Yampa River Forest Restoration Short Term Plan

This is the short-term implementation plan outlining site preparation, planting, protection activities, methodology and timeline for two priority areas in the next three years (2019-2021). The two areas identified are Colorado Parks and Wildlife (CPW) Chuck Lewis State Wildlife Area (SWA) and City of Steamboat Springs' Rotary Park.

The goals are based primarily on Objective 5.3 of the *Yampa River Health Assessment and Streamflow Management Plan (YRHASMP)*: "*To maintain or improve riparian vegetation extent and condition greater than or equal to 20% of mapped riparian area with woody vegetation cover by reach for Chuck Lewis, Rotary Park and other identified parcels*".

The ReTree program's philosophy has been to start small, be successful, and build on that success through an adaptive management approach. Although the aim is to mitigate temperature issues by providing shade in the riparian areas, the overall goal is to improve the system's resiliency by growing the overstory component while increasing species and genetic diversity.

Background

The City of Steamboat Springs' 2018 Yampa River Health Assessment and Streamflow Management Plan (aka Stream Management Plan) found that the riparian forest along the Yampa River is degraded on the reach above the Chuck Lewis SWA and through town to the Wastewater Treatment Plant. Enhancing the quality of the vegetation, particularly the shading canopy cover, was identified as a top priority action in the Stream Management Plan that would improve stream temperature and water quality on the Yampa Rive, over time. It will also help to restore aquatic and terrestrial habitat and stabilize the river channel, thus making it more resilient to floods, droughts and human impacts.

Area Selection

The YRHASMP divided the river into sections (reach), and those were mapped and inventoried (Figures 1 and 2). Each reach is 100 m in width from each side of the river and reflects varying levels of overall health and riparian processes (Figures 4 and 4 - Dominant Cover Maps). Working in conjunction with one of the consultants that developed this report, the plan is to continue working in two public areas: City of Steamboat Rotary Park and CPW Chuck Lewis SWA. These two public areas encompass reaches 6,7 and 8, and 2,3,4 and 5, respectively. They have been selected as the short-term plan priority based on access, land ownership (public), existing shade (east bank), river structure and depth.

Riparian Forest Restoration Approach

Riparian forest restoration project will focus on native shade trees in critical parts of those two public areas, by protecting vegetation that already exists and expanding the vegetative cover in areas where there is no overstory and/or it has been impacted by beaver activity. The project team will work with

already present native riparian species such as cottonwood (*Populus angustifolia*), mountain alder (*Alnus incana*) and willows (*Salix sps*).

Riparian forest restoration is an iterative process of site preparation, planting, long-term care, protection, monitoring and evaluation, and replanting if necessary. The project team will ground truth the riparian mapping and inventory done by the YRHASMP project. During this process there will be further refining of specific areas for planting and protection within each reach, based on need, access and future river or wetland restoration projects.

Planting Tactics

Although the restoration goals are the same at both Chuck Lewis SWA and Rotary Park, the planting tactics may be different. Planting efforts at Chuck Lewis SWA is led by CPW with assistance from the project team. Planting effort at Rotary Park are led by the project team.

The following describes planting tactics conducted by the project team:

Measuring wells will be set up during high flow to establish water table ranges within the areas of planting, and thus inform planting location and irrigation needs. Plant material will be procured through the Colorado State Forest Service (CSFS) Seedling Nursery on an annual basis. The project team has been working with the nursery, providing clippings of local vegetation stock and/or seeds to grow native seedlings for this project. In addition, the project team will set up test plots to determine successful removal of invasive reed canary grass (*Phalaris arundinacea*). Reed canary grass is a major threat to natural wetlands as it outcompetes native species by forming dense vegetative mats that prevent seedlings from reaching soil and establishing roots.

The general schedule is to plant in the fall, therefore site preparation takes place through the summer. Seedlings are fenced and mapped, to aid in their protection, and monitoring efforts take place in the spring and fall. For each planting season, the project team will prepare a specific planting plan with detailed instructions for each planting location. The project team will coordinate and implement all riparian planting project phases, from well monitoring set up to fencing. After each season, the team will evaluate the monitoring data and modify the following year's project plan as needed, adapting to succeed.

<u>Chuck Lewis Wildlife Area</u>

Baseline:

CLSWA Dominant Cover Type and Reach Number	**Acres**	**Percentage**
Total	111.123	100.00%
Bareground	7.238	6.51%
3	5.170	4.65%
4	0.542	0.49%
5	1.525	1.37%
Developed	1.167	1.05%
4	1.167	1.05%
Flowing Open Water	11.393	10.25%

2	0.338	0.30%
3	3.097	2.79%
4	5.402	4.86%
5	2.556	2.30%
Herbaceous	53.011	47.70%
2	3.166	2.85%
3	13.923	12.53%
4	26.223	23.60%
5	9.699	8.73%
Lantic Open Water	0.190	0.17%
3	0.190	0.17%
Subcanopy Forest	8.389	7.55%
3	5.100	4.59%
4	2.571	2.31%
5	0.718	0.65%
Shrub scrub	29.735	26.76%
2	0.298	0.27%
3	6.780	6.10%
4	13.686	12.32%
5	8.971	8.07%

As shown on the Chuck Lewis SWA Dominant Cover Maps (Figure 3), the baseline indicates this CPW area currently has 7.9 % subcanopy forest cover in 3 different reaches. The ReTree program calculates that an additional area of approximately 1.2 acres will be added to this total, with 0.5 acres increase in reach 4 and 0.7 acres in reach 5. These areas will be covered by cottonwood, alder and willow seedlings after the short-term project has been implemented, increasing overall subcanopy forest in the reach.

Chuck Lewis SWA Short Term Planting Schedule

(see Figure 5, Chuck Lewis SWA planting map, for more details)

2019	Plant in existing fenced area: • 127 coyote willows • 20 peach willows • 54 mountain alders
2020	Plant 250-300 cottonwoods and mountain alders behind existing fenced area from 2019
2021	Go back to meadow area (2015) and plant 250-300 cottonwoods and mountain alders

Part of the plan is to also continue monitoring previous planting efforts (ReTree 2015-2018).

Rotary Park

Baseline

Rotary Park Dominant Cover Type and Reach number	**Acres**	**Percentage**
Total	64.438	100.00%
Bareground	1.852	2.87%
7	1.840	2.86%

8	0.013	0.02%
Developed	0.016	0.03%
8	0.016	0.03%
Flowing Open Water	12.240	19.00%
6	0.244	0.38%
7	5.816	9.03%
8	6.180	9.59%
Herbaceous	37.855	58.75%
6	0.554	0.86%
7	8.590	13.33%
8	28.703	44.54%
9	0.008	0.01%
Lantic Open Water	0.883	1.37%
7	0.883	1.37%
Shrub scrub	11.591	17.99%
6	1.004	1.56%
7	3.608	5.60%
8	6.979	10.83%

As shown on the Rotary Park Dominant Cover Maps (Figure 4), the baseline indicates that there is no subcanopy forest in any of the reaches. In three years, the subcanopy forest vegetation cover will have been increased by 1-2 acres in reach 8, with a target of 40% survival of the seedlings planted.

Rotary Park Schedule of Activities

June 2019: Set up measuring wells at planting areas and define monitoring frequency. Wells will be placed on a 20-meter grid starting a meter from the bank edge, 9 wells total in 2 areas within the selected planting sites.

June 2019-October 2019: Measure water level in wells bi-weekly.

July 2019: Inventory all overstory trees above 10 inches within the reach. Begin beaver mitigation work. (See below for details of mitigation work.)

July – September 2019: Prepare site by removing the sod layer along planting lines, weed whacking (on going) and clearing/pruning of existing overstory trees. Begin reed canary grass removal testing. (See below for details of testing.)

September - October 2019: Plant 200 cottonwoods planted along monitoring wells and reed canary grass trials. Fence planted area to prevent browsing and map planted areas.

Rotary Park Short Term Planting Schedule
(See Figure 6, Rotary Park Planting Map, for more details)

2019	200 – cottonwood and alder (70/30).
2020	400 – cottonwood and alder (70/30). Try cottonwood stakes
2021	600 – cottonwood and alder (70/30)

The strategy is to go back the first year after planting and replace up to half of what was planted if it has not survived to the target percentage. Additional monitoring will take place at year 3, and year 10 to assess survival rate and overall condition of plant material. Another planting effort would take place at year 10 if needed to meet the target goal.

If needed, irrigation systems will be set up to respond to water table monitoring levels at the identified planting sites. There might be need to irrigate plants for the first two years to allow for enough root development.

Monitoring

Monitoring of water levels, trees survival and health, and fencing will be conducted according to the following schedule:

- Water level measurements – will be collected bi-weekly from June (or earliest access to the site) through October.
- Tree survival and healthy – Will be assessed annually in year 1, 3, and 10, as described above.
- Fencing – will be evaluated bi-annually in spring (earliest access to the site) and fall to ensure effective protection of the seedlings.

Monitoring data will be collected, mapped and reported to the project team and City of Steamboat Springs Water Resources Manager according to schedule.

Reed Canary Grass Removal Tests (1x1 m): Reed canary grass presents significant competition to native species seedling. During the summer of 2019 and 2020, test plots will be set up to try different methods for control and/or removal of the grass. The successful strategy identified for reed canary grass removal will be used in all future plantings, where reed canary grass is an issue.

The following provides the process for set up and monitoring of the test plots.

Set up 1 m squares with wooden sakes and flagging. Set up will take place in June-July. Removal measures include:

- Control
- Tarp/weed barrier
- Weed Whacking
- Mulch
- Willow staking

Control, weed barrier, weed whacking and mulch will be started in June-July and continued through the summer. Willow staking will take place in spring 2020. These tests will be set up and replicated for a total of 3 areas through Planting Areas 1 & 2.

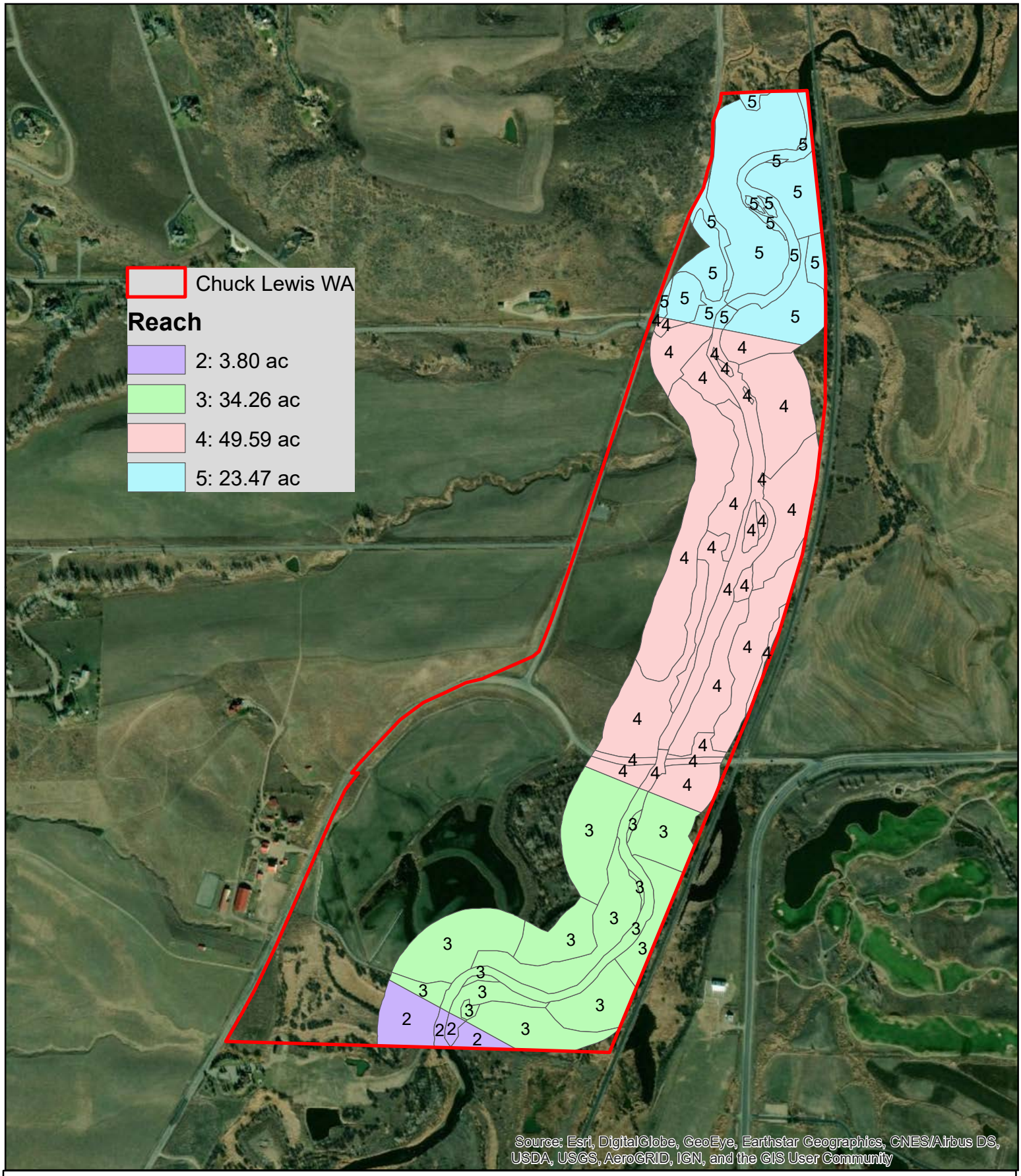
Beaver Mitigation: Beaver activity impacts the survival of young cottonwood saplings. To help meet restoration goals, existing cottonwoods saplings through these reaches will be caged to reduce damage by beaver activity. The following provides the process for protecting the young cottonwoods.

- Choose young trees to be protected based on beaver activity and tree diameter (between 5 & 25 cm diameter) with a focus on cottonwood and alder.

- Fence the trees according to standard operating procedure provided by Confluence Resource Management. GPS each location after completion.
- Monitor previous efforts and repair/expand cages where needed (Rotary, 9th street bridge, River Creek Park and Workman Park).

Project team will continue to expand program expand on a yearly basis.

Yampa River Restoration Project - Reaches within Chuck Lewis Wildlife Area



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Prepared By:
Colorado State Forest Service
Steamboat Springs District
October 12, 2019

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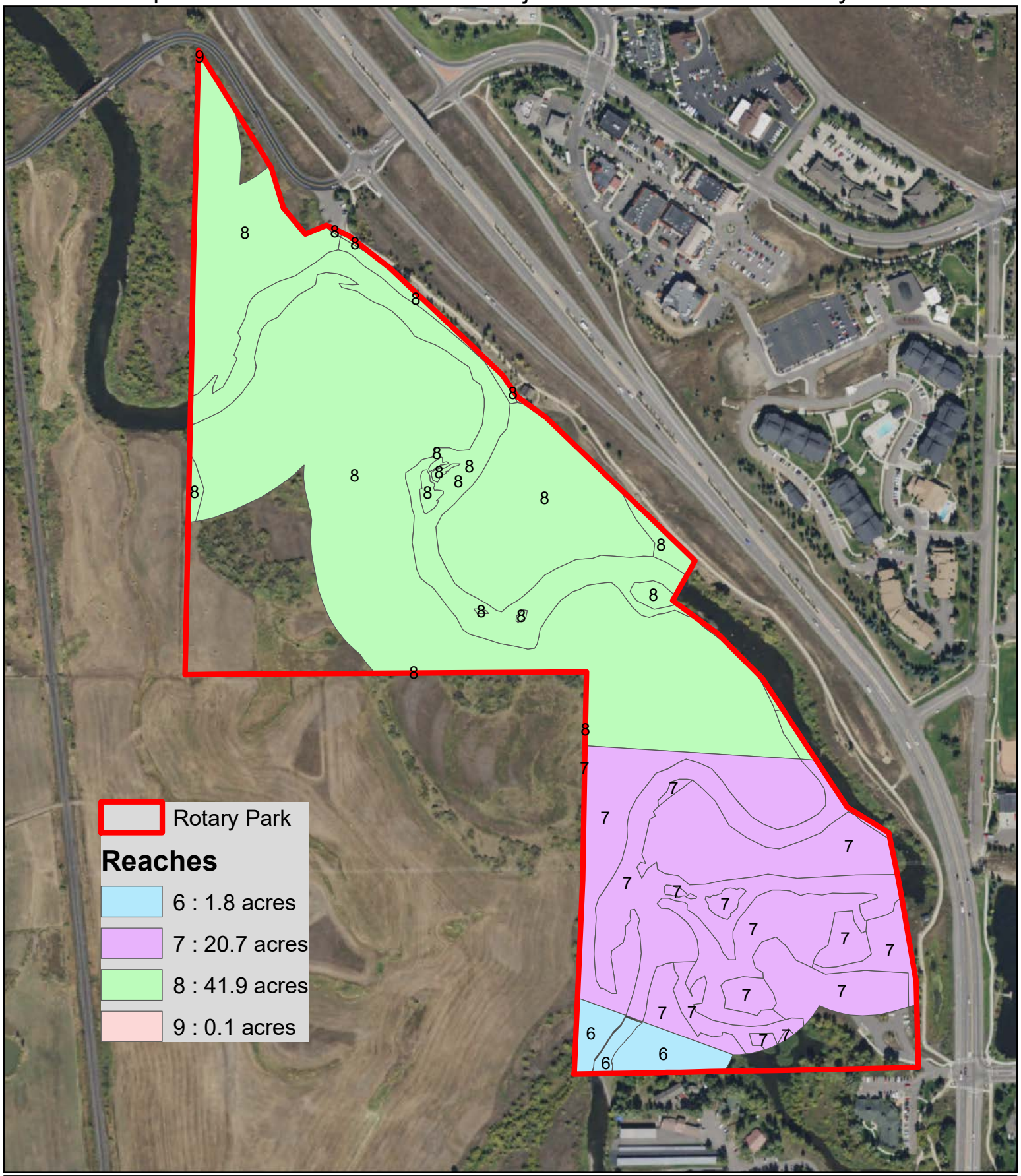
Yampa River Forest Restoration Project - Reaches within Rotary Park



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Colorado State Forest Service
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October 12, 2019

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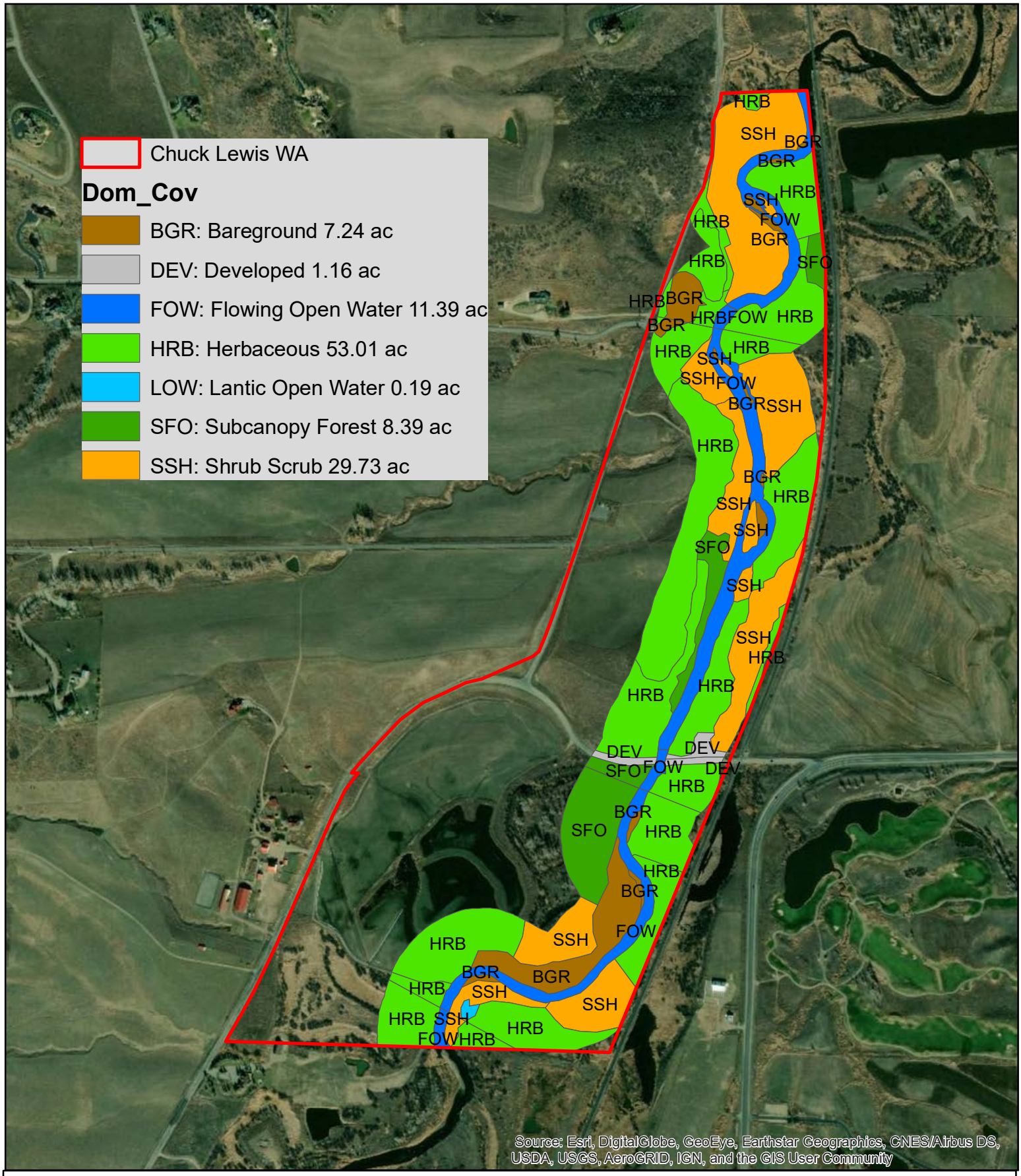
Yampa River Restoration Project - Dominant Cover - Chuck Lewis Wildlife Area



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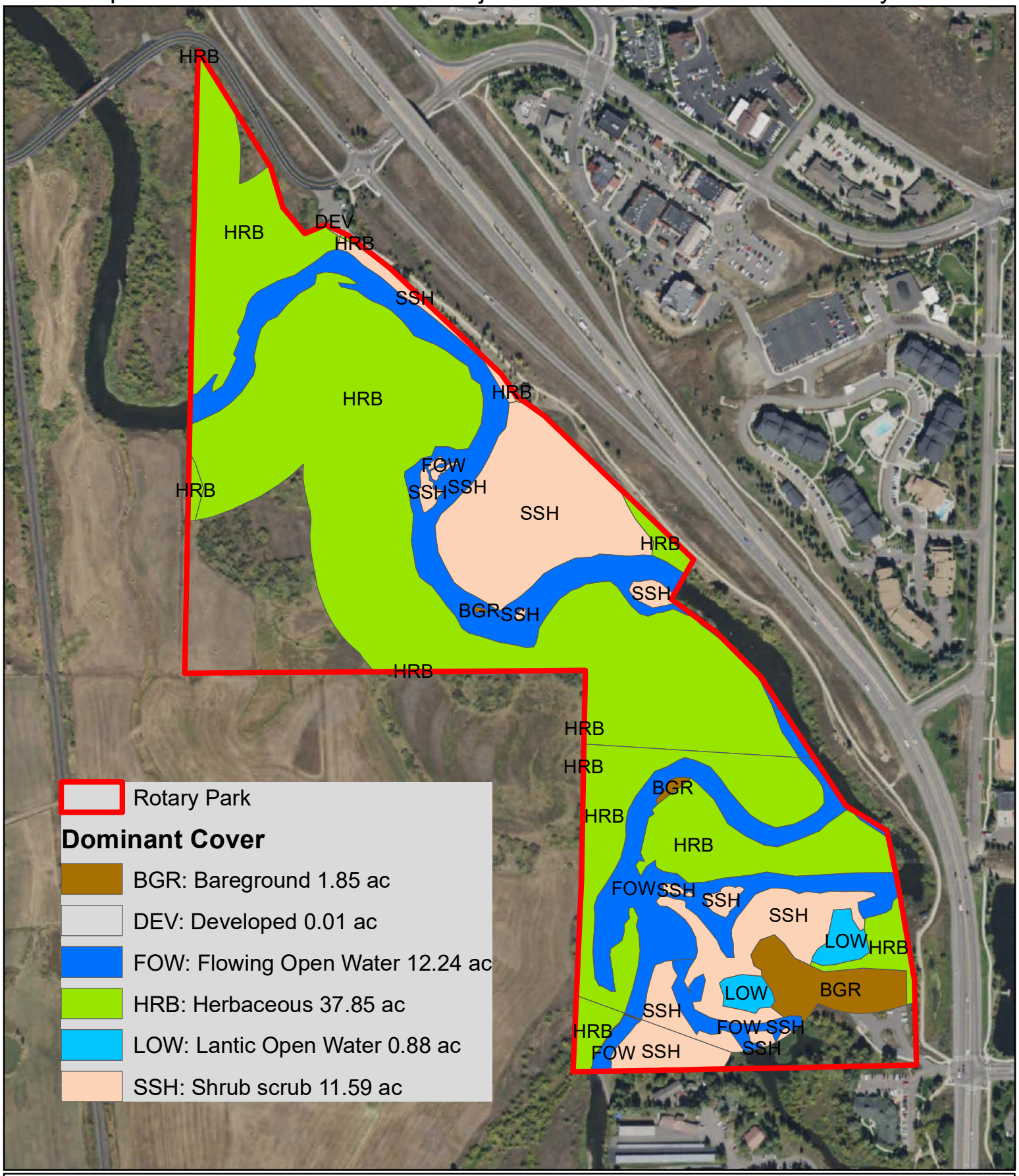
Yampa River Forest Restoration Project - Dominant Cover within Rotary Park



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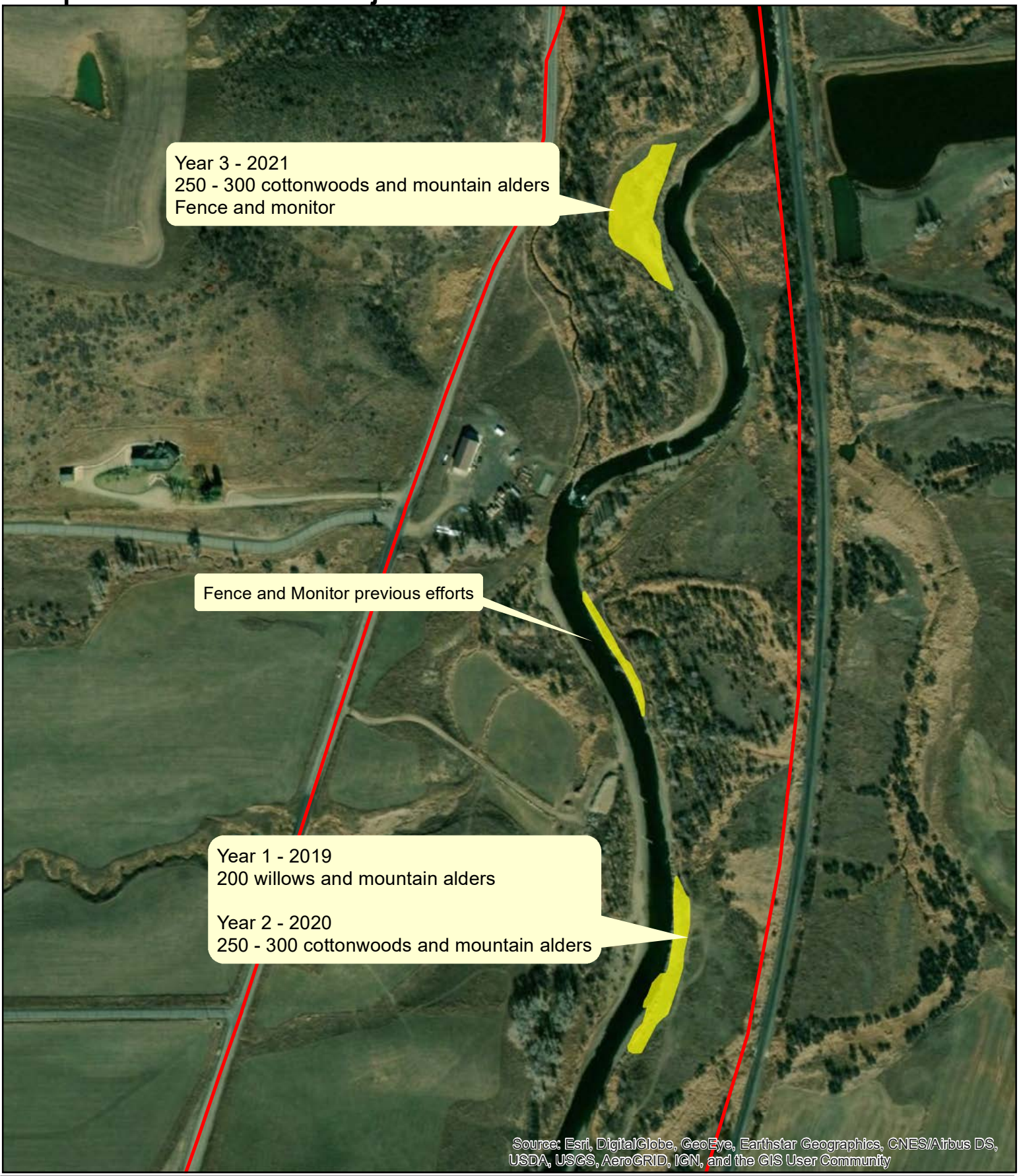
Yampa River Restoration Project - Short Term Plan - Chuck Lewis Wildlife Area



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October 12, 2019

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Chuck Lewis WA Planting Areas

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Yampa River Forest Restoration Project - Short Term Implementation Plan

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