# Huff Creek Coordinated Resource Management Plan (CRMP)

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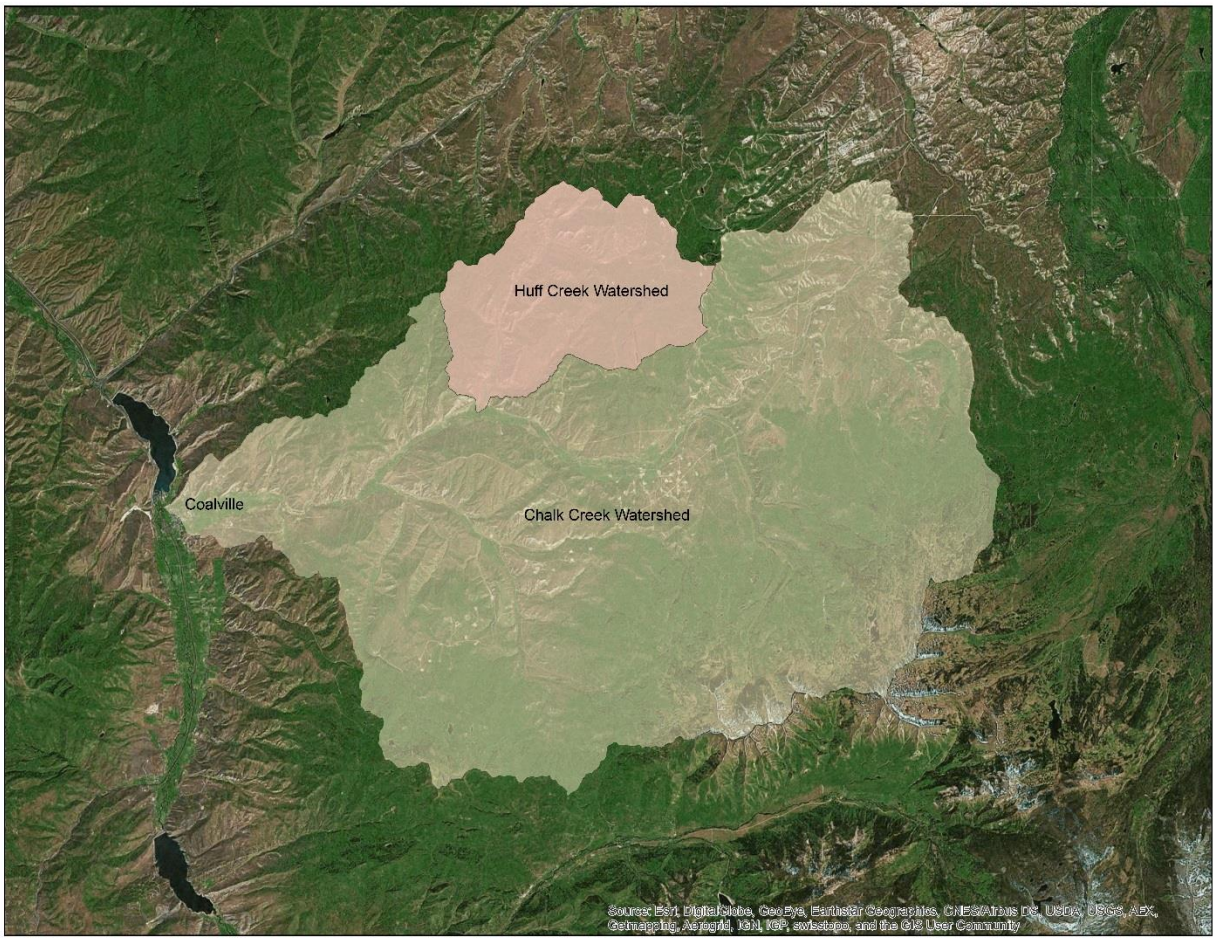
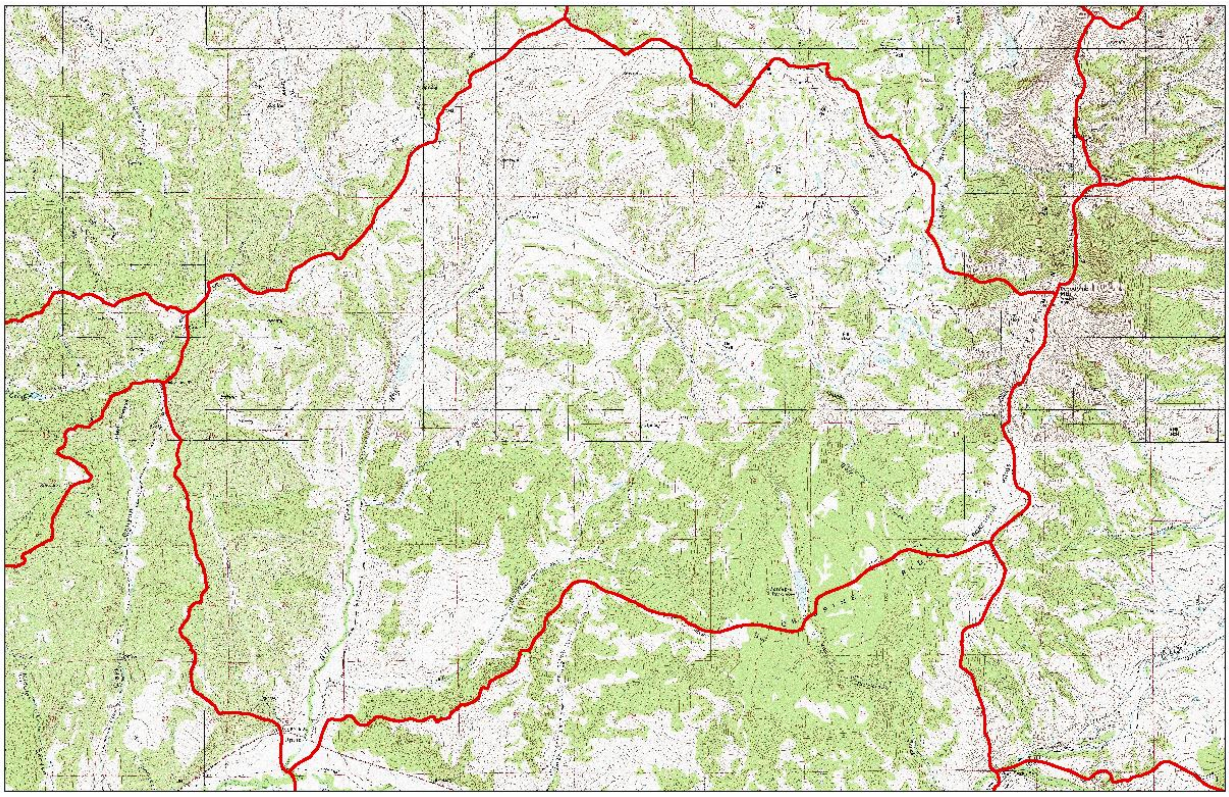
# 1.0 Project map




Map of Huff Creek Watershed within Chalk Creek Watershed



Topographic Map of huff Creek Watershed

## 2.0 Purpose of the Plan

The purpose of the coordinated resource management plan (CRMP) is to identify resource concerns and conservation opportunities in the Huff Creek Watershed and to develop planning objectives and feasible conservation actions. The plan presents solutions that, when implemented, will achieve the vision and goals of the CRMP Steering Committee, the Summit Conservation District and the local landowners. The CRMP will be the guidance document for developing conservation plans. The CRMP can be used to apply for funding through a variety of federal, state, and local programs to implement the planned conservation actions.

## 3.0 Project Sponsor

The sponsors of this project include: The Summit Conservation District, Utah Department of Agriculture and Food, Utah Division of Water Quality, Utah Division of Wildlife, Trout Unlimited, and USDA-NRCS.

## 4.0 Authority

The Summit Conservation District is a legal subdivision of the State of Utah and is responsible for local soil and water conservation programs. On 04/12/2016 the Summit Conservation District Board voted to support and sponsor a CRMP for the Huff Creek Watershed. They then submitted an application to the Utah Department of Agriculture and the Utah Department of Water Quality for funding to develop the CRMP. Funding for the CRMP was approved on 4/25/2017. Glenn Adams was contracted to coordinate and to write the CRMP.

# 5.0 Voluntary Implementation

Implementation of resource conservation actions by landowners will be through voluntary participation. Conservation plans will be developed and implemented. These plans will be tailored to address the specific resource concerns and conservation opportunities that pertain to each particular land unit and the desires of each landowner.

## *5.1 Public participation*

**Landowner Committee**

The landowner Committee is comprised of the following:

- Bill Battersby
- Gary Boyer
- Neil Dawson
- Kenny Jacobson
- Ken Dawson
- Russ Boyce
- Ken Boyce
- Curtis Louder
- Kirk Orgill
- Colby Pace

**Technical Advisor Committee (TAC)**

The Technical Advisory committee was formed to provide needed technical assistance to the Steering committee.

Members of the TAC:

- Andy Pappas
- Glenn Adams
- Doug Garfield
- Cade Willoughby
- Craig McKnight
- Colby Pace

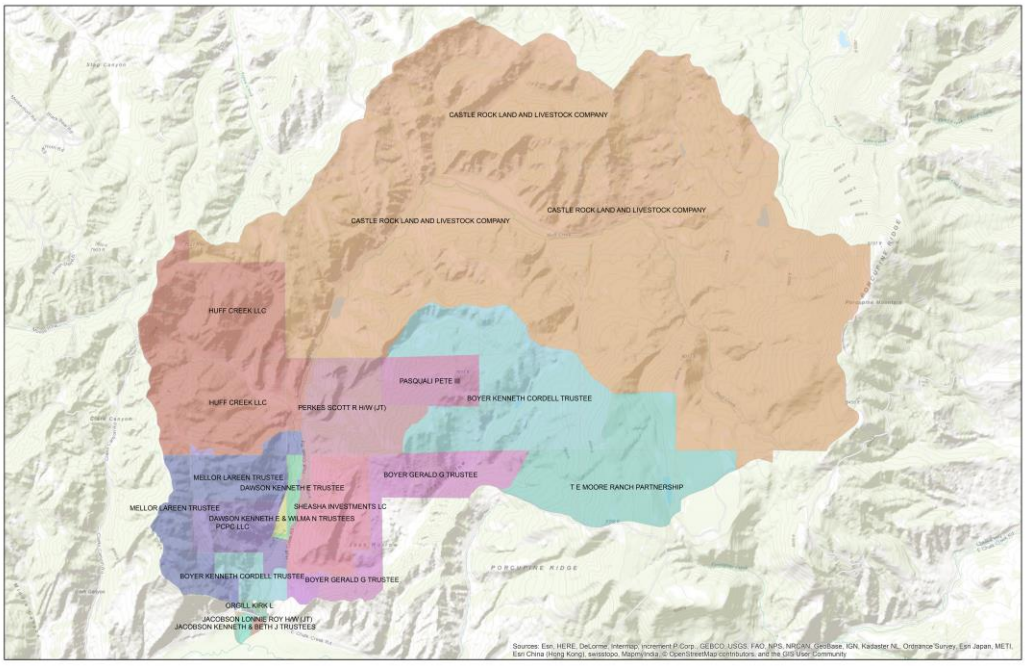
# 6.0 Description of planning Area

## *6.1 Location of the Planning Area*

The focus of the plan is the Huff Creek Watershed. The planning area included the stream from its confluence with Chalk Creek upstream to it headwaters. The creek is 10.6 miles long and includes one retention pond. The watershed is approximately 20,000 acres in size and is part of the greater Chalk Creek watershed East of Coalville, Utah.

## *6.2 Land Ownership*

Land ownership within this watershed is all private. Note the attached map for the ownership pattern and the owners.




Huff Creek Watershed Land Ownership Map

## *6.3* Agriculture

The primary agricultural uses in the Huff Creek Watershed are hay production for feeding to livestock and livestock grazing. There is 204 acres of irrigated ground that is currently under flood irrigation. The remaining 20,000 acres is range ground that is grazed during summer months. Livestock can be found in the watershed year round but in higher concentrations from May to October.

## *6.4 Water Quality*

### 6.4.1 Non- Point Pollution

Nonpoint source pollution originates from many diffuse sources across the landscape. In the watershed, nonpoint sources include agricultural practices such as livestock grazing and irrigation, septic systems, and channel erosion. Restoring water quality and protecting beneficial uses will require describing and addressing each of these sources individually using an appropriate set of implementation measures and best management practices. Efforts to reduce nonpoint sources are voluntary.

### 6.4.2 Agricultural Pollution

Grazing, hay, and alfalfa production are the primary agricultural activities that occur in the watershed. These activities involve the use of fertilizers, manure spreading and irrigation in some areas of the watershed. Agriculture is considered a nonpoint source. As water runs across agricultural fields, it picks up sediment and nutrients that are deposited and mobilized through active grazing, application of fertilizers, and irrigation.

### 6.4.3 Grazing Effects to Water Quality

Rangeland and pasturelands in the study watershed are typically adjacent to local streams. Cattle within a grazed pasture rarely spread out and cover the entire acreage evenly; rather, they tend to congregate around areas where water is readily available (riparian areas and stream channels) and forage is plentiful. Consequently, a greater proportion of the manure is deposited in or nearby stream channels and riparian areas, resulting in a greater potential for direct

transport of nutrients. Typically, cattle graze in the valleys in the fall and spring. In the hot summer months, they are taken to the higher elevation forests, and in the winter, they are relocated to the West Desert.

In addition, grazing impacts in-conjunction with past willow eradication in the Huff Creek riparian area have resulted in erosion and sediment inputs, which has diminished water quality. This is an issue in various parts of the watershed. Chalk Creek and Huff Creek are currently listed on the State of Utah's 303D list for elevated levels of sediments and phosphorous. Soils in the watershed tend to be rich in phosphorous, so destabilization of stream banks resulting in elevated levels of erosion increases phosphorous inputs into Huff Creek.

#### 6.4.4 Effects of Fertilizer and Manure Application to Water Quality

Fertilizer and manure are applied to fields to improve crop yields on agricultural lands. Applied fertilizer may wash off during storm events or during irrigation, particularly flood irrigation. Water flowing off fields may drain directly back to the stream or to irrigation and drainage ditches.

*Mid-Huff Creek – Note new flood plain forming along with desirable woody species achieved with time control of grazing*

## *6.5 Water Quantity*

#### 6.5.1 Irrigation Efficiency

Irrigation return flow is runoff from agricultural fields (such as pasture and hay fields) that is generated by irrigating the field. The runoff either returns to the irrigation ditch or the stream directly down gradient from the field. Irrigation return flow is primarily associated with flood irrigation practices and less so with sprinkler irrigation. Flood irrigation allows water to flow from a ditch or stream onto the fields directly through a head gate or other diverting works. This

method effectively flushes soil, biomass, manure, and fertilizer off the field and into the ditch or stream. Sprinkler systems apply less water at rates that allow water to infiltrate the soil, thereby reducing irrigation return flow generated from surface runoff.

Over-irrigation of pasture and hay land will also raise the water table and lead to changes in the mobility of phosphorus in soils. Phosphorus has been observed to move more easily through soils that are consistently waterlogged because most of the iron present in these soils is reduced, and sorption potential is decreased (Sharpley 1995). Waterlogged soils are also prone to the loss and transport of fine, lightweight soil particles (such as silt and clay) to receiving waters. These fine particles represent the primary phosphorus sorption sites in the soil. These particles carry a significant amount of phosphorus with them when they are removed and leave the remaining soil deficient in phosphorus holding capacity (Hedley et al. 1995). Nitrogen is highly mobile in soils, and over-irrigation would promote leaching through the soil layers. Return flow also easily transports nitrogen to irrigation canals and streams from irrigated fields.

Flood irrigation efficiency was assumed to be 30%, and sprinkler irrigation was assumed to be 70%. The surface runoff was assumed to be 40% from flood-irrigated land and 5% for sprinkler-irrigated lands (personal communication, Thomas Hoskins, NRCS, December 12, 2012). These values reflect the difference in the amount and quality of irrigation return flow generated from flood irrigation compared to sprinkler irrigation.

## *6.6 Riparian Area Quantity and Quality*

In June of 2016 an SVAP2 (Stream Visual Assessment Protocol) was conducted by the Summit Conservation District, NRCS and UDWQ on Huff Creek to assess stream conditions. SVAP is a multifaceted assessment tool used to provide a snapshot of current stream conditions. The watershed measures approximately 12 miles from its headwaters on Porcupine Mountain to the streams confluence with Chalk Creek. Conditions on the entire stream was assessed  Two of the elements scored on the SVAP are riparian quality and quantity. Based on the data collected from the SVAP approximately 15,654 ft. (3 miles) or 25% of Huff Creek was scored as either severely degraded or in poor condition based on the riparian quantity and quality scores. Streamside management practices such as willow eradication have contributed to degraded riparian conditions resulting in a loss of stream vegetative cover, unstable bank conditions and sediment inputs.

Changes in riparian management practices would result in improved conditions on Huff Creek. Some implementation practices to consider would be stock water development off of the stream out of the riparian area. In addition, limiting or controlling grazing access with riparian fencing would be highly beneficial. Doing this would be very beneficial as livestock currently have uncontrolled access to much of the stream over the summer grazing period, and in some areas year-round. Developing better permanent fish friendly irrigation diversion structures to facilitate improved irrigation, improve fish passage, and reduce washouts and sediment inputs during high water could benefit areas lower down in the watershed where irrigation water is being diverted from Huff Creek. A new tool that could be beneficial in certain areas where riparian degradation has occurred would be the installation of BDA's (Beaver Dam Analog) structures. These structures mimic natural beaver dams. Installing these types of structures in incised areas of Huff Creek could help to slow stream velocities, capture sediment and build streambeds back up and raise water tables. This practice coupled with selective willow plantings could help to restore historic riparian conditions that once prevailed on Huff Creek.

*Riparian Area on Huff Creek before fencing*

*Riparian Area on Huff Creek After fencing – note healing of riparian zone*

## *6.7 Fish and Wildlife*

All wildlife is dependent upon viable habitat to survive and thrive and without habitat sufficient to meet the specific needs of wildlife species, there will not be wildlife. Thus, habitat and wildlife conservation were considered a single resource concern. No single set of species were considered as "wildlife" in the discussions with landowners, but particular focus was given to more iconic wildlife species such as mule deer and elk. Not only are wildlife a key component to a healthy ecosystem, wildlife species are an important resource for Huff Creek landowners. When the Huff Creek landowners conducted an exercise used to identify the most important resource issues of concern, their number 4 was "Big Game Winter Range Condition". Wildlife are an important part of the ecology, ecosystem, history, and aesthetic of the Huff Creek. Big game species such as Mule Deer and Elk are also a significant economic resource to many of the landowners.

The Huff Creek Watershed includes a good mix of habitat types ranging from aspen and conifer plant associations in the upper elevations to the riparian areas along Huff Creek. In-between these two extremes are plant association dominated by: oak brush, snowberry, sagebrush, and grass. Together and in the mosaic pattern that these plant communities occur as provides excellent habitat for the mentioned species and many others including many species of birds, raptors, rodents and predators such as mountain lion, bobcat, badger. All these species are dependent healthy plant association and habitats.

Wildlife species are reliant upon adequate and healthy habitats to survive. When components of required habitats are diminished or do not exist in a particular area, wildlife species typically move to find the required habitats or are eliminated from the area.

For example, deer in the Huff Creek require both summer and winter range habitat to survive. During the warm summer months deer spend time in the upper reaches of the watershed and feed on understory plants and grasses that occur on range sites, forested areas, and riparian areas. However, during the winter the cold and snow eliminate much of the food sources once available to deer. This forces them to move to areas typically on southern facing aspects with lower snow depths and vegetation that remains nutritionally adequate even during the coldest months of the year.

Without both of these habitat types deer will not be able to complete their life cycle within the South Fork watershed and may not remain full time residents of South Fork.

Additionally, if any of the habitat types are lacking, this will be the limiting factor influencing the carrying capacity and health of the entire species within the watershed.

In addition to large animals such as deer and elk, this watershed also provides habitat to sage grouse. Sage grouse habitat requirement are not too different from deer in that they require a variety of habitats depending on the season of the year. The required habitats for sage grouse include the sagebrush plant community in its various stages of succession from early grass and forb dominated to late successional stage that is characterized by mature big sagebrush.

The challenge becomes how to manage for wildlife species that require a complex diversity of habitats that occur throughout the watershed. This challenge is especially paramount because land ownership rarely encompasses all of the habitat types needed by any wildlife species. This requires management that recognizes that wildlife and the habitats they rely on do not respect fences, nor does management.

## *6.8 Climate*

Climate Coalville - Utah

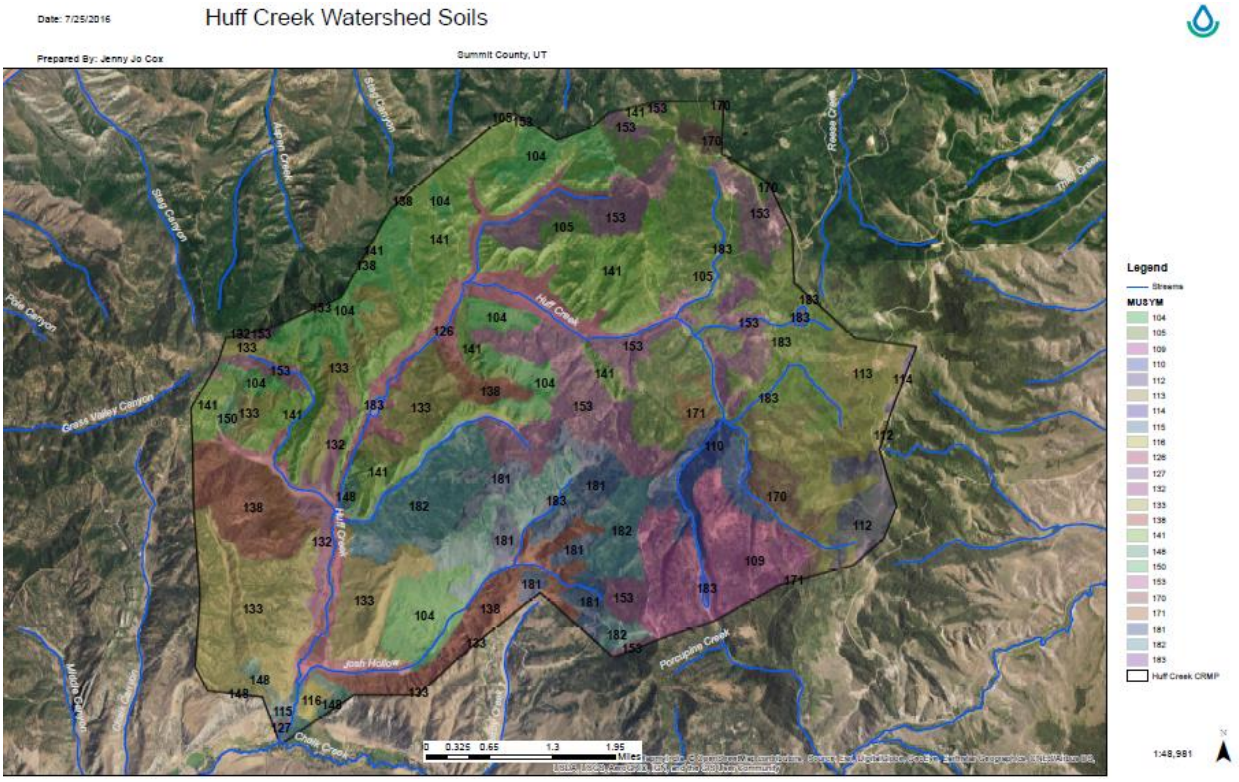
°C | °F

| | Jan | Feb | Mar | Apr | May | Jun |
|---|---|---|---|---|---|---|
| Average high in °F: | 36 | 42 | 51 | 59 | 69 | 79 |
| Average low in °F: | 11 | 14 | 22 | 28 | 34 | 40 |
| Av. precipitation in inch: | 1.3 | 1.22 | 1.61 | 1.85 | 2.01 | 1.14 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |
| | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
| Average high in °F: | 86 | 84 | 76 | 65 | 48 | 37 |
| Average low in °F: | 46 | 44 | 37 | 27 | 20 | 12 |
| Av. precipitation in inch: | 0.98 | 1.06 | 1.38 | 1.61 | 1.61 | 1.14 |

Coalville, Utah, gets 17 inches of rain per year. Snowfall is 74 inches. The number of days with any measurable precipitation is 53.

On average, there are 224 sunny days per year in Coalville, Utah. The July high is around 87 degrees. The January low is 13. Sperling's comfort index for Coalville is a 65 out of 100, where a higher score indicates a more comfortable year-around climate. This index is based on the total number of days annually within the comfort range of 70-80 degrees, and we also applied a penalty for days of excessive humidity.

## *6.9 Soils*




For a complete soil and ecological site description for the Huff Creek Watershed refer to the NRCS Huff Creek Watershed Soil Report in the appendix.

There are 23 different soil types in the watershed. Most are Loams.

The most dominate soil type (approximately 40% of the watershed) are the Fewkes soil complexes. Fewkes soils are clay loams occurring on up to 60% slopes; Mountain Big sagebrush is the common ecological site for this soil. These are well drained soils that don't flood or pond. Their parent material is derived from sandstone, quartzite and shale.

Another soil of interest occurs on the stream terraces associated with riparian areas. Soil 126 Echocreek loam occurs on 2-10 % slopes and is associated with Basin Wildrye Ecological Type. This soil is alluvial from sandstone, quartzite and shale. It is considered prime farmland when irrigated due to its well-developed horizons. These are well drained soils with a low runoff classification. This soil has a high available water storage profile, hence was historically a floodplain.

The NRCS Soil Report gives not indication of soils with characteristics that would limit potential future conservation projects in the Huff Creek Watershed.

### *6.10 Forestry*

PJ Abraham provided the forestry input to this plan. The Castle Rock property (within the Huff Creek Watershed on the Ensign Ranch) has a stewardship plan for about 10,000 acres. It was written in 2003 and is due for revision. The following is a summary of the plan, for more specifics the plan is included in the Appendix. This existing plan suggests aspen cutting and ground based logging.

This same 10,000-acre Stewardship Plan is in a Conservation Easement through the Forest Legacy Program.

The property is very diverse in its topography and forest cover types. Forested areas of lower elevation (approximately 6,400 feet to 7,200 feet) consist of woodland stands and aspen. Woodland stands include gamble oak, chokecherry, juniper, and pinyon pine. Forested areas of higher elevation (approximately 7,200 feet to 9,000 feet) consist of mainly aspen, with Douglas-Fir and subalpine fir scattered within these stands.

This Stewardship Plan encourages the following activities: 1) activities which create and/or maintain existing aspen stands; 2) sanitation and salvage activities which will reduce hazardous fuel loads in forests and rangeland environments; 3) sanitation and salvage activities which will improve forest health through diversifying stand structure and composition. All impacts of prescribed silvicultural activities must be mitigated such that aesthetics are minimally impacted.

| | |
|---|---|
| Forested acres: | 2, 239 acres |
| Woodland acres: | 1, 014 acres |
| Potential riparian acres: | 402 acres |
| Rangeland acres: | 6, 428 acres |
| **Total acres:** | **10, 083 acres** |

**Specific Insect and Disease problems**

| | |
|---|---|
| Stands 15, 29, 34, 38, 42, and 44: | Evidence of flathead borers in aspen. |
| Stands 12, 27, 29, and 40: | Aspen experiencing higher levels of cankers and rot. |

Note the Appendix for Forest management Recommendations.

# 7.0 Resource Concerns and Conservation Opportunities

*Table 1-Natural Resource Concerns*

| **Natural Resource Concerns for the Huff Creek Watershed** | | |
|---|---|---|
| | **Resource Concern** | **Ranking Points** |
| 1 | Adequate Water Quantity and Delivery System | 35 |
| 2 | Soil Erosion Control | 25 |
| 3 | Water Quality (Sediment and Nutrient input) | 23 |
| 4 | Big Game Winter Range Condition | 13 |
| 5 | Range Ecological Condition | 13 |
| 6 | Control of Invasive Weeds | 12 |
| 7 | Riparian Area Management (with a goal of PFC) | 10 |
| 8 | Fire Management (resource protection and improvement) | 7 |
| 9 | Forest Health (Aspen and Conifer Management | 5 |
| 10 | Fish Management with a focus Bonneville Cutthroat Trout | 5 |

The rankings listed above were the result of ratings completed by: Bill Battersby, Gary Boyer, Ken Boyer, Ken Dawson, Huff Creek LLC-Scott Perks, Ken Jacobson, Reed Mellor/Doug yates, and Kirk Orgill.

# 8.0 Huff Creek Watershed Resource Concerns, Strategy, Proposed Actions and Monitor Plan

The following list of resource concerns and conservation opportunities was developed by the landowner committee and was derived from the original natural resource concern list originally prepared by the committee. After consideration and thought the original list was reduced to this list as some of the concerns were redundant, especially as to riparian health.

1. Irrigation Water Quantity and Delivery
2. Riparian Area Management
3. Big Game Winter Range
4. Upland Range Condition
5. Invasive Weed Control
6. Fire Management (resource protection)
7. Forest Health
8. Fish Management (focus on Bonneville Cutthroat Trout)

*Photo along upper Huff Creek – note point bar attempting to re-establishing sedges and grasses along with new flood plain.*

The following table lists the resource concern, the strategy needed to address the concern, the proposed action and the monitoring plan for each action:

*Table 2-Resource Concern, strategy, Proposed Action, Monitoring, Partner*

| Resource Concern | Strategy | Proposed Action/Practice | Monitor Plan | Partner (s) |
|---|---|---|---|---|
| ***1. Irrigation Water Quantity and Delivery*** – Existing delivery infrastructure is in poor condition, ditches leak and the reservoir upstream has lost capacity due to silt, and storage water rights are unclear. | 1. Improve the delivery system<br>2. Secure storage water rights<br>3. Need system data | 1. head gate replacement and construction ( 5 head gates)<br>2. 3 miles of ditch repair or piping<br>3. Engage Hydrologist to assess delivery system and needs<br>4. Water Management Plan | 1. Photo Point<br>2. Observation by land owner | NRCS, 319, UDWQ, TU, UDWR, UDAF/GIP, WBWCD, RMEF, MDF, DFFSL, Huff Creek Landowners, Summit County |
| ***2. Riparian Area Management***, Soil Erosion Control, Water Quality (Sediment and Nutrient input) – Past shrub eradication projects and overgrazing jeopardized stream bank stabilization and general riparian area health. | 1. Stabilize streambank where compromised<br>2. Restore shrub component of riparian vegetation where absent<br>3. Apply time control of livestock grazing needed to insure plant recovery from grazing<br>4. Nutrient accumulation from livestock will be filtered and trapped as Riparian Areas improve using proposed projects. | 1.Use natural materials (juniper) to stabilize erosion<br>2. Install BDA where needed<br>3. Install Riparian fencing to improve time control of livestock grazing<br>4. Develop off-site/off/stream livestock water to take pressure off of riparian area<br>5. Willow planting with native stock<br>6. Controlled grazing, discourage season long grazing using the above tools | 1. Photo Point with notes<br>2. total phosphorus sample (1/month in summer for 6 months) | NRCS, 319, UDWQ, TU, UDWR, UDAF/GIP, WBWCD, RMEF, MDF, DFFSL, Huff Creek Landowners, Summit County |
| ***3. Big Game Winter Range*** – Sustain and protect existing winter range as it is important | 1.All of the strategies and projects identified in the plan | 1.All of the mentioned projects | 1. Photo Points | UDWR, MDF, RMEF, Huff Creek Land Owners |

| | | | | |
|---|---|---|---|---|
| to the wildlife and the economy of outfitting and guiding in the area | augment big game winter range and help to sustain and protect it<br>2.Need a comprehensive database of existing big game populations and trends along with targets | 2. Work with ken Clay to develop comprehensive database and target populations numbers | | |
| ***4. Upland Range Condition*** – Over the years invasive weeds have established in the uplands, reducing forage production and decreasing ecological condition. Historical heavy use by livestock have reduced the presence of deep rooted perennial grasses. | 1. Develop livestock water to improve livestock distribution, therefore improving range condition.<br>2. Create weed map with priorities as to treatment.<br>3. Identify areas in need of seeding in order of re-establishing deep-rooted perennial grasses<br>4. Where season-long grazing occurs, use appropriate tools to create improved time control of grazing | 1. Livestock water development in "Right Hand Canyon" (Boyer)<br>2. Develop livestock water in Pete's Right Canyon (Huff Creek LLC)<br>3. Create Water Gaps in riparian fencing for livestock water use<br>4. Continue to treat invasive weeds by priority<br>5. Seed identified areas<br>6. Implement time control of grazing where needed using fencing, water development, herding, etc.<br>7. Build 1 mile of fence on Gary Boyer's place to improve time control of grazing | 1. Photo Points with notes | NRCS, UDWQ, TU, UDWR, UDAF/GIP, RMEF, MDF, DFFSL, Huff Creek Landowners, Summit County |
| ***5. Invasive Weed Control –*** these plants occur in the riparian areas and on the uplands and have invaded over time. Species of concern in | 1. Map weed population and prioritize needs<br>2. Work with county and others to develop a plan of treatment | 1. Map weeds<br>2. Treat weeds as landowners and through the county | 1. Photo Points<br>2. Weed population maps | NRCS, TU, UDWR, UDAF/GIP, WBWCD, RMEF, MDF, DFFSL, Huff Creek |

| | | | | |
|---|---|---|---|---|
| this watershed include: Canadian thistle, hounds tongue, Leafy Spurge, cheatgrass and bulbous bluegrass | | | | Landowners, Summit County |
| 6***. Fire Management*** (resource protection) | Asset protection (homes, outbuildings, etc.) | Prepare fire protection plan (includes fuel inspection and mitigation plan) | Photo points | Summit county, landowner, Fire District |
| 7***. Forest Health*** (Aspen and Conifer Management) | Aspen Stand maintenance | 1.Aspen clone treatment, 2.conifer thinning, etc. | Photo points | Summit county, landowner, State of Utah, NRCS |
| 8*. Fish Management* (focus on Bonneville Cutthroat Trout) | Improve fish passage | 1.Enlarge culverts | Fish survey | State of Utah, Weber River Water Conservancy, Trout Unlimited |

*photo points – Note APPENDIX C. Photo Point Protocol for directions as to establishing photo points.

# 9.0 Compliance with NEPA and Other Regulations

Whenever federal funds are used to implement conservation actions, the federal agency providing the funding will prepare the necessary environmental evaluations, assessments, environmental impact reports and decision documents. The information gathered by the respective agency will meet the requirements of the national; Environmental Policy (NEPA) and other regulations as required.

# 10.0 Implementation Plan

## *10.1 Identify causes and sources of pollution (Element a)*

The sources and causes have been identified in sections 6.4 Water Quality and 6.5 Water Quantity. Livestock grazing, irrigation practices and streambank erosion are sources of pollution. Solution to these sources of pollution are riparian area and irrigation infrastructure restoration.

The load analysis indicates that agricultural and grazing activities on private land contribute to a large portion of both nitrogen and phosphorus loading to Huff Creek Watersheds. The nonpoint source nature of these activities and their occurrence on private land pose a challenge for addressing loads in a comprehensive and successful manner and requires active engagement and interest by local private landowners.

Landowners in the watershed have come together and found that water quality is there major priority. The goal of the plan is to address water quality concern within the watershed while keeping agriculture sustainable.

## *10.2 Estimate load reductions expected (Element b)*

The following tables display the estimated phosphorus load reductions, allocations and targets. Sources identified include livestock grazing, hay production and streambank erosion. Solution include riparian area restoration and time control of grazing.

*Table 3-Estimated Phosphorus Load Reductions*

| Estimated Loads | Total Phosphorus | Total Nitrogen |
|---|---|---|
| Private Grazing | 119 | 540 |
| Irrigation/ Fertilizer | 6 | 28 |
| Channel Erosion | 70 | 177 |
| Natural Background | 38 | 245 |
| Upstream | 0 | 0 |
| **Total** | **233** | **990** |

*Table 4- Estimated Phosphorus Load Allocations*

| Load Allocations | Total Phosphorous | Total Nitrogen |
|---|---|---|
| Grazing Private | 36 | 70 |
| Irrigation/ Fertilizer | 2 | 4 |
| Channel Erosion | 21 | 23 |
| Natural Background | 38 | 459 |
| Upstream | 0 | 0 |
| **Total** | **97** | **556** |

*Table 5- Estimated Phosphorus Load Reduction targets*

| Load Reduction Targets | Total Phosphorous | Total Nitrogen |
|---|---|---|
| Grazing Private | 83 | 470 |
| Irrigation/ Fertilizer | 4 | 24 |
| Channel Erosion | 49 | 154 |
| Natural Background | 38 | 0 |
| Upstream | 0 | 0 |
| **Total** | **136** | **434** |

## *10.3 Describe management measures and targeted critical areas (Element c)*

The primary targeted critical area is the riparian area of Huff Creek. Management measures include riparian area fencing, time control of grazing, shrub planting and irrigation structure restoration. Monitoring of the riparian areas will be by stream reach. Photo points will be established and as strategies are implemented restoration will be recorded thus.

## *10.4 Estimate technical and financial assistance needed (Element d)*

To generate the estimated cost for the Best management practices recommended in this CRMP, the Natural Resource Conservation Service Cost list for EQIP FY 2017 was used. The costs identified in this cost list include the cost for materials, and labor to install the BMPs listed.

In addition to the cost of the BMPs that are recommended in this implementation plan, there will also be costs associated with the technical assistance needed to help plan the projects and oversee the management of the grants that are used to fund this plan. The technical assistance needs include the engineering designs that will be needed in areas where a harder fix will be required such as the segment of Huff Creek, where old car bodies need to be removed and rock

structures will need to be installed. Additional technical support will include obtaining the proper permits and clearances need such as stream alteration permits, Archeological clearances, and NEPA clearances.

*Table 6-Huff Creek CRMP Budget*

| Practice | Amount | Unit | Unit Cost | Cost |
|---|---|---|---|---|
| Pumping Plant (533) | 5 | each | $ 6,817.43 | $ 34,087.15 |
| Livestock Pipeline (430) | 11000 | pound | $ 3.20 | $ 35,200.00 |
| Watering Facility (614) | 25000 | gallons | $ 1.17 | $ 29,250.00 |
| Range Planting (533) | 100 | ac | $ 121.03 | $ 12,103.00 |
| Forest Stand Improvement (666) | 200 | ac | $ 286.50 | $ 57,300.00 |
| Fencing (382) | 132000 | ft | $ 1.37 | $ 180,840.00 |
| Diversion Dams (362) | 5 | each | $ 50,000.00 | $ 250,000.00 |
| Stream Bank Stabilization (580) | 2000 | ft | $ 29.09 | $ 58,180.00 |
| Riparian Forest buffer (391) | 200 | ac | $ 3,441.21 | $ 688,242.00 |
| Irrigation Pipeline (430) | 11690 | pound | $ 2.47 | $ 28,874.30 |
| Sprinkler System (442) | | | $ 500,000.00 | $ 500,000.00 |
| Education/Outreach | | | | $ 20,000.00 |
| Beaver Dam Analog | 48 | each | $ 500.00 | $ 24,000.00 |
| **Total Cost** | | | | **$ 1,894,076.45** |

## *10.5 Develop an information and education component (Element e)*

Huff Creek Watershed is 100% privately owned. This makes it a challenge to educate landowners on what state and federal agencies can provide. In order to educate the landowner, they created a CRMP work group that hosts monthly meetings were they bring in experts to talk about how to improve conditions in the watershed. When experts to talk we had them talk about the following bullets

- Understand the importance of managing for clean water and the potential benefits proper management can have on their operations and other landscape-scale resources including soil, forage, animal health, and water availability on their lands).
- Understand and be trained on the Best Management Practices (BMPs) that can be used to improve or protect water quality.
- Be aware of the various sources of funding and other technical assistance available to help in implementing best management practices;
- Be aware of changes in regulatory requirements.
- Understand what resource concerns are found in the watershed.

By having monthly meeting landowners have found resource concerns on their properties and have contacted different agencies to find the BMP's that would help restore the resource concern.

## *10.6 Describe interim, timeline, measurable milestones (Element f,g,h)*

Project milestones can be found in section 10.2 Huff Creek CRMP Project Timeline.

*Table 7-Huff Creek CRMP Timeline*

| Activity | Agency Responsible | Timeline |
|---|---|---|

| | | |
|---|---|---|
| Development of Local Working Group | Summit CD | By 2016 |
| | | |
| Begin project monitoring | UDWQ, UDAF, Summit CD | 2018-2022 |
| ***Milestones*** | | |
| *Sampling Analysis Plan Developed in coordination with the Local Working Group* | *Summit CD* | *Spring of 2017* |
| | | |
| Implement Phase 1 (Ensign Ranch) | UDWQ, TU, NRCS, UDWR, Private Landowners | 2018-2020 |
| ***Milestones*** | | |
| *Identify landowners willing to implement BMPs within the Huff Creek watershed* | UDWQ, TU, NRCS, UDWR, Private Landowners | *2018* |
| | | |
| *Solicit funding for Phase 1 of the Huff Creek Project- $613,000* | *UDWQ, UDAF, UDWR,NRCS,TU, GIP* | *Fall of 2018* |
| | | |
| *Reduce temperature and sediment in Huff Creek by Implementing 325 acres of riparian Improvements, and manage livestock along the creek.* | *UDWQ, UDAF, NRCS, TU Private Landowners* | *Fall of 2020* |
| | | |
| Implement Phase 1 (Lower Huff) | UDWQ, TU, NRCS, UDWR, Private Landowners | *2020-2023* |
| ***Milestones*** | | |
| *Identify landowners willing to implement BMPs within the Huff Creek watershed* | UDWQ, TU, NRCS, UDWR, Private Landowners | *2020* |
| | | |
| *Solicit funding for Phase 2 of the Huff Creek Project- $1.5 Million* | *UDWQ, UDAF, UDWR,NRCS,TU, GIP* | *Fall of 2020* |
| | | |
| *Reduce temperature and sediment in Huff Creek by Implementing 204 acres of riparian Improvements, and manage livestock along the creek.* | *UDWQ, UDAF, NRCS, TU Private Landowners* | *Fall of 2023* |

## *10.7 Develop a monitoring component (Element i)*

Monitoring methods are listed in the Section 8.0. Summit Conservation District will be following the Chalk Creek Sampling Analysis Plan (Appendix D.). It was developed to show the water quality/ watershed improvements that are made while implementing the Huff Creek CRMP.

# Appendixes

*Appendix A – NRCS Custom Soil Resource Report for Huff Creek*

*Appendix B – Forest Management Recommendations*

*Table 8- Forest Management Recommendations*

| Stand | Recommended Treatment(s) | Desired Outcomes | Limitations |
|---|---|---|---|
| 1-5, 7-21, 23, 24, 26-33, 35, 39-41, 44 | No Treatment(s) Recommended due to low stocking values, young stand age, and/or high level of defect in aspens (ie. Forks in boles). | Monitor | None |
| 6, 22, 25, 34, 36-38, 42, 43 | Clearcut Regeneration Method (aspen regeneration).<br><br>Ground based logging for stands with less than 35% slopes.<br><br>Cable logging for stands with greater than 35% slopes. | Enhance forest health<br>Enhance wildlife habitat<br>Timber value of mature stands | 6, 37, 43- Difficult to access due to remoteness from road and steep slopes susceptible to erosion.<br>34, 36, 38- Parts of these stands are difficult to access due to remoteness from road and steep slopes.<br>Current market conditions for aspen may not allow for viable logging practices. |

**Fuel Types, Loading and Special Burning, Wildfire or Interface Considerations**

The surveyed forested stands on the property can be classified as Fuel Model 9. The sagebrush meadow areas are classified as Fuel Model 5. The gamble oak woodland areas are classified as Fuel Model 6. Fuel loading is light across all stands with the exception of stand 28, which has a substantial amount of down and dead trees. Also stand 32 has many blown down trees along the road which runs through the upper portion of the stand.

**Future Actions That May Be Required**

All Stands: Perform follow-up timber sale monitoring (erosion control devices), range seeding success, and pile burning activities; monitor Douglas-fir & aspen regeneration**;** monitor stand trend and health.

**Practice Implementation Schedule**

*Table 9- Forest Practice Implementation Schedule*

| Stand | Activity | Acres | Est. Volume Removed | Year |
|---|---|---|---|---|
| **22** | Clearcut regeneration- ground based logging | 5 | 9,375 b.f. | 2003 |
| **25** | Clearcut regeneration- ground based logging | 9 | 35,514 b.f. | 2003 |
| **34** | Clearcut regeneration- cable logging | 29 | 119,857 b.f. | 2004 |
| **36** | Clearcut regeneration- cable logging | 34 | 80,376 b.f. | 2003 |
| **38** | Clearcut regeneration- ground based logging | 158 | 247,586 b.f. | 2005 |
| **42** | Clearcut regeneration- ground based logging | 70 | 227,780 b.f. | 2006 |

NOTE: Cable and helicopter logging treatments should occur within the same treatment period; some road improvement work necessary before accessing stands. These road improvements will be of significant cost. Several stands should be offered in one sale to offset these significant road reconstruction costs.

**The Moore property (not included in the Stewardship Plan but located on Lower Huff Creek) has a unique ponderosa pine stand. It is recommended that harvesting cones from this existing stand would aid in the perpetuation of this specie in the area.

## *Appendix C - Photo point Protocol*

Quick Guide to Photo Point Monitoring

### Summary

Photo point monitoring consists of repeat photography of an area of interest over a period of time; it is an easy, yet effective, method of monitoring vegetation and ecosystem change. This document provides a quick reference to the field procedures; more detailed discussion of methodology, analysis techniques, and other applications of photo point monitoring, refer to the USDA Photo Point Monitoring Handbook (Hall 2002).

### Define Monitoring Objectives

Photo documentation may be established for a variety of reasons, and different objectives will generally require different techniques. To obtain relevant and accurate information, the objective for monitoring must be carefully considered and defined before establishing photo points.

*Determine Photo Type:*

Feature photo point method documents visual changes occurring at a fixed point through time. Generally, this method is used to document change resulting from a restoration activity (fig.1); where photos are taken before, during, and immediately after construction. Generally, the photos are periodically replicated thereafter to demonstrate the long-term effectiveness of the restoration.

Figure 1. Example of feature photos of a stream/riparian restoration project.

Landscape photos can capture changes undertaken at a broader scale such as forest stand treatment or floodplain restoration. These photos are often taken from a ridge, hill top or aerially during a low flight.

Opportunistic photos are not taken from a permanently marked location and are not intended to be formally repeated. They provide valuable information when taken during construction activities, or when used to document damages to a site that may require follow-up actions (such as high-water events, fire, etc.); or as part of a vegetation/soil monitoring protocol to visually document a sample point.

*Identify what/when to photo.* Within selected monitoring areas, identify elements in the landscape that are most critical to document in order to achieve the project objectives. Ensure that enough photo points are established to adequately document changes that are expected to occur. Ensure that the timing of the photos is appropriate to achieve the objectives.



**Equipment List**

Camera with back-up battery & adequate memory space/film

GPS (w/ compass)

Clip board/pens

Marker Board or other record sheets

Hammer/Stakes (if new establishment)

Photo Point Map (if replicating)

Prior Photos (if replicating)

## ESTABLISHING FIXED PHOTO POINTS IN THE FIELD

**To determine the location of a fixed photo point, consider the following:**

*Will changes be visible on the photo?*

*Will the photo capture the "area of interest"?*

*Can this location be reached conveniently and consistently?*

*Will the location of the photo point need to change over time?*

**Carefully record the location of each fixed photo point.**

Mark each photo point location in the field with a stake or other identifying marker that will hold up to site conditions for the duration of the monitoring effort.

Typical markers are a t-post, wood survey stake sprayed florescent, or capped rebar.

For permanent points (such as conservation easement monitoring), a recommended marker is a survey grade stake with florescent cap pounded in to expose two to three inches above ground. Some caps can be imprinted with text (point ID) for no additional cost.

If it meets the objectives; use an already established feature as the photo point marker (e.g. fence brace/gate, on top of a water control structure/culvert, at the toe of a stream vane, etc.).

Consider potential conflicts with livestock (rubbing on posts), or damage to vehicle/farm equipment.

Avoid using plastic flagging or tape.

Consider placing a second stake or post in the center of the photo area, 5-10 meters from the photo point; to serve as a marker for where to place a cover pole (gives scale to the photo). See Figure 2.

Record GPS coordinates for each photo point location. Download the waypoints to a point shapefile. Label the GPS points using double digits (01, 02, 03…). Save the shapefile in the Toolkit customer folder, with an easily identifiable name such as "CRP Photo Points".

Record detailed directions for locating and taking the photo points. The next person taking the photo may be unfamiliar with the site; provide them with enough information to easily find the location. These details can be documented in field notes, in the table of the photo point shapefile (print report for file, see Appendix B for an example), on the photo point map, or any other format that works for this purpose.

Consider using a marker board to place in the corner of the photo, which states point number, date, and direction of the photo. See figure 2.

It helps to label each photo with the point number and general direction it was taken (01-NW).

Develop a Photo Point Map. Mark the location and number of each photo point on an aerial map. **Point: 01-NW**

Use an appropriate map scale and small point $^{1/3}_{\text{skyline}}$ symbol; to provide an exact point location, that if necessary, a user could take out into the field to find the photo point marker.

## Technique of Taking Photos

It is best to take photos early in the morning, late in the afternoon, or on slightly overcast days when the sun is less intense. This eliminates dark shadows and harsh glare in the photos. Avoid taking photos when visibility is poor (due to low light, fog, or heavy rain) or when snow on the ground obscures the habitat changes. Take photos with the sun at your back.

Choose camera settings that give the greatest depth of field (every element from foreground to background is in sharp focus). Digital cameras generally provide this requirement in the "Landscape" setting. Document the type of camera (digital vs. 35mm etc.) and settings used.

Fill out a marker board (dry erase or similar) with point number, date, and direction of the photo; and place it in an upright position so that it appears in either corner of the photo's foreground. The text should be large enough to be readable in the photograph.

Else, keep a side record of the data that corresponds to each photo.

Hold the camera at eye level (~5'). Try to include one-third skyline in the photo to help establish the scale of the area being photographed, and to provide reference points for future replication (Figure 2).

If replicating a photo point, ensure that the image viewed is the same as in the original photo. Look for references such as rocks, trees, mountains, and fence-lines.

If establishing a new photo point, ensure that reference points are included to assist future efforts.

## Photo Management

Save the images in a consistent, designated location; that is labeled in an easily identifiable folder (e.g. Projects/Tar Ranch/Photo Points/2013). Photos will need to be easily found for future efforts.

It may be necessary to compress the images, to reduce the file size. (1024x768 is appropriate)

Print the Photos in a format that will provide: 1] project name, 2] photo date, 3] and an image name for each photo (e.g. 01-NW).

An NRCS approved program that provides this format is CADMEDIA Master. If not installed, you may request this program from ITS staff. Attach the photo point map, and the recorded directions (if separate).

Photo points will be compared and analyzed to show habitat trends and conditions, and to assist in making management decisions.

*Appendix D - Chalk Creek Sampling Analysis Plan*

Under separate cover.