

Recovery Outline for White Bluffs Bladderpod
(*Physaria douglasii* subsp. *tuplashensis*)



Photo: T. McCracken, USFWS

Species Name:	White Bluffs bladderpod <i>Physaria douglasii</i> subsp. <i>tuplashensis</i>
Species Range:	Washington, United States
Recovery Priority Number:	6C
Listing Status:	Threatened; December 20, 2013 (78 FR 76996)
Lead Regional Office:	Interior Region 9 Portland, Oregon
Lead Field Office:	Eastern Washington Field Office Spokane, Washington
Lead Contact:	Stacy James

1) Background

Type and Quality of Available Information to Date:

- **Important information gaps:** We believe the quantity, quality, and reliability of the information regarding the recent past (since 1997) and current distribution of White Bluffs bladderpod is sufficient for us to understand the recovery needs for this subspecies. Additional research on microhabitat and climate requirements will help us reach recovery goals after specific threats have been ameliorated and population augmentation efforts have been completed. A study of the genetic diversity of the single known population could inform us of the subspecies' potential ability to adapt to changing environmental conditions and whether inbreeding depression is occurring.
- **Treatment of uncertainties:** Uncertainties will be clarified to the extent possible during the recovery process for White Bluffs bladderpod. Uncertainties include:
 - current population size and distribution of plants on private and state land;
 - historical population size and range-wide distribution;
 - reasons for the large annual variation in survival;
 - effects of microclimate and climate change on the subspecies; and
 - current influence of groundwater on the stability of the White Bluffs where the subspecies occurs.

Brief Life History:

White Bluffs bladderpod is a low-growing, herbaceous, perennial plant in the Brassicaceae (mustard) family, with a sturdy taproot and a dense rosette of broad gray-green pubescent leaves. The subspecies produces showy yellow flowers on relatively short stems in May, June, and July (Washington Department of Natural Resources [WDNR] 2011, p. 213) and most adult plants flower every year (Caplow 2003, p. 3-2). Based on preliminary counts, extremes in seed productivity could range from zero to over 65,000 seeds per plant (The Nature Conservancy [TNC] 1998, p. 5; Beck 1999, p. 24). A seed viability study has not been done but anecdotal field observations suggest seed remain viable in the seedbank for at least 1 year (Newsome, H., pers. comm. 2018). Approximately every 3 to 4 years is a good reproduction year, as represented by upswings in the number of flowering plants observed (Newsome, H., pers. comm. 2018).

This endemic subspecies consists of a single population that inhabits dry, steep upper zone and top exposures in the White Bluffs area of Hanford Reach National Monument (Monument; Figure 1). White Bluffs bladderpod is closely associated with a layer of highly alkaline, fossilized cemented calcium carbonate soils along cliff tops and their associated slopes. The habitat is arid and sparsely vegetated, with a high degree of exposure to weather extremes. Although the area occupied by White Bluffs bladderpod is rocky and has low fuel loads, it is still

susceptible to wildfire (U.S. Fish and Wildlife Service [USFWS] 2013a, p. 24020). A diversity of pollinators have been observed on White Bluffs bladderpod flowers, including: butterflies, flies, wasps, bumblebees, moths, beetles, and ants (TNC 1998, p. 5). Primary pollinators and their relative effectiveness have not been determined. However, propagation work by Monument staff and volunteers suggests that specific pollinators are not a limiting factor for the subspecies.



Figure 1. The White Bluffs along the Hanford Reach of the Columbia River.
Photo: T. McCracken, USFWS

Limiting Life History Characteristics:

White Bluffs bladderpod may require soils high in calcium, as do many of the endemic *Lesquerella* (now *Physaria*) species. Most individuals reach reproductive condition in their first or second year but the lifespan of this short-lived subspecies is probably 4 to 5 years. The population size varies from year to year, and the survival of seedlings and adults appears to be highly variable (Dunwiddie *et al.* 2002, pp. 7-8), as is the observed density of individuals along the bluffs.

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The physical and biological features and habitat characteristics required to sustain the subspecies (USFWS 2013a, pp. 24020-24021) include the following:

- Primary Constituent Element 1 – Weathered, alkaline paleosols (soil formed long ago in a climate different from the climate occurring where the soil is now found) and mixed soils overlying the Ringold Formation. These soils occur within and around the exposed caliche-like (alkaline, fossilized, cemented calcium carbonate lacking nitrate constituents) cap deposits associated with the White Bluffs and are 210 to 275 meters (m) (700 to 900 feet [ft]) in elevation.
- Primary Constituent Element 2 – Sparsely vegetated habitat (less than 10 to 15 percent total cover), containing low amounts of nonnative or invasive plant species (less than one percent cover).
- Primary Constituent Element 3 – The presence of insect pollinator species.
- Primary Constituent Element 4 – The presence of native shrub steppe habitat within the effective pollinator distance (300 m [approximately 980 ft]).
- Primary Constituent Element 5 – The presence of stable bluff formations with minimal landslide occurrence.

Primary Threats:

The White Bluffs bladderpod listing rule (USFWS 2013b) described eight threats to the subspecies. They are summarized as follows:

Listing Factor	Threat at time of listing	Current primary threat
Factor A: destruction, modification, or curtailment of its habitat or range	wildfire	✓
	fire suppression activities	
	slope failure, landslides	✓
	recreational activities and/or off-road vehicle (ORV) use	✓
	competition, fuels load from nonnative plants	✓
Factor E: Other natural or manmade factors	small population size	
	limited geographic range	
	climate change	

The threats identified at the time of listing under the Endangered Species Act (ESA) remain as threats today. The following are currently considered the primary threats.

Slope Failure, Landslides – The threat of groundwater-induced landslides affects the subspecies' entire range (USFWS 2013b, p. 24003). As a result, the habitat in approximately 35 percent of the known range of White Bluffs bladderpod has been moderately to severely altered (Brown 1979, pp. 4, 39; Drost *et al.* 1997, pp. 3, 76; Cannon *et al.* 2005, p. 4.25). The subspecies has not been observed in areas where recent landslides have occurred, whether the landslide disturbance was moderate or severe.

Competition, Fuels Load from Nonnative Plants – Invasive, nonnative plant species compete with White Bluffs bladderpod for space and moisture and can increase the likelihood and intensity of fire. Likewise, fire can result in an increase in invasive, nonnative plants. For example, as a result of a fire in 2007, a higher percent cover of weedy plant species, including cheatgrass (*Bromus tectorum*), has become established within and around the White Bluffs bladderpod population on the top of the bluffs (Newsome, H., pers. comm. 2018). In addition to cheatgrass, there are aggressive flowering plants in the area. An infestation of yellow starthistle (*Centaurea solstitialis*), a nonnative weed and rapid invader of arid environments even in the absence of disturbance, was discovered in 2003 within a portion of the range of White Bluffs bladderpod (Evans *et al.* 2003, p. 55). Yellow starthistle are still present in proximity to the bladderpod population, as is rush skeletonweed (*Chondrilla juncea*).

Wildfire – Wildfire is considered a secondary threat because White Bluffs bladderpod occupy mostly rocky, sparsely vegetated areas. However, fires have burned through portions of its range and appear capable of at least short-lived, negative effects on the subspecies. For example, in July 2007, a large wildfire burned through the northern portion of the White Bluffs bladderpod population. Monitoring conducted the following year found that the average number of plants per 100-m transect was lower in burned transects compared to unburned transects, although the difference was not statistically significant (Newsome and Goldie 2008, p. 5). In 2011, 4 years after the burn, there were more plants in the unburned transects but again there was no significant difference (Newsome 2011, p. 3). The population size estimates in 2008, 2009, and 2010 were lower than in 2007, but in 2011 the population had approximately doubled relative to 2007 (Newsome 2011, p. 4).

Although the subspecies can apparently tolerate some fire, wildfires continue to threaten the population because contemporary fires on the Monument tend to be large and unpredictable, potentially affecting large numbers of plants and significant areas of pollinator habitat. Also, an increase in cheatgrass after the 2007 fire has increased fuel loads and may make future fires more damaging. Fire suppression activities could potentially be as great a threat as the fire itself; firelines are often constructed on the tops of bluffs. In addition, for safety and strategic reasons, firefighting equipment and personnel are commonly staged on ridge tops (Whitehall, R., pers. comm. 2012), although this has not been necessary within the White Bluffs bladderpod population to date.

Recreational Activities and/or ORV Use – Off-road vehicle use is not permitted on the Monument. However, ORV use has been documented in the White Bluffs area, particularly in the southern end of the subspecies' distribution. The location and extent of this threat has been mapped by Monument staff. Damage from ORVs includes crushed plants, disturbed and destabilized soil, and the spread of nonnative plant seeds.

Current Biological Status of the Species:

Overview: At the time of listing, White Bluffs bladderpod was known only from a single population on the White Bluffs of the Columbia River in Franklin County, Washington. In the 1990s, the population occurred intermittently in a narrow band usually less than 10 m (33 ft) wide along an approximately 17-km (10.6-mile [mi]) stretch of the river bluffs, at approximately 152 to 290 m (500 to 950 ft) elevation (Rollins *et al.* 1995, p. 206; Beck 1999, p. 14). The historical distribution of White Bluffs bladderpod is unknown.

Most or all of White Bluffs bladderpod's current distribution is within lands owned by DOE at the Hanford Site (Figure 2). These lands are part of the Monument, which is approximately 78,780 ha (195,000 ac) in size and contains much of the Hanford Reach of the Columbia River. The Central Washington National Wildlife Refuge Complex (NWRC) (formerly Mid-Columbia River) manages the Monument through a Memorandum of Understanding (MOU) with DOE. The remainder of the subspecies' range was on private and WDNR lands (USFWS 2013b, p. 23988), however there have been no recent confirmed reports of White Bluffs bladderpod occurring on either ownership. The approximately 823 ha (2,033 ac) of critical habitat designated by the Service all occurs within the Monument (USFWS 2013c, p. 77002).

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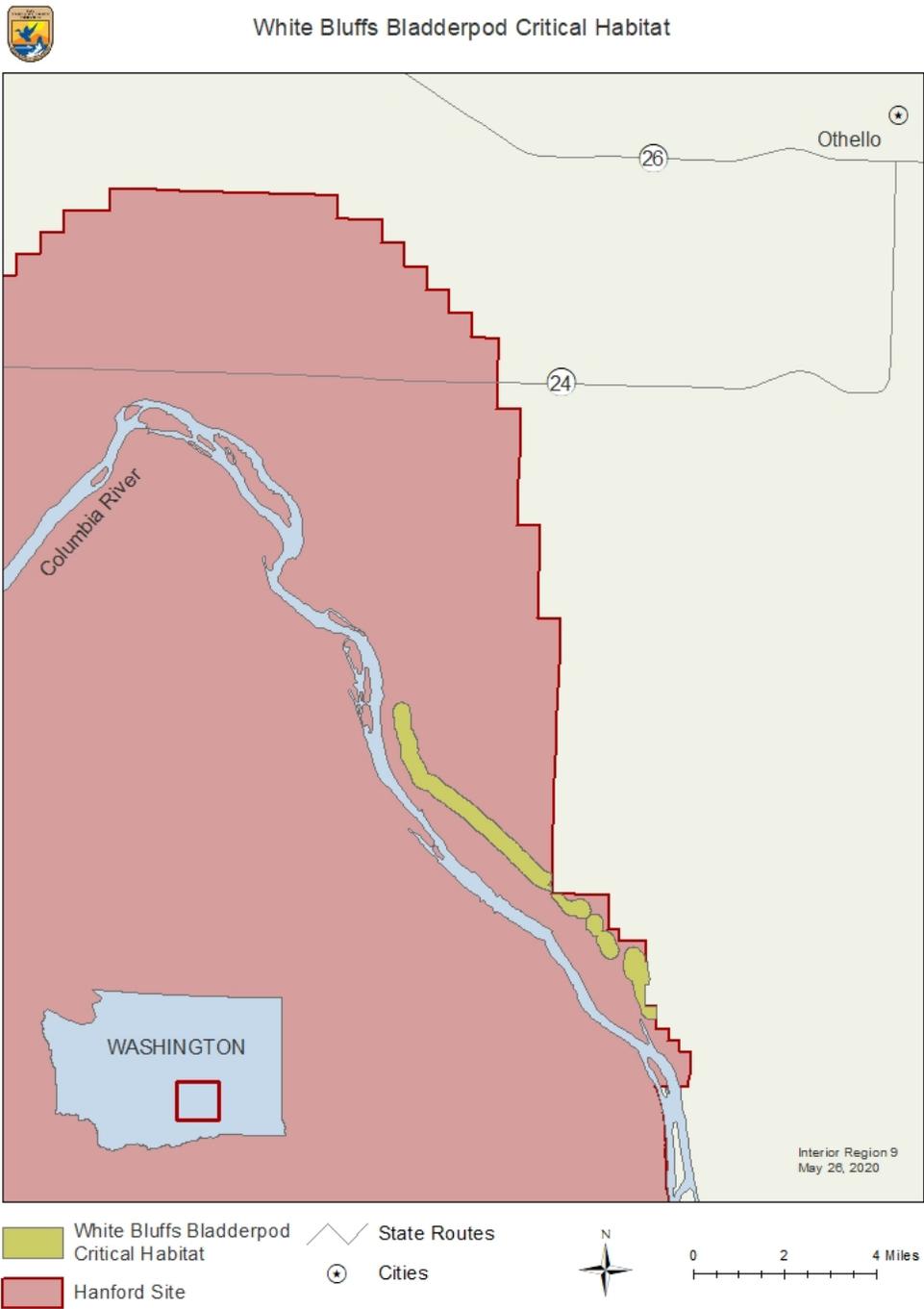


Figure 2. Map of the Hanford Site and designated critical habitat for White Bluffs bladderpod.

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The distribution and size of the White Bluffs bladderpod population is uncertain because monitoring occurs only along permanent transects in a narrow area 3.7 km (2.3 mi) long in the northern part of the subspecies' range. The transects are consecutive, occurring one after the other along the edge of the cliff top. They are in the most physically stable area occupied by the subspecies, and were designed to measure trends over time rather than to monitor the size of the entire population. Population estimates are based on visual surveys of flowering plants in 10 or 20 100-m (328-ft) transects and the mean number of plants per transect is multiplied by 37 to provide an extrapolated estimate for the entire 3.7 km (2.3 mi) long area. There is no set acreage or boundary markers; surveyors record all plants they can see from the cliff top. The number of plants per transect varies widely among transects. The annual population estimate has fluctuated considerably since monitoring began in 1997 (Figure 3). For example, the population estimate was 9,949 plants in 2010 and 58,887 plants in 2011 (Newsome 2011, p. 4). The dramatic 2011 increase was likely related to record-setting spring precipitation following a moist and mild winter (Newsome 2011, p. 2). Since 2011, the population estimate has ranged from 2,529 to 8,472 (Newsome 2019, p. 5) individual plants.

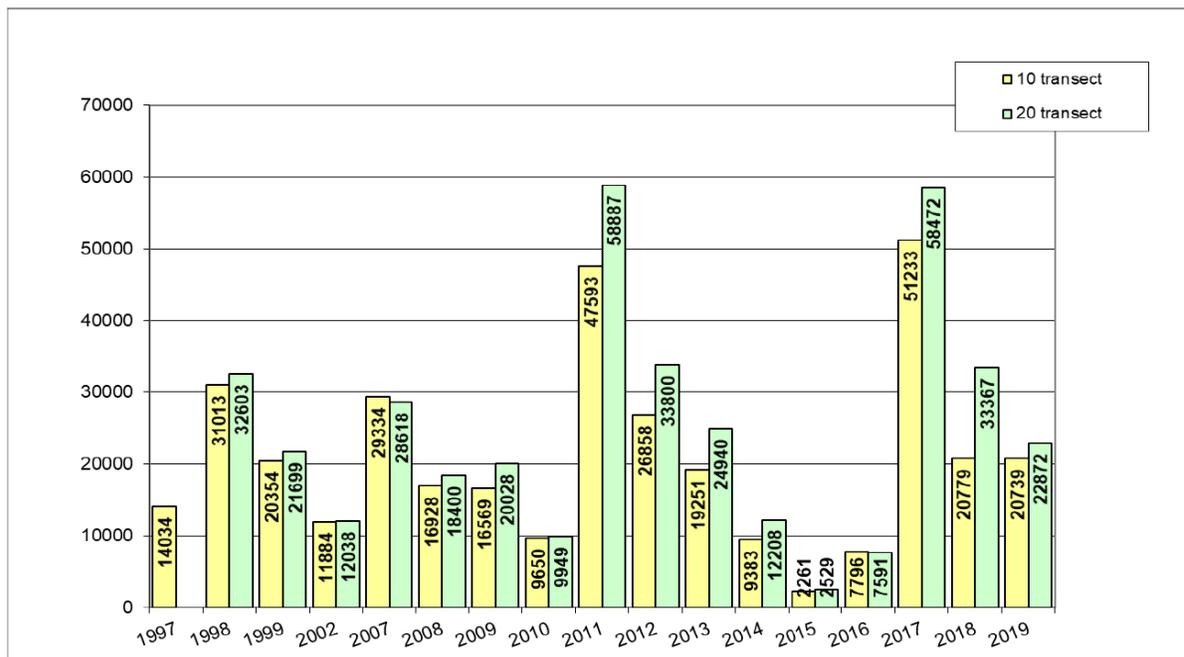


Figure 3. The estimated population size (y-axis) of White Bluffs bladderpod in 3.7 km of its range (Newsome 2019) from 1997 to 2019 (x-axis).

Resiliency, Representation, Redundancy (3Rs): The 3Rs (USFWS 2016, p. 6) are used to evaluate a species' current and future condition, and are described below for White Bluffs bladderpod.

- **Resiliency** – Resiliency “describes the ability of the species to withstand stochastic disturbance events, which is associated with population size, growth rate, and habitat quality” (USFWS 2016, p. 6). White Bluffs bladderpod population size varies greatly from year to year and the exact causes of this variation are unknown but may include soil moisture and air temperature at critical times. Irrespective of cause, the subspecies' capacity to rebound and have very productive years is a resilient trait. The subspecies' ability to re-sprout after fire, short generation time, nearly annual flowering (and sometimes twice annually), deep taproot, and seeds that may be viable in the soil beyond one growing season are also characteristics associated with resiliency. All of the designated critical habitat falls within the Monument, which is managed for conservation by the Service and could be managed to reduce stochastic disturbance where the plants are found. However, the subspecies' specialized habitat requirements may lower its resiliency. Conversion of land to agriculture and groundwater-related bluff slumping have reduced the amount and quality of suitable habitat from pre-development times. Overall, the subspecies has many resilient properties but its location in a small, landslide-prone area with numerous other threats remains concerning.
- **Representation** – Representation “describes the ability of a species to adapt to changing environmental conditions, which is related to distribution within the species' ecological settings” (USFWS 2016, p. 6). The subspecies exists in an extreme environment where average annual rainfall is approximately 15 centimeters (6 inches) and summer high temperatures are often well above 32 degrees Celsius (90 degrees Fahrenheit). Predictions are for even hotter summers. The influence of changing weather patterns on White Bluffs bladderpod is unknown but because of its narrow habitat requirements and confinement to a single location, future changes in environmental conditions may be poorly tolerated. The genetic diversity (*i.e.*, potential to adapt to changing environments) of the population remains to be determined.
- **Redundancy** – Redundancy “describes the ability of a species to withstand catastrophic events, which is related to the number, distribution, and resilience of populations” (USFWS 2016, p. 6). Because White Bluffs bladderpod is restricted to a single population in a small, functionally linear area, the subspecies' redundancy is low. The most likely catastrophic event facing the subspecies is landslides, which have resulted in the loss of plants and habitat. Any loss of habitat reduces the chance the subspecies will persist, given that it is currently restricted to a rare habitat type.

Conservation Actions to Date:

Earlier, the Service developed an action plan for White Bluffs bladderpod; it outlined a number of actions that were intended to reduce threats and thereby reduce the likelihood of Federal listing (USFWS 2009). No additional funding was allocated to implement the actions in the plan. Nevertheless, Monument staff and volunteers completed several actions to secure this subspecies (Newsome 2014, entire). In particular, starting in 2011 they successfully conducted seed collection, seed banking, seedling propagation, and outplanting.

Seeds were collected from the wild and propagated at an urban location where cultivation methods were developed and evaluated. Some of the plants flowered and produced seed while at the propagation location, so it was concluded that specific pollinators are probably not a limiting factor (Newsome, H., pers. comm. 2018). While a portion of the wild-collected seeds were used for growing plants, the rest were banked in collaboration with Rare Care and the Miller Seed Vault at the University of Washington Botanic Gardens. To augment and expand the population, Monument staff identified potentially suitable but unoccupied sites for introduction. From 2013 to 2015, seedlings were planted outside designated critical habitat on the western end of the White Bluffs in Grant County, Washington, where landslides are less likely to occur compared to occupied habitat. As of 2017, the outplanting area had 376 plants, of which 311 were second-generation seedlings (Washington Natural Heritage Program [WNHP] 2018, p. 49). In 2018, only 206 plants were documented so it is uncertain if White Bluffs bladderpod will persist there (Newsome, H., *in litt.* 2018), although annual population fluctuations are common in this subspecies. Of the 206 plants, only 5 were from the original plantings, which is not unexpected given the subspecies' short lifespan, and also indicates successful reproduction.

Other actions taken by the Central Washington NWRC to protect White Bluffs bladderpod include the following:

- Through a mutual aid agreement, the Monument's fire program cooperates with other fire departments to fight fires. All cooperators have maps of sensitive areas on the Monument and attempt to protect the White Bluffs from fire and avoid soil-disturbing activities there.
- The Monument's Wildland Fire Management Plan includes guidelines for fire suppression on the White Bluffs, including prohibition of equipment within 0.4 km (0.25 mi) of the escarpment edge of the White Bluffs due to instability and potential sloughing (USFWS 2001, p. 40).
- Constructing fencing at the bottom of the White Bluffs to prevent incursion of ORVs.
- Controlling non-native yellow starthistle.
- The WB-10 Ponds, grandfathered irrigation ponds in an easement within the Wahluke Unit of the Monument, are managed by the Central Washington NWRC to minimize hydrological effects on the White Bluffs. The U.S. Bureau of Reclamation maintains the right to operate the ponds (USFWS 2008, p. 2-78).

Three plans were developed by the Central Washington NWRC for overall Monument management, fire management, and invasive species control, which address or discuss threats to White Bluffs bladderpod, albeit not completely. These helpful plans would benefit from updating to include current species information and identification of more specific conservation actions and funding sources. The following summarizes the plans as they relate to White Bluffs bladderpod:

- 1) Hanford Reach National Monument Comprehensive Conservation Plan (CCP) and Environmental Impact Statement – This plan (USFWS 2008) provides a strategy and general conservation measures for rare plants that may benefit White Bluffs bladderpod. The strategy includes support for monitoring, inventory and control of invasive species, fire prevention, plant propagation, reintroduction, and Geographical Information Systems (GIS) mapping, but does not prescribe mandatory conservation elements. The CCP acknowledges that protection of the subspecies is needed, that management actions are required to address its protection, and further states that protection of the subspecies requires that these issues be addressed in any management action (USFWS 2008, p. 3-95). The CCP also includes an in-place educational and enforcement program that reduces the likelihood of human-caused wildfires.
- 2) Wildland Fire Management Plan – This plan (USFWS 2001) is an operational guide for managing the Monument’s wildland and prescribed fire programs. The plan defines levels of protection needed to promote firefighter and public safety, protect facilities and resources (including the White Bluffs), and restore and perpetuate natural processes, given current understanding of the complex relationships in natural ecosystems.
- 3) Invasive Plant Species Inventory and Management Plan – This plan (Evans *et al.* 2003) identifies conservation targets, prevention, detection and response activities, prioritization of species and sites, inventory and monitoring, adaptive management, and several other strategies to address invasive species. Infestations of yellow starthistle that threaten White Bluffs bladderpod are identified as high priorities for treatment (Evans *et al.* 2003, p. 25).

Conservation Summary:

Since the listing in 2013, important progress has been made to protect White Bluffs bladderpod from potential threats and augment the population. Seed collection, propagation, and planting techniques have been developed, conservation measures to protect the plant are part of Monument operations, and 2017 was the second highest individual plant count in the last 20 years. In addition, conservation measures outlined in a 2018 Biological Opinion (USFWS 2018, p. 5) were implemented during the 2019-2020 rebuild of an Avista Utilities owned electrical transmission line that runs through occupied habitat. However, the threats that existed at the time of listing remain, indicating that further actions are needed as described below in section 2.

Recovery Priority Number:

White Bluffs bladderpod was initially assigned a Recovery Priority Number of 6C, based on the high degree of threat, a low potential for recovery, and its status as a subspecies; the “C” indicates the potential for conflict with economic activities (USFWS 1983a, p. 43104; USFWS 1983b, p. 51935). The potential conflict with economic activities relates to agriculture, which occurs adjacent to the existing bladderpod habitat.

The probability of recovering White Bluffs bladderpod is moderate because it largely or solely exists on Federal land, in an area unlikely to be developed; its estimated population recently exceeded 50,000 in a portion of its range; it is easily propagated in a greenhouse setting; and it has been successfully outplanted. Nevertheless, the variation in the number of individuals over time is concerning and a minimum viable population size needs to be determined.

White Bluffs bladderpod may have always been a range-restricted, population-limited taxon, as its suitable habitat is naturally limited. The habitat needs of the subspecies are problematic as stochastic events (*e.g.*, wildfire, landslides) could dramatically affect both the number of individuals and their distribution. Protecting the White Bluffs from disturbances is paramount to the subspecies’ survival and recovery.

2) Interim Recovery Program

Interim Recovery Strategy:

The goal of the initial phase of recovery is to protect occupied habitat, maintain or increase the population, and increase the range of White Bluffs bladderpod if suitable habitat exists.

The goal of the recovery program is to establish a framework within which recovery actions are undertaken to ensure the long-term survival of White Bluffs bladderpod, and to control or minimize threats to the extent that the subspecies no longer requires the protections afforded by the ESA and therefore warrants delisting. This section of the Recovery Outline contains actions that should be taken in the near-term (Table 1) as well as long-term actions (Table 2). These actions build on existing conservation actions identified in the Hanford Reach National Monument CCP (USFWS 2013b, pp. 24000, 24004). The subspecies’ biology and threats, discussed previously, are the basis for developing these specific recovery actions.

Action Plan:

The following tables contain near-term (Table 1) and long-term (Table 2) actions that should be taken to address threats and recover White Bluffs bladderpod.

Table 1. Near-term recovery actions for White Bluffs bladderpod, the threats that will be addressed by these actions, how addressing these threats will contribute to recovery, and the potential agencies / entities that may help implement the recovery actions.

Recovery Actions	Threats Addressed	Contributions to Recovery	Potential Agencies / Entities
1. Reduce or eradicate yellow starthistle and rush skeletonweed in and around occupied habitat on the Monument	Nonnative plants	Reduce invasive weed competition and prevent habitat degradation	USFWS ¹
2. Develop and implement an invasive species plan for occupied habitat on the Monument (including annual monitoring and management)	Nonnative plants, wildfire	Reduce fire fuels and invasive weed competition and prevent habitat degradation	USFWS WDNR Washington Native Plant Society
3. Maintain fuel breaks along Highway 24	Wildfire, fire suppression activities, nonnative plants	Reduce risk of catastrophic loss from wildfire, reduce fire fuels and invasive weed competition, maintain pollinator habitat	USFWS
4. Continue mutual aid agreement with other agencies to fight fires	Wildfire, fire suppression activities, nonnative plants	Reduce risk of catastrophic loss from wildfire, reduce fire fuels and invasive weed competition, maintain pollinator habitat	USFWS DOE
5. Implement beneficial projects that serve as conservation measures for the Avista powerline project	Limited geographic range, small population size	Limit habitat degradation and plant mortality, inform decisions on recovery of the population	Avista Utilities

¹ USFWS may include staff from the Ecological Services, National Wildlife Refuges, and other Service Programs.

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Table 1 cont.

Recovery Actions	Threats Addressed	Contributions to Recovery	Potential Agencies / Entities
6. Prevent illegal use of ORVs on the Monument (determine access points, construct and maintain fencing and signage)	Recreational activities and/or ORV use	Prevent habitat degradation	USFWS
7. Map the areas of the White Bluffs experiencing landslides over time, and assess causes of landslides	Slope failure, landslides	Inform decisions on recovery of the population	USFWS U.S. Geological Survey U.S. Bureau of Reclamation WDNR
8. Determine and enhance subspecies' occupancy of state lands	Limited geographic range, small population size	Increase population size, number of populations, and geographic range	WDNR
9. Continue population monitoring, develop methodology to estimate size of entire population on the Monument	Limited geographic range, small population size	Improve understanding of population size and trends, improve data collection, inform decisions on recovery of the population	USFWS WDNR Washington Native Plant Society Rare Care
10. Continue seed banking, propagation, and outplanting, explore direct seeding, and determine if additional areas on the Monument or state lands are suitable for expanding the subspecies' range	Limited geographic range, small population size, climate change	Increase population size, number of populations, and geographic range	USFWS Rare Care Washington Native Plant Society WDNR

Recovery Outline for White Bluffs Bladderpod

Table 2. Long-term recovery actions for White Bluffs bladderpod, the threats that will be addressed by these actions, how addressing these threats will contribute to recovery, and the potential agencies / entities that may help implement the recovery actions.

Recovery Actions	Threats Addressed	Contributions to Recovery	Potential Agencies / Entities
1. Explore the feasibility of the Avista powerline right-of-way being maintained as a fuel break	Wildfire, fire suppression activities, nonnative plants	Reduce risk of catastrophic loss from wildfire, reduce fire fuels and invasive weed competition, maintain pollinator habitat	Avista Utilities
2. After mapping landslides and determining potential causes, formulate and implement actions to reduce landslides throughout the White Bluffs	Slope failure, landslides	Prevent habitat degradation	U.S. Bureau of Reclamation U.S. Geological Survey Natural Resources Conservation Service
3. Reach out to neighboring private landowners who might be willing to conserve habitat and be part of population monitoring and/or outplanting, then implement coordinated actions	Limited geographic range, small population size	Increase population size, number of populations, and geographic range	USFWS ¹ WDNR Franklin Conservation District Natural Resources Conservation Service
4. Determine impacts of climate and microhabitat conditions on population trends	Climate change, limited geographic range, small population size	Inform decisions on recovery of the population	USFWS U.S. Geological Survey
5. Perform genetic study to better understand genetic diversity and ability to adapt	Limited geographic range, small population size	Inform decisions on recovery of the population	U.S. Geological Survey

¹ USFWS may include staff from the Ecological Services, National Wildlife Refuges, Partners for Fish and Wildlife, and other Service Programs.

The actions in Tables 1 and 2 address the threats to this subspecies as outlined in the listing rule. The listing rule did not include pesticides as a threat to White Bluffs bladderpod because specific information was not available (USFWS 2013b, p. 23998). There are at least three potential ways that pesticides could affect the subspecies: (1) direct impacts to plants from spray drift, (2) indirect impacts on pollinators, and (3) indirect impacts on pollinator habitat. To better understand whether pesticides are a threat, a study involving Service and other environmental contaminants specialists could be designed to look at these potential impacts.

3) Preliminary Steps for Recovery Planning

Will a recovery plan be developed:

A recovery plan will be developed, with a draft published for public comment; we anticipate the draft publication in fiscal year 2021.

Type of recovery plan:

A single-species recovery plan will be developed. White Bluffs bladderpod was paired with Umtanum desert buckwheat in listing documents, but the two species are different enough in their life histories, population size, and threats to warrant individual recovery plans.

Who will develop the recovery plan:

The Service will develop the recovery plan. Stakeholders, species experts, and others will be invited to participate in phone calls or meetings as warranted, and will be given an opportunity to review and comment on a draft of the recovery plan prior to its finalization. Partners also will be invited to contribute directly to developing and implementing recovery strategies and actions.

Agencies / entities / Tribes who could potentially help with recovery planning include but are not limited to:

- Washington State Department of Natural Resources, Natural Heritage Program
- Confederated Tribes of the Umatilla Indian Reservation
- Yakama Nation
- U.S. Department of Energy
- U.S. Bureau of Reclamation
- University of Washington
- Avista Utilities
- Botanical experts

Plan for stakeholder role/involvement:

White Bluffs bladderpod is a State-listed endangered species (WNHP 2018, p. 49) and the Service may engage WDNR in recovery actions via ESA Section 6 funding. There is at least one State-owned parcel near the south end of the subspecies' range and maintaining, augmenting, or reintroducing plants there may be important for protecting the subspecies. The Service also may seek a partnership with the Washington Native Plant Society for volunteer and technical help on a number of recovery actions. Other plans for stakeholder involvement are described in Tables 1 and 2.

Recovery planning milestones:

January 2021 – public review of draft recovery plan

January 2022 – final recovery plan

Approved

**Acting Regional Director,
Interior Regions 9 and 12
U.S. Fish and Wildlife Service**

Date _____

Citation

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