WATERSHED MANAGEMENT: EASTSIDE RESTORATION PROJECT

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USFS Intern June-August 2015

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Table of Contents

Acknowledgements ........................................................................................................................................ 2
Executive Summary ......................................................................................................................................... 3
Project Objectives .......................................................................................................................................... 4
Project Approach ......................................................................................................................................... 5
  Dispersed Recreation Monitoring .................................................................................................................. 5
  Water-Source Suitability for Drafting ............................................................................................................ 6
  Road Conditions Survey ............................................................................................................................... 7
Project Outcomes ........................................................................................................................................ 8
Conclusions .................................................................................................................................................. 9
Appendix .....................................................................................................................................................10
Acknowledgements

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Executive Summary

With the acceptance to the Watershed Management Experiential Learning Internship funded by the United States Department of Agriculture, I was assigned to the United States Forest Service, Mount Shasta District Watershed Department for the months of June-August 2015. Under the supervision of Steve Bachmann, USFS Hydrologist and Becky Cooper, USFS Recreation Officer, I provided support for the Eastside Watershed Restoration Project. The watersheds associated with the project are the Sand Flat Well, White Deer Lake, Bear Lake, Grasshopper Flat, Upper Bear Creek, and Bartle Creek- McCloud River. The purpose of my involvement with the project was to collect data needed to develop proposed action plans for spring restoration, wildlife habitat, water quality and dispersed recreation management.

During the internship, I was given many different opportunities to work with different departments in order to understand the roles each department plays in the multi-use agency. Among the enjoyable tasks like e-fishing for Redband Trout, Northern Spotted Owl hooting, and stream discharge monitoring, I will focus on the tasks that required extensive research and data collecting. Dispersed recreation, water-suitability, and road condition surveys were tasks within the project that lasted several days to accomplish, and mostly done in a team effort with Hydrologic Technician Felicia Schneider.
Project Objectives

As a student at California State University, Chico, pursuing in a B.S. in Recreation Administration for Parks and Natural Resource Management, the internship is a solid base for career preparation for a federal agency. The USDA has provided students with opportunities in science related occupations which the USDA has identified as mission critical. My potential career pathway in Natural Resource Management is aligned with the goals of the agency in developing a more diverse organization. Although my background is better suited for a path in Recreation Administration, I understand that the management of resources and the effects of human impact is important part in the field of Recreation.

The objective of the internship was centered on recreation and ecosystem management with a focus on water resources management, within the Eastside Restoration Project area. My goal for this internship was to develop a hands-on approach to water resource management. I desired a better understanding of how human activities affect water quality, as well as exposure into potential careers available within the USFS. Within the agreement plans of the internship, my role as an intern was to provide survey and inventory assistance for the Eastside Restoration project. Due to decades of fire suppression, wet and dry meadows have become encroached. The USFS has realized that management of riparian reserves would be beneficial to the sustainability of these habitats. Some tasks within this project included Northern Spotted Owl surveys, riparian area surveys, dispersed recreation, water-source suitability and road condition surveys.
Project Approach

Dispersed Recreation Monitoring

The first task within the Eastside Restoration Project was to complete a thorough dispersed recreation monitoring analysis. The purpose of this inventory was to document and evaluate potential hazards and environmental impacts on campsites that are located outside of developed camping, and in a more primitive forested area. Most importantly, the Recreation Department had proposed a plan to clear unnecessary sites that do not have frequent visitor use, and diminish the aesthetic value of the natural landscape. Under the guidance of the Recreation Officer, and in a team effort with Hydrologic Technician, Felicia Schneider, we set off to conduct a current survey of the North McCloud area. We drove on the main roads of Highway 89, roads 15, 49, and 13 into classified/unclassified forest service roads. We searched for sites that had visible signs of human use, such as camp developments and/or litter. For every site we found, we completed a disperse recreation form, noting signs of evidence, camp developments, environmental impacts, etc. (A-1).

With the use of GPS, we marked waypoints and notated coordinates for future data analysis. We also photographed the sites. The photos provided evidence and better descriptions of the campsites. Over the course of five days we documented twenty-three dispersed recreation sites. With the data collected, the next step was to digitize the information. I prepared an Excel spreadsheet that captured every section of the dispersed recreation site monitoring form (A-2). The spreadsheet will allow the Recreation Department to explore a more compiled collection of data which could be transferred in a data software system. Overall, the information we gathered allowed us to find trends in dispersed recreation. We found that most sites with structural developments were mostly used by hunters. Evidence of this can be seen with game racks, tables, and outhouses (A-3). These hunters continue to use these sites every year during hunting season; these sites will be left for continued use. The less developed sites are what we concluded to be used by campers who seek out a place to rest for an evening, or a couple of days. These sites are projected to be cleared back to a natural setting by next year.
Water-Suiteability for Drafting

Water drafting is the process of extracting water from streams, ponds or impoundments for use on roads dust abatement, fire suppression, and construction projects. Tank trucks are filled through various drafting equipment, most commonly, a suction hose and then the water is transferred to desired locations. Drafting can have adverse impacts to water quality such as erosion, sediment delivery, chemical spills, riparian vegetation loss, as well as stream flow reduction. Through the Water-source Toolkit by USFS Mount Shasta District Ranger, Carolyn Napper, I was able to conduct an evaluation of drafting sites. The sites selected for evaluation were Ash Creek, Algoma Camp, Tate Creek, and Bear Springs. Using the provided evaluation form from the Toolkit, I rated the sites by high, moderate, or low suitability. High meant the site was highly suitable. Moderate, location requires mitigation and/or project design modification. Low, site not suitable and may require alternate location or different drafting method. The ratings are based off indicators such as location, landscape position, stream bank condition, position of drafting site, etc. (A-4). The back of the form required a diagram of the site, which I also included notes and recommendations for site.

I completed evaluations for two drafting sites in Ash Creek; site one, located on Road 19, and site two, located on Pilgrim Creek Road. Site one, received a very low suitability rating. I concluded that the site was located extremely close to the stream with a high evidence of erosion from access roads. The site was very muddy, evidence of spillage from tank truck, and high probability of chemical runoff. The site requires excavation for repair, and a well-vegetated buffer strip between stream and vehicle stop is needed. The second site in Ash Creek, I reported had low evidence of drafting use. I later confirmed that the site was no longer used for drafting. The Algoma Camp and Tate Creek drafting sites received a high water-source suitability rating. I reported there were minimal impacts to stream banks, no identifiable modification to the streambed, and only minimal maintenance was required. Both sites had a suitable well-vegetated buffer strip.

\footnote{The toolkit provides guidance on meeting National and Regional Best Management Practices for water quality, as well as the standards needed to meet various federal, and state requirements. For further information on USDA Forest Service water-source suitability please refer to the Water-source Toolkit by Carolyn Napper, which can be accessed online: http://www.fs.fed.us/eng/pubs/pdf/WaterToolkit/02_cover_toc.pdf}
Bear springs, located on an off-channel pond, and was constructed to collect a portion of streamflow for drafting. This helps maintain streamflow requirements and reduces impacts on sensitive areas. I documented that the pond had a liner that would eventually wear-out over time, and a metal outflow device that would require periodic maintenance (A-5). This site received a moderate suitability rating. Some factors that prevented a high rating are; location of site is in a riparian area, and the stream type will adjust laterally over time. There is potential for sediment to mobilize, and as mentioned, the site requires maintenance for operation. The completed evaluation forms were transferred to Hydrologist, Steve Bachmann for further review and determination of maintenance/closure of drafting sites.

Road Conditions Survey

During the course of the internship, the Mount Shasta District received heavy rainfall during the month of July. Forest Service roads can be greatly impacted by erosion over time, which in turn create hazards and danger to the safety of the public. As a measure to prevent future erosion, and to evaluate storm damage, a mandatory road condition inventory was undertaken. Under the guidance of Geologist Juan De La Fuente, a protocol was created to assess the condition of roads that were affected by the storm. In assistance to the Hydrology Technician, we set off on the southeast flank of Mount Shasta to plot GPS points of the evidence of erosion. With the use of a USFS road map, we notated hazards, clogged/damaged culverts, and mud flow. We also took photographs that documented evidence of the storm damage (A-6).

There were some issues we encountered during the process. Some of the roads were deeply eroded by gullies, making them very difficult to drive on. With both hands on the wheel, and all-wheel drive we were able to continue plotting, and documenting the erosion. At some locations fallen trees or debris had blocked the roads, forcing us to turn back around. The worst roads we found were located on private land. It was evident there were different road maintenance practices for private land ownership. The survey results provided the Geologist information for future storm patterns, and the most potentially dangerous roads.
Project Outcomes

Within the Eastside Watershed Restoration Project, the tasks fulfilled have met goals towards the restoration of eastside watersheds. The dispersed recreation monitoring has provided the Recreation Department with critical information to begin future removal of unneeded campsites to reduce the human impact. Along with the information I had gathered, I digitized the forms that were completed last year, consolidating information into one spreadsheet. Through this experience I have a better understanding of the role of recreation in the Forest Service in relation to natural resources. It has provided me with the skills in GPS plotting, surveying, and data management.

The water-resource suitability survey was more of a challenge. I had a difficult time deciphering the conditions that met the high, moderate, and low ratings. This required me to do further research to have a better understanding of the subject matter. This survey has met my personal goal of the “hands-on” approach to water resource management. I was able to work alone on the task, take my time, and have the opportunity for experiential learning. I also fulfilled my role as an intern, providing inventory and survey assistance for the Forest Service. I was also pleased to work on the road conditions inventory. The inventory of storm affected roads was critical for the protection of the public. The inventory enabled the Forest Service to prioritize road work following the storm.

During the road conditions survey, we found that Sierra Pacific Industries did a phenomenal job repairing the damaged roads. They were expeditious in the reconstruction, and the preventive maintenance needed. They established drains alongside the roads, and cleared/repair coverts allowing proper flow into channels. This was a great opportunity to work alongside soil scientists and geologists like Juan De La Fuente.
Conclusions

The overall outcome of this internship has been an amazing learning experience. Being a part of the Eastside Restoration Project has given me a better understanding of the efforts the Forest Service has made to conserve the natural resources on the Mount Shasta and McCloud Ranger District. The opportunity to work with different departments and employees has allowed me to decide what direction I want to go with my career endeavors. Being a military veteran, I was able to see how the hiring preference allowed many veterans to continue to serve their country, by working for USFS.

The internship has provided me with more experience in natural resource management. I definitely am interested in continuing to work for the federal government, but feel that the direction would involve public relations/information. I am interested on how organizations function, and have a great interest in connecting Americans to the outdoors. Many Americans, particularly from the inner cities are very much disconnected from natural landscapes. In order to have citizens invested in the conservation and preservation of our public lands, we have to make it accessible and a part of their family traditions. As a result, I plan to continue to pursue a career within the agency that focuses on public involvement.
Appendix

Figure A-1

Dispersed Recreation Site Monitoring Form

Quad Sheet: [Redacted] Date: 7/13
Map Coordinates: 39° 28' W 112° 30' W Lat / Long Coordinates: [Redacted] 13° 15' N 112° W Sub watershed: 10.94 Elevation: 4463
Wetland #: [Redacted] Camp Name: [Redacted]

Site Description

Evidence of Recreation Activities (may select more than one):
☐ Camping ☐ Hiking ☐ Biking ☐ Fishing ☐ Hunting ☐ OHV
☐ Target Shooting ☐ Other ____________________________

# Camp Sites: 1 # Tent Sites: 2 # Fire Rings: 0

Camp Developments:
☐ None ☐ Linear or radial mowing arrangements ☐ Trenching ☐ Nails
☐ Level site test sites ☐ Game rack ☐ Other (describe): ____________________________
☐ Structural modifications (i.e. benches, shelters, tables, describe & #) ____________________________

Impacts:
Nearest Proximity to Stream: NA ft. Proximity to Meadow/Wetland: 0 ft.
Stream type: ☐ Perennial ☐ Seasonal ☐ N/A
Stream Name: ____________________________ Comments: ____________________________
Potential for Water Quality Impacts: ☐ Y ☐ N
Comments: ____________________________

User Created Trails Associated with Campsite: ☐ Y ☐ N
Erosion from Trail Evident: ☐ Y ☐ N

Access: ☐ Class I Trail ☐ Class II Trail ☐ Class III Trail Distance from Classified Road: 0 ft.
☐ No Trail Capacity: UC Road Length: 0 ft.
Road condition (i.e., hazards, erosion): ____________________________

Presence/Alkalinity of Erosion:
Rills: ☐ Y ☐ N Length: ___ Width: ___ Depth: ___
Gullies: ☐ Y ☐ N Length: ___ Width: ___ Depth: ___
Laminar (Shoal): ☐ Y ☐ N Length: ___ Width: ___
Sediment Delivery to Water: ☐ Y ☐ N Sediment Delivery to Meadow: ☐ Y ☐ N

Level of Use: ☐ H (1/hr.) ☐ M (3/hr.) ☐ L (<1/yr.) ☐ None
Litter: ☐ None ☐ 30 sec. clean-up ☐ 1.5 min. clean-up
☐ < 10 min. clean-up ☐ > 10 min. clean-up
Litter Type (i.e. car parts, railroad ties, couches, burnt glass/metal, hazardous materials): ____________________________
Litter Removal: ☐ Y ☐ N Comments: ____________________________

Human/Dog Waste: ☐ Y ☐ N
Comments: ____________________________

Dominant Vegetation Type:
☐ Conifer Forest ☐ Deciduous Forest ☐ Chaparral ☐ Brush land ☐ Meadow
☐ Grassland ☐ Riparian ☐ Non-Veg Shore or Bank
Comments: ____________________________

Tree and Shrub Damage: ☐ Y ☐ N
Describe: ____________________________

Root Exposure: ☐ Y ☐ N
Describe: ____________________________

Area (ft²): Barren ___ Parking ___ Tent Site(s) ___ Campfire Area ___ Trails ___ Other (describe): ____________________________ Total Affected Area: ___ ft²

Site Map (Include waypoint location, north arrow, fire rings, structures, camp sites, water, roads, trails, other impacted areas, etc.):

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Figure A-2
## Water-source Suitability Form

Circle the correct answer for each indicator below.

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<th>NA</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
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<tbody>
<tr>
<td>Location of facility</td>
<td>NA</td>
<td>Minimal intrusion to riparian area</td>
<td>Part of facility in riparian area</td>
<td>Facility located in riparian area (100%)</td>
</tr>
<tr>
<td>Landscape position</td>
<td></td>
<td>Uplands-Forested areas</td>
<td>Floodplain</td>
<td>Vulnerable or unstable location - Located on outside bend of stream</td>
</tr>
<tr>
<td>Stream channel type</td>
<td></td>
<td>Well-Armed Pool type A1, A2 (transport reach) low sediment yield</td>
<td>Stream types C or E, stable but can adjust laterally over time</td>
<td>Fine-textured soils, unstable reach types D-F or G, poorly vegetated, evidence of streambank erosion</td>
</tr>
<tr>
<td>Streambank condition (includes trampling, road cuts, or other mechanical impacts to the streambank) and floodplain intrusion</td>
<td></td>
<td>Minimal impacts to streambank - does not impact floodplain processes</td>
<td>Some streambank impacts with limited excavation</td>
<td>Flee cut access road to stream edge, stream bed altered to create pond - May impact floodplain process, restrict access</td>
</tr>
<tr>
<td>Delivery potential to stream (erosion potential and connectivity to stream)</td>
<td></td>
<td>No potential for sediment or spill movement into stream</td>
<td>Potential for sediment to mobilize but effective filter stop</td>
<td>Potential for sediment to mobilize and enter stream channel</td>
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<tr>
<td>Position of drafting site (within the streambed, floodplain)</td>
<td></td>
<td>Minimal intrusion to streambed or floodplain (hydrant)</td>
<td>Margin of floodplain</td>
<td>Constructed in streambed or other sensitive location (in-channel pond)</td>
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<td>Streambed alteration (includes modification of the channel bottom to create a pool for drafting or recreational use)</td>
<td></td>
<td>No identifiable modification to streambed</td>
<td>Some streambed modification</td>
<td>Streambed altered to create pool, may include creating a dam structure or mechanical modification of channel bottom</td>
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<td>Water flow capacity</td>
<td></td>
<td>Adequate flows to maintain stream health, aquatic, and habitat needs throughout drafting season</td>
<td>Partially limiting flows for aquatic or habitat needs</td>
<td>Limited stream flows to meet Forest LRMP goals and objectives</td>
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<tr>
<td>Height of vertical lift from water surface to vehicle loading area Height ________ ft</td>
<td></td>
<td>Less than 10 foot vertical lift</td>
<td>10-17 foot vertical lift</td>
<td>Greater than 17 feet vertical lift</td>
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<tr>
<td>Water-source longevity and maintenance needs</td>
<td></td>
<td>Requires minimal maintenance between use and poses no resource risks</td>
<td>Requires some maintenance for operations</td>
<td>Requires routine maintenance prior to use and may require maintenance/repair after high flows or floods</td>
</tr>
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</table>

**Summary Suitability Rating**

[Blank]

Add up the circled indicators in each column (High, Moderate and Low) to rate each site.

NA = Not applicable at site
High = Site is HIGHLY suitable for a water source.
Moderate = Site has some constraints, which requires mitigation and project design modification.
Low = Site has severe constraints, which may dictate an alternate location or drafting method.

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**Beaver Springs**

**Figure A-4**

**Photos:** 151-155