

5-YEAR REVIEW
Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*)

GENERAL INFORMATION:

Species: *Thelypodium howellii* ssp. *spectabilis*

Date listed: June 25, 1999

FR citation(s): Endangered and threatened wildlife and plants; threatened status for the plant *Thelypodium howellii* ssp. *spectabilis* (Howell's spectacular thelypody). 64 FR 28393.

Classification: Threatened

BACKGROUND:

Most recent status review: The last status review was finalized on March 9, 2010. Citation: Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*): 5-Year Review Summary and Evaluation. U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office, Portland, OR, March 9, 2010 (see Appendix; also available at: https://ecos.fws.gov/docs/five_year_review/doc3249.pdf).

FR Notice citation announcing this status review: 80 FR 8100, Initiation of 5-Year Status Reviews of 133 Species in Hawaii, Oregon, Idaho, and Washington. Published February 13, 2015 (available at: <https://www.gpo.gov/fdsys/pkg/FR-2015-02-13/pdf/2015-03015.pdf>).

ASSESSMENT:

Information acquired since the last status review:

This 5-year review was conducted by the U.S. Fish and Wildlife Service's (USFWS) Oregon La Grande Field Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on February 13, 2015. We also contacted the U.S. Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS) and Oregon Department of Agriculture Native Plant Conservation Program to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

Review Analysis:

Please refer to the previous 5-year review for *Thelypodium howellii* ssp. *spectabilis* ("thelypody") published on March 9, 2010 for a complete review of the species' status, threats, and management efforts. No significant new information regarding the species' biological status has come to light since listing or since the last 5-year review to warrant a change in the Federal listing status of *T. howellii* ssp. *spectabilis*.

Thelypodium howellii ssp. *spectabilis* was listed as threatened in 1999 because of its very restricted range, the potential for further habitat destruction from agricultural and urban development, the prevalence of chronic habitat degradation from livestock grazing, invasive weeds, and alteration of wetland hydrology, and the fact that only one of the known populations had any legal protections in place to facilitate long-term protection of the plant (U.S. Fish and

Wildlife Service 1999). All of the known occurrences are on private land and many are not accessible for monitoring.

Since listing, there has been very little permanent habitat loss at known *Thelypodium howellii* ssp. *spectabilis* sites resulting from development or land use conversions. However, in many areas chronic habitat degradation continues, primarily resulting from intensive livestock grazing during the plant's growing season.

New threats:

- None discovered.

New management actions or other information:

- Surveys
 - Additional population information was collected in 2011 (Oregon Department of Transportation 2013), where State highway crews documented approximately 35 plants growing on the side of Highway 84. This population had been documented previously in 2009, 1997 and 1996, is within the previously described range, and is located 0.15 miles from another population.
 - USDA-NRCS conducted a survey of seven sites on June 25, 2014. In four of the seven experimental sites where the Oregon Department of Agriculture Native Plant Conservation Program had conducted transplants in 2002 and 2007, no *T. howellii* ssp. *spectabilis* were found. USDA-NRCS attributed this decline to a competition from nonnative species including intermediate wheatgrass (*Thinopyrum intermedium*) and whitetop (*Cardaria draba*), which were thought to be outcompeting *T. howellii* ssp. *spectabilis* (U.S. Department of Agriculture-Natural Resource Conservation Service 2014).
- Research
 - In 2014, EcoWest Consulting Inc. and the USFWS finished an experiment titled "The influence of Population Dynamics, Grazing, and Precipitation Patterns on the Restoration of a Threatened Riparian Mustard to Former Habitat" (2014). *Thelypodium howellii* ssp. *spectabilis* was the subject of this Before/After Control/Impact (BACI) design study, which began in 2008 and concluded in 2014. The results of the study were largely inconclusive due to the life history and moisture and soil sensitivity of *T. howellii* ssp. *spectabilis*, which resulted in highly variable results. However, the researchers suggest that changes in grazing practice to late season grazing after post-seed dispersal may allow these plants to expand into other areas.

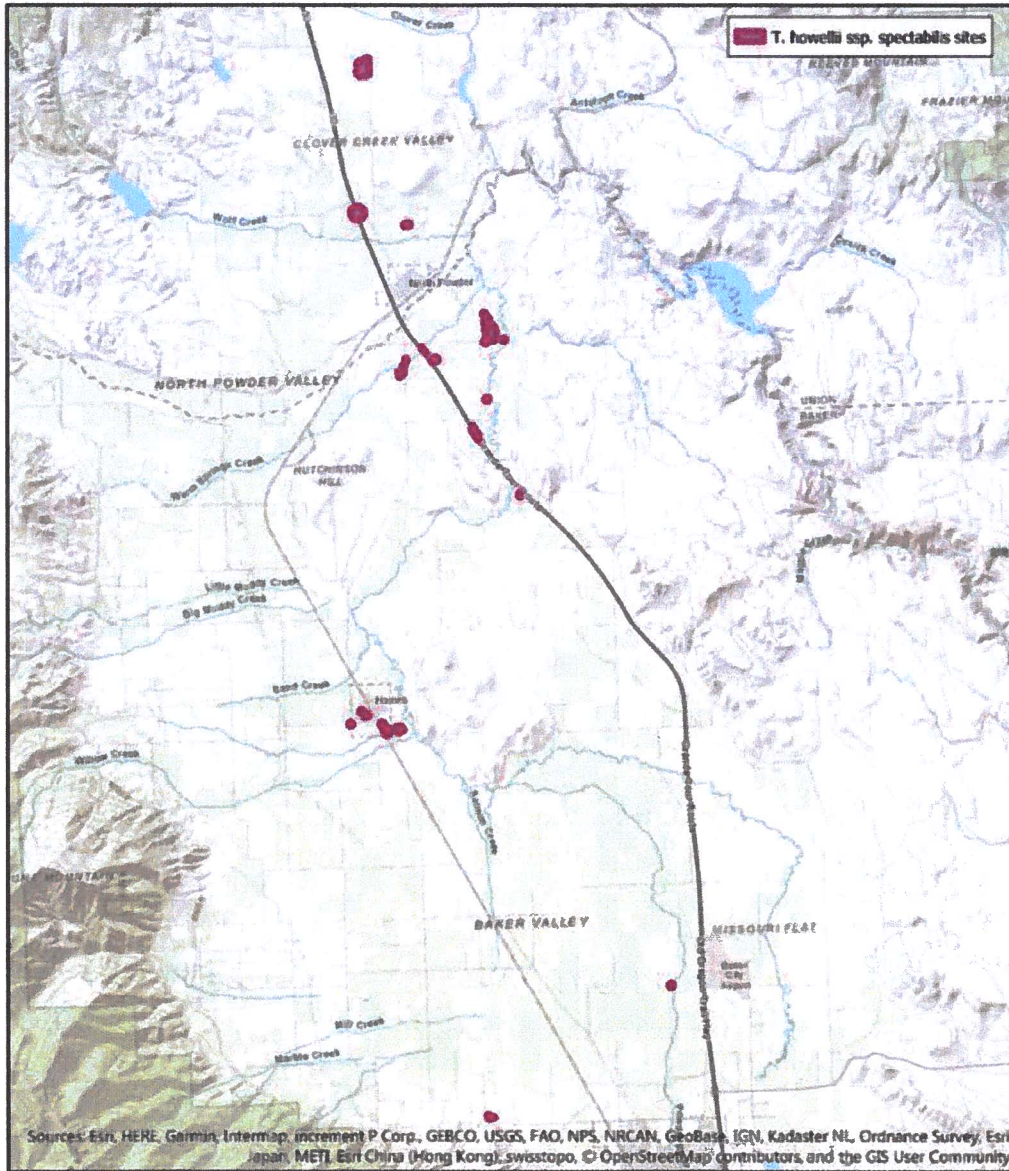
Synthesis:

Since our last 5-year review of *Thelypodium howellii* ssp. *spectabilis* in 2010, we have received a limited amount of new information regarding the species, including a few survey reports and research results from USDA-NRCS and independent consultants. The best available information indicates that the number of known sites and distribution of the species remains the same as described in our 2010 status review (Figure 1). There is no new information that changes our understanding of the threats to the species. None of the new information that has become available to us since our 2010 5-year review alters our understanding of the species' current distribution or status.



U.S. Fish & Wildlife Service

Howell's spectacular thelypody Known Sites - Species Status Assessment 2018



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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La Grande, Oregon
Produced June 23, 2018
Base map: ESRI State Boundaries
File: GIS_Thelypdy_SGA_3/18.mxd

0 0.75 1.5 3 Miles

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Figure 1. *T. howellii ssp. spectabilis* known sites (Source: Oregon Biodiversity Information Center 2018)

Conclusion:

After reviewing the best available scientific information, we conclude that *Thelypodium howellii* ssp. *spectabilis* remains a threatened species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our 2010 status review remains an accurate reflection of the species' current status.

Recommendations for future actions:

- **Landowner Outreach** – Work with local officials in Baker and Union counties to develop a Thelypody Conservation Proposal that includes participation incentives that would then be taken to landowners in thelypody habitat for their consideration. Such a proposal would likely include provisions for establishment of pastures with special management elements for thelypody conservation (e.g., rest or reduced grazing during the growing season).
- **Grazing Research** – Continue controlled studies to determine the response of thelypody to livestock grazing outside the plant's primary growing season, as well as the potential to use grazing as a tool to control competing vegetation.
- **Manage Haines Rodeo Grounds Site** – Work with the Baker County Road Department to reinstate implementation of the management plan for this site. Of particular concern at this site is control of competing vegetation in thelypody-occupied areas.
- **Management Plan for Miles Easement** – Finalize a management plan for the Miles Easement and actively pursue its successful implementation.
- **Succeed at Baldock Slough** – Continue the effort to successfully establish a thelypody population at Baldock Slough. Control of invasive weeds will need to be a key component of this effort.
- **Monitoring Plan** – Develop and use a practical, standardized methodology for monitoring thelypody populations so that we can obtain comparable data across sites and across years. This methodology would also serve as the basis for a subsequent Post-Delisting Monitoring Plan, satisfying one of the delisting criteria in the Recovery Plan.

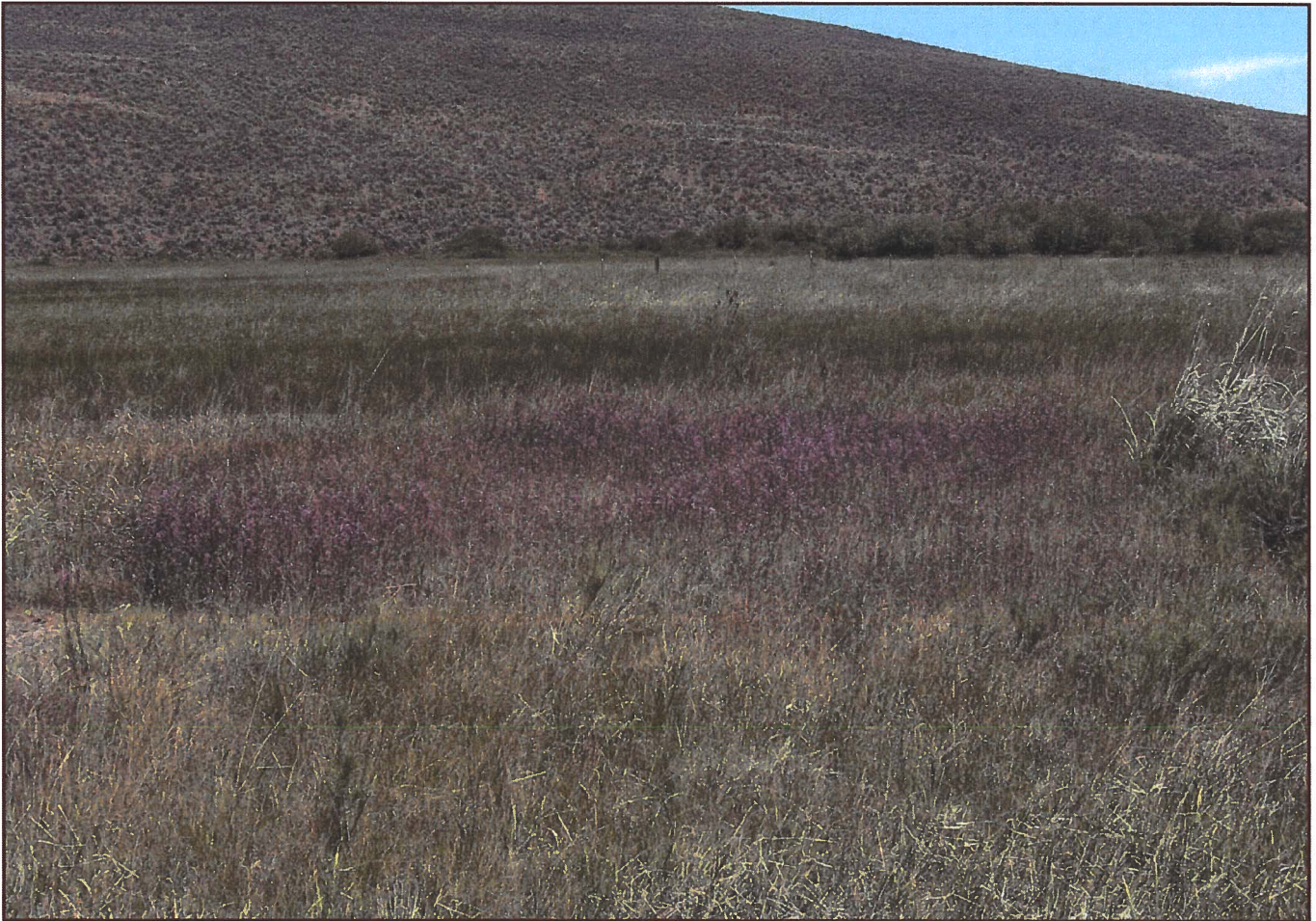
Approve Paul Henson Date 9/10/18
Lead Field Supervisor, Fish and Wildlife Service

References

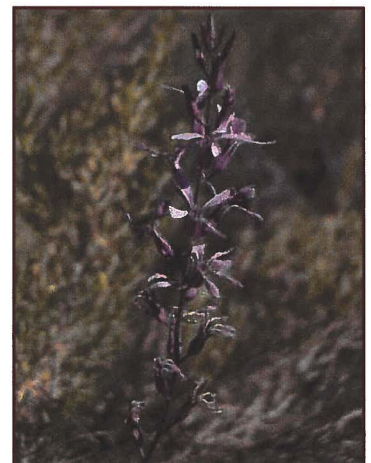
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- U.S. Dept. of Agriculture – Natural Resource Conservation Service. 2014. Results of Site Visit to Howell’s Thelypody Areas on the Baldock Slough WRP Easement. U.S. Dept. of Agriculture – Natural Resource Conservation Service, La Grande, Oregon. 2 pp.
- U.S. Fish and Wildlife Service. 1999. Endangered and Threatened Wildlife and Plants; Threatened Status for the plant *Thelypodium howellii* ssp. *spectabilis* (Howell’s spectacular thelypody). Federal Register 64:28393-28403.
- U.S. Fish and Wildlife Service. 2002. Recovery Plan for Howell’s Spectacular Thelypody (*Thelypodium howellii* ssp. *spectabilis*). U.S. Fish and Wildlife Service, Portland, Oregon. 47 pp.
- U.S. Fish and Wildlife Service. 2010. Howell’s spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*) 5-Year Review Summary and Evaluation. U.S. Fish and Wildlife Service, La Grande Field Office. 18 pp.

**Howell's spectacular thelypody
(*Thelypodium howellii* ssp. *spectabilis*)**

**5-Year Review
Summary and Evaluation**



**U.S. Fish and Wildlife Service
Oregon Fish and Wildlife Office
Portland, Oregon
March 9, 2010**



5-YEAR REVIEW

Species reviewed: Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*)

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5-YEAR REVIEW
Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*)

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

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Other Reviewers:

Jimmy Kagan, Director, Oregon Natural Heritage Program

Rebecca Currin, Native Plant Conservation Program, Oregon Dept. of Agriculture

1.2 Methodology used to complete the review

The U.S. Fish and Wildlife Service (Service) initiated a 5-year review of *Thelypodium howellii* ssp. *spectabilis* (Howell's spectacular thelypody) in October 2008. This review was conducted by the Oregon Fish and Wildlife Office's La Grande Field Office and summarizes current scientific research and surveys related to Howell's spectacular thelypody (thelypody). All pertinent literature and documents used in this review are on file at the La Grande Field Office. The primary sources of information used in this analysis were recent survey information in our files, reports provided by the Oregon Department of Agriculture (ODA) Native Plant Conservation Program, and the 2002 Recovery Plan for this taxon (USFWS 2002). The Project Leader of ODA's Native Plant Conservation Program was asked to review this analysis.

1.3 Background

1.3.1 FR Notice citation announcing initiation of this review

Federal Register / Vol. 72, No. 45 /March 8, 2007/10547-10550

1.3.2 Listing history

Original Listing

FR notice: Endangered and threatened wildlife and plants; threatened status for the plant *Thelypodium howellii* ssp. *spectabilis* (Howell's spectacular thelypody). 64 FR 28393.

Date listed: June 25, 1999

Entity listed: Sub-species

Classification: Threatened

1.3.3 Associated rulemakings

N/A

1.3.4 Review History

This is the first 5-year status review for Howell's spectacular thelypody. Information that has become available since it was listed in 1999 has been used to determine the current status of the subspecies.

1.3.5 Species' Recovery Priority Number at start of this 5-year review

The Howell's spectacular thelypody was assigned a recovery priority number of eight (8) reflecting a moderate degree of threat and a high potential for recovery.

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Recovery Plan for Howell's Spectacular Thelypody

Date issued: June 3, 2002

Dates of previous revisions, if applicable: Not applicable

2.0 REVIEW ANALYSIS

2.1 Distinct Population Segment (DPS) Policy

The DPS policy does not apply to plant species.

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes
 No

Howell's spectacular thelypody has a final approved recovery plan (USFWS 2002) with measurable recovery criteria for delisting the taxon. The recovery criteria for delisting this subspecies are described in section 2.2.3. Since it is listed as threatened there are no downlisting criteria.

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

Yes
 No

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery plan?

Yes
 No

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information

The 2002 Recovery Plan for Howell's spectacular thelypody contains the following recovery criteria (USFWS 2002, pg 12):

"Delisting will be considered when all the following conditions are met:

1. At least five stable or increasing thelypody populations are distributed throughout its extant or historic range. Populations must be naturally reproducing with stable or increasing trends for 10 years.
2. All five populations are located on permanently protected sites. Permanently protected sites are either owned by a State or Federal agency or a private conservation organization, or protected by a permanent conservation easement that commits present and future landowners to the conservation of the species.
3. Management plans have been developed and implemented for each site that specifically provide for the protection of the thelypody and its habitat.
4. A post-delisting monitoring plan is in place that will monitor the status of the thelypody for at least 5 years at each site."

What follows is a review of where things currently stand in regards to accomplishment of the four recovery criteria.

Delisting Criterion #1 - Distribution and Trend in Abundance

Criterion #1 calls for maintaining at least five Howell's thelypody populations within the plant's historic range in the Baker Valley/Powder River Valley of eastern Oregon. The Recovery Plan does not establish specific plant abundance targets for population recovery, stipulating only that each population be stable or increasing in size for a period of 10 years. Population size targets are of limited use, since the abundance of this biennial plant fluctuates widely from year-to-year as it responds to annual variability in climate and soil moisture.

The 2002 Recovery Plan identifies 11 different occurrences that are grouped into five separate “populations” (USFWS 2002, pg. 4) (Figure 1). The labeling of these geographically-clustered occurrences as “populations” is a loose application of the term, since we do not know the extent of genetic interchange among occurrences. The 2008 update of the Oregon Natural Heritage Information Center’s (ORNHIC) database documents 15 Howell’s thelypody occurrences (Table 1); all within the same geographic range described in the Recovery Plan (ORNHIC 2008). The known occurrences vary substantially in size and plant abundance. Some are small patches just several hundred square feet in size, while others extend over 10 to 20 acres. Perhaps because of this situation, the Recovery Plan does not specify how many occurrences within a population cluster need to be maintained for a population to be considered recovered.

One additional population has been established since the subspecies was listed. Staff from ODA’s Native Plant Conservation Program translocated thelypody plants to three locations near Baldock Slough on a property that has a permanent conservation easement through the Wetland Reserve Program (WRP) (Currin et al. 2008).

All of the known thelypody occurrences are on private land and many are not accessible for monitoring. Since federal listing in 1999, population monitoring efforts have focused on three sites where there are mechanisms in place that allow for thelypody monitoring: (1) the Haines Rodeo Grounds site, (2) the Miles Easement near North Powder, and (3) the Baldock Slough introduction site. Of these three, the Haines Rodeo Grounds population is the only one that can be said with some confidence to be meeting Criterion #1 for population distribution and abundance.

The other known thelypody locations are all located on private lands where we have either very limited or no access to the occupied sites. Some of the occurrences are visible from public roads and occasional roadside presence/absence surveys have been done in June/early July (when flowering plants are highly visible) to document that the occurrence is still extant, while the less visible sites have not been observed in many years (Table 1).

Figure 1. Map of Howell's Spectacular Thelypody occurrences (Source: ORNHIC 2009).

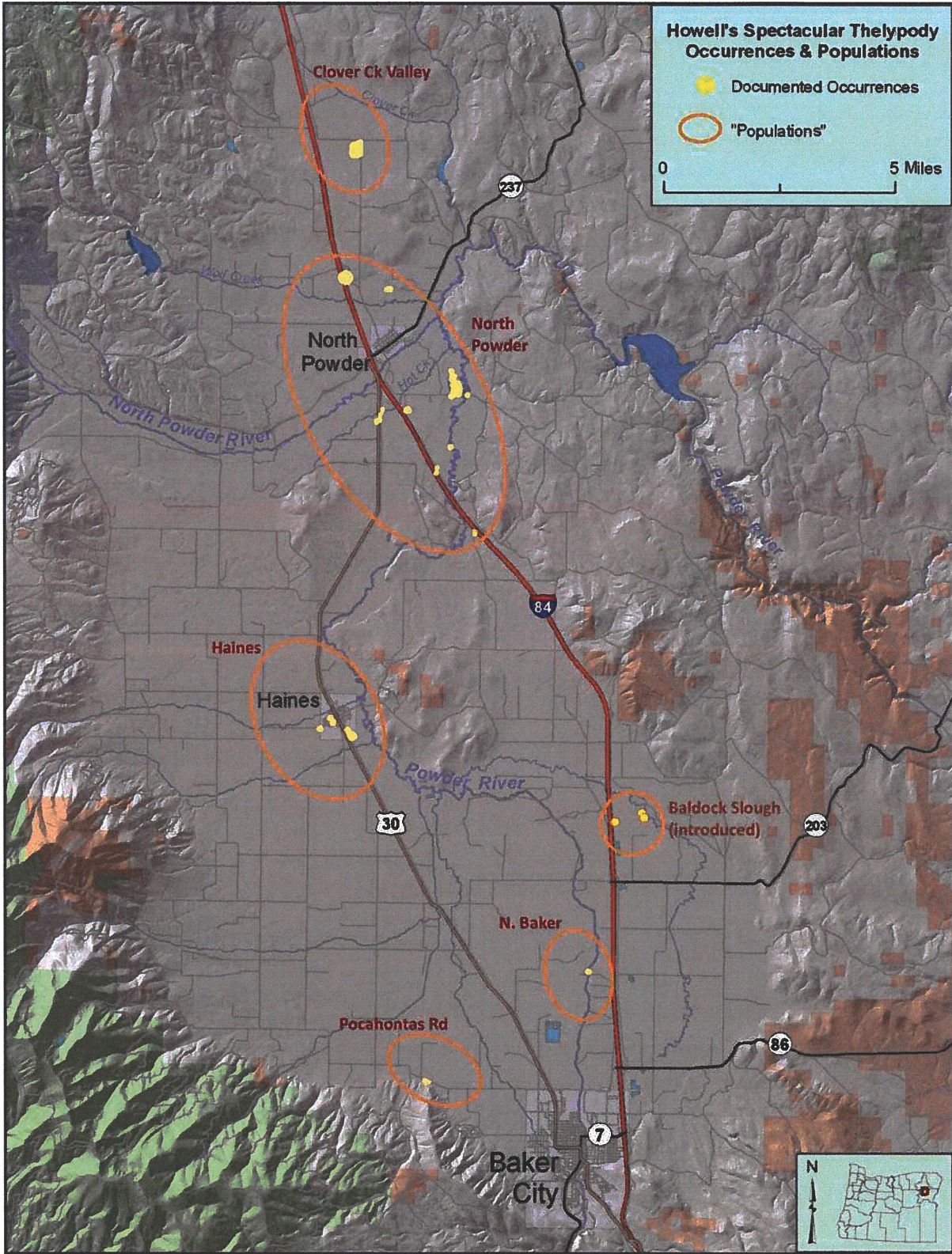


Table 1. Status of documented Howell's thelypody occurrences in the Baker-Powder River Valley.

Occurrence (EO ID)	Population	Pop. Size	Pop. Status/ Last Year Seen	Habitat Security/ Conservation Potential	Mgmt. of Threats
Haines Rodeo Grounds (11674)	Haines	Large (>50,000)	Stable trend./ 2009	Secured as mitigation site. High conserv. potential	Fenced, not grazed; some weed mgmt.
Anthony Lakes Hwy (13920)	Haines	Medium	Extant, trend unknown/ 2009	No current protection, but has conservation potential	Not Managed
Town of Haines – Olson & 4 th St (8732)	Haines	Small	Extant, trend unknown/ 2009	Vacant lot in town; Low conservation potential	Not Managed
Haines Water Tower – Olson & 2 nd St (19701)	Haines	Small	Extant, trend unknown/ 2009	Vacant lot in town; No protections; low potential	Not Managed
Miles Ranch Easement (8733)	North Powder	Large (>35,000)	Extant, trend unknown/ 2008	Site protected by conserv. Easement; High potential	Some fencing & grazing mgmt
“Dodson Easement” Wolf Creek near North Powder (6634)	North Powder	6,000 in 0.6ac area in 1995	Unknown/ 1996	No protections. TNC had a lease agmt in early 1990s.	Not Managed
S. of North Powder (21640)	North Powder	Unknown	Unknown	No protections; unknown conservation potential	Not Managed
Near North Powder (9402)	North Powder	Unknown	Unknown	No protections; unknown conservation potential	Not Managed
Hot Creek (4703)	North Powder	Small	Unknown. Last seen – 1997	No protections; unknown conservation potential	Not Managed
Hot Creek (16211)	North Powder	Unknown	Possibly extirpated	No protections; unknown conservation potential	Not Managed
So. of North Powder (15015)	North Powder	Unknown	Possibly extirpated	No protections; unknown conservation potential	Not Managed
Btwn Wolf Ck & No. Powder (17494)	North Powder	Unknown	1952 report. Current status unknown	No protections; unknown conservation potential	Not Managed
Pocahontas Rd, 2.5 mi NW of Baker City (7347)	Pocahontas Rd	Small (250-300 in 1998)	Unknown/ 1998	No protections; unknown conservation potential	Not Managed
3 mi N of Baker City (19840)	North Baker	Small	Unknown/ 1995	No protections; unknown conservation potential	Not Managed
Clover Ck Valley (22007)	Clover Ck Valley	Unknown	Unknown/ 1998	No protections; unknown conservation potential	Not Managed
Baldock Slough	Introduced	Small	Declining/ 2009	Within WRP easement. High conserve. potential	Not grazed; some weed mgmt.

Delisting Criterion #2 – *Security of Habitat*

As mentioned above, three of the known thelypody sites now have some type of formalized habitat protections in place. Two of the protected sites – the Haines Rodeo Grounds Site and the Miles Ranch Site – support the two largest known thelypody occurrences.

A major step forward occurred in 2001 when the site adjacent to the Haines Rodeo Grounds (EO ID 11674) was purchased as a mitigation site for Howell's thelypody. A 51-acre parcel encompassing over 99 percent of the known occupied habitat at this location was purchased by the Baker County Road Department (with funding from the Federal Highway Administration) as a mitigation site to offset impacts to thelypody from the Anthony Lakes Highway Improvement Project (Widener & Associates 2002). A management plan was written for the parcel in 2002 (Widener & Associates 2002), and in April 2003, Baker County adopted an ordinance – "Ordinance No. 03-01: Specifying Authorized Uses for Property Held by Baker County in Mitigation for the Anthony Lakes Highway Project, Related to the Threatened Plant Species Howell's Spectacular Thelypody" – to provide direction for managing the area. The site is currently protected by a fence and the Baker County Road Department excludes most land use activities, including livestock grazing, to protect the Howell's thelypody population.

The Miles Ranch thelypody occurrence (EO ID 8733) is mostly within a 609-acre perpetual conservation easement held by the United States Government. The easement was established in 1990 and was initially managed by the Oregon Department of Fish and Wildlife (ODFW) until 1999, when management responsibility was transferred to the Bureau of Land Management (BLM). In 2006, management responsibility for the easement was transferred again, this time to the U.S. Fish and Wildlife Service. The landowners are Myron and Dorothy Miles. The easement's general provisions state that: "The agreed upon purposes of this reservation are the preservation and maintenance of the wetland and floodplain areas existing as of the date of this conveyance as well as protection and enhancement of plant and animal habitat and populations. Such purposes shall constitute the dominant estate within the easement area." The easement boundary is fenced, although control of adjacent livestock has been an ongoing issue due to fence damage and problems keeping gates closed.

The Baldock Slough site, where a small new thelypody population was established in the early 2000's, is on private land that is protected through a NRCS Wetland Reserve Program (WRP) permanent easement. This site is also fenced.

In the early 1990s, the Nature Conservancy had a lease agreement with a landowner to protect a 0.6 acre thelypody occurrence just north of Wolf Creek (EO ID 6634). However, that agreement expired in 1996 and the landowner declined efforts to renew it (J. Kagan, pers. comm. 12/18/09).

The remaining occurrences are on private lands with no special management protections. There is sentiment among some of the local landowners that protecting this plant could

lead to land use restrictions that would negatively affect their agricultural operations and/or property values.

Delisting Criterion #3 – *Habitat Management to Control Threats*

A management plan for Howell's thelypody has been developed for the Haines Rodeo Grounds Mitigation Site (Widener & Associates 2002) and a draft plan has been developed for the Miles Easement site (USFWS 2004). Significant progress has been made on implementation of the Rodeo Grounds plan; Baker County has done weed control work and their efforts to protect the site from unauthorized uses have been effective. Qualitative monitoring of the plant population has occurred in most years and some quantitative monitoring has also been done.

There has been less active management of the Miles Easement and some threats remain. However, habitat conditions at the site have improved substantially from what they were in the early 1990's (J. Kagan, pers. comm. 12/18/09).

The Baldock Slough site is being managed as a wetland habitat reserve. The area is not grazed by livestock and land use activities are regulated. Invasive weeds, primarily whitetop (*Lepidium draba*) and perennial pepperweed (*Lepidium latifolium*), are a problem at this site but efforts to control their spread are occurring.

Delisting Criterion #4 – *Post-Delisting Monitoring Plan in Place*

A post-delisting monitoring plan has not yet been developed. Statistically rigorous quantitative monitoring of thelypody population size is labor-intensive and expensive, and of questionable value given the wide year-to-year swings in plant abundance. Only the newly established and very small Baldock Slough population has been monitored in a statistically rigorous fashion (Currin et al. 2008).

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history

ODA's Native Plant Conservation Program staff have worked extensively on propagation and outplanting techniques for this taxon (Raven 2001, Gisler 2002, Currin et al. 2005, Currin et al. 2008). This work has increased our understanding of the plant's life history and growth habits.

In 2001 and 2002, the first introductions of Howell's spectacular thelypody seeds and cultivated plugs into new (Baldock Slough) and existing (Miles Ranch) thelypody sites were completed. Initial results found that 32.8% of the transplant plugs and 1% of the seeds survived to flower in 2003 (Currin et al. 2005). In 2002 and 2003, grow-out and seed-increase programs were initiated by ODA in Corvallis, Oregon and by two plant nurseries in Connell, Washington and Boise,

Idaho. However, these attempts to propagate thelypody plants at nurseries were not successful (Currin et al. 2005).

Subsequent work done to identify potential outplanting sites has led to increased understanding of soil and micro-habitat conditions where the plant occurs. Howell's spectacular thelypody favors the ephemeral moist alkaline soils of native grassland remnants in Baker and Union counties in northeastern Oregon (Currin et al. 2007).

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends

In recent years, thelypody abundance has been tracked to varying degrees at three sites: (1) the Haines Rodeo Grounds, (2) the Miles Ranch Easement, and (3) the Baldock Slough introduction site. Only the small recently established Baldock Slough population has been monitored annually.

The large populations at Haines Rodeo Grounds and Miles Ranch have been monitored sporadically and with varying degrees of intensity, with more effort focused on the Rodeo Grounds. Both of these populations appear stable in the overall areal extent of plant occurrence. However, plant abundance and fine-scale distribution patterns tend to vary greatly from year-to-year in response to climatic conditions and soil moisture. In one intensively monitored ½-acre plot at the Haines Rodeo Grounds site, the abundance of flowering thelypody plants increased 567% from 2008 to 2009 (from 3,011 plants to over 20,000 plants) (Leslie Gecy, 2009, *in litt.*). This change did not correspond with any change in habitat conditions, but appeared to be a response to an unusually wet spring. Given such dramatic fluctuations at an undisturbed site, one has to wonder whether labor-intensive efforts to accurately document trends in plant abundance will really improve our ability to predict the likelihood of population persistence.

Haines Rodeo Grounds

There have been a number of thelypody monitoring efforts at the Haines Rodeo Grounds site over the last decade, although none have been thorough enough to produce a precise estimate of total population size. However, results from intensive counts of small subplots indicate that on a good year the site may well have over 50,000 flowering plants. The high level of year-to-year variation in plant abundance is well illustrated by the results of intensive sampling done on four ½-acre plots at this site as part of a study to evaluate the effects of late-season grazing (Gecy, 2009, *in litt.*):

Plot	# Plants		% Change
	<u>2008</u>	<u>2009</u>	
SW	131	840	+540%
SE	340	1,329	+290
RW	1,074	4,173	+288
RE	3,011	20,000+	>567

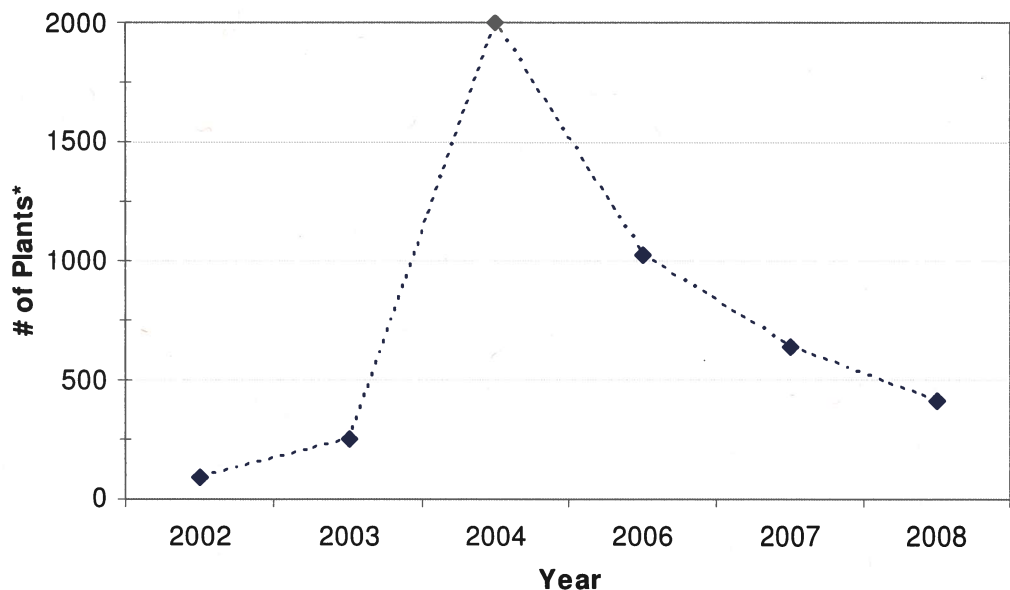
Miles Ranch Easement

There have been occasional efforts to monitor thelypody at the Miles Ranch Easement, although most of this work has focused specifically on experimental trials to grow out plugs and seedlings (Currin et al. 2005, 2007). A survey of the easement done in 2000 came up with a population estimate of 36,796 plants (OR Natural Heritage Information Center Database, 2008).

Baldock Slough

Six years after the initial introduction, the three original experimental thelypody populations continue to persist, although the overall abundance of the population has declined in recent years (Figure 2). A total of 415 flowering individuals were found in the three areas in 2008.

Figure 2. Total number of Howell's thelypody plants present at the three introduction areas at Baldock Slough. All plants (seedlings, rosettes, and reproductive plants) were counted in 2002 & 2003. The large count in 2004 reflects an estimate of seedling numbers for that year. In 2006, 2007, & 2008 only reproductive plants were counted. (Source: Currin et al. 2008).



2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.)

The Recovery Plan (USFWS 2002) identified “research on genetic variation within and among existing sites and potential for inbreeding depression” as a recovery task. However, we are not aware of any genetics work on this taxon since it was federally listed in 1999.

2.3.1.4 Taxonomic classification or changes in nomenclature

No changes have been made to the taxonomic classification of Howell's thelypody since it was federally listed in 1999.

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.)

Our understanding of the spatial distribution of Howell's thelypody remains much the same as described in the 2002 Recovery Plan. The effort to establish a new population at Baldock Slough is the only significant addition to the known spatial distribution of this taxon. Because the plant occurs primarily on private land, and most of the area landowners are concerned about the consequences of having a listed species on their property, our understanding of the current distribution is limited by lack of access to areas of potential habitat.

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem)

The available habitat and prevailing land uses remain essentially the same as they were at the time of listing. Cattle grazing is the dominant land use and Howell's thelypody is readily consumed by cows. In areas that are intensively grazed during the spring and early summer, thelypody flowering stalks tend to only be found underneath or among shrubs, where they have avoided being eaten. However, it is thought that thelypody might not be harmed by, and may benefit from, late-season livestock grazing that occurs once the plants set seed and die back to basal rosettes (typically sometime in August) (Kagan, pers. comm. 2009; Berta Youtie, pers. comm. 2010).

A research project was initiated in 2008 at the Haines Rodeo Grounds site to investigate thelypody's response to late-season grazing. Four half-acre plots have been established, two in an area with high thelypody concentrations and two in an adjacent area that has been intensively grazed and has only a few thelypody plants (Gecy 2008). Baseline data on thelypody abundance was collected in 2008 and 2009, and then two of the plots were grazed in August 2009. In 2010, we will collect data on how thelypody responds to this type of grazing treatment. The study is planned to be continued for three more years (Gecy 2008).

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range

The primary threat to Howell's thelypody is chronic impacts to habitat and individual plants from intensive cattle grazing during the period of the year when plants are actively growing (typically April through July) (Kagan 1986). Almost

all of the remaining areas where this plant occurs, or has potential to occur, are un-irrigated pasture lands that are grazed by cattle for most or all of the year. Thelypody has successfully persisted in low abundance in some of these areas, apparently by escaping consumption by growing underneath rabbitbrush and greasewood shrubs, and through survival in spots that do not receive substantial grazing pressure during the spring/early summer period. It appears quite likely that thelypody can tolerate cattle grazing during periods of the year when it is not actively growing, and a study is now in progress to try to determine the extent of that tolerance.

A secondary threat to Howell's thelypody is permanent loss of suitable habitat through conversion of semi-natural areas to irrigated agriculture, residential development, or expanding human infrastructure such as roads. Much of the historic habitat for this plant was lost in the early 1900s as much of the natural habitat in the Baker/Powder River Valley was converted to irrigated agriculture. However, at the present time, the permanent loss of habitat is a relatively minor threat to Howell's thelypody.

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes

As stated in the Recovery Plan, this factor is not considered to be a threat since Howell's thelypody is not a source of human food or of commercial horticultural interest. Nothing has occurred since the time of listing to change this conclusion.

2.3.2.3 Disease or predation

Herbivory by livestock is covered above in Section 2.3.2.1. There are no other known threats associated with disease or predation.

2.3.2.4 Inadequacy of existing regulatory mechanisms

Howell's thelypody is federally-listed as a threatened species and state-listed as an endangered species and is therefore protected by regulatory measures associated with those listings. However, there are no measures in either the Federal or State Endangered Species Act that protect listed plants on private lands, unless the impact results from either "willful destruction in violation of State trespass laws" or a federally-funded activity.

2.3.2.5 Other natural or manmade factors affecting its continued existence

Whitetop and perennial pepperweed are major problem weeds in the Baker Valley and the County Weed Control Specialist and local landowners actively spray infestations to control their spread. The most commonly used herbicides are Escort and Telar. These are used because whitetop and perennial pepperweed are both in the mustard family (Brassicaceae) and these herbicides are particularly

effective at controlling plants in this family. However, thelypody is also a member of the mustard family, so these herbicides are also very effective at killing it. The County Weed Control Specialist is careful to avoid spraying these chemicals in areas where thelypody occurs, but some landowners may unknowingly spray thelypody plants in their efforts to control noxious weeds.

2.4 Synthesis

Howell's spectacular thelypody was listed as threatened in 1999 because of its very restricted range, the potential for further habitat destruction from agricultural and urban development, the prevalence of chronic habitat degradation from livestock grazing, invasive weeds, and alteration of wetland hydrology, and the fact that only one of the known populations had any legal protections in place to facilitate long-term protection of the plant (USFWS 1999).

Since listing, there has been very little permanent habitat loss at known thelypody sites resulting from development or land use conversions. However, in many areas chronic habitat degradation continues, primarily resulting from intensive livestock grazing during the plant's growing season. Significant progress has been made in securing protection of several sites and altering land use practices at those sites to reduce habitat degradation. Three thelypody sites now have legal mechanisms in place to manage the habitat for conservation of this plant. Two of the protected sites encompass the two largest known thelypody populations, while the third site contains one of the smallest and most precarious populations - the newly established Baldock Slough population.

The delisting criteria in the Recovery Plan call for protection of at least five stable thelypody populations (USFWS 2002). So, although progress has been made, we remain well short of the delisting criteria; at least two or three more viable sites need to be protected to achieve recovery objectives. In the near term, our best opportunity to protect additional sites would be to develop a workable grazing management strategy for thelypody-occupied areas and then approach landowners, with some type of incentives, to find individuals who may be willing to modify their grazing management practices in targeted areas to facilitate thelypody conservation. If willing landowners could be recruited, the potential for meeting the thelypody recovery criteria would be high, as evidence suggests that the plant is capable of rapid recovery when it is not extensively grazed during its growing season.

This plant was listed as threatened in 1999, rather than endangered, because it was determined to be not immediately threatened with extinction. That determination was based on the fact that a permanent conservation easement provided substantial protection for the Miles Ranch population, and the belief that grazing could be managed in a manner that would not adversely affect thelypody habitat (USFWS 1999). Today, the protection of additional thelypody sites along with some modest progress in developing compatible livestock grazing management practices have moved this subspecies further away from the threat of extinction. Thus, for all of the reasons identified above, the designation of Howell's spectacular thelypody as a threatened species remains appropriate.

3.0 RESULTS

3.1 Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist

Extinction

Recovery

Original data for classification in error

No change is needed

3.2 New Recovery Priority Number: 8 (no change)

Brief Rationale:

This recovery priority number reflects a taxon facing a moderate degree of threat and a high potential for recovery. Although Howell's thelypody is currently protected in only three locations, it does have a high potential for recovery if some adjustments could be made to livestock grazing practices over a relatively small area. We think such adjustments remain possible if the right landowner incentives are provided.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- **Landowner Outreach** – Work with local officials in Baker & Union counties to develop a Thelypody Conservation Proposal that includes participation incentives that would then be taken to landowners in thelypody habitat for their consideration. Such a proposal would likely include provisions for establishment of pastures with special management elements for thelypody conservation (e.g., rest or reduced grazing during the growing season).
- **Grazing Research** – Continue and complete controlled studies to determine the response of thelypody to livestock grazing outside the plant's primary growing season, as well as the possible role of grazing in controlling competing vegetation.
- **Manage Haines Rodeo Grounds Site** – Continue successful management efforts at this site and work to update and fully implement the existing Management Plan.
- **Management Plan for Miles Easement** – Finalize a management plan for the Miles Easement, working with staff from the mid-Columbia National Wildlife Refuge Complex, and actively pursue its successful implementation.
- **Succeed at Baldock Slough** – Continue the effort to successfully establish a thelypody population at Baldock Slough. Control of invasive weeds will need to be a key component of this effort.
- **Monitoring Plan** – Develop and use a practical, standardized methodology for monitoring thelypody populations so that we can obtain comparable data across sites and across years. This methodology would also serve as the basis for a subsequent Post-Delisting Monitoring Plan, satisfying one of the delisting criteria in the Recovery Plan.

5.0 REFERENCES

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Personal Communications

Kagan, James, Oregon Natural Heritage Program, Portland, Oregon. December, 18, 2009.

Youtie, Berta, January 6, 2010.

Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Rhinichthys osculus ssp.*

Current Classification: Threatened

Recommendation resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: N/A

Review Conducted By: John Stephenson

Neil R. Corbett Date 6/22/10
Lead Field Supervisor, Fish and Wildlife Service

