

# **Rare Plant Surveys on the Crooked River National Grassland**

**Report to the Interagency Special Status/Sensitive Species Program  
FY2010 Inventory & Conservation Planning Project**



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View of the Island, Crooked River National Grassland

*Photo by Christina Veverka, 2010*

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## INTRODUCTION

A field survey was conducted during the summer of 2010 to expand the botanical knowledge of one of the more unique ecological areas in the eastern Cascades – the Crooked River National Grassland (CRNG). The Grassland has habitat for three of Oregon’s unique and rare plant species: *Astragalus peckii*, *Penstemon peckii*, and *Texosporium sancti-jacobi*. All three species have been identified by the ISSSSP program (through field unit assessments) as High Priority species that have critical data gaps. The current extent of knowledge of these species is scant, at best. In order to properly manage and conserve these rare plant species, it is imperative that resource managers have information on potential habitat areas, and at the minimum, know the location of documented occurrences.

The following provides a brief summary of the ecology and distribution of the three target species:

- ❖ *Astragalus peckii* – Oregon Department of Agriculture, Threatened; Global Rank 3, State Rank 3, OBIC List 1; Forest Service R6 Sensitive
- ❖ *Penstemon peckii* - Federal Species of Concern, Global Rank 3, State Rank 2, OBIC List 1; Forest Service R6 Sensitive
- ❖ *Texosporium sancti-jacobi* - Federal Species of Concern, Global Rank 3, State Rank 1, OBIC List 2; Forest Service R6 Sensitive

*Texosporium sancti-jacobi* (woven spore lichen) is a rare and inconspicuous crustose lichen that is endemic to western North America. It is rare on both regional and local scales, with approximately 20 widely scattered occurrences in south-central Washington, central Oregon, southern Idaho, and central and southern California (McCune 1992). This species is restricted to exposed ridge top or plateau areas of arid or semiarid shrub steppe or grassland habitats that are relatively undisturbed and are characterized by *Artemisia* species, native bunchgrasses, and abundant cryptogamic soil crusts. Within this habitat, *T. sancti-jacobi* is further restricted to microsites of decaying organic matter, particularly mounds of *Poa secunda* or small mammal scat. This species is distinguished from other crustose lichens by its distinctive whitish-margined apothecia that contain olive-colored, powdery spore masses (Ponzetti 1999).

Within Oregon the first occurrence of *T. sancti-jacobi* was discovered by Bruce McCune in 1991 within the CRNG, on a basalt plateau known as The Island (McCune and Rosentreter 1992). During this visit a second occurrence of this species was found on the rim of Big Canyon, approximately 6 km northwest of The Island. In recent years *T. sancti-jacobi* has been found at Rim Rock Springs within the CRNG, and on BLM lands east of the CRNG (per. comm. Mark Lesko, 2010)

The greatest threat to *T. sancti-jacobi* is loss of habitat by extensive destruction to soil crusts from overgrazing, invasion of weedy annual grasses and the resulting increases in fire frequency, and (on private land) conversion of rangelands to agriculture and suburban developments (McCune 1992, Ward and Helliwell 2007). The most critical data gap for *T. sancti-jacobi* on the CRNG is the extent and condition of the two historical occurrences. The location of these sites was not documented with GPS equipment when they were first found, so the precise locations of these sites are not known. These sites have not been revisited in over 15 years, so there is no information on the current condition or extent of *T. sancti-jacobi* at these sites (per. comm. Bruce McCune, 2010). There are threats to both subpopulations, with OHV use at the Big Canyon site and a medusahead (*Taeniatherum caput-medusae*) infestation on The Island.



**Figure 1.** *Astragalus peckii* and *Texosporium sancti-jacobi* (Photos courtesy of ODA and Thayne Tuason, 2005)

*Astragalus peckii* (Peck’s milkvetch) is a small and rare member of the pea family. It is endemic to central Oregon, with the entire population known from occurrences in only three counties (Deschutes, Klamath, and Crook). Because of this species limited distribution, it has been listed as Threatened by the Oregon Department of Agriculture, and is an OBIC List 1 species. *A. peckii* is found on very dry sites in the loose, sandy soil or pumice that is prevalent in the eastern Cascades. It is found on barren flats, sagebrush or rabbitbrush openings in lodgepole pine forests, and in western juniper woodlands.

*A. peckii* has not been documented on the CRNG, even though potential habitat for this species does exist. Potential threats to this species include OHV damage, overgrazing, and loss of habitat from noxious weed invasion.

*Penstemon peckii* is another rare species endemic to central Oregon, with its entire global population located within a 485 sq. mile area (Pajutee 2009). It is a Federal Species of Concern, with 98% of its population occurring on lands managed by the Forest Service. Until recently it was thought that *P. peckii* was restricted to the meadow and open forest habitat of the area around Sisters, Oregon. But in 2003 this species was discovered within the CRNG, which extended the range of this species and opened up the possibility of additional habitat within the CRNG (Pajutee 2009). Because this subpopulation of *P. peckii* is outside the previously known range for the species, it is unique ecologically and important genetically. However, there is almost no information on this subpopulation of *P. peckii*, as a lack of funding prevented follow-up work to gather site data and survey for additional occurrences of this species within the CRNG. Potential threats to this species include loss of habitat from development (on private lands), OHV damage (private and Forest Service lands), and degradation of habitat from forest management activities and disruption of natural fire regimes.



**Figure 2.** *Penstemon peckii*, a rare endemic of the eastern Cascades (Photos courtesy of Oregon Flora Project, Gerald D. Carr)

## SURVEY AREA

The Crooked River National Grassland, located in central Oregon within Jefferson County, is the only National Grassland within the Forest Service's Pacific Northwest Region. The 112,357 acre Grassland is comprised of sagebrush steppe vegetation consisting of bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber's needlegrass (*Achantherum thurberianum*) Idaho fescue (*Festuca idahensis*), with rabbitbrush (*Chrysothamnus* sp.), bitterbrush (*Purshia tridentata*) and several species of sagebrush (*Artemisia* sp.). Historically the area was once home to 700 homesteads, so much of the land has been cultivated and used as pasture for cattle grazing. What natural vegetation that does remain provides glimpses of the extensive native grassland savanna that once dominated the area.

One of the most unique features of the Grassland is a basalt plateau known as The Island, which was designated a Research Natural Area in 1986. The Island became a peninsula when Round Butte Dam was constructed, backing up the Metolius, Deschutes, and Crooked Rivers to form Lake Billy Chinook (Halvorson 2004). The 200-acre plateau is ecologically significant, as it has some of the last and best, remaining examples of undisturbed native communities of western juniper/big sagebrush/bluebunch wheatgrass and western juniper/big sagebrush-bitterbrush (Halvorson 2004). Due to the plateau's inaccessibility, it was only grazed once back in 1921.

The Island lies within Cover Palisades State Park, and is jointly managed by the Oregon Parks and Recreation Department, Forest Service and the BLM.

## METHODS

Pre-field work consisted of compiling existing data on the three target species using the following data sources:

- Forest Service NRIS (Natural Resource Inventory System) Database
- ISSSSP Species Information Sheets
- Oregon Biodiversity Information Center Database (formerly Oregon Natural Heritage Information Center)
- Forest Service botany records
- Personal communications with Mark Lesko (USFS), Rick Demmer (BLM), Dr. Bruce McCune (OSU).

Potential habitat areas were identified using GIS maps, GoogleEarth aerial photos, and personal knowledge from Ochoco/CRNG Botanist, Mark Lesko. Field surveys were prioritized for the three species as follows:

1. Revisits to the two historical sites of *T. sancti-jocobi* on The Island and the along the rim of Big Canyon. Additional surveys on the Forest Service portion of The Island, and surveys on Haystack Butte, Canadian Bench, and Tam-a-Lau trail on The Peninsula.
2. Targeted surveys for *A. peckii* in a potential habitat area located north of the Miller Ranch.

3. Focused surveys for *P. peckii*, were conducted in areas of highest habitat potential that had not been previously surveyed. These areas were intermittent drainages dominated by *Pinus ponderosa* and *Festuca idahoensis*.

For all surveys, the controlled intuitive protocol was used to locate rare plant occurrences in potential habitat areas. Although this method was adequate for vascular plant species, it offered only a cursory check for *T. sancti-jacobi*.

All plant surveys were recorded and entered into the NRIS TES Survey database using the 2008 NRIS Protocols. All occurrences of the target species were also recorded and entered into the NRIS Element Occurrence database.

Survey information for all new rare plant occurrences was also submitted (via hardcopy forms) to the Oregon Biodiversity Information Center.

## RESULTS AND DISCUSSION

### *T. sancti-jacobi* surveys

The historical occurrence of this species was relocated on the southeast corner of The Island. This occurrence, as well as the other *T. sancti-jacobi* sites, are relatively well protected in this area. This is a result of The Island's geographic isolation, both presently and historically. Currently access to The Island is by special permission of State Parks, which has dramatically reduced the impacts of foot traffic in the area. In the past, the steep, basalt bluffs of the area protected the area from livestock grazing.

The most immediate threat to *T. sancti-jacobi* on the Island is the presence of medusahead (*Taeniatherum caput-medusae*), a highly invasive, non-native annual grass. This infestation is being controlled through a concerted volunteer effort between the Oregon Parks Department, BLM and Forest Service, with volunteers manually removing medusahead during an annual spring weed pull.

During the survey on The Island, new occurrences of *T. sancti-jacobi* were discovered on both the Forest Service and BLM managed sections of the Island (Fig. 5). Each occurrence was quite small, with the total ground coverage of *T. sancti-jacobi* less than 1 sq. ft. for each. It was rather surprising only these few new occurrences of *T. sancti-jacobi* were found on The Island. Considering the high habitat quality of the area, it was expected that there would be a greater presence of *T. sancti-jacobi* within the RNA. Finding such few new occurrences only emphasizes the regional rarity of this crustose species.

Within the northeastern section of The Island, a new occurrence of *Rhizocarpon diploschistidina* was discovered, a crustose species that is parasitic on the common cowpie lichen (*Diploschistes muscorum*). This was an exciting discovery, as this a new species science whose taxonomy has yet to be published in the scientific literature (per. comm. Bruce McCune, 2010). This species was first observed by Rick Demmer of the BLM within the CRNG at Rim Rock Springs, and was subsequently identified by Bruce McCune of Oregon State University (per. comm. Rick Demmer, 2010).



**Fig. 3. Occurrence of a new crustose lichen species, *Rhizocarpon diploschistidina* (in yellow), found by botanist Mark Lesko on the Island.** (Photo by Christina Veverka, 2010)

Finding this occurrence of *R. diploschistidina* reinforces The Island's importance as a Research Natural Area. It also offers the tantalizing prospect that there may be other rare lichen species that have yet to be discovered and documented in this unique ecological area.

The historical *T. sancti-jacobi* site along the rim of Big Canyon was visited, but no occurrence of the species was seen. This is of tremendous concern, considering the global rarity of this species and the few sites where this species has been documented. The Big Canyon site does have an extensive medusahead infestation, which appears to be spreading into the basalt scab areas where *T. sancti-jacobi* would be found. It is highly recommended that a subsequent, and more detailed survey, be conducted within this area to attempt to locate occurrences of *T. sancti-jacobi*.

Additional surveys for *T. sancti-jacobi* were conducted on Haystack Butte on May 7, 2010. This area was considered to have high potential for the target species because of the presence of sagebrush steppe and scab habitat and a steep topography that would deter livestock grazing. Although appropriate habitat for *T. sancti-jacobi* was observed on the butte, no occurrences were found. It is suspected that the elevation of Haystack Butte (4,022 ft.) may be outside of the range for *T. sancti-jacobi*. (All the documented sites of *T. sancti-jacobi* have been less than 3,280 ft.) Haystack Butte also had evidence of cattle grazing on the plateau, which may be another factor in the lack of the target species at the site.



**Figure 4. One of several new occurrences of *Texosporium sancti-jacobi* discovered on the Island, Crooked River National Grassland.** (Photo by Christina Veverka, 2010)

Because *T. sancti-jacobi* was not observed on Haystack Butte, surveys were not conducted at other sites (Gray Butte and Pine Ridge) that had been identified in that vicinity and with a similar elevation range. Instead, surveys were focused on potential habitat areas within the western section of the CRNG, within the Canadian Bench area and along the Tam-a-Lau trail. However, no occurrences of the target species were observed during these surveys.

**Table 1. NRIS Database entries for rare plant occurrences from the CRNG surveys.**

Species	NRIS #	Location
<i>T. sancti-jacobi</i>	0607050009	The Island
<i>Rhizocarpon diploschistidina</i>	0607050010	The Island
<i>Penstemon peckii</i>	0607050011	County Road 900
<i>Penstemon peckii</i>	0607050002 (expansion of existing site)	Fremont Canyon

#### A. Peckii survey

Potential habitat north of Miller Ranch was surveyed for *A. peckii*, but no occurrences of the target species were found. Potential habitat areas were surveyed in other areas of the CRNG, including the Canadian Bench and Tam-a-Lau trail areas. However, *A. peckii* was not observed within these areas, even those there were appropriate soil and vegetation types for this species. Currently the most northern occurrence of *A. peckii* lies on State lands within north-central Deschutes County (OBIC 2010). Despite the abundance of available habitat within the CRNG, it is suspected that the Grassland simply lies outside of the range of *A. peckii*.

#### Penstemon peckii surveys

A new occurrence of *P. peckii* was found in a broad, intermittent drainage off of County Road 900, just south of Miller Ranch (Fig. 6). This occurrence was mapped at 6.5 acres, making it the largest *P. peckii* site within the CRNG. The habitat at this site consisted of an open canopy of ponderosa pine and western juniper (*Juniperus occidentalis*), with an understory of rabbitbrush, sagebrush, Idaho fescue, Ross's sedge, and bottlebrush squirreltail. Other drainages with similar vegetation features were also surveyed within this area; however, *P. peckii* was only found within the one area. In considering the location of this site in relation to the other few *P. peckii* sites that have been found within the Grassland, it is suspected that this latest occurrence may be the eastern edge of the global population of this species. This site of *P. peckii* marks the transition from open ponderosa pine/Idaho fescue to juniper/shrub/grassland. Because *P. peckii* inhabits open areas of ponderosa pine and Idaho fescue (Pajutee 2009), potential habitat ceases once it changes to juniper. Therefore, this new site of *P. peckii* may represent the eastern edge for this species.

Additional small sites of *P. peckii* were located farther south along County Road 900; these sites were added to an existing occurrence (NRIS #0607050002).

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