

# Wetland and Rare Plant Program, 2013

Yellowstone Center for Resources  
Vegetation Program  
Yellowstone National Park

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## Wetland & Rare Plant Program Functions



Mildly geothermally influenced wetland near Old Faithful. NPS photograph

The wetland and rare plant program at Yellowstone National Park serves to protect wetlands and rare plants by three primary functions: 1) Serving as the local authority for the taxonomy, distribution, and identification of northern Rocky Mountain plant species and 2) performing wetland delineation/classification and complex wetland investigations for the purpose of protection, management, mitigation, and restoration of wetland resources and 3) monitoring wetlands and rare plants once they have been restored.

## Wetlands

The National Park Service (NPS) mandates through policies that wetlands must be protected. The three criteria for being a wetland are: presence of hydrology or water for a minimum of 10% of the growing season, hydric soils and hydrophytes. The U.S. Army Corps of Engineers (USACE) also requires that we avoid wetlands and if a wetland is impacted, a permit must be issued by the USACE, a wetland mitigation plan written if wetland impacts are greater than 0.1 acres and the NPS must mitigate for the wetland at a ratio determined by the USACE. NPS policies require that mitigation be only in the form of wetland restoration within the region. This means that wetland enhancement and wetland creation are not allowed for the NPS. Once a permit for construction has been issued, the permit is not released by the USACE until the wetland mitigation sites identified in the wetland mitigation plan meet certain criteria. The criteria for a successful wetland mitigation site are identified in the wetland mitigation plan. Successful wetland criteria require the wetland mitigation sites have high cover of native hydrophytic plant



NPS wetland technician using Munsell color chart to determine if the soil is hydric. NPS photograph

species and wetland hydrology. In order to document that native hydrophytic plant species and wetland hydrology have established, vegetation monitoring transects, photographic points, and shallow groundwater monitoring wells are installed at each mitigation site. NPS installs and reads the vegetation transects and groundwater monitoring wells; and submits reports to the USACE.

### **Successful Wetland Mitigation Project**

**Turbid Lake Road** was part of Yellowstone National Park's (YNP) East Entrance Road from 1902 until the road was reconstructed between 1928-1936. The 1928-1936 reconstruction realigned a portion of the road to follow the shore of Yellowstone Lake. The original 5.5 mile long segment, now referred to as the Turbid Lake Road, was open to visitor traffic until the 1950's and was also used for YNP administrative travel until 1986 when it was closed to vehicular traffic.

The Turbid Lake Road traverses prime grizzly bear habitat and several wetlands, some of which are geothermally influenced. Prior to restoration, the road had been totally closed for fifteen years yet there had been little to no reestablishment of natural vegetation. Yellowstone National Park did the following to the Turbid Lake Road: decompacted and ripped the roadbed to encourage revegetation, excavated stream crossings to restore the original drainage and reshaped the road cuts and fills to encourage unrestricted surface flow of water. Salvaged topsoil and "clumps" of herbaceous vegetation from adjacent undisturbed areas were spread on the reclaimed areas. In the summer of 2003, part of the Turbid Lake Road burned in the East Wildfire. The natural disturbance helped camouflage the road scar in the forested wetlands and aided in the vegetation renewal process.

Yellowstone National Park began restoration of the Turbid Lake Road in 1997 and completion of roadbed removal was completed in 2004. The wetlands restored are wet sedge meadows and eventually some will be forested wetlands. All of the wetlands restored were classified as palustrine emergent wetlands (Cowardin, *et al.* 1979). Yellowstone National Park (YNP) has restored thirty one wetlands to mitigate wetland impacts associated with the work on Dunraven and East Entrance Road. Wetland Specialist in the park had estimated that YNP would be able to restore 2.922 acres of wetlands. YNP restored 2.517 acres of wetlands or 86% of the anticipated wetland area was successfully restored. Challenges faced on this project with wetland restoration included existing patches of nonnative species such as timothy (*Phleum pratense*) quickly invaded disturbed ground and thrive in wetlands. Mildly geothermally influenced sites also presented a challenge as they did not meet the criterion for success suggesting they are more difficult to restore due to their unusual hydrology.

### **Current Wetland Mitigation Projects**

**Gibbon River Canyon Road** was a 1.8 mile long segment of the Grand Loop Road between Madison and Norris obliterated in the fall of 2010. The road was confined by the river and numerous wetlands and thermal features. The extensive wetland mitigation proposed is compensation for 2.51 acres of lost wetland functions and values resulting from the reconstruction of the Madison to Norris road between Gibbon Meadows picnic area and Madison Junction.



Wetland mitigation site (previously the Grand Loop Road) along the Gibbon River. NPS photograph

In 2010, the old road base (asphalt and fill) were removed, contours restored, and replanted with native vegetation. Earthwork, riverbank stabilization with coir logs, and revegetation with native plants will restore the river corridor to natural conditions. Since it is an old road base, some nonnative species do exist and treatment for these species is expected to continue on into the foreseeable future. In

2011 a high water year resulted in the loss of topsoil and coir logs in newly restored areas. Some of these areas were replanted in the field season of 2011. However many of these areas were washed out down to bedrock and will likely not ever have high vegetation cover.

The permit requires restoration of 2.57 acres. During the field season of 2013, wetland mitigation sites had vegetation transects installed and read. Groundwater monitoring wells were also installed and monitored. Most of the wetland mitigation sites are currently meeting the wetland hydrology criteria for success.



On-site wetland mitigation successfully restored along the East Entrance Road. NPS photograph

**East Entrance Road Rock Cut Sites** are examples of on-site wetland mitigation. On-site restoration of wetlands along rock cuts and hillslope cuts was expected to occur when the area was excavated and the contour and vegetation restored. In places the road cuts were excavated into the cliff faces (also called rock bench sites). Most of these rock cuts did not have retaining walls (no fill material added) to the cliff face. Due to the vertical nature of the rock cut sites, the permit states the rock cut sites will be documented with photo documentation and no groundwater monitoring wells or vegetation plots would be feasible. In yet other sites impacts occurred on the downhill side and on yet other sites, ditches were expected to be restored on sites parallel to the

original wetland ditch. In 2013 field crews relocated the on-site wetland mitigation sites and photo documented the sites. Routine Wetland Determination Forms were also filled out for rock cut sites with wetland hydrology and vegetation. Many of the rock cut sites lacked the hydrology to be considered successful.

**Norris Picnic Area** is the site of a small section of abandoned road (0.12 miles or 620 feet) between the Norris Picnic Area and Gibbon River that was removed in 2009. The wetland credit is compensation for excavating and backfilling 0.03 acre of wetland abutting the Gibbon River. The mitigation site here is part of a larger wetland complex that is adjacent to the Gibbon River and receives surface water from the river in the spring. The remaining wetland credit will be applied to Norris to Golden Gate Phase II. During the field season of 2013, the site had shallow groundwater monitoring well installed. Five vegetation transects were installed and 52 plots total were read at the site in September 2013. The vegetation monitoring revealed that the site is not revegetating as quickly as planned. Fifty seven species were found, eight of which were nonnative, 17 were native upland, and 32 were native hydrophyte species. The vegetation and groundwater monitoring indicate this site is well on its way to being successfully restored.

### **Future Wetland Mitigation Projects**

**Elk Park Road** is a future wetland mitigation project where removal of the old road base will start in the fall of 2014. Elk Park is located just South of the Norris Geyser Basin. Part of the Grand Loop Road, this segment a wagon trail originally then auto road traversed thru this soggy meadow continuing towards the back of the Norris Geyser Basin. This old segment of road was last used around 1919 and then the road was realigned to his current (?) location. However,



Mitigation site, originally the Grand Loop Road, to be restored at Elk Park. NPS photograph

while much of the road has been reclaimed or taken back by the geothermal wetland, the road scar remains. Once the road scar is removed, the hydrology will be restored to the wetland complex.

Elk Park is a beautiful example of a geothermal wetland. While this wetland complex is not particularly diverse in plant species, geothermally influenced wetlands are found in few other places in the world besides Yellowstone making them quite rare on the landscape. Many geothermal wetlands are dependent on thermal features to maintain the wetland hydrology. The dominant plant growing in this wetland is beaked spikerush (*Eleocharis rostellata*) and when you see it growing in Yellowstone, you can be almost 100% certain that the wetland is thermally influenced and the thermal feature is in close proximity.

During the summer of 2013, field crews documented the existing conditions on the old road base for a wetland mitigation plan that was submitted to the USACE. Current conditions were documented using GPS equipment, looking at soil material, and filling out Routine Wetland Determination Forms. A Functional Wetland Assessment was also completed. The Functional Wetland Assessment will be used to assess the functionality of the wetland post restoration. Wetland acres that are anticipated to be restored were estimated as well as wetland improvements. Much of the road is now considered wetland; however the subtle change in microtopography of the road also changes the hydrology or flow of water thru the wetland. Portions of the road that are currently wetland will be improved by removal of the road fill material. Elk Park wetland mitigation will be for impacts to wetlands along the first phase of the Norris to Golden Gate road project.

## Yellowstone Rare Plants



Clammy weed (*Polanisia trachysperma*)  
photograph by Sandi Ohlen

The NPS has policies that direct us to protect rare plants. YNP is home to three endemic plants (Ross's bentgrass (*Agrostis rossiae* var. *rossiae*), Yellowstone Sand Verbena (*Abronia ammophilia*), and Yellowstone sulphur buckwheat (*Eriogonum umbellatum* var. *cladophorum*). However, while they occur nowhere else in the world, these plants are not a listed species on the Endangered Species Act (ESA). There are no plants that occur in YNP that are listed on the U.S. Endangered Species Act. However each state (Wyoming, Montana, and Idaho) maintains a rare plant list or species of concern list. YNP also maintains its own rare plant list or plants that we believe we need to protect. For example, YNP is on the edge of the Great Basin Flora so some plants occur in the Gardiner Basin or the north part of the park that do not occur anywhere else in the park and in some cases are known to have only one population within the park. However, just across the park boundary in Paradise Valley, the species may be common. Other species are special to the geyser basins or thermal features. Yet other species occur at high elevations on calcareous substrates (calciophiles).

There are approximately 98 species on the Wyoming list, 58 species on the Montana list, and 39 species on the Idaho list that occur in the park. Five of the species of concern on the Idaho list are known to occur on the Idaho side of the park (meaning the other 34 occur in WY or MT portion of the park). Of the 58 species listed in Montana, fifteen of them are known to occur within the Montana borders of the park. 85 of the species listed for Wyoming occur in the Wyoming portion of the park. There are 199 plants that are not listed on any state lists but YNP feels warrant additional protection in the park due to the limited

knowledge of these species or the limited occurrence of the species in the park. One such example of a plant is clammy weed (*Polanisia trachysperma*). It was just discovered in the field season of 2014 to occur within the park and it is only known to occur at one site. Another such example of a plant is swamp loosestrife (*Lysmachia ciliata*). It was discovered to occur in the park during the field season of 2012. However the local nativity of this plant is questioned. While it is native to Wyoming, it was found right off the road in a small pond that has seen a lot of human disturbance. It is a mystery whether this plant was transplanted off of equipment or someone's boot. Yet other plants hotspots bentgrass (*Agrostis rossiae* var. *pauzhetica*), small-flowered gaura (*Gaura parviflora*), annual paintbrush (*Castilleja exilis*), and branched centaury (*Centaurium pulchellum*) only grow on thermal ground in the park. Of the 199 species that are considered rare in YNP, eleven of them are historical records and three of them have likely been extirpated.

## YNP Herbarium



Herbarium specimen (Yellowstone sulphur buckwheat, a YNP endemic) housed at the YNP herbarium. NPS slide

The Yellowstone Herbarium (YELLO) contains mainly plants collected in Yellowstone National Park. Our herbarium specimens document the presence of plants in the park over time, and the history of plant collecting in the park, making it an incredibly valuable resource for staff, visitors, and researchers. In 2013, field crews found rush skeletonweed (*Chondrilla juncea*) for the first time in the park. The collection of rush skeletonweed will be kept in the YNP herbarium to document the population. Field crews also found new populations of other species (Scotch thistle, velvet grass, tamarisk) that are on the YNP watch list. These collections will also be housed in the herbarium to document the new populations and for reference material for future crews. The Yellowstone Herbarium is located in the Heritage and Research Center in Gardiner, Montana. Our collection includes: vascular and non-vascular plants, fungi, and lichens. Our oldest specimens date back to 1899 and traveled to the World Fair in 1903. We have over 12,000 specimens including collections of aquatic plants and non-vascular plants, both of which are some of the best collections in the Rocky Mountains. Yellowstone herbarium may now likely have the most comprehensive scientific collection of native aquatic vascular plant specimens in the western United States. We have multiple scopes and reference material that are available to use during the hours the herbarium is open.

