 1995).

2.3 Habitat

Ute ladies'-tresses are known to occur in moist meadows associated with perennial stream terraces, alluvial banks, floodplains, and oxbows where vegetation cover is relatively open and not overly dense, overgrown, or overgrazed (Fertig et al. 2005; USFWS 1992a). A few populations are found in riparian woodlands, but the orchid seems generally intolerant of shade, preferring open, grass- and forb-dominated sites (USFWS 1995). Associated vegetation typically falls into the facultative wetland vegetation classification category (USFWS 1992b). Facultative wetland plants usually occur in wetlands but can occur in nonwetlands (Lichvar et al. 2012).

Over one-third of all known Ute ladies'-tresses populations are found on perennial stream features. These sites are subject to periodic floods that rework stream features and create early successional conditions that are beneficial to the establishment and persistence of Ute ladies'-tresses.

Ute ladies'-tresses are also known to occur in seasonally flooded river terraces, subirrigated or spring-fed abandoned stream channels and valleys, and lake shores. Populations have been also been observed along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other human-modified wetlands (Fertig et al. 2005).

The elevation range of known Ute ladies'-tresses populations is from 720 to 1,830 feet in Washington and up to 7,000 feet in northern Utah (Fertig et al. 2005; USFWS 1992b).

At the time of listing, existing populations of Ute ladies'-tresses in Utah were found in Daggett, Duchesne, Garfield, Uintah, Utah, and Wayne Counties, and historical occurrences were known from Salt Lake, Tooele, and Weber Counties (Fertig et al. 2005). These populations were dispersed across 10 different watersheds (Duchesne, Escalante, Fremont, Jordan, Lower Green, Lower Weber, Southern Great Salt Lake Desert, Spanish Fork, Upper Green–Flaming Gorge Reservoir, and Utah Lake). Since 1992, a dozen new sites have been documented along the Wasatch Front and the Uinta Basin. These sites extend the known range of

Ute ladies'-tresses into Wasatch County and the Ashley-Brush, Provo, and Strawberry watersheds (Fertig et al. 2005).

2.4 Life History

Ute ladies'-tresses are long-lived perennial forbs that are thought to reproduce exclusively by seed. The life cycle of Ute ladies'-tresses consists of four stages: seedling, dormant, vegetative, and reproductive (flowering or fruiting) (Fertig et al. 2005).

Seedling Stage. Fruits are produced in late August or September with seeds shed shortly after. Ute ladies'-tresses seeds are microscopic and readily dispersed by wind or water. It is thought that germinated seedlings require a symbiotic relationship with mycorrhizal soil fungi in order to survive, the absence of which might be a limiting factor in the establishment of new populations. Seedlings likely develop slowly into larger, dormant mycorrhizal roots or grow directly into above-ground vegetative shoots, but neither has been confirmed in the wild.

Dormant Stage. No data are available regarding the number of years required for Ute ladies'-tresses roots to reach sufficient size to develop above-ground leafy shoots. Long-term monitoring studies have shown that vegetative or reproductive Ute ladies'-tresses plants can revert to dormancy for one to four or more growing seasons before re-emerging with new above-ground shoots.

Vegetative Stage. New vegetative shoots are produced in October and persist through the winter as small rosettes. These rosettes resume growth in the spring and develop into leafy plants. These plants might remain in this state all summer or develop flowers. Vegetative individuals die back in the winter to subterranean roots or persist as winter rosettes. Monitoring studies show that plants can remain in the vegetative stage for 2 or more years, or transform to dormant or reproductive condition in subsequent years.

Reproductive Stage. Across its range, Ute ladies'-tresses typically bloom from early July to late October. Bees, particularly solitary bees, are the species' primary pollinator. Individual flowers are arranged in a spiral, with the lowermost blossoms of the inflorescence maturing before those higher up the stalk.

3.0 Methodology

HDR used geographic information systems (GIS) software to develop potentially suitable habitat polygons for Ute ladies'-tresses in the three alternative study areas. These polygons included riparian areas as well as areas along water courses and in wet meadows where vegetation is not overly dense and below 7,000 feet in elevation. See Figure 1 for an overview map of the three alternatives; the areas below 7,000 feet are highlighted.

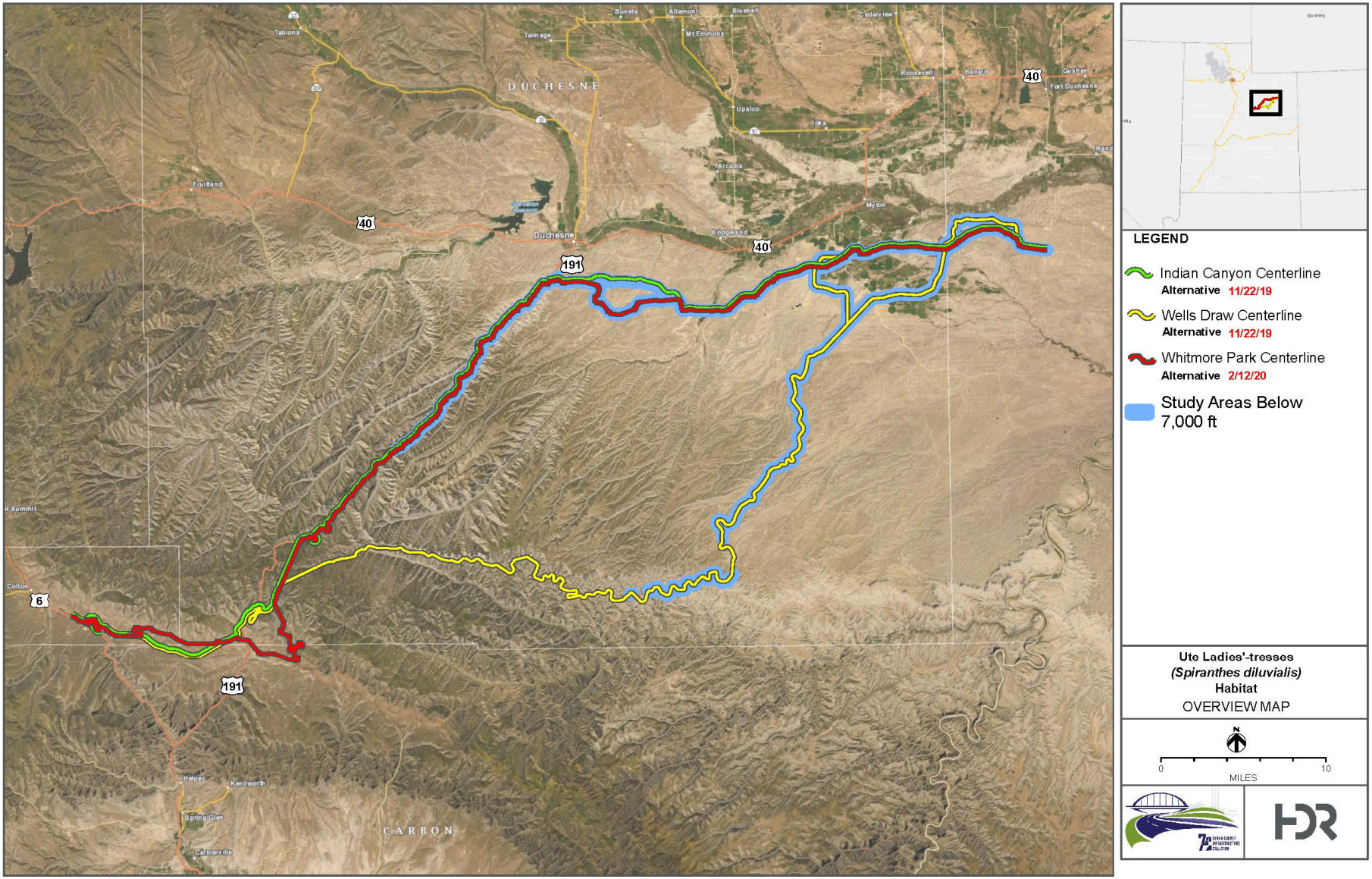
See Appendix A of this memorandum for a revised version of the 1992 *Interim Survey Requirements for Ute Ladies'-tresses Orchid (Spiranthes diluvialis*) (USFWS 1992b). Based on the suitable habitat criteria described in the interim survey requirements, habitat surveys are not required for sites above 7,000 feet in elevation. For sites below 7,000 feet, the following habitat types do not qualify as Ute ladies'-tresses habitat (USFWS 1992b):

- Sites that are highly disturbed or modified such as highway rights-of-way built on compacted soils or rock fill; rock or soil fills with steep back slopes; active construction sites; landscaped bluegrass lawns
- Upland sites
- Sites entirely inundated by standing water
- Sites composed entirely of heavy clay soils
- Very saline sites such as dense monospecific stands of saltgrass (*Distichlis spicata*)
- Sites composed entirely of dense stands of reed canary grass (*Phalaris arundinacea*), tamarisk (*Tamarix* species), greasewood (*Sarcobatus vermiculatus*), teasel (*Dipsacus sylvestris*), or common reed (*Phragmites australis*)

HDR prepared tablets equipped with the ESRI data-collection application Collector for use in both field navigation and data entry. The Collector application included data layers for aerial images, study area boundaries, and potentially suitable habitat polygons for Ute ladies'-tresses that HDR developed on desktop computers. HDR biologists then visually inspected all riparian, wetland, and mesic areas identified below 7,000 feet in elevation in each of the three alternative study areas to confirm whether these areas displayed characteristics consistent with the description of Ute ladies'-tresses suitable habitat in Section 2.3, Habitat.

Field evaluations were conducted between June 22 and July 1, 2020. Following the field evaluation, HDR biologists used the field data to digitize areas of suitable habitat in the study areas.

Figure 1. Overview of Alternative Routes



4.0 Results

HDR biologists identified approximately 11.40 acres of potential Ute ladies'-tresses habitat in the Indian Canyon study area, 0.99 acre in the Wells Draw study area, and 11.35 acres in the Whitmore Park study area. Table 1 summarizes the acreage by land ownership and study area. Appendix B shows the distribution of the potentially suitable Ute ladies'-tresses habitat identified in each study area. Short summaries of the potential Ute ladies'-tresses habitat identified in each alternative study area are provided after the table.

Table 1. Acreage by Land Ownership for Ute Ladies'-tresses Potential Habitat

Property Ownership	Indian Canyon Study Area	Wells Draw Study Area	Whitmore Park Study Area
Private	10.516	0.992	10.466
Tribal	0.076	0.000	0.079
Bureau of Land Management	0.000	0.000	0.000
U.S. Department of Agriculture Forest Service	0.801	0.000	0.799
Utah Department of Transportation	0.005	0.000	0.005
Utah School and Institutional Trust Lands Administration	0.000	0.000	0.000
Total acreage	**11.398**	**0.992**	**11.349**

4.1 Indian Canyon Study Area

A majority of potential Ute ladies'-tresses habitat for the Indian Canyon study area occurs on wetland terraces adjacent to Indian Canyon Creek and wet meadow wetlands that rely on Indian Creek as a primary source of hydrology. These terraces and wet meadows often exhibit moderately dense vegetation and nonsaline conditions, which provide potentially suitable habitat for Ute ladies'-tresses (Figure 2). Areas that had very dense vegetation or had apparent saline indicators (saline indicators included salt crust or a dominance of saltgrass) were excluded as potential habitat. Within the Indian Canyon study area, common plant species found in areas identified as potential Ute ladies'-tresses habitat include mountain rush (*Juncus arcticus* ssp. *littoralis*), foxtail barley (*Hordeum jubatum*), alkali buttercup (*Ranunculus cymbalaria*), and willow species (*Salix* species).

Stream characteristics can vary throughout Indian Canyon, with the stream becoming more incised as it travels down canyon toward Duchesne. As the stream becomes more deeply incised, there are fewer floodplain and terrace features and therefore less potential habitat for Ute ladies'-tresses (Figure 3).

Two smaller sites containing potential Ute ladies'-tresses habitat were identified outside and east of Indian Canyon in the Indian Canyon study area. These sites total 1.101 acres and are located on floodplains and terraces of two different intermittent stream channels.

Figure 2. Potential Ute Ladies'-tresses Habitat on a Wetland Terrace adjacent to Indian Canyon Creek in the Indian Canyon and Whitmore Park Study Areas

Figure 3. Potential Ute Ladies'-tresses Habitat on a Wetland Terrace adjacent to Indian Canyon Creek in Lower Indian Canyon in the Indian Canyon and Whitmore Park Study Areas

4.2 Wells Draw Study Area

Unlike the Indian Canyon and Whitmore Park alternatives, the Wells Draw alternative avoids Indian Canyon, where a majority of the potential Ute ladies'-tresses habitat was identified. Just under an acre (0.99 acre) of potential Ute ladies'-tresses habitat was identified in the Leland Bench area of the Wells Draw study area. These sites receive water from small streams and canal diversions (Figure 4 and Figure 5). Within the Wells Draw study area, common plant species found in areas identified as potential Ute ladies'-tresses habitat include mountain rush and foxtail barley. High salinity is common in the Wells Draw study area, which limited the amount of potential habitat.

Figure 4. Potential Ute Ladies'-tresses Habitat on a Wetland Terrace Created by a Canal Diversion in the Wells Draw Study Area

Figure 5. Potential Ute Ladies'-tresses Habitat on a Wetland Terrace in the Wells Draw Study Area

4.3 Whitmore Park Study Area

The Whitmore Park study area mirrors that of the Indian Canyon study area through Indian Canyon. The study areas differ slightly as the alternatives head east toward the Myton Bench area, where the Whitmore Park route veers south for a short distance until rejoining with the Indian Canyon route. This distinction among routes accounts for the slight difference (0.06 acre) in potential Ute ladies'-tresses habitat identified in the Indian Canyon and Whitmore Park study areas.

5.0 References

Fertig, W., R. Black, and P. Wolken

2005 Rangewide Status Review of Ute Ladies'-tresses (*Spiranthes diluvialis*). Prepared for USFWS and the Central Utah Water Conservancy District.

Lichvar, R.W., N.C. Melvin, M. Butterwick, and W.N. Kirchner

2012 National Wetland Plant List Indicator Rating Definitions. ERDC/CRREL TR-12-1. Hanover, New Hampshire: U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

[USFWS] U.S. Fish and Wildlife Service

1992a Endangered and Threatened Wildlife and Plants; Final Rule to List the Plant *Spiranthes diluvialis* (Ute Ladies'-tresses) as a Threatened Species. Federal Register 57(12): 2048–2054.

1992b Interim Survey Requirements for Ute Ladies-tresses Orchid (*Spiranthes diluvialis*). November 23.

1995 Ute Ladies'-tresses (*Spiranthes diluvialis*) Agency Review Draft Recovery Plan. Denver, Colorado. 46 pp.

APPENDIX A

1992 Interim Survey Requirements for Ute Ladies'-tresses Orchid (*Spiranthes diluvialis*)

Interim Survey Requirements for Ute Ladies'-tresses Orchid
(Spiranthes Diluvialis)

November 23, 1992

The U. S. Fish and Wildlife Service (Service) has established the following interim requirements and guidelines for surveys to determine the presence or absence of the Federally threatened plant species *Spiranthes diluvialis*, Ute ladies'-tresses orchid. These guidelines were developed by the Service in consultation with biologists and ecologists knowledgeable about the species. These guidelines and recommendations are designed to supplement, not substitute for, professional methods, expertise, and judgment typically used to conduct rare plant surveys.

Because the species is so rare, very little is known about its habitat preferences and population ecology. These interim survey requirements have been developed in order to gain more information about the species, identify potential habitat, streamline and standardize survey procedures. As more information becomes available through these surveys, the interim requirements will be revised and simplified as appropriate.

Documentation of compliance with these requirements and recommendations is accomplished through submission to the Service of a survey report. The Service will respond with a letter indicating acceptance of the report.

All Federal agencies have a responsibility under Section 7(a)(1) of the Endangered Species Act to conserve Federally listed threatened and endangered species. The Service encourages all Federal agencies to review their properties and projects and make funds available to conduct surveys in all appropriate potential habitat, including habitat outside the areas specified in these guidelines.

1. Introduction

Spiranthes diluvialis occurs in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated flood plains below ~~6,500~~ 7,000 feet elevation in Utah, Colorado, and Nevada. Typical sites include old stream channels and alluvial terraces, sub-irrigated meadows, and other sites where the soil is saturated to within 18 inches of the surface at least temporarily during the spring or summer growing seasons. Associated vegetation typically falls into the Facultative Wet wetland vegetation classification category (from the National List of Plant Species that Occur in Wetlands developed by the Service). The species occurs primarily in areas where the vegetation is relatively open and not overly dense, overgrown, or over grazed. Although very rare now, it is estimated that it was once common in low elevation riparian areas in Colorado, Utah, and Nevada.

The moist soil conditions and vegetation composition of known *Spiranthes diluvialis* sites suggest that wetlands regulated under the Clean Water Act qualify as potential *Spiranthes diluvialis* habitat. Therefore, jurisdictional wetlands, as well as other drier sites matching the description above, should be surveyed.

2. Qualification of Surveyor **Replaced by the 2011 USFWS Utah Surveyor Guidelines**

Spiranthes diluvialis is difficult to identify in the field, and since the orchid is rare and flowers for such a short time, few people have had the opportunity to become acquainted with the species. The Service does not want to exclude any person from conducting surveys. Therefore, the Service has developed a minimum set of qualification criteria that demonstrate whether a surveyor is sufficiently acquainted with *Spiranthes diluvialis* to collect consistent and accurate information for the survey report. Documentation that these criteria have been met is accomplished by submitting a statement of surveyor qualifications as part of the survey report.

The survey report shall contain a statement of qualifications of the individual conducting the survey, including:

a. Description of botanical expertise and training (e.g, graduate degree in botany, ecology, or other appropriate discipline).

b. Experience in conducting rare plant surveys (list dates, locations, and plants included in previously conducted surveys).

c. Actions taken to become acquainted with the known locations and appearance of *Spiranthes diluvialis* (such as visiting herbaria to look at specimens, conversations or site visits with others familiar with the species for a description of ecology and likely occurrences).

d. Documentation of correct identification of *Spiranthes diluvialis* in the field. The surveyor is required to enclose a photograph of the species taken at a known site and a statement certifying when and where the photograph was taken.

e. References, particularly documenting contact with known *Spiranthes diluvialis* experts.

3. Areas Requiring a Survey **Out of Date. Use Fertig 2005 instead.**

The following areas in Colorado have been determined to have a high probability of occurrence of *Spiranthes diluvialis* based on current and historical records of the species. Surveys are required for appropriate sites below 6,500 feet elevation within these areas:

a. Boulder and Jefferson counties.

b. The South Platte River 100 year flood plain and perennial tributaries from the Front Range as far east as Brush, Morgan county.

c. The Fountain Creek 100 year flood plain and perennial tributaries from the Front Range to the southern boundary of El Paso county.

d. The Yampa River 100 year flood plain and its perennial tributaries from Steamboat Springs west to the Utah border.

A perennial stream is usually represented by a sold blue line on a USGS 7 2 minute quad map.

4. Habitat Description and Sites Requiring a Survey **Out of Date. Use Fertig 2005 instead.**

Spiranthes diluvialis is typically found associated with alluvial deposits of silty, sandy, gravelly, or cobbly soil. The species may occasionally also be found in highly organic soils or peat. The species seems to prefer well drained soils with fairly high moisture content (soil around the roots will form a soft ball). Soils may exhibit some gleying or mottling but are generally not strongly anaerobic. *Spiranthes diluvialis* is found in some heavily disturbed sites, for example, old gravel mines that have since been developed into wetlands, and along well traveled footpaths built on old berms. The species is also found in grazed pastures with introduced pasture grasses.

Spiranthes diluvialis is found with grasses, sedges, and rushes, in shrubs, and riparian trees such as willow species. It rarely occurs in deeply shaded sites and prefers partially shaded open glades or pastures and meadows in full sunlight. Common associated species on the Front Range include:

Horsetail *(Equisetum spp.)*
Milkweed *(Asclepias incarnate)*
Verbena *(Verbena hastate)*
Agalinis *(Agalinis tenuifolia)*
Lobelia *(Lobelia siphilitica)*
Blue-eyed grass *(Sisyrinchium spp.)*
Triglochin *(Triglochin spp.)*
Carpet bentgrass *(Agrostis stolonifera)*
Reedgrass *(Calamagrostis)*
Goldenrod *(Solidago spp.)*

Sites below 6,500 feet elevation occurring within the areas described in Section 3 exhibiting the following features shall be surveyed for *Spiranthes diluvialis*:

a. Seasonally high water table (within 18 inches of the soil surface for at least one week sometime during the growing season, growing season defined as when soil temperatures are above 41 degrees Fahrenheit).

b. In or near wet meadows, stream channels, or flood plains.

c. Vegetation falling into the Facultative Wet or Obligate Wet classification, including introduced pasture grasses.

d. Jurisdictional wetlands as specified under the Clean Water Act.

~~Heavily grazed and weedy sites shall be surveyed for the orchid if they otherwise meet the criteria indicating potential suitability as *Spiranthes* habitat as listed above.~~

5. Sites Not Requiring a Survey

Some sites are either clearly not appropriate *Spiranthes diluvialis* habitat or have very low potential to be *Spiranthes diluvialis* habitat. A survey for *Spiranthes diluvialis* is not required for such sites. Sites below 7,000 feet elevation occurring within the areas described in Section 3 **not** requiring a survey for *Spiranthes* include:

a. Highly disturbed or modified sites such as:

1. Highway right-of-ways built on filled and compacted soil material.

2. Highway right-of-ways build on rock fills, either revegetated or not revegetated.

3. Rock or soil fills with steep back slopes (may or may not be associated with a road).

4. Active construction sites where all vegetation has been stripped exposing bare soil.

5. Construction sites where construction has been completed within the last five years, but the area has not been revegetated.

6. Landscaped and maintained (mowed) bluegrass lawns.

b. Upland sites, including, for example:

1. Prairie dog towns.

2. Short grass prairie.

3. Sagebrush or shadscale rangeland.

c. Sites entirely inundated by standing water, including, for example, monocultures of cattails *(Typha latifolia)* or Olney=s three-square *(Scirpus americanus).* Note that although inundated areas need not be surveyed, mesic slopes surrounding or adjacent to standing water must be surveyed if they otherwise meet the criteria indicating potential suitability as *Spiranthes diluvialis* habitat.

d. Sites composed entirely of heavy clay soils. However, *Spiranthes diluvialis* is found in areas where more well-drained soils or peat overlay a clay layer.

e. Very saline sites. *Spiranthes diluvialis* occurs in alkaline conditions and is somewhat tolerant of saline conditions. However, it has not been found in highly saline sites as indicated by dense monospecific stands of saltgrass *(Distichlis spicata stricta).*

f. Sites entirely composed of dense strands of:

1. Reed canary grass *(Phalaris arundinacea)*

2. Tamarisk or Salt-cedar *(Tamarix ramosissima)*

3. Greasewood *(Sarcobatus vermiculatus)*

4. Teasel *(Dipsacus sylvestris)*

5. Common reed *(Phragmites australis)*

6. Timing of Survey

Because *Spiranthes diluvialis* is very difficult to locate unless it is flowering, because timing of flowering varies, and because the species may not flower every year, the following requirements must be met:

a. Reconnaissance may be conducted at any time of year to determine whether a site exhibits the characteristics described in Section 5 and therefore does not require a survey. If potential habitat is found to exist on the site, then a survey must be conducted at the appropriate time.

b. Surveys shall be conducted during the blooming season, which is normally between July 20 and August 31. However, surveys may be conducted earlier or later if flowering is occurring in a nearby known population comparable to the site being surveyed. Surveyors shall verify that a nearby population is flowering at the time the survey is conducted either by calling a Service representative or including a dated photograph of the flower population. The date of the survey shall be noted in the survey report.

c. *Spiranthes diluvialis* does not necessarily flower every year. Therefore, in drainages where *Spiranthes diluvialis* is known to occur, the Service recommends that surveys be conducted annually for three consecutive years. Also, for any site within required survey areas where habitat alteration has not yet occurred following an initial approved survey. Surveys shall be conducted annually for three consecutive years or until habitat alteration commences.

Under very special circumstances, earlier surveys may be possible for sites small enough to allow a complete a "hands and knees" search for vegetative parts of *Spiranthes diluvialis*. The Service shall be contacted for prior approval and procedural requirements for such early surveys.

Surveys will be considered final for three years. If habitat alteration has not begun within three years, the Service must be contacted regarding the need for a survey update.

7. Maps

The Service recommends that, where available, Soil Conservation Service (S. C. S.) maps (for location of wetland soils) and National Wetland Inventory maps be consulted prior to site surveys to help identify likely potential habitat. Surveyors should be aware that *Spiranthes diluvialis* is not limited to mapped wetlands. In order to avoid duplication of effort and gain more information about the ecology and distribution of *Spiranthes diluvialis*, a USGS 7.2 minute quad map must be submitted with the survey report showing routes taken for all search sites regardless of whether a population of the species was located during the search.

For survey sites too small to be adequately represented on a USGS 7.2 minute quad map, an engineering drawing or more detailed map showing the area that has been surveyed must be included in the report. The site(s) should be indicated and labeled on the accompanying USGS 7.2 minute quad map.

8. Ecological and Site Features

In order to gain more information about the ecology and site characteristics of *Spiranthes diluvialis*, so that better predictions about its location and distribution can be marked, the following information must be collected and reported for each site surveyed:

a. For sites disqualified as potential *Spiranthes diluvialis* habitat, describe the basis on which the site was disqualified.

b. For sites requiring a survey, the following information must be collected. This information can be brief and qualitative for sites where *Spiranthes diluvialis* is not found (a few words, a phrase, or a descriptive sentence is sufficient).

1. List the most frequent or dominant associated plant species of both the over story and under story vegetation (e.g., over story of mature cottonwood trees with an under story of orchard grass and smooth brome).

2. Describe the plant community, including a qualitative assessment of dominance (e.g., riparian willow community, willows dominant, with native grasses *Deschampsia caespitose* and sedges).

3. Describe the ecological condition/management history of the site (such as cultivated field, old gravel mine, good condition native grassland with winter cattle grazing, recently flooded stream edge).

4. Describe the geomorphology of the site, including, for example, the nature of the material (e.g., alluvium), the landscape position (e.g., bench above old stream bed).

5. Describe the soils including, for example, texture, whether moist, presence of mottling or other hydric soil indicators, and list the map unit from the S. C. S. county soil survey if available.

6. Describe the hydro logic characteristics, for example, depth to water table (if possible to determine without major excavation), inferences about frequency, duration, and season of flooding, presence of standing water, high water mark of a stream or water body in relation to location of surveyed site.

7. Describe any other site characteristics that appear relevant to understanding the ecology, population biology, or distribution of *Spiranthes diluvialis.*

In addition, for **each** site where a population of *Spiranthes diluvialis* is found, the following information must be collected and included in the survey report:

a. Map the population on a USGS 7.2 minute quad map and on a finer scaled map or engineering drawing if appropriate.

b. Count the number of individuals if fewer than 500.

c. Estimate the number of individuals if more than 500. Include a description of the method used for population estimation.

d. Note the phenological stage of the plants (e.g., proportion of plants that are flowering, proportion of flowers that have set seed).

e. Note the specific geomorphologic, hydrologic, and soil conditions where the population occurs if it varies from the site description above.

f. Note any other possibly relevant ecological information.

g. Include a photograph of the population that illustrates its setting and habitat.

9. Survey Report

The survey report submitted to the Service should follow the outline below:

a. Name and qualifications of surveyor.

b. Brief project description indicating proposed impact to the site.

c. Site location (address and legal description).

d. Dates surveys were conducted.

e. Ecological and site features as described above.

f. Appendices.

1. Maps

2. Photographs

10. Notification

The Service shall be notified immediately if a new population of *Spiranthes diluvialis* is discovered. For sites located in Colorado and Utah, the surveyor shall notify either:

Bernardo Garza, U.S. Fish and Wildlife Service, P.O. Box 25486 – DFC, Denver, Colorado 80225, telephone 303-236-4377 or

Rita Reisor, U.S. Fish and Wildlife Service, 2369 West Orton Circle, West Valley City, Utah 84119, telephone 801-975-3330

11. Service Approval

Survey reports for sites in Colorado shall be submitted to either of the two Colorado addresses above. The Service will review submitted reports and reply with a written letter of acceptance within 30 days of receipt of the report. If the survey report is judged insufficient for any reason, the Service will notify the author within 30 days and discuss revisions. If the report is judged insufficient due to an inadequate survey, the Service will make every effort to notify the author promptly so that a satisfactory survey may be completed during the allowed survey time. However, given the narrow survey time frame, it may not be possible to rectify an inadequate survey effort during the current field season.

Surveys will be considered final for three years. If habitat alteration has not begun within three years, the Service must be contacted regarding the need for a survey update.

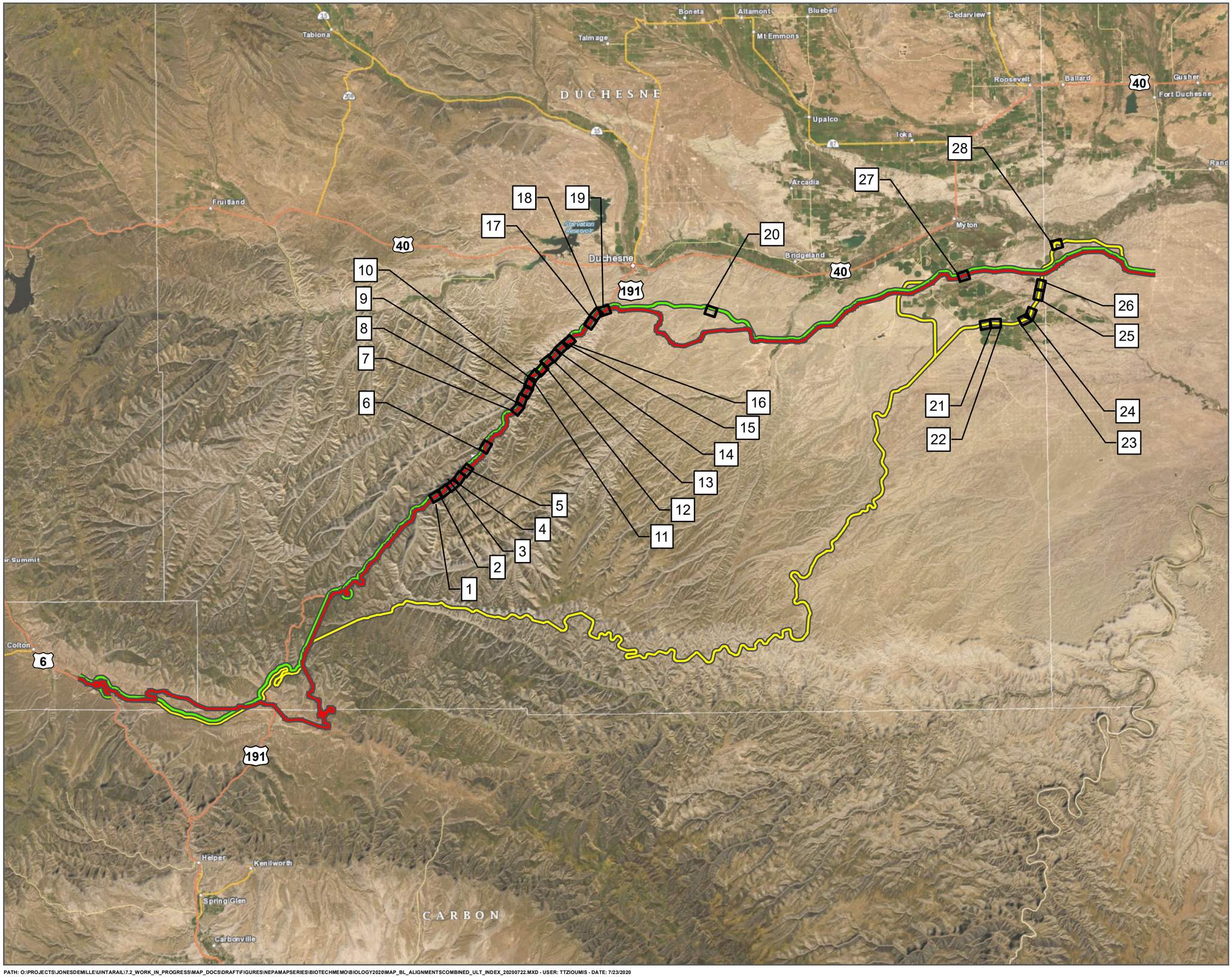
12. Service Follow-up

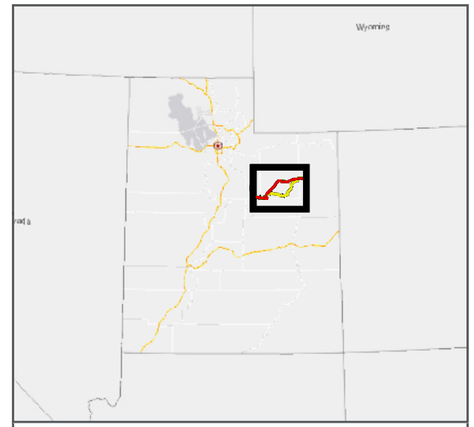
Survey reports and maps will be retained by the Service. Ecological information will be summarized and used to improve our understanding of *Spiranthes diluvialis* habitat and help predict actual and potential habitat. The Service will prepare periodic reports to keep the public informed about the distribution and ecology of *Spiranthes diluvialis.* The reports will include recommendations for protection strategies and habitat management practices and will identify additional research needs.

Survey requirements will be revised as appropriate based upon the most current available information.

APPENDIX B

Ute Ladies'-tresses Potential Habitat Maps





LEGEND

Indian Canyon Centerline
Alternative **11/22/19**

Wells Draw Centerline
Alternative **11/22/19**

Whitmore Park Centerline
Alternative **2/12/20**

Map Series Pages

Ute Ladies'-tresses
(Spiranthes diluvialis)
Habitat
INDEX MAP

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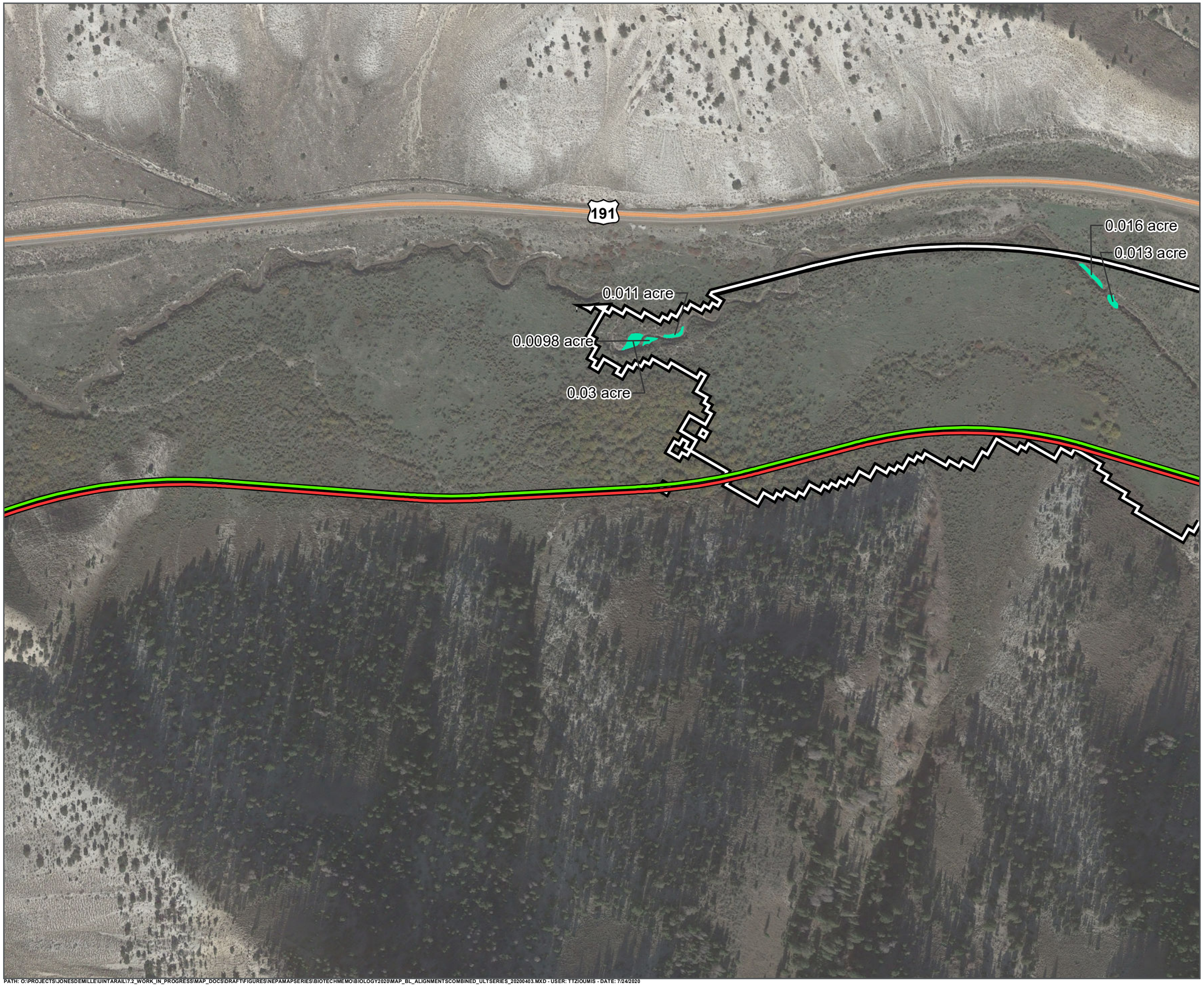

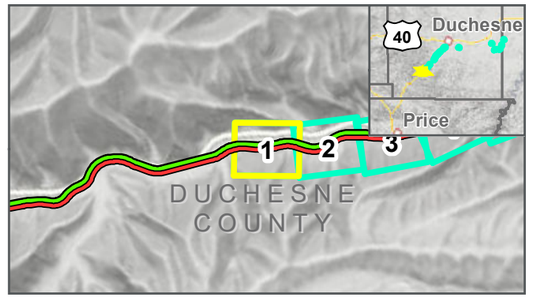

LEGEND

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Ute Ladies'-tresses *(Spiranthes diluvialis)*
Habitat
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0 125 250 Feet
1 inch = 250 Feet

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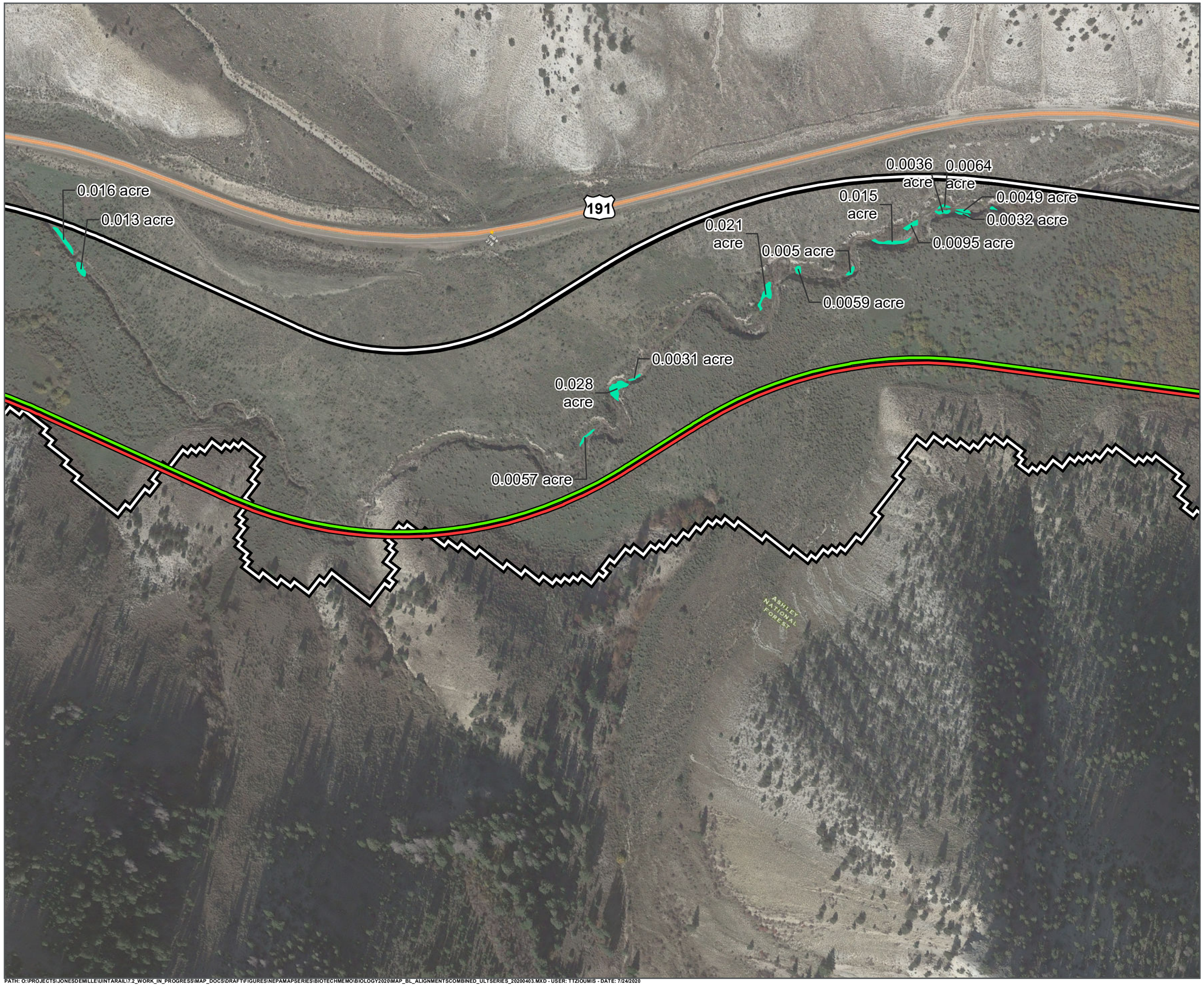

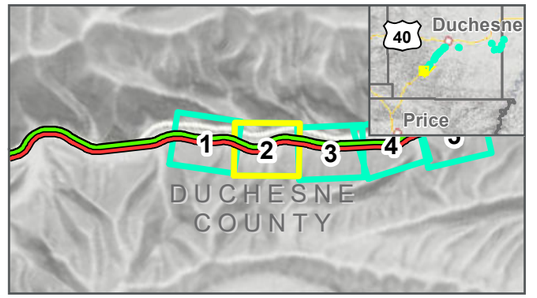

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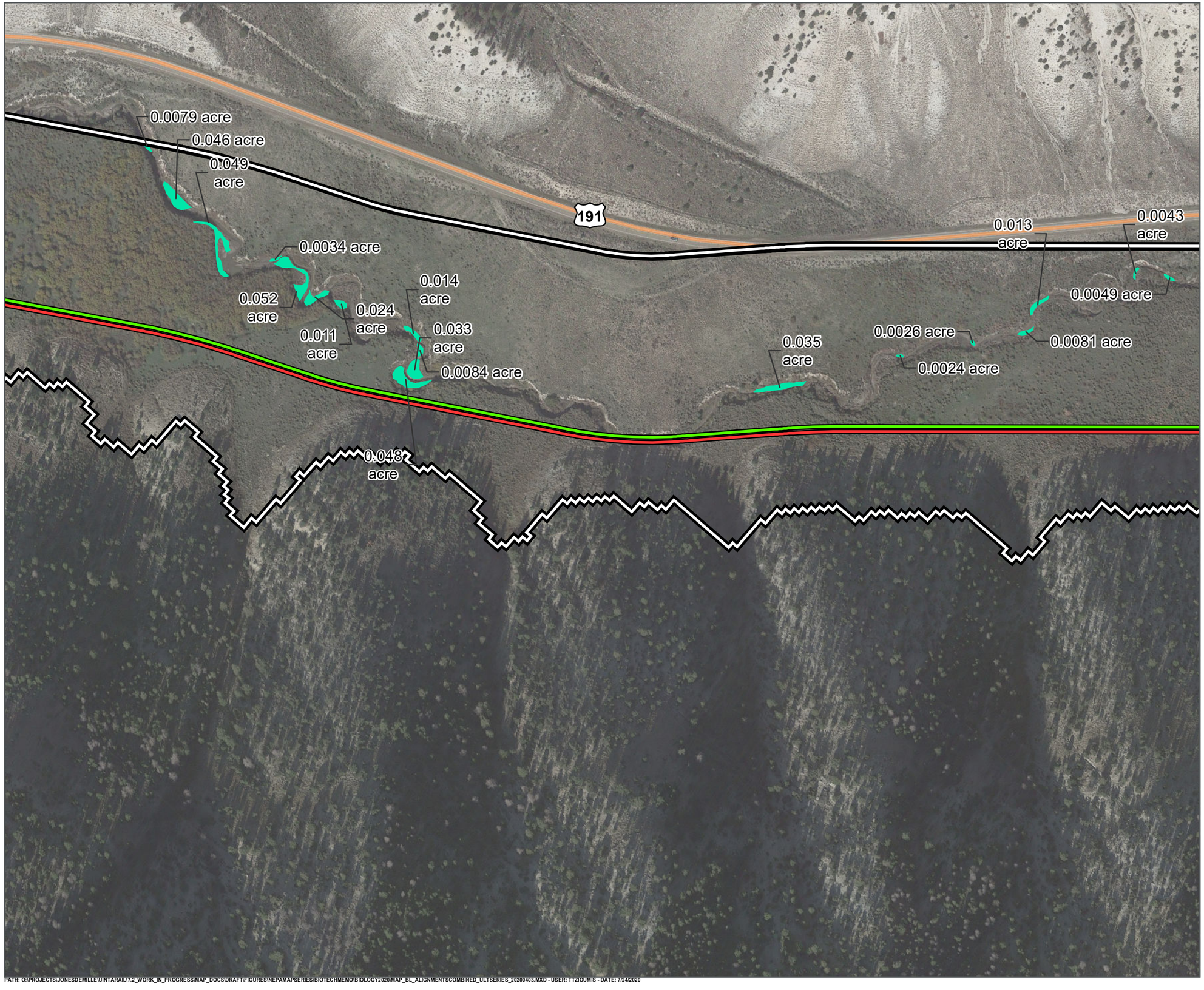

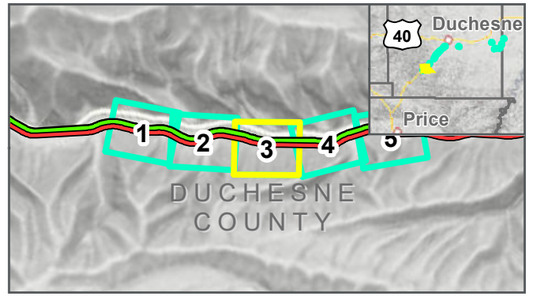

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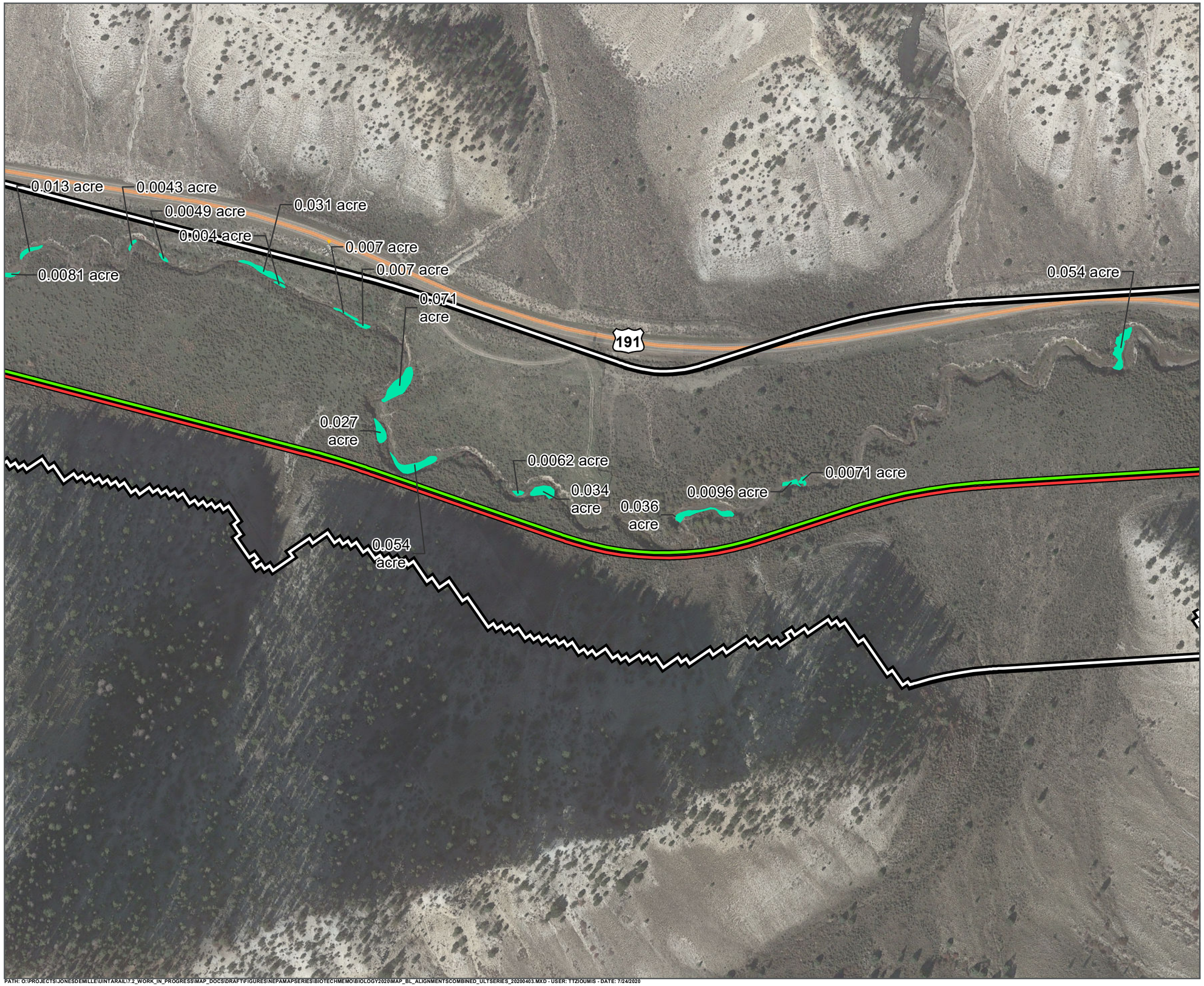

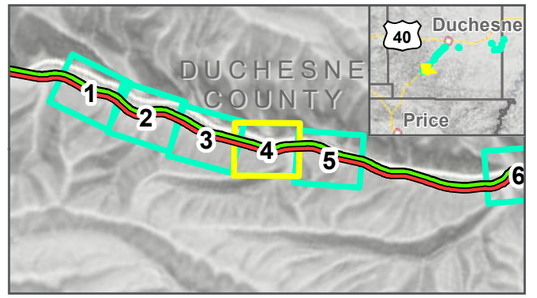

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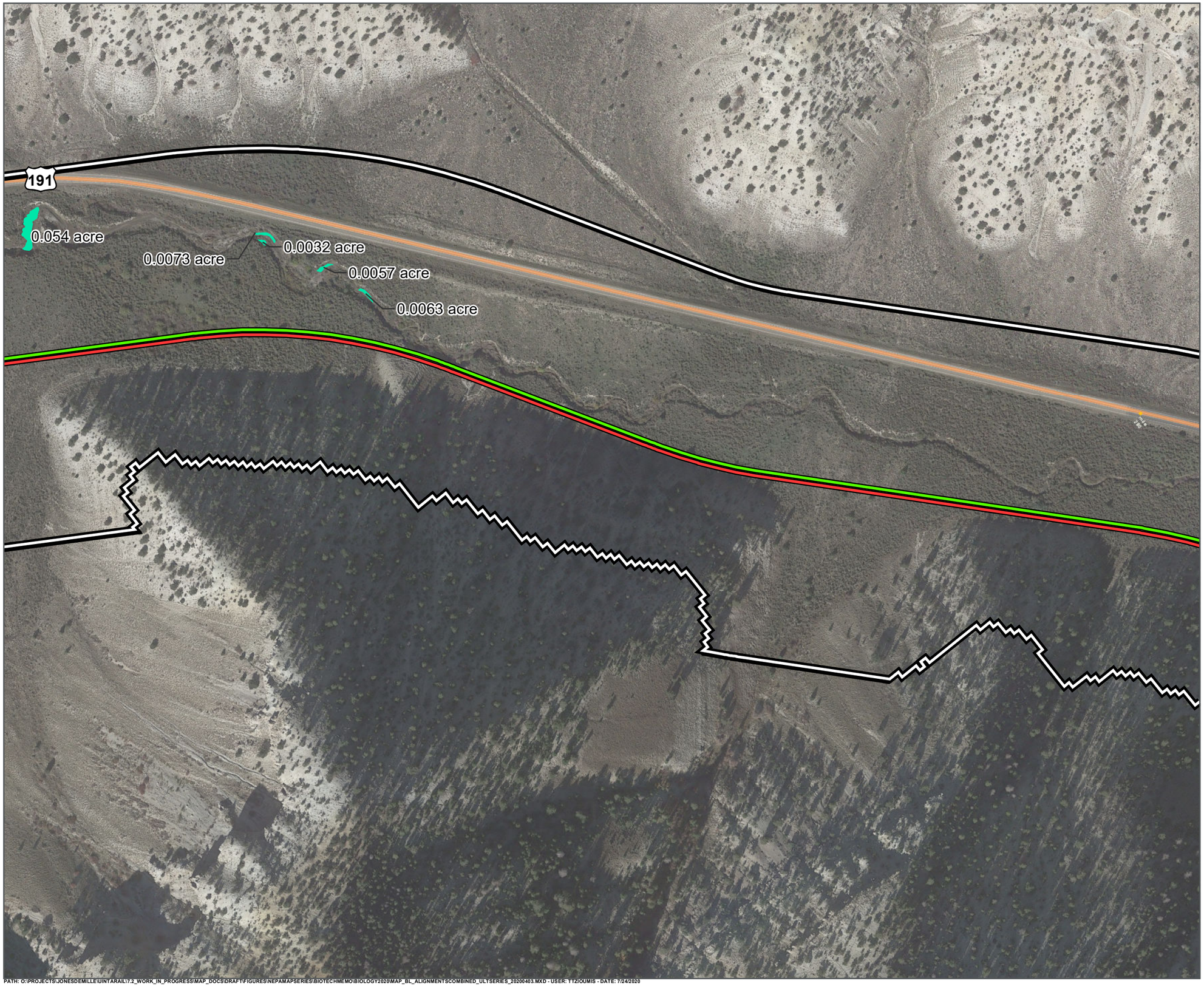

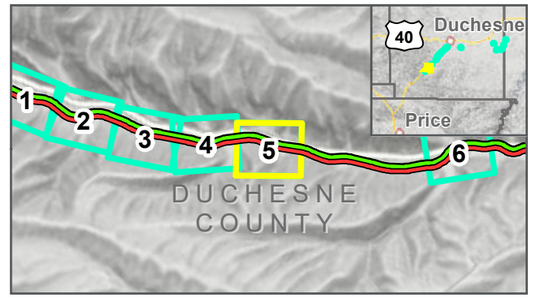

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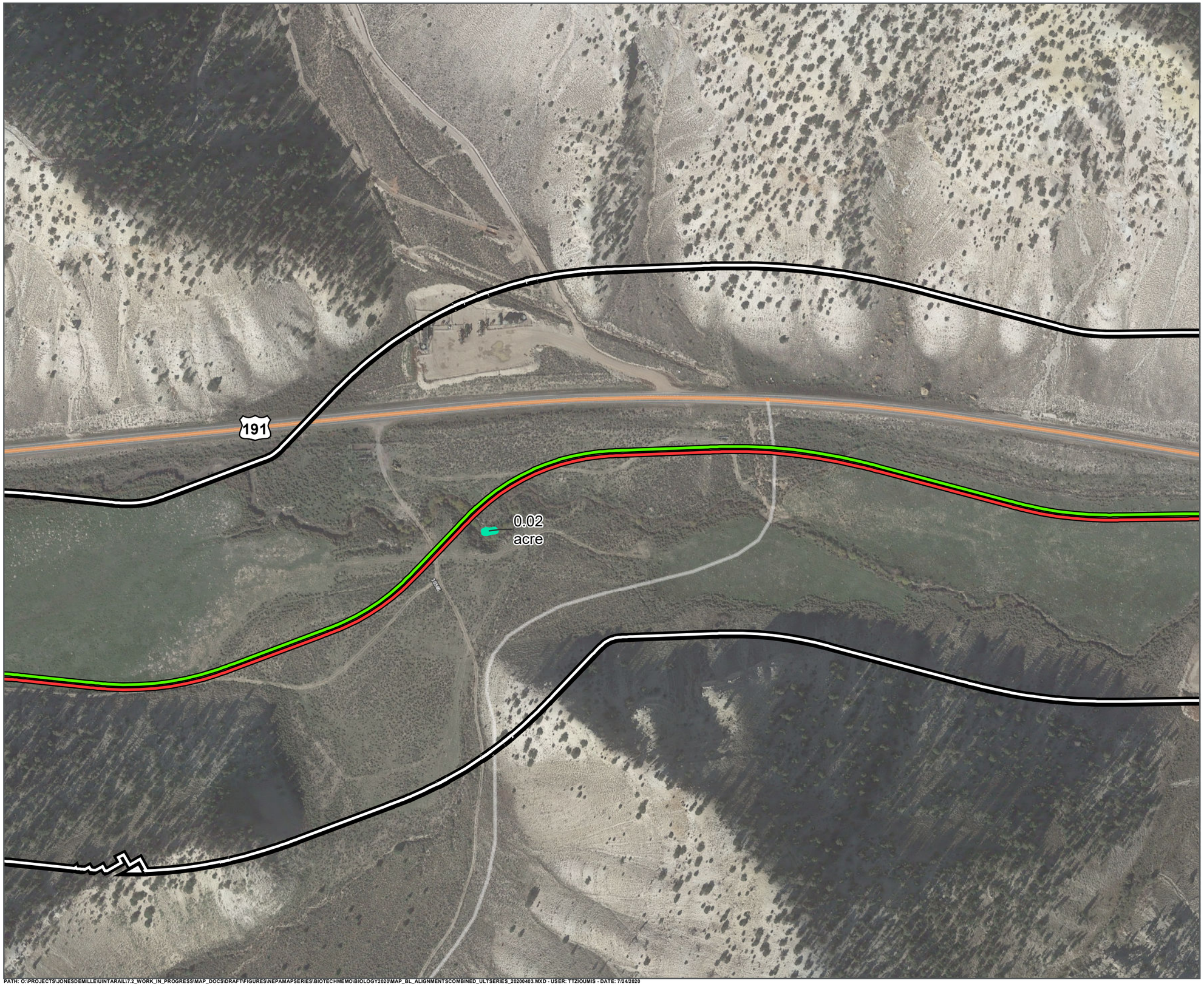

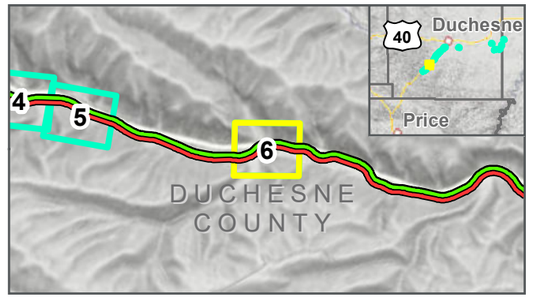

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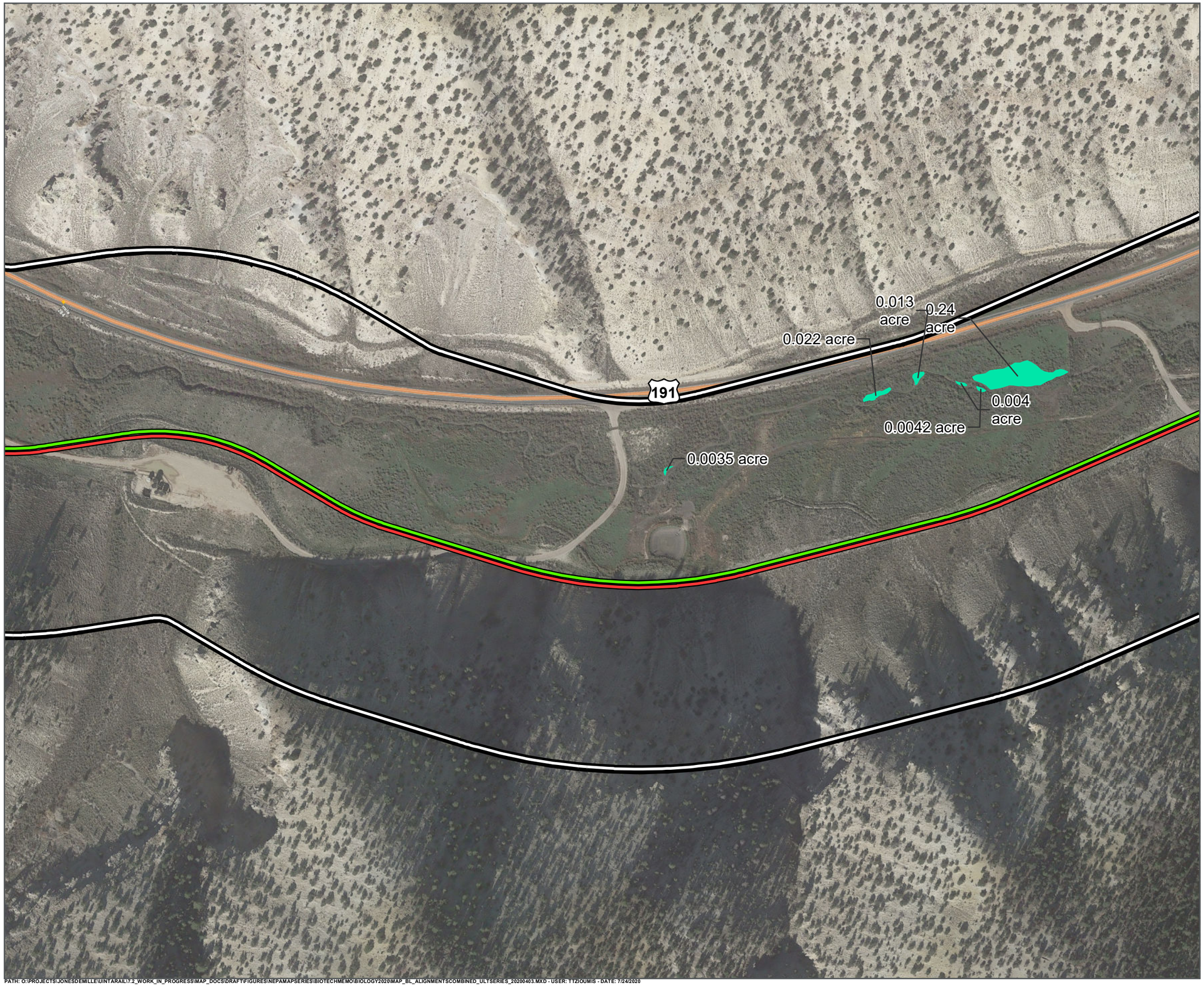

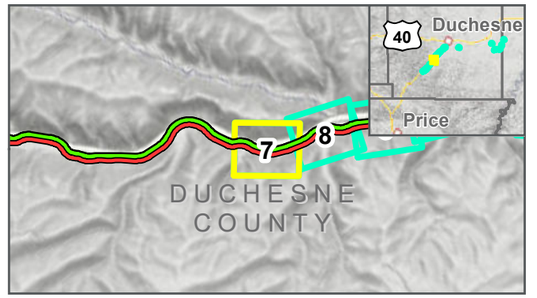

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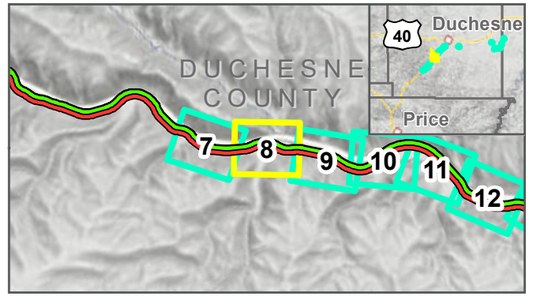

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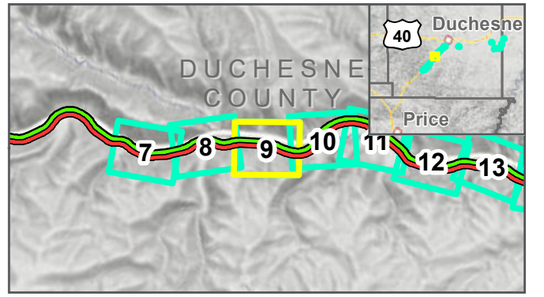

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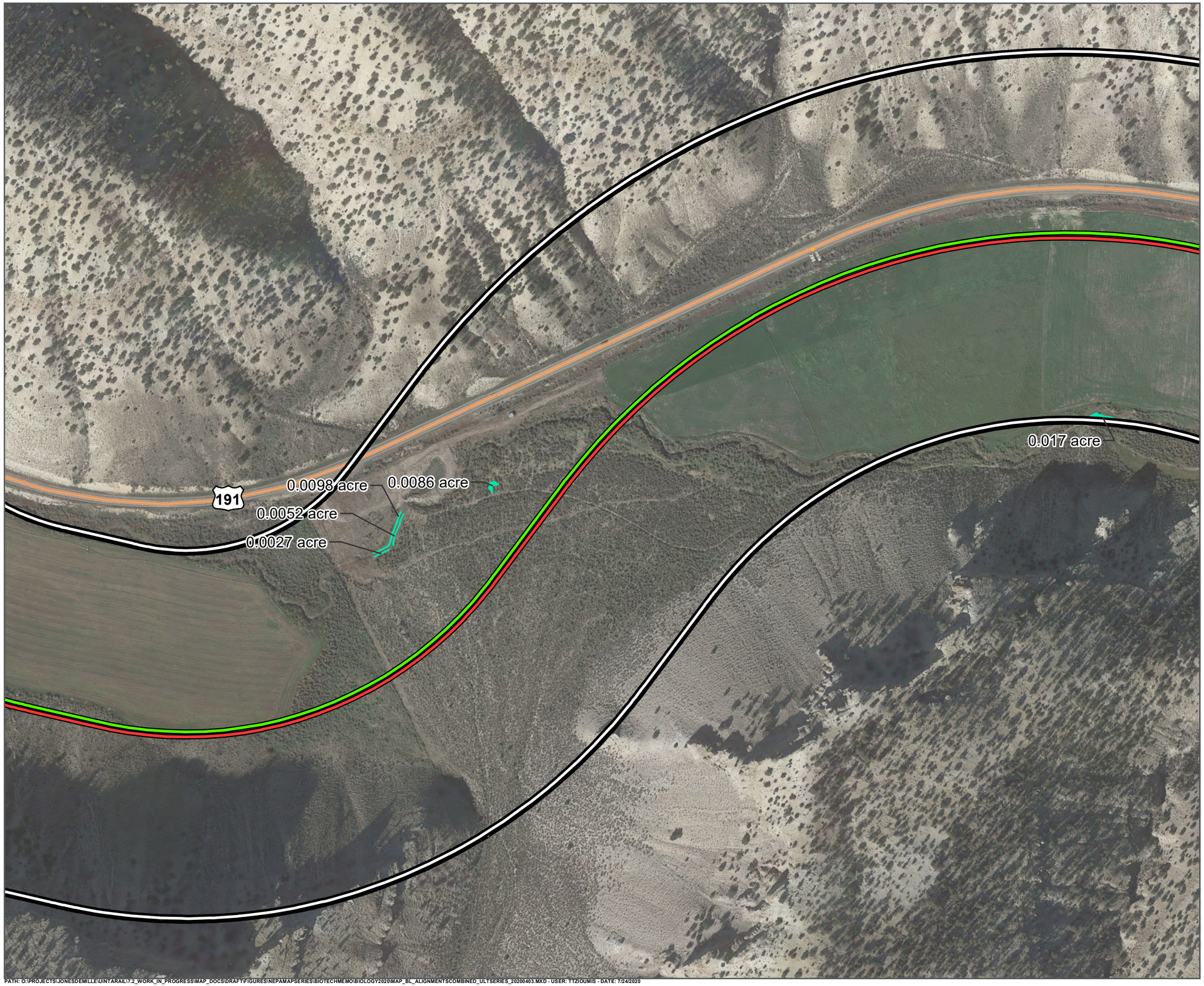

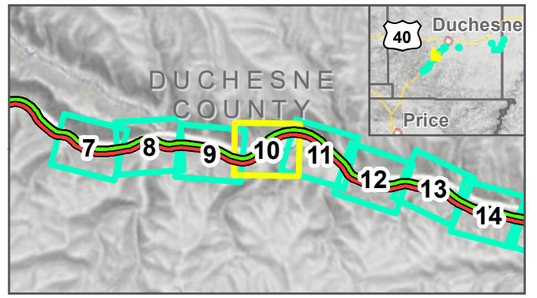

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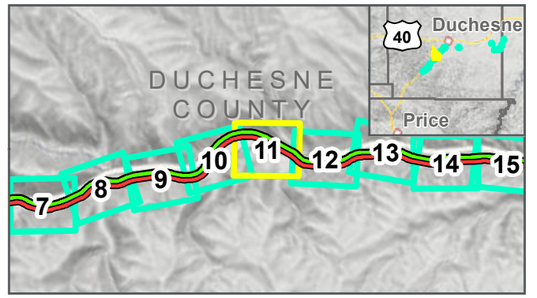

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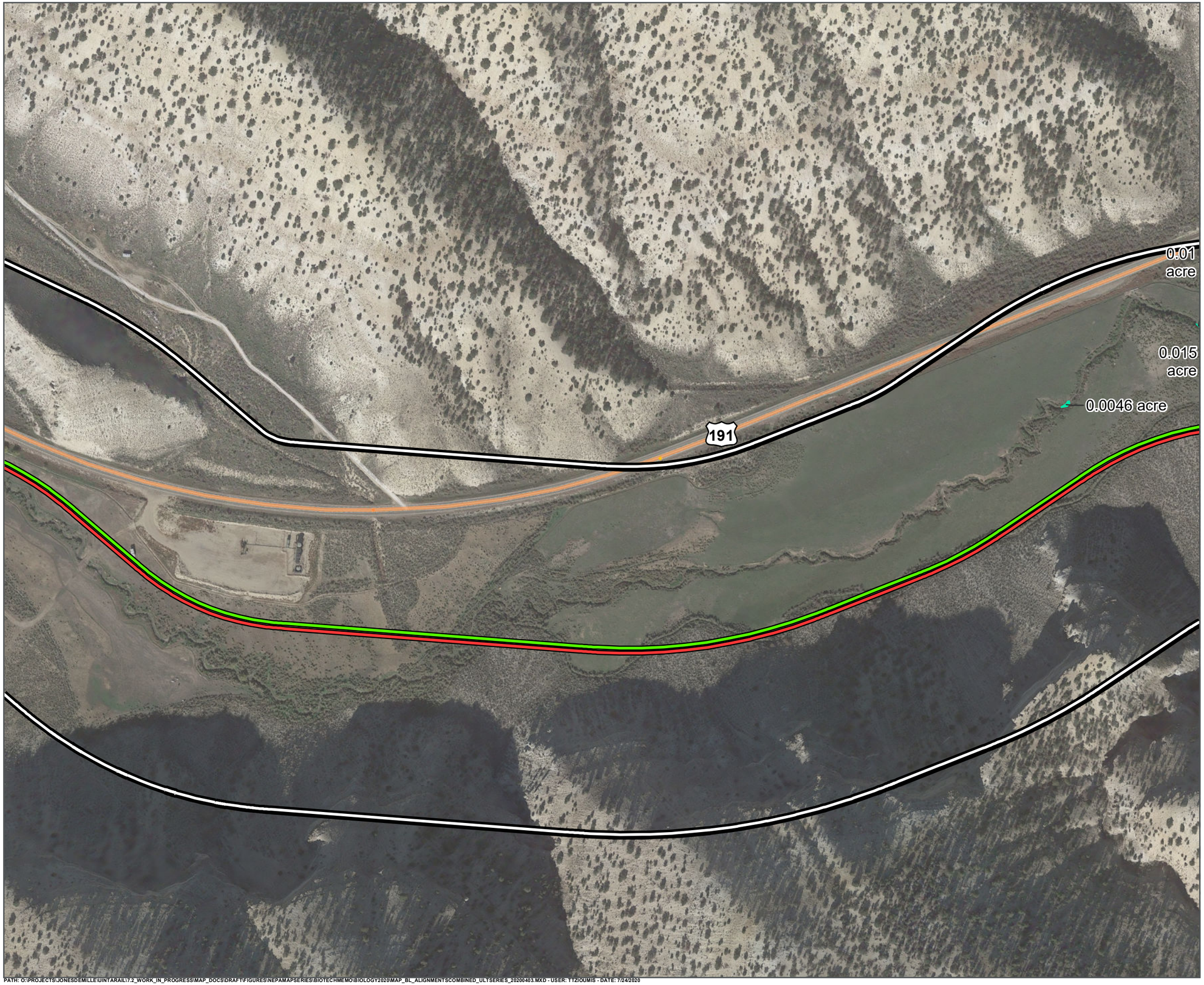

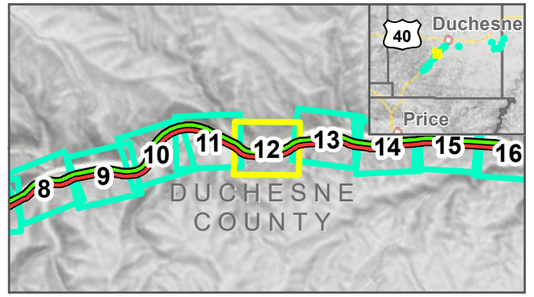

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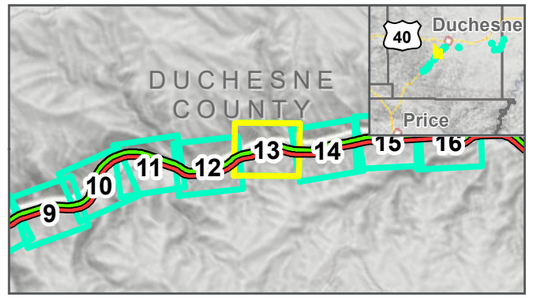

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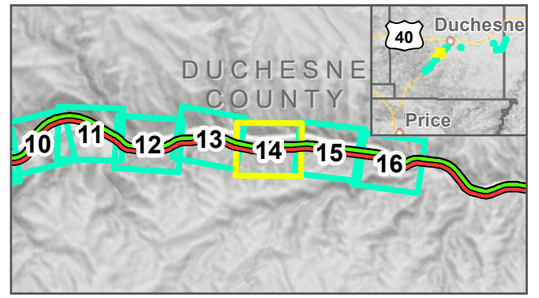

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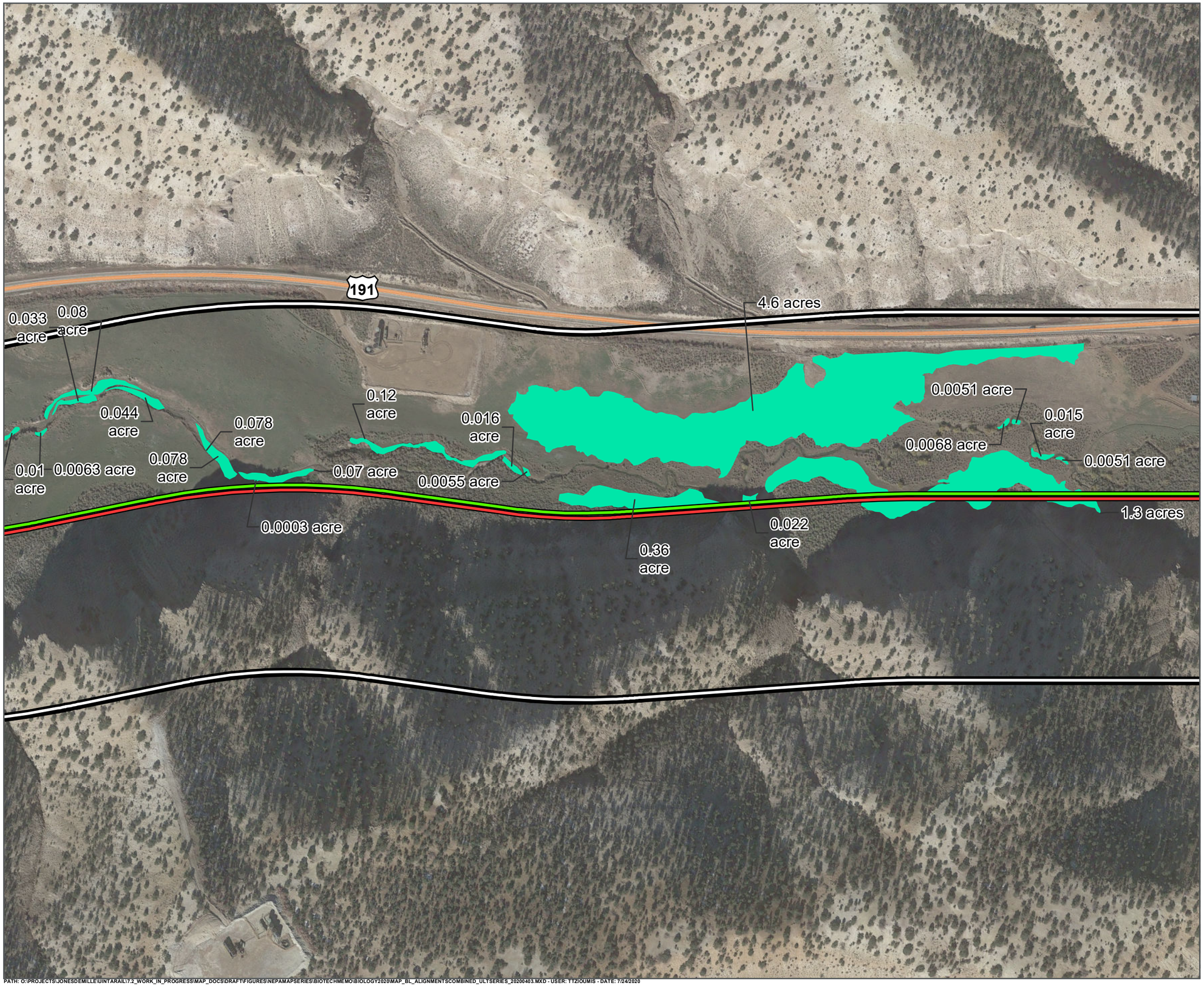

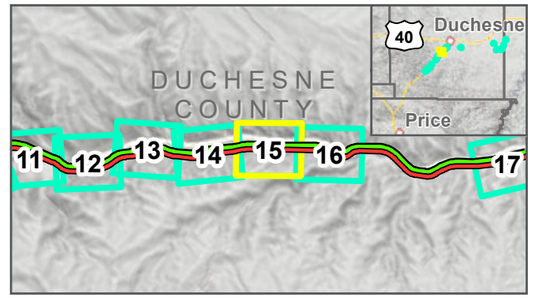

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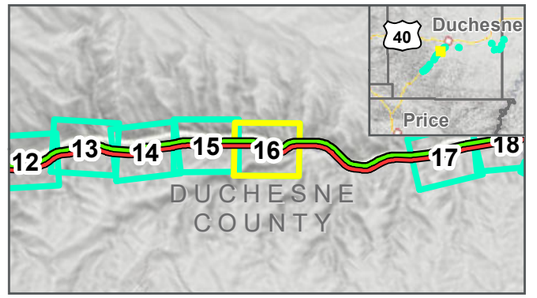

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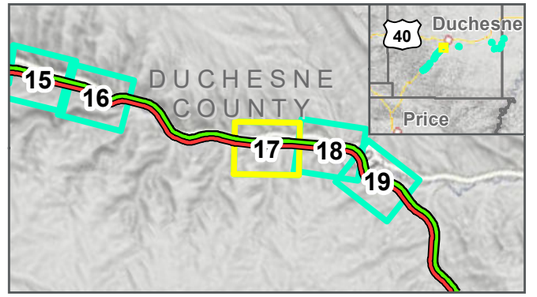

LEGEND

- Map Extent (current view in yellow)
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- Indian Canyon Centerline
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- Whitmore Park Centerline
- Ute Ladies'-tresses Potential Habitat

Ute Ladies'-tresses *(Spiranthes diluvialis)* Habitat

MAP SERIES

0 125 250 Feet

1 inch = 250 Feet

DATA SOURCES:
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COODINATE SYSTEM:
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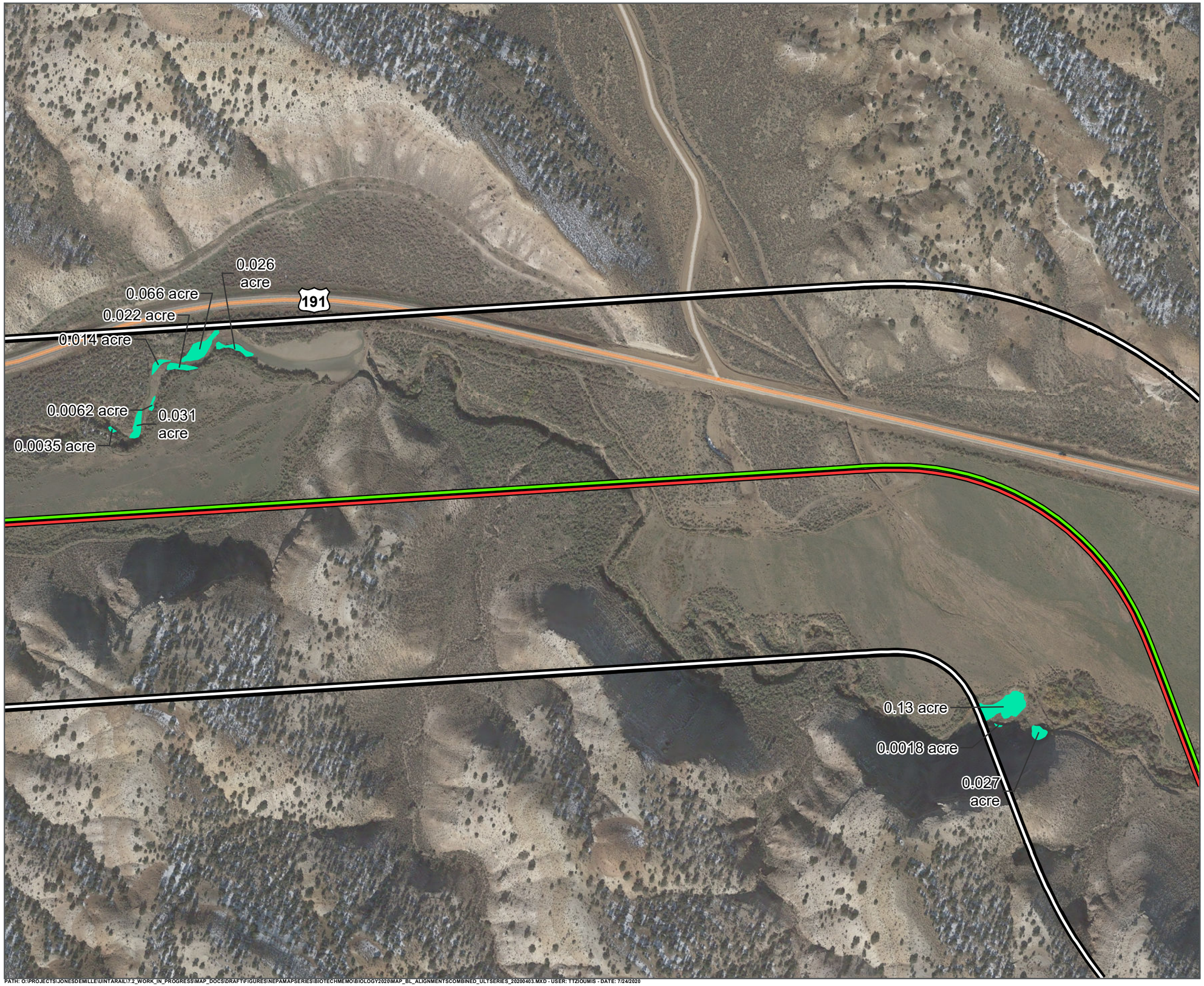

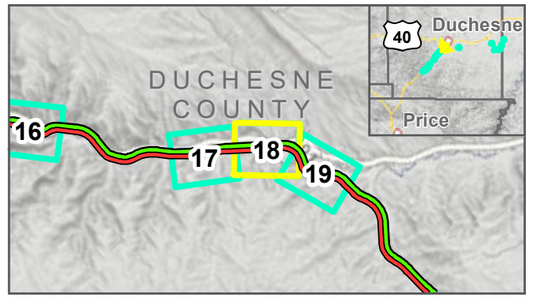

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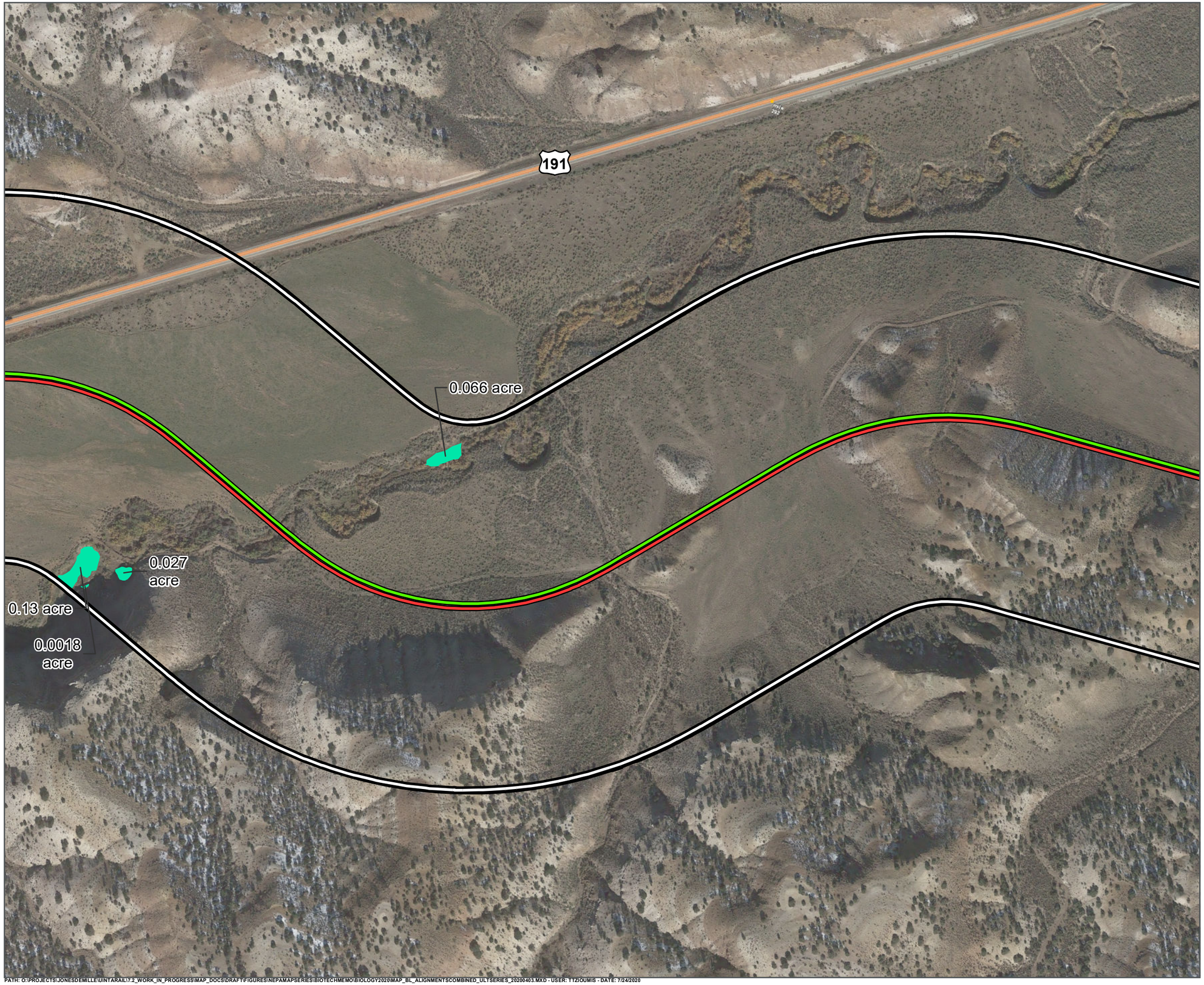

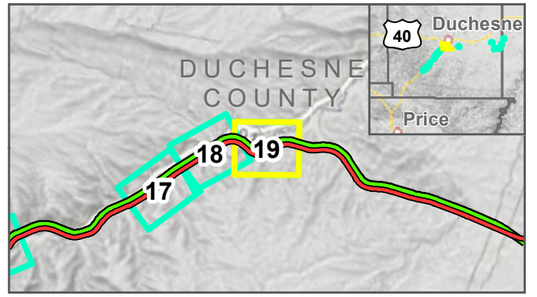

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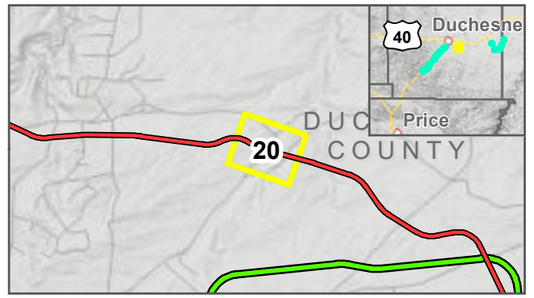

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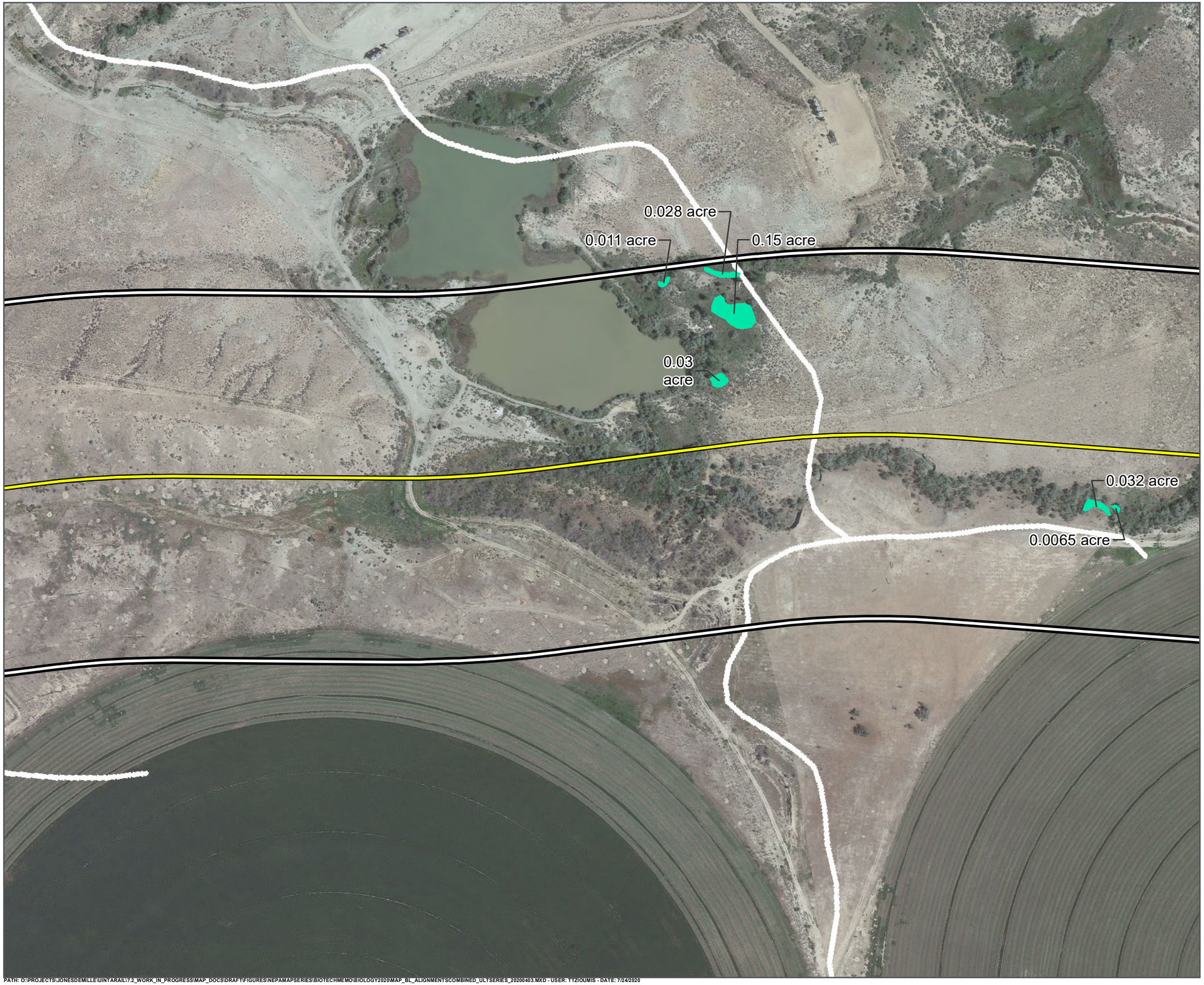

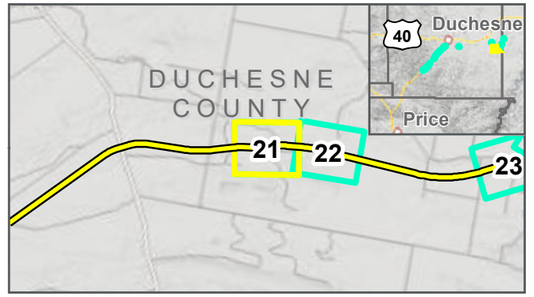

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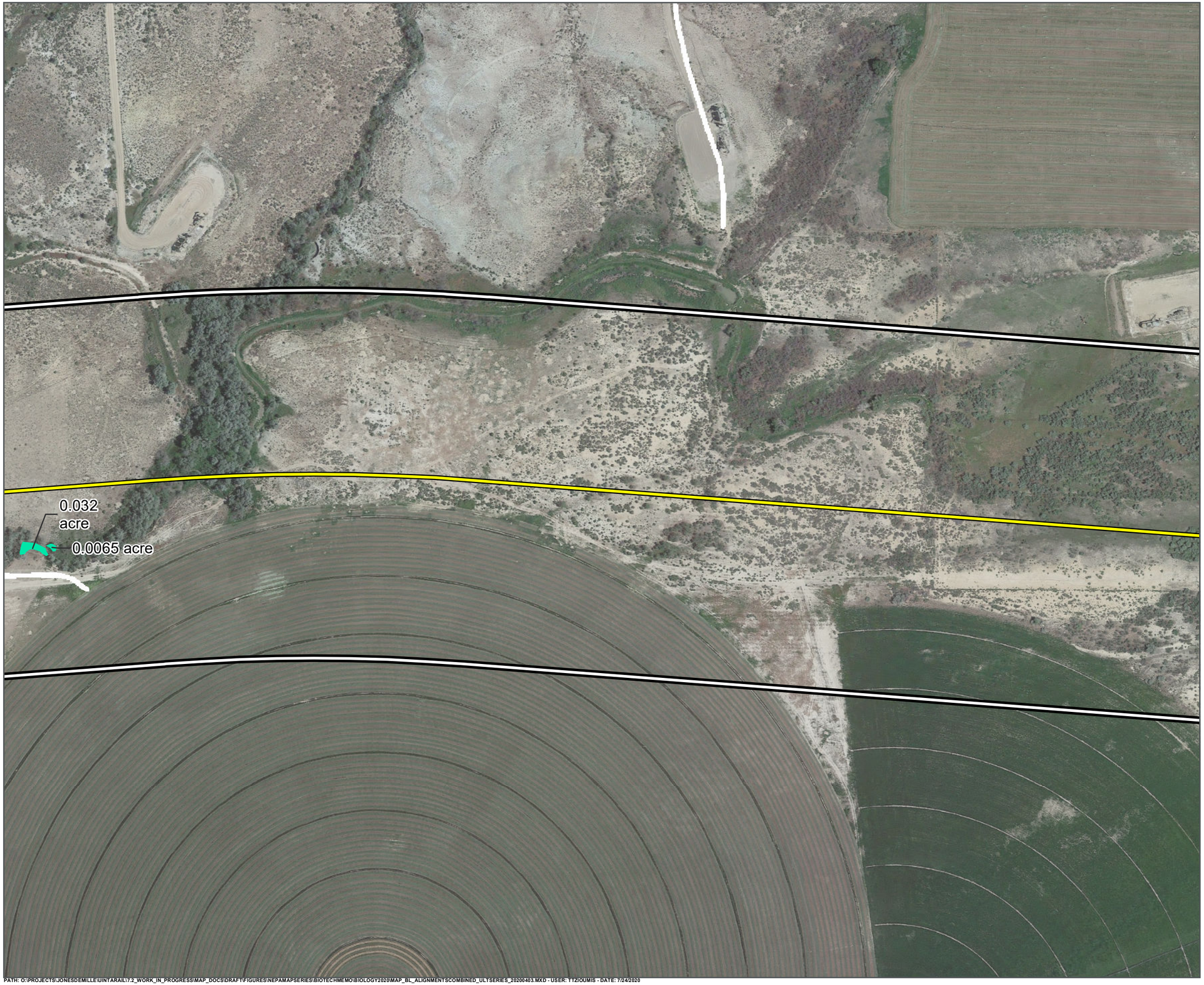

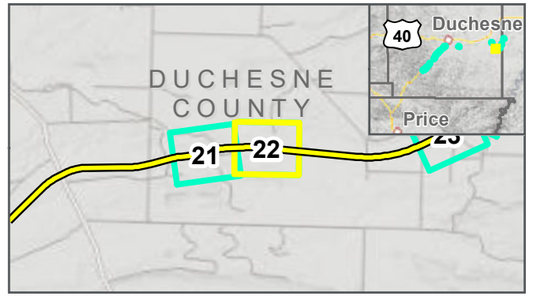

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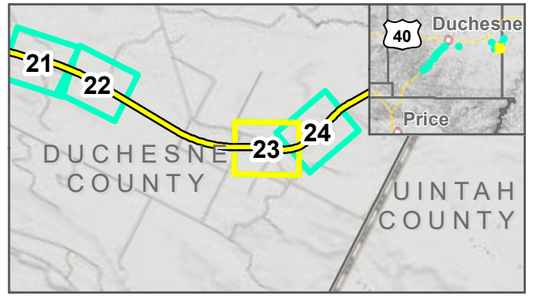

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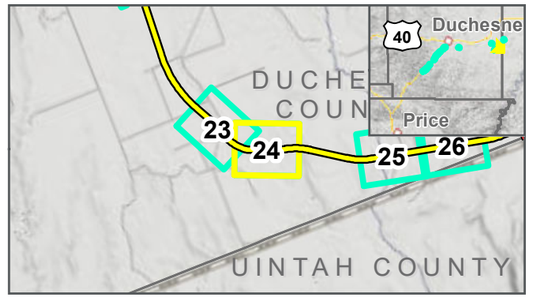

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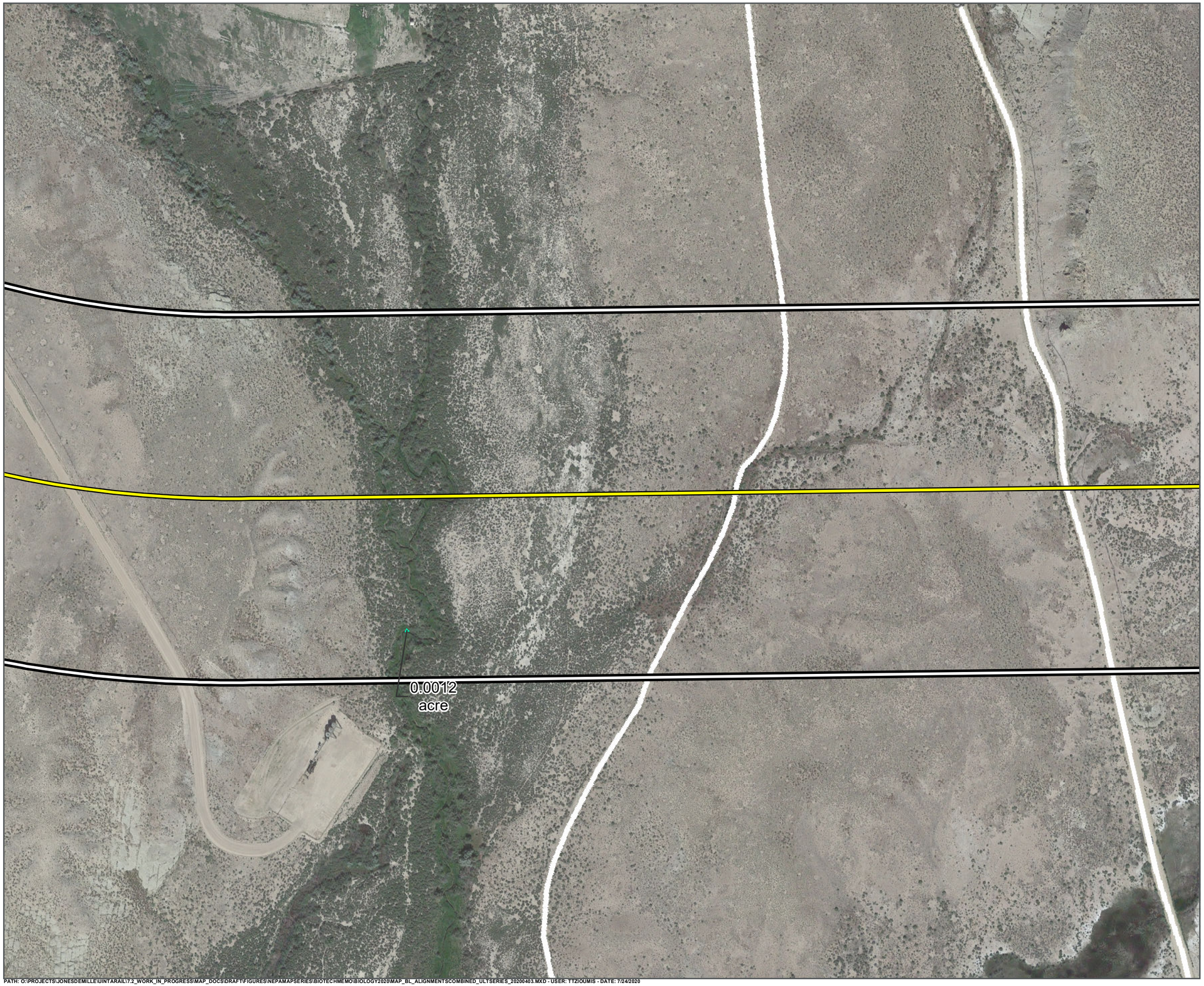

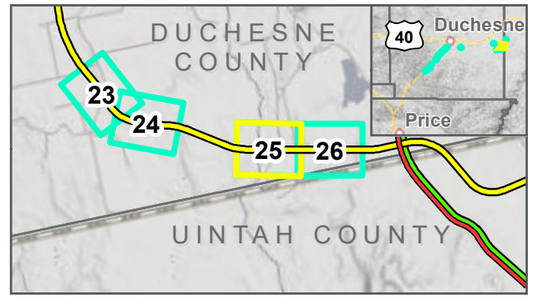

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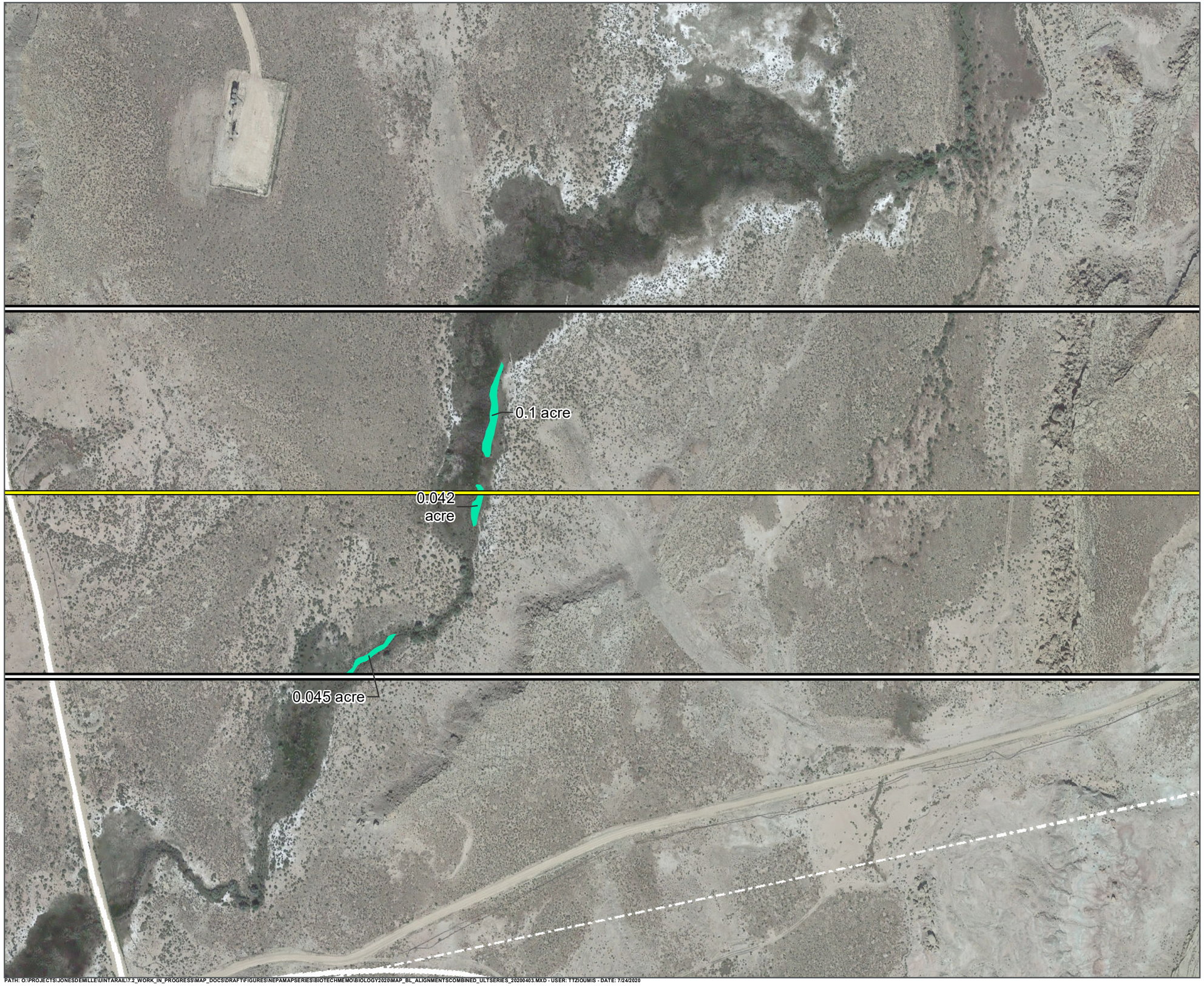

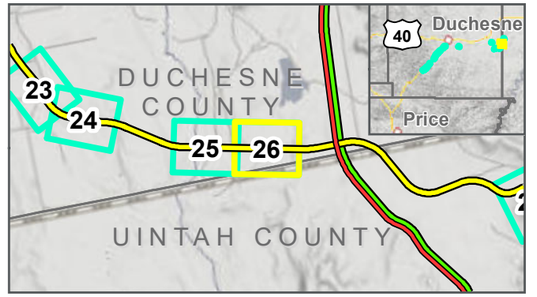

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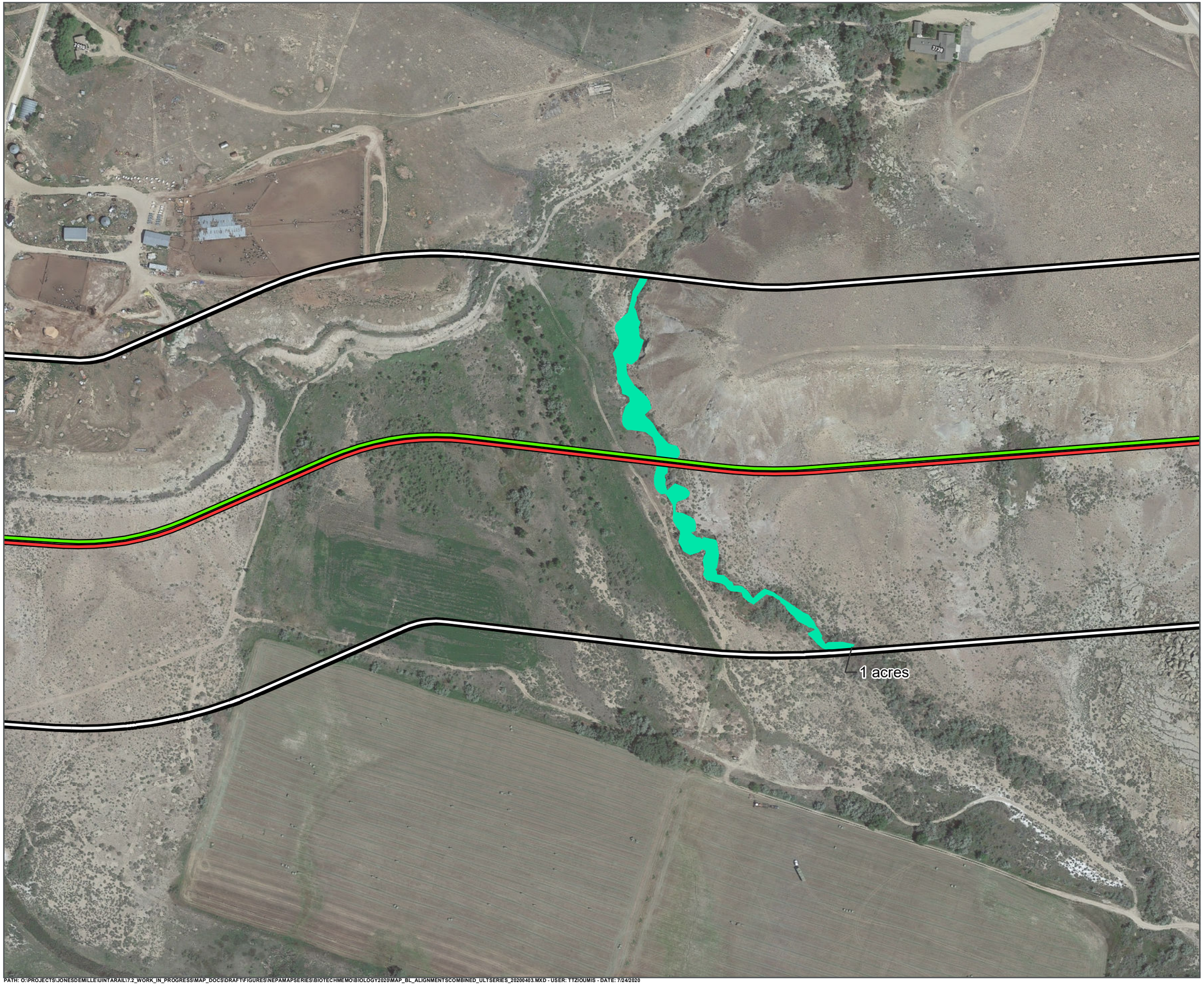

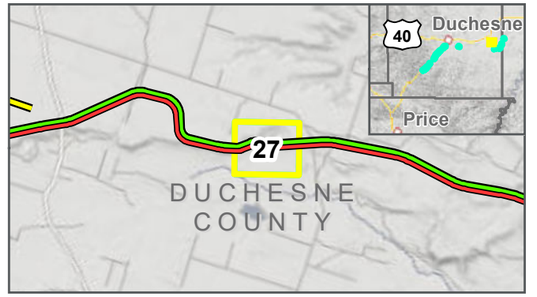

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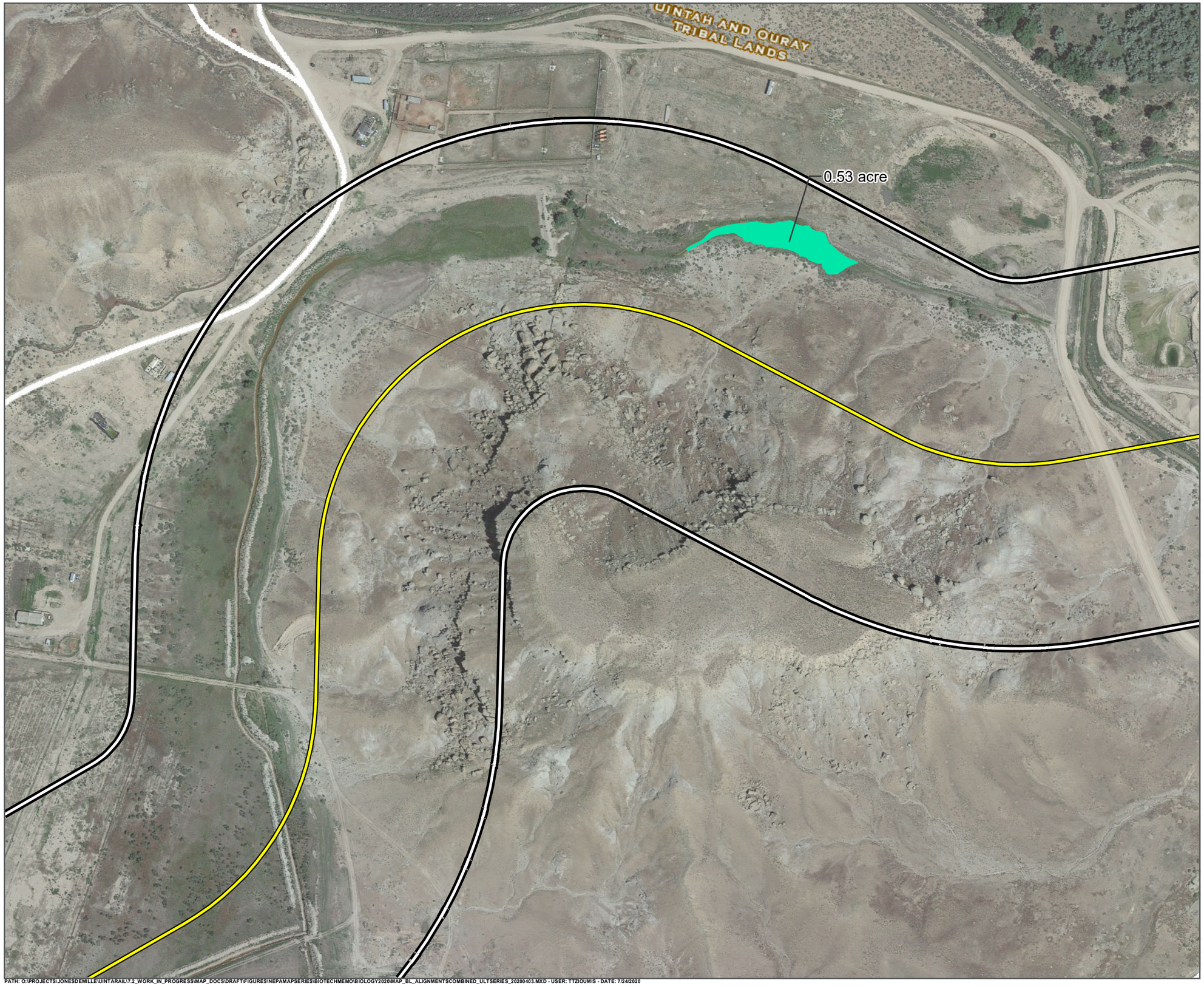

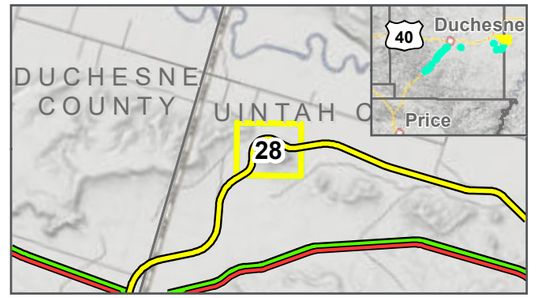

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