DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2012–0017; 4500030113]

RIN 1018–AX72

Endangered and Threatened Wildlife and Plants; Threatened Status for *Eriogonum codium* (Umtanum Desert Buckwheat) and *Physaria douglasii* subsp. *tuplashensis* (White Bluffs Bladderpod)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service, determine to list Umtanum desert buckwheat (***Eriogonum codium***) and White Bluffs bladderpod (***Physaria douglasii*** subsp. ***tuplashensis***) as threatened, under the Endangered Species Act of 1973, as amended (Act). This final rule implements the Federal protections provided by the Act for these species.

DATES: This rule becomes effective on May 23, 2013.

ADDRESSES: This final rule, comments and materials received, as well as supporting documentation used in preparing this rule, are available on the Internet at *http://www.regulations.gov* and at *http://www.fws.gov/wafwo/HanfordPlants.* These documents are also available for public inspection, by appointment, during normal business hours, at U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, 510 Desmond Drive SE., Suite 102, Lacey, WA 98503–1263; (360) 753–9440 (telephone); (360) 753–9008 (facsimile).

FOR FURTHER INFORMATION CONTACT: Ken Berg, Manager, U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, 510 Desmond Drive, Suite 102, Lacey, Washington, 98503–1263, by telephone (360) 753–9440, or by facsimile (360) 753–9405. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Endangered Species Act (Act), a species warrants protection through listing if it is currently, or is likely to become, in danger of extinction throughout all or a significant portion of its range. Listing a species as an endangered or threatened species can only be completed by issuing a rule.

Purpose of Rule: This rule will list Umtanum desert buckwheat and White Bluffs bladderpod as threatened under the Act because both species are likely to become endangered within the foreseeable future due to continued threats.

The basis for our action. Under the Endangered Species Act, we can determine that a species is an endangered or threatened species based on any of five factors: (A) Destruction, modification, or curtailment of its habitat or range; (B) Overuse; (C) Disease or predation; (D) Inadequate existing regulations; or (E) Other natural or manmade factors. We have determined that Umtanum desert buckwheat is threated by wildfire, nonnative plants, seed predation, small population size, limited geographic range, and low recruitment. White Bluffs bladderpod is threatened by wildfire, irrigation-induced landslides and slope failure, harm by recreational activities and off-road vehicle use, nonnative plants, small population size, and limited geographic range.

Peer review and public comment. We sought comments from independent specialists to ensure that our designation is based on scientifically sound data, assumptions, and analyses. We invited these peer reviewers to comment on our listing proposal. We also considered all comments and information received during the public comment period.

Background

It is our intent to discuss only those topics directly relevant to the listing determinations for Umtanum desert buckwheat and White Bluffs bladderpod in this final rule. A summary of topics relevant to this final rule is provided below. Additional information on both species may be found in the Candidate Notice of Review, which was published October 26, 2011 (76 FR 66370).

Geography, Climate, and Landscape Setting

Umtanum desert buckwheat and White Bluffs bladderpod are found only on the Hanford Reach of the Columbia River, the last free-flowing stretch of the Columbia River within U.S. borders. The Hanford Reach lies within the semi-arid shrub steppe Pasco Basin of the Columbia Plateau in south-central Washington State. The region's climate is influenced by the Pacific Ocean, the Cascade Mountain Range to the west, and other mountain ranges located to the north and east. The Pacific Ocean moderates temperatures throughout the Pacific Northwest, and the Cascade Range generates a rain shadow that limits rain and snowfall in the eastern half of Washington State. The Cascade Range also serves as a source of cold air, which has a considerable effect on the wind regime on the Hanford reach. Daily maximum temperatures vary from an average of 1.7 °Celsius (C) (35 °Fahrenheit (F)) in late December and early January, to 36 °C (96 °F) in late July. The Hanford Reach is generally quite arid, with an average annual precipitation of 16 centimeters (cm) (6.3 inches (in)). The relative humidity at the Hanford Reach is highest during the winter months, averaging about 76 percent, and lowest during the summer, averaging about 36 percent. Average snowfall ranges from 0.25 cm (0.1 in) in October to a maximum of 13.2 cm (5.2 in) in December, decreasing to 1.3 cm (0.5 in) in March. Snowfall accounts for about 38 percent of all precipitation from December through February (USFWS 2008, pp. 3.8–3.10).

The Hanford Reach National Monument (Monument), which includes approximately 78,780 hectares (ha) (195,000 acres (ac)), contains much of the Hanford Reach of the Columbia River. All of the land is owned by the Department of Energy (DOE) and was formerly part of the 145,440-ha (360,000-ac) Hanford Site. The Hanford Site was established by the U.S. Government in 1943 as a national security area for the production of weapons grade plutonium and purification facilities. For more than 40 years, the primary mission at Hanford was associated with the production of nuclear materials for national defense. However, large tracts of land were used as protective buffer zones for safety and security purposes, and remained relatively undisturbed.

The Monument was established by Presidential Proclamation in June 2000, to connect these tracts of land, protecting the river reach and the largest remnant of the shrub steppe ecosystem in the Columbia River Basin. The Hanford Reach National Monument Proclamation identifies several nationally significant resources, including a diversity of rare native plant and animal species, such as Umtanum desert buckwheat and White Bluffs bladderpod (USFWS 2008, p. 1–4). The Proclamation also sets forth specific management actions and mechanisms that are to be followed: (1) Federal lands are withdrawn from disposition under public land laws, including all interests in these lands, such as future mining claims; (2) off-road vehicle use is prohibited; (3) the ability to apply for water rights is established; (4) grazing is

prohibited; (5) the Service and DOE (subject to certain provisions) are established as managers of the Monument; (6) a land management transfer mechanism from the DOE to the Service is established; (7) cleanup and restoration activities are assured; and (8) existing rights, including tribal rights, are protected.

All lands included in the Hanford Reach National Monument are Federal lands under the primary jurisdiction of the DOE. Approximately 66,660 ha (165,000 ac) of these acres are currently managed as an overlay refuge by the Service through agreements with the DOE. Overlay refuges exist where the Service manages lands for the benefit of fish and wildlife resources, but is not the primary holder in fee title of lands forming the refuge (USFWS 2008, p. 1–7). Because the Monument is administered as a component of the National Wildlife Refuge System, the legal mandates and policies that apply to any national wildlife refuge apply to the Monument. The Proclamation directs the DOE and the Service to protect and conserve the area's native plant communities, specifically recognizing the area's biologically diverse shrub steppe ecosystem (USFWS 2008, pp. 1.21, 3.5). The DOE manages approximately 11,716 ha (29,000 ac) of land within the Monument and retains land surface ownership or control on all Monument acreage. Thus, the Service and DOE have joint management responsibility for the Monument.

The parcel of land where Umtanum desert buckwheat occurs is on part of what was historically called the McGee Ranch, a historical homestead of more than 364 ha (900 ac) within the greater Hanford installation. Management of this parcel has been retained by DOE due to unresolved issues related to contaminants. This situation is expected to be resolved over time, and management conveyed to the Service, since this area is not essential to the operation of the Hanford facility. Umtanum desert buckwheat and White Bluffs bladderpod both occur in narrow, linear bands on bluffs above and on opposite sides of the Columbia River. The populations are approximately 15 kilometers (km) (9 miles (mi)) apart, and although relatively near to each other, their habitat has a widely disparate geologic history and subsequent soil development. These conditions create unique habitats and substrates that support these and other rare endemic plants (see *Species Information* sections) within the Hanford Reach.

Previous Federal Actions

Candidate History: Umtanum desert buckwheat (*Eriogonum codium*) and White Bluffs bladderpod (formerly *Lesquerella tuplashensis,* now *Physaria douglasii* subsp. *tuplashensis* (see ''Taxonomy'' section below)), were identified as candidates for possible addition to the Lists of Endangered and Threatened Wildlife and Plants in our Annual Candidate Notice of Review, published in the **Federal Register** on October 25, 1999 (64 FR 57542). We refer to both species by their common names throughout this rule. Both species were given a Listing Priority Number (LPN) of 5 at that time; the LPN is assigned to a species based on the immediacy and magnitude of threats and the species' taxonomic status. In 1999, threats to both species were considered to be of high magnitude, but not imminent. However, in 2002, the LPN for Umtanum desert buckwheat was revised to LPN 2, which is assigned when threats to a species are of high magnitude and imminence (67 FR 40663; June 13, 2002), based on new information revealing low reproduction for the species. The LPN for White Bluffs bladderpod was revised to LPN 9 in 2009 (74 FR 57810; November 9, 2009), to reflect new information indicating threats were now moderate to low in magnitude and imminence. In 2009, the Service completed a Spotlight Species Action Plan for White Bluffs bladderpod to set conservation targets and identify actions to achieve those targets for the next 5 years. This plan can be found on the Service's Web site at: *http://www.fws.gov/ecos/ajax/docs/action_plans/doc3090.pdf.* The 2011 Notice of Review, published October 26, 2011 (76 FR 66370), included Umtanum desert buckwheat and White Bluffs bladderpod; both species have been maintained as candidates since 1999.

Petition History: On May 4, 2004, the Service received a petition requesting that Umtanum desert buckwheat, White Bluffs bladderpod, and several other species be listed as endangered under the Act (Center for Biological Diversity *et al.* [CBD] 2004, pp. 49, 100). On July 12, 2011, the Service filed a multiyear work plan as part of a settlement agreement with the Center for Biological Diversity (CBD) and others in a consolidated case in the U.S. District Court for the District of Columbia. The settlement agreement was approved by the court on September 9, 2011, and will enable the Service to systematically review and address the conservation needs of more than 250 species, over a period of 6 years, including Umtanum desert buckwheat and White Bluffs bladderpod.

We proposed listing Umtanum desert buckwheat and White Bluffs bladderpod as threatened under the Act (16 U.S.C. 1531 *et seq.*) with critical habitat (77 FR 28704) on May 15, 2012, and announced the availability of a draft economic analysis. Proposed critical habitat included shrub steppe habitats within Benton County, Washington, for Umtanum desert buckwheat, and within Franklin County, Washington, for White Bluffs bladderpod. The final critical habitat rule can be found elsewhere in today's **Federal Register**.

Species Information

Umtanum Desert Buckwheat

Umtanum desert buckwheat is a long-lived, woody perennial plant that forms low mats. Individual plants may exceed 100 years of age, based on counts of annual growth rings on cross sections of the main stems of recently dead plants. Growth rates are also extremely slow, with stem diameters increasing an average of only 0.17 millimeters (mm) (0.007 in) per year (The Nature Conservancy (TNC) 1998, p. 9; Dunwiddie *et al.* 2001, p. 62). A detailed description of the identifying characteristics of Umtanum desert buckwheat is found in Reveal *et al.* (1995, pp. 350–351). Umtanum desert buckwheat is State-listed as Endangered, with a G1 (i.e., critically imperiled world-wide, and particularly vulnerable to extinction) global ranking and an S1 (i.e., critically imperiled State-wide, and particularly vulnerable to extinction) State ranking (WDNR 2011a, p. 5).

Taxonomy

In 1995, Florence Caplow and Kathryn Beck resumed large-scale rare plant surveys on the Hanford Site that were initiated in 1994 by TNC and the DOE, as part of the Hanford Biodiversity Project. Two previously undescribed plant taxa were discovered, including Umtanum desert buckwheat (Caplow and Beck 1996, p. 5). The species was fully described in Reveal *et al.* (1995), and the current nomenclature has been unchallenged since that time. Umtanum desert buckwheat is recognized as a distinct species, and there is no known controversy concerning its taxonomy.

Habitat/Life History

Umtanum desert buckwheat was discovered in 1995 during a botanical survey of the Hanford installation (Reveal *et al.* 1995, p. 353), and is found exclusively on soils over exposed basalt from the Lolo Flow of the Wanapum

Basalt Formation. As the basalt of the Lolo Flow weathers, a rocky soil type is formed that is classified as lithosol, a term describing the well-drained, shallow, generally stony soils over bedrock (Franklin and Dyrness 1973, p. 347), and talus slopes associated with eroding outcrops and cliffs. These cliffs (scarps), and loose rock at the base of cliffs or on slopes (defined as scree) are found along the crests and slopes of local hills and ridges, including east Umtanum Ridge, where Umtanum desert buckwheat occurs. This type of landform in the Columbia Basin is determined by the underlying basalts, which may be exposed above the soil on ridge tops or where wind and water erode the fine soils away (Sackschewski and Downs 2001, p. 2.1.1).

The Lolo Flow contains higher levels of titanium dioxide and lower levels of iron oxide than the neighboring Rosalia Flow, also of the Priest Rapids Member. The flow top material commonly has a high porosity and permeability and has weathered to pebble and gravel-sized pieces of vesicular basalt (Reveal *et al.* 1995, p. 354). This basalt typically contains small (< 5 mm (0.2 in)) crystals of the mineral olivine and rare clusters of plagioclase crystals (Reidel and Fecht 1981, pp. 3–13). It is unknown if the close association of Umtanum desert buckwheat with the lithosols of the Lolo Flow is related to the chemical composition or physical characteristics of the bedrock on which it is found, or a combination of factors not currently understood (Reveal *et al.* 1995, p. 354).

Preliminary counts indicate that seed set occurs in approximately 10 percent of flowers observed, potentially limiting reproductive capacity. Based on a pollinator exclusion study (Beck 1999, pp. 25–27), the species is probably capable of at least limited amounts of self-pollination, although the percentage of seed set in the absence of pollinators appears to be low. A variety of insect pollinators were observed on Umtanum desert buckwheat flowers, including ants, beetles, flies, spiders, moths and butterflies (TNC 1998, p. 8). Wasps from the families *Vespidae* and *Typhiidae* and a wasp from the species *Crioscioliа* have been observed in the vicinity of Umtanum desert buckwheat, but not on the plant itself. A bumble bee, *Bombus centralis,* has been observed by Washington Department of Natural Resources (WDNR) specialists utilizing flowers of Umtanum desert buckwheat plants (Arnett 2011b, pers. comm.).

Common perennial plant associates of Umtanum desert buckwheat include *Artemisia tridentata* (big sagebrush), *Grayia spinosa* (spiny hopsage), *Krascheninnikovia lanata* (winterfat), *Eriogonum sphaerocephalum* (rock buckwheat), *Salvia dorrii* (purple sage), *Hesperostipa comata* (needle and thread), *Pseudoroegneria spicata* (bluebunch wheatgrass), *Poa secunda* (Sandberg's bluegrass), *Sphaeralcea munroana* (Munro's Globemallow), *Astragalus caricinus* (buckwheat milkvetch), and *Balsamorhiza careyana* (Carey's balsamroot). Common annual associates include *Bromus tectorum* (cheatgrass), *Sisymbrium altissimum* (tumblemustard), *Phacelia linearis* (threadleaf phacelia), *Aliciella leptomeria* (sand gilia). *Aliciella sinuata* (shy gilia), *Camissonia minor* (small evening primrose), and *Cryptantha pterocarya* (wingnut cryptantha).

Historical Range/Distribution

The only known population of Umtanum desert buckwheat occurs along the top edges of the steep slopes on Umtanum Ridge, a wide mountain ridge in Benton County, Washington, where it has a discontinuous distribution along a narrow (25–150 m (82–492 ft) wide by 1.6 km (1 mi) long) portion of the ridge (Dunwiddie *et al.* 2001, p. 59). The species was discovered in 1995 (Reveal *et al.* 1995, p. 354), and there are no verified records of any collections prior to that year.

Current Range/Distribution

It is unknown if the historic distribution of Umtanum desert buckwheat was different than the species' current distribution, but it is likely the species has been confined to this location during at least the last 150 years, as annual growth ring counts from fire-killed plants revealed individual ages in excess of 100 years. Individual plants with greater stem diameters (and, therefore, presumably older) are present, which supports the 150-year minimum locality occupation estimate.

Population Estimates/Status

The only known population of Umtanum desert buckwheat was fully censused (an accounting of the number of all individuals in a population) in 1995, 1997, 2005, and 2011 (see Table 1). In 1995, researchers counted 4,917 living individual plants, and in 1997, researchers counted 5,228 individuals (Dunwiddie *et al.* 2001, p. 61). The 1995 census was ''roughly counted'' (Beck 1999, p. 3) (i.e., there was a greater degree of estimation), while the 1997 count was more precise. In addition, the 1995 count may have overlooked an isolated patch with 79 plants to the east that was discovered in 2011. It is not uncommon for estimated population counts to be substantially lower than precise counts (Arnett 2011a, pers. comm.).

TABLE 1—UMTANUM DESERT BUCKWHEAT POPULATION COUNTS 1995–2011

Census year	Total plants counted
1995	4,917
1997	5,228
2005	4,408
2011	5,169

After a wildfire in 1997 burned through a portion of the population, a subsequent count found 5,228 living and 813 dead individual plants. A minimum of 75 percent of the 813 dead individual plants died as a direct result of the fire (Dunwiddie *et al.* 2001, p. 61). No survival or resprouting was noted in fire-killed plants in following years. Because a more accurate count was used to derive the number of dead individual plants (Beck 1999, p. 3), this total represents a fairly precise measure of the impact of the 1997 wildfire on Umtanum desert buckwheat (Arnett 2011a, pers. comm.), although it is likely some plants were totally consumed by the fire and thereby unidentifiable.

In 2005, researchers reported 4,408 living plants (Caplow 2005, p. 1), which represents a 15 percent decline in the population over an 8-year period. However, this result likely reflects some variability in how the census was performed over the years since the species was discovered in 1995. On July 12, 2011, a complete population census was conducted, which recorded 5,169 living individuals. This count was somewhat higher than average, which could be attributable to a more thorough census, the identification of plant clusters not previously documented, and the recording of larger clumps as containing more than one individual plant. These clumps were likely counted as individual plants in previous counts (Arnett 2011a, pers. comm.).

Demographic monitoring of the largest subpopulation within the main population commenced in 1997, and demonstrated an average 2 percent annual mortality of adult flowering plants. During the 9 years of monitoring, only 4 or 5 seedlings have been observed to survive beyond the year of their germination (Kaye 2007, p. 5). Since 2007, the demographic monitoring plots continue to reflect population declines and minimal recruitment (Arnett 2011b, pers. comm.). Dunwiddie *et al.* (2001, p. 67) documented a lack of plants in the

smallest size classes and the absence of any seed survival over 1 year. Their data did not indicate any spikes or gaps in the size distribution of plants that might reflect years of unusually high or low recruitment of plants, although evidence of such could have been obscured by the variable growth rates of the plants. Populations of long-lived species with low adult mortality can survive with relatively low recruitment rates (Harper 1977 in Dunwiddie *et al.* 2001, p. 67). Further, the survival of a few seedlings each year may be sufficient to replace the occasional adult that dies, or alternatively, an occasional bumper crop of seedlings surviving to maturity during several favorable years may ensure the long-term survival of the population (Dunwiddie *et al.* 2001, p. 67). However, no demographic data supported either of these scenarios for this species (Dunwiddie *et al.* 2001, p. 67).

An unpublished draft population viability analysis (PVA) was completed in 2007 by Thomas Kaye (2007, p. 5), based on 9 years of demographic data. A PVA is a quantitative analysis of population dynamics, with the goal of assessing the risk of extinction of a species. The 2007 study, which took into account observed environmental variability, determined there was little or no risk of a 90 percent population decline within the next 100 years; an approximate 13 percent chance of a decline of 50 percent of the population over the next 50 years; and a 72 percent chance of a 50 percent decline within the next 100 years. The PVA concluded the decline is gradual, consistent with the decline noted by Caplow (2005, p. 1) between 1997 and 2005, and will likely take several decades to impact the population (Kaye 2007, p. 7). Although census data indicates more individuals in 2011 compared to the number of individuals in 1995 and 2005, this increase likely reflects some variability in how the census was performed. The inflorescence for Umtanum desert buckwheat consists of a cluster of flowers arranged on a main stem or branch. As stated earlier, the fact that the 2011 census was somewhat higher than previous plant counts may be attributable to the identification of plant clusters not previously documented, or individually counting plants present in plant clusters (rather than counting the cluster itself as one plant) (Arnett 2011a, pers. comm.). Since 1995, numerous surveys have been conducted at other locations within the lower Columbia River Basin, within every habitat type that appears to be suitable for Umtanum desert buckwheat. However no other populations or individuals have been found to date.

Species Information

White Bluffs Bladderpod

White Bluffs bladderpod is a low-growing, herbaceous, perennial plant with a sturdy tap root and a dense rosette of broad gray-green pubescent leaves (WDNR 2010). The subspecies produces showy yellow flowers on relatively short stems in May, June, and July. The subspecies inhabits dry, steep upper zone and top exposures of the White Bluffs area of the Hanford Reach at the lower edge of the Wahluke Slope. Along these bluffs, a layer of highly alkaline, fossilized cemented calcium carbonate (caliche) soil has been exposed (Rollins *et al.* 1996, pp. 203–205). A detailed description of the identifying physical characteristics of White Bluffs bladderpod is in Rollins *et al.* (1996, pp. 203–205) and Al-Shehbaz and O'Kane (2002, pp. 319–320). White Bluffs bladderpod is State-listed as Threatened, with a G2 (i.e., imperiled world-wide, vulnerable to extinction) global ranking and an S2 (i.e., vulnerable to extirpation) State ranking (WDNR 2011).

Taxonomy

Although specimens of this taxon were originally collected from a population in 1883, the plant material was in poor condition, no definitive identification could be made, and the plant was not recognized as a species at that time. The population was rediscovered in 1994, and was described and published as a species, *Lesquerella tuplashensis,* by Rollins *et al.* (1996, pp. 319–322). A petition requesting that *L. tuplashensis* be listed as endangered under the Act stated that ''the taxonomic status of *Eriogonum codium* (Polygonaceae) as a valid species is uncontroversial (e.g., Reveal et al. 1996; Kartesz 1998)'' (Center for Biological Diversity *et al.* [CBD] 2004, pp. 49, 100). Since then, the nomenclature and taxonomy of the species have been investigated.

In a general paper on the taxonomy of *Physaria* and *Lesquerella,* O'Kane and Al-Shehbaz (2002, p. 321) combined the genera *Lesquerella* and *Physaria* and reduced the species *Lesquerella tuplashensis* to *Physaria douglasii* subsp. *tuplashensis* (O'Kane and Al-Shehbaz (2002, p. 322)), providing strong molecular, morphological, distributional, and ecological data to support the union of the two genera.

Rollins and Shaw (1973, entire) took a wide view of the degree of differentiation between species and subspecies (or varieties) of *Lesquerella,* although many species of *Lesquerella* are differentiated by only one or two stable characters. The research of Rollins *et al.* (1996, pp. 205–206) recognized that, although *L. tuplashensis* and *L. douglasii* were quite similar, they differed sufficiently in morphology and phenological traits to warrant recognition as two distinct species. Simmons (2000, p. 75) suggested in a Ph.D. thesis that *L. tuplashensis* may be an ecotype of the more common *L. douglasii.* Caplow *et al.* (2006, pp. 8–10) later argued that *L. tuplashensis* was sufficiently different from *douglasii* to warrant a species rank because it: (1) Was morphologically distinct, differed in stipe (a supporting stalk or stem-like structure) length and length-to-width ratio of stem leaves, and had statistically significant differences in all other measured characters; (2) was reproductively isolated from *L. douglasii* by nonoverlapping habitat and differences in phenology for virtually all *L. tuplashensis* plants; and (3) had clear differences in the ecological niche between the two taxa.

Based on molecular, morphological, phenological, reproductive, and ecological data, the conclusions in Al-Shehbaz and O'Kane (2002, p. 322) and Caplow *et al.* (2006, pp. 8–10) combining the genera *Lesquerella* and *Physaria* and reducing the species *Lesquerella tuplashensis* to *Physaria douglasii* subsp. *tuplashensis,* provide the most consistent and compelling information available to date. Therefore, we consider the White Bluffs bladderpod a subspecies of the species *Physaria douglasii,* with the scientific name *Physaria douglasii* subspecies *tuplashensis.*

Habitat/Life History

The only known population of White Bluffs bladderpod is found primarily on near-vertical exposures of weathered, cemented, alkaline, calcium carbonate paleosol (ancient, buried soil whose composition may reflect a climate significantly different from the climate now prevalent in the area) (*http://www.alcwin.org/Dictionary_Of_Geology_Description-84–P.htm*). The hardened carbonate paleosol caps several hundred feet of alkaline, easily eroded, lacustrine sediments of the Ringold Formation, a sedimentary formation made up of soft Pleistocene deposits of clay, gravel, sand, and silt (Newcomb 1958, p. 328). The uppermost part of the Ringold Formation is a heavily calcified and silicified cap layer to a depth of at least 4.6 m (15 ft). This layer is commonly called ''caliche'' although in this case, it

lacks the nitrate constituents found in true caliche. The ''caliche'' layer is a resistant caprock underlying the approximately 274–304 m (900–1,000 ft) elevation (above sea level) plateau extending north and east from the White Bluffs (Newcomb 1958, p. 330). The White Bluffs bladderpod may be an obligate calciphile, as are many of the endemic *Lesquerella* (now *Physaria*) (Caplow 2006, pp. 2–12). The habitat of White Bluffs bladderpod is arid, and vegetative cover is sparse (Rollins *et al.* 1996, p. 206).

Common associated plant species include: *Artemisia tridentata* (big sagebrush), *Poa secunda* (Sandberg's bluegrass), *Bromus tectorum* (cheatgrass), *Astragalus caricinus* (buckwheat milk-vetch), *Eriogonum microthecum* (slender buckwheat), *Achnatherum hymenoides* (Indian ricegrass), and *Cryptantha spiculifera* (Snake River cryptantha). Occasionally, White Bluffs bladderpod is numerous enough at some locations to be subdominant.

Because of its recent discovery and limited range, little is known of the subspecies' life-history requirements. In a presentation of preliminary life-history studies, Dunwiddie *et al.* (2002, p. 7) reported that most individuals reach reproductive condition in their first or second year, most adult plants flower every year, and the lifespan of this short-lived subspecies is probably 4 to 5 years. The population size appears to vary from year to year (see Table 2), and the survival of seedlings and adults appears to be highly variable (Dunwiddie *et al.* 2002, p. 8); however, more monitoring is needed to determine the magnitude and frequency of high- and low-number years, as well as to obtain an understanding of the causes of these annual fluctuations (Evans *et al.* 2003, p. 64). Monitoring by Monument staff (Newsome 2011, p. 5) suggests that the annual population fluctuations appear to be tied to environmental conditions, such as seasonal precipitation and temperature.

Historical Range/Distribution

In 1996, White Bluffs bladderpod was only known from a single population that occurred along the upper edge of the White Bluffs of the Columbia River in Franklin County, Washington. The population was described to occur intermittently in a narrow band (usually less than 10 m (33 ft) wide) along an approximately 17-km (10.6-mi) stretch of the river bluffs (Rollins *et al.* 1996, p. 205).

Current Range/Distribution

White Bluffs bladderpod is still known only from the single population that occurs along the upper edge of the White Bluffs of the Columbia River, Franklin County, Washington, although the full extent of the subspecies' occurrence has now been described. Most of the subspecies distribution (85 percent) is within lands owned by the Department of Energy (DOE) and once managed by the Washington Department of Fish and Wildlife as the Wahluke Wildlife Area (USFWS 2008, p. 1–3). This land remains under DOE ownership, and is managed by the Monument. The remainder of the subspecies' distribution is on private land (Newsome 2011, pers. comm.) and WDNR land (Arnett 2012, pers. comm.).

TABLE 2—ESTIMATED* POPULATION SIZE OF WHITE BLUFFS BLADDERPOD

Year	10-Transect sample	20-Transect sample
1997	14,034	N/A
1998	31,013	32,603
1999	20,354	21,699
2002	11,884	12,038
2007	29,334	28,618
2008	16,928	18,400
2009	16,569	20,028
2010	9,650	9,949
2011	47,593	58,887

*Mean number of plants per transect × total number of transects along permanent 100-m (328-ft) monitoring transects (from Newsome 2011, p. 3). An additional 20-transect sample was added to monitoring after 1997 to increase statistical confidence.

Population Estimates/Status

The size of the population varies considerably between years. Censuses in the late 1990s estimated more than 50,000 flowering plants in high population years (Evans *et al.* 2003, p. 3–2) (see Table 2). Since 1997 to 1998 when the monitoring transects currently used were selected, the population ranged between an estimated low of 9,650 plants in 2010 to an estimated high of 58,887 plants in 2011 (see Table 2). Following the monitoring period in 2007, a large wildfire burned through the northern portion of the population within the monitoring transects. Annual monitoring was conducted through 2011 to attempt to determine the effects of fire on White Bluffs bladderpod. The monitoring results indicated that when burned and unburned transects were compared, plants in burned transects appear to have rebounded to some extent (Newsome 2011, p. 5), although the data have too much variability to discern that difference. However, the burned transects appeared to have a mean of 24 percent fewer plants than in the unburned transects.

The high variability in estimated population numbers was confirmed by the 2011 data, which documented the highest population estimate since monitoring began in 1997, even though it immediately followed the year representing the lowest estimate (2010). May 2011 was identified by the Hanford Meteorological Station (*http://www.hanford.gov/page.cfm/HMS*) as the fifth coolest and seventh wettest month of May recorded on the installation since its establishment in 1944 (Newsome 2011, p. 2). This environment likely provided ideal conditions for germination, growth, and flowering for this year's population following a rather moist fall and mild winter season (Autumn 2010 precipitation was 4.6 cm (21.8 inches) above average; winter 2011 precipitation was 0.6 cm (0.24 inches) below average.) (*http://ww.hanford.gov/page.cfm/hms/products/seaprcp*).

Summary of Comments and Recommendations

In the proposed rule published on May 15, 2012 (77 FR 28704), we requested that all interested parties submit written comments on the proposal by July 16, 2012. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. We did not receive any requests for a public hearing.

During the comment period, we received two public comment letters addressing the proposed listing. All substantive information provided during the comment periods has either been incorporated directly into this final determination or is addressed below.

Peer Review

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinions from five knowledgeable individuals with scientific expertise that included familiarity with the species, regional botanical knowledge, the geographical region in which the species occur, and conservation biology principles. We received responses from four of the peer reviewers.

We reviewed all comments received from peer reviewers for substantive issues and new information regarding the proposed listing for the two plant species. The peer reviewers generally concurred with our methods and conclusions, and provided editorial comments, taxonomic clarifications, additional citations, and information on

species distribution, arid lands ecology, geology, and habitat associations to improve the final rule. These comments have been incorporated into the final rule, but have not been individually addressed below. The more substantive peer reviewer comments are addressed in the following summary and have been incorporated into the final rule as appropriate.

Peer Reviewer Comments

(1) *Comment:* One peer reviewer presented recommendations with regard to the control of invasive plant species and the use of herbicides, in light of their effects on pollinators. He also recommended the development of a detailed plan that explicitly describes how noxious and invasive weeds such as cheatgrass (*Bromus tectorum*) would be managed, to minimize risks to Umtanum desert buckwheat, White Bluffs bladderpod, and their supporting habitat's native flora.

Our Response: We appreciate and agree with the comment. In accordance with section 4(f)(1) of the Act, recovery plans for the conservation and survival of both species will be developed and implemented after publication of this final rule. The plans will describe site-specific management actions and objective, measurable criteria, which, when met, would result in the recovery of these species. The recovery plans will address each of the threats described in the listing rule, including invasive species, and propose a series of prioritized actions (which could include pollinator conservation measures) to address those threats.

(2) *Comment:* For Umtanum desert buckwheat, one peer reviewer suggested it may be difficult to identify trends in the size of the population using the data presented in Table 1, because there are apparent differences in census methodologies and no statistical estimate of uncertainty in the values, making the figures less precise than one might normally expect in census counts of plant populations. As a result, he commented that the figures appear not to support the contention that the population is gradually declining. The peer reviewer suggested that ''it would be clearer (and perhaps make a more convincing argument) to present trends from the demographic monitoring in the subpopulation over this entire 15-year monitoring record, rather than summarize just the first 9 years and report that the declines have continued since then.'' The reviewer also recommended the development of a more rigorous monitoring program to improve the accuracy of population estimates.

Our Response: We agree that the total population counts for Umtanum desert buckwheat in Table 1 reflect considerable uncertainty, and that the method for estimating the total population needs to be improved in the future. Section 4(b)(1)(A) of the Act requires that we make determinations based on the best scientific and commercial data available. Demographic monitoring of a subset of the total population indicates a slow decline based on 9 years of high-quality data, in contrast to the census estimates shown in Table 1. That high-quality data represents the best available scientific information, and has been applied in this determination. The next population viability analysis is anticipated within or near 2016, and will be based on at least 15 years of annual data from the demographic study subpopulation, which will improve data precision.

(3) *Comment:* For Umtanum desert buckwheat, one peer reviewer indicated that, while the summary of factors in Table 4 is comprehensive and accurate in assessing individual threats, he did not feel that adequate consideration was given to how the threats interact collectively. The reviewer suggested that because Umtanum desert buckwheat is vulnerable to single catastrophic events such as wildfire, it should be listed as endangered rather than threatened.

Our Response: Pursuant to section 3(20) of the Act, a species is listed as threatened if it is likely to become an endangered species within the foreseeable future, throughout all or a significant portion of its range. Under section 3(6) of the Act, a species is endangered if it is in danger of extinction, throughout all or a significant portion of its range. Therefore, the key statutory difference between threatened and endangered status is the timing of when a species may be in danger of extinction (i.e., either now (endangered) or in the foreseeable future (threatened)). The primary threats to Umtanum desert buckwheat include wildfire, nonnative plants, and increased fuel loads resulting from nonnative plants becoming established. We have considered the combined effect of these threats.

The development of a comprehensive conservation plan (CCP) for the management of the Monument (i.e., any lands managed as part of the National Wildlife Refuge System) is a Service requirement under the National Wildlife Refuge System Improvement Act. This Act provides guidelines and directives for the administration and management of all lands within the system, including ''wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, wildlife management areas, or waterfowl production areas.'' The Secretary of the Interior is authorized to permit by regulations the use of any area within the system provided ''such uses are compatible with the major purposes for which such areas were established.'' (USFWS 2228, p. 793).

The Service published a notice of intent to begin development of this CCP and environmental impact statement (EIS) in the **Federal Register** on June 12, 2002, for public comment. This began a multiyear process to identify issues that needed to be addressed and the management alternatives that would best address those issues (69 FR 40333). The CCP was developed by the Service to protect and conserve biological (and other) resources, and includes several management objectives, including treating invasive species and restoring upland habitat (USFWS 2008 pp. 19–22). In addition, the species is in a very gradual decline, and access to the area where the population occurs is prohibited without special authorization from the Department of Energy. Further, shrub and grass fuels on parts of the ridge where Umtanum desert buckwheat occurs are sparse, which reduces the likelihood that a wildfire event would affect the entire population. These factors collectively reduce the likelihood that extinction is imminent and certain due to a single catastrophic event. Accordingly, we have determined threatened status is appropriate for Umtanum desert buckwheat. Please refer to the ''Cumulative Impacts'' section for a discussion of how we view the collective interactions of each of the threats to this species.

(4) *Comment:* For White Bluffs bladderpod, one peer reviewer stated that ''fully half of the areal extent of the bladderpod population (the southern 5 miles) is immediately abutted by irrigated cropland, and occurs in areas of landslides and slumping bluffs.'' He commented that the southern area would be particularly vulnerable to landslides and slumping, putting the species in more danger of extinction. Because of this risk, the reviewer suggested the species was worthy of a status of endangered. Furthermore, the commenter stated there has been little or no monitoring of the status and trends of the population in the southern portion of the area where it occurs.

Our Response: The threat of active landslides and slumping is most prevalent in approximately 35 percent of the 17-km (10.6-mi) linear extent

(range) of the subspecies. The species is fairly numerous and continuous along the entire linear extent of its range, including those areas that are not experiencing landslides. Further, plants are presently persisting in some areas where landslides have occurred. The bluffs and cliffs outside of the influence of irrigation water are more stable, and presumably at a lower risk to slumping. Because the risk of landslides is relatively low over the majority of the area where the subspecies occurs (65 percent of the range), we have determined that threatened status is appropriate, in light of the definitions of endangered and threatened species in the Act. Please see our response to *Comment* (3) above for Umtanum desert buckwheat for additional information regarding the difference between endangered and threatened status under the Act. Regular monitoring in the southern portion of the area has not been conducted to date, which is primarily due to the presence of mixed ownerships and the physical difficulties of accessing the slumped areas. Identifying an appropriate monitoring plan for the entire White Bluffs bladderpod population will be a primary objective of the recovery planning process under section 4(f) of the Act.

(5) *Comment:* For White Bluffs bladderpod, one peer reviewer stated that, although possible effects of pesticides and herbicides on pollinators are mentioned briefly in the text as a potential threat, the use of chemicals is not included in Table 5 as a potential threat.

Our Response: Agricultural lands do not function as habitat for the White Bluffs bladderpod, but may support pollinators. Although pollinators that forage on agricultural lands may be at risk of being exposed to pesticides, we do not believe this situation rises to a level of threat to the overall population for the following reasons: (1) Agricultural land use is adjacent to approximately 35 percent (rather than a majority) of the population; (2) we presume pesticides and herbicides have been applied on these lands since their initial conversion to agricultural use; (3) White Bluffs bladderpod persists adjacent to the agricultural areas; and (4) we have no scientific evidence with which to base a conclusion that the application of these chemicals represents an indirect threat to White Bluffs bladderpod.

(6) *Comment:* For Umtanum desert buckwheat, one peer reviewer commented that he would rank the severity of threat for recreational activities and/or ORV use as moderate (rather than low), since an ATV or a couple of motorbikes moving through the population, however unlikely, could have at least moderate impacts.

Our Response: ''Scope'' as applied in our assessment refers to the extent of species numbers or habitat affected by a threat; ''Intensity'' refers to the intensity of effect by the threat on the species or habitat; and ''Timing'' refers to the likelihood of a threat currently affecting the species. Although a determined individual could trespass in the area, we believe the deterrents that are in place, including access restrictions, ''unauthorized entry prohibited'' signs, fencing, and enforcement, significantly reduce the likelihood of a trespass event. As a result, we have no substantive information that would indicate these activities represent an ongoing threat to the Umtanum desert buckwheat population.

(7) *Comment:* For White Bluffs bladderpod, one peer reviewer recommended that we provide a statistical test or present the numbers used to draw the conclusion that a comparison of burned and unburned transects indicate that plants in burned transects appear to have rebounded to some extent.

Our Response: The citation used to support this observation has been added. The author of the report acknowledges some uncertainty because the data has too much variability for us to discern that difference with any confidence; the final rule has been clarified in that regard.

(8) *Comment:* For White Bluffs bladderpod, one peer reviewer commented that the invasive plant species inventory and management plan developed for the Hanford Monument could be argued to be an inadequate existing regulatory mechanism under Factor D, since threats can be minimized through consistent invasive plant management.

Our Response: The purpose of the Biodiversity Studies of the Hanford Site 2002–2003 study (Evans *et al.* 2003, entire), was to address some of the outstanding questions related to a previous study, and was not intended to establish a regulatory program or mechanism. Regardless, our determination that the invasive species management plan is not a regulatory mechanism with regard to Factor D does not affect our status determination for this species.

Public Review Comments

(9) *Comment:* One commentor supported the listing of both species, and recommended that we clearly distinguish White Bluffs bladderpod *(Physaria douglasii* subsp. *tuplashensis)* from the more common and wide-ranging Columbia bladderpod *(Physaria douglasii).*

Our Response: The research that recognizes White Bluffs bladderpod as a species (currently a subspecies) is included in the ''Taxonomy'' section of this final rule (Caplow *et al.* (2006, pp. 8–10). This research established that the two species differ with regard to numerous measurable physical traits. They also occur in different habitats, have different reproductive timing, and occupy different ecological niches.

(10) *Comment:* One commentor recommended that public access not be restricted any further than it currently is, once the species is listed, and that neither species has been impacted to date by lawful public access.

Our Response: This rule serves only to list both species under the Act, thereby providing the Act's protections. Any decisions regarding changes in management of access to areas occupied by the species will be made through separate processes by the agencies that administer those lands.

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and (E) other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination. Each of these factors for both Umtanum desert buckwheat and White Bluffs bladderpod are discussed below.

Umtanum Desert Buckwheat

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Caplow and Beck (1996, pp. 40–41) and other studies indicate that threats to Umtanum desert buckwheat and its habitat are primarily due to wildfire and associated firefighting activities (Beck 1999, pp. 27–29; Dunwiddie *et al.* 2001, p. 66). The invasion of nonnative plants

that increase the availability of wildfire fuel sources is also a threat, as discussed below. Unauthorized livestock trespassing, prospecting, and off-road vehicle use represent potential threats, which appear to be presently reduced because of improved boundary integrity, access controls, fencing, and enforcement. Below is a detailed discussion of these threats and their potential effects on survival and recovery of the species.

Wildfire: Fire may be the primary threat to Umtanum desert buckwheat, and it is likely to become an even greater threat if the frequency or severity of fires increases (TNC 1998 p. 9; Dunwiddie *et al.* 2001, p. 62). Prior to manmade disturbances (livestock grazing, introduction of exotic species, and farming), the historic fire regime was a 32- to 70-year fire return interval of small, high-intensity fires that removed small patches of the fire-intolerant shrub overstory. Small, infrequent fires maintained bunchgrass openings within the shrub-steppe habitat, providing for both shrub and grassland communities. The historic fire regime has been significantly altered by sociopolitical and economic factors. After the 1900s, human activities interrupted the natural fire interval and patterns of burning. Agricultural development and livestock grazing reduced the light fuels that would normally carry a fire; livestock grazing also had the effect of suppressing native bunchgrasses and allowing nonnative invasive species such as *Bromus tectorum* (cheatgrass), *Sisymbrium altissimum* (tumblemustard), and native sagebrush densities to increase (USFWS 2008, p. 3–15). Cheatgrass may compete seasonally with Umtanum desert buckwheat for space and moisture. In turn, the establishment and growth of highly flammable cheatgrass increases the likelihood of fire (Link *et al.* 2006, p. 10), potentially further negatively (or adversely) impacting the Umtanum desert buckwheat population.

In mid-August 1984, approximately 80,800 ha (200,000 ac) both on and off the Hanford Site were burned in a fire that expanded 20 miles westward during a 24-hour period. The 1984 fire was initiated by a lightning strike on private land (DOE 2000, p. 3–1). During the summer of 1997, a fire escaped from the Yakima Training Center (U.S. Department of the Army) and traveled down the ridge occupied by Umtanum desert buckwheat. The fire burned on all sides and partially through the population, which caused considerable mortality of adult plants (Dunwiddie *et al.* 2001, p. 60). It was conservatively estimated that up to 20 percent of the population may have been killed by the fire event (Dunwiddie *et al.* 2001, p. 62). The fire was most severe where vegetative cover was dense and less severe on thinner soils supporting little or no vegetation. Shrub and grass fuels on parts of the ridge are sparse, and the fire was patchy in the area where Umtanum desert buckwheat is located (Newsome 2011, pers. comm.). In late July 1998, a wildfire triggered by a lightning strike burned approximately 2,828 ha (7,000 ac) before it was contained (DOE 2000, p. 3–1). From 2001 to 2011, there have been 84 wildfire incidents documented, affecting approximately 38,164 ha (94, 460 ac) of lands within the Monument (see Table 3).

TABLE 3—WILDFIRE HISTORY, HANFORD MONUMENT LANDS AND HANFORD REACH/SADDLE MOUNTAIN NATIONAL WILDLIFE REFUGE

Year	Number of fires	Acres burned	Hectares burned
2011	2	1	0.4
2010	3	3,350	1,353
2009	10	529	214
2008	6	1,340	542
2007	8	77,319	31,237
2006	5	34	14
2005	8	10,910	4,408
2004	8	41	17
2003	16	512	207
2002	7	299	121
2001	11	125	51
Totals	84	94,460	38,164.4

http://www.fws.gov/fire/program_statistics/ (acres/hectares rounded)

Umtanum desert buckwheat appears to be intolerant of fire, and plants were easily killed. Even plants that were singed but not visibly charred appeared to be negatively affected, and many died the year following the fire. The fire did not stimulate vigorous new growth on established plants or sprouting from the plants' root crowns, which is sometimes observed with other species. In addition, there was no apparent flush of seedlings the following spring. Based on this lack of regeneration, or resprouting from burned plants, the species does not appear to be fire-tolerant (Dunwiddie *et al.* 2001, p. 66). Due to the intensity of the fire in some areas, many plants were entirely consumed and no traces remained that could be definitively identified, which led researchers to believe that the total impact of the 1997 fire on the population was likely considerably higher than the 813 burned plants documented. The long-term impact of the fire to the population is unknown, but may be significant given the slow growth rates, minimal recruitment, and the increase in cheatgrass on the site following the fire. Cheatgrass plants are interspersed with Umtanum desert buckwheat plants, thus increasing their flammability (Dunwiddie *et al.* 2001, pp. 66, 68). Mortality from the fire occurred primarily among plants growing where associated vegetation was more abundant, thereby providing fuel to carry the fire. After the fire, a reduction in native plant diversity and loss of shrub components was also observed in areas adjacent to the population. Based on the best available information, wildfire represents an ongoing threat to Umtanum desert buckwheat.

Fire Suppression Activities: In addition to wildfire itself, fire suppression activities could present a threat to the species if they occur in the same area as the population, since this species appears to be highly sensitive to any physical damage (see discussion

under off-road vehicles below). The Umtanum desert buckwheat population is located on a flat natural fire break of rocky soils above steep-slopes, where fire lines and firefighting equipment would tend to be concentrated (Whitehall 2012, pers. comm.; Newsome 2011, pers. comm.). Although fire suppression activities did not take place within the Umtanum desert buckwheat population during the response to the 1997 fire, the surrounding area is at high risk of wildfire from human and natural (lightning) ignition sources. The Service's fire program statistics (see Table 3) indicate a recurrence of wildfire events within Monument lands, which would be anticipated to continue.

The 2001 Hanford Reach Wildlife Fire Management Plan prescription for this area states that ''except on existing roads, the use of any equipment (including light engines) within ¼ mile of the escarpment edge of the Umtanum Ridge is prohibited because of surface instability and potential for sloughing at the escarpment. Protection of sensitive resources is an objective unless achieving this objective jeopardizes either firefighter or public safety'' (USFWS 2001, p. 36). Accordingly, if a wildfire were to occur in the surrounding area, protection of the Umtanum desert buckwheat population may not be possible if fire direction and firefighter/public safety considerations were to necessitate establishing fire lines or response equipment staging areas within or near the population. Although the need for wildfire suppression activities near or within the Umtanum desert buckwheat population is unpredictable, this activity is considered a threat to this species based on the Monument's wildfire history (see Table 3).

Nonnative Plant Fuel Sources: Another potential consequence of fire and other disturbances that remove native plants from the shrub steppe communities of eastern Washington is the displacement of native vegetation by nonnative weedy species, particularly cheatgrass. As a result of the 1997 fire, a higher percent cover of weedy plant species, including cheatgrass, has become established within and around the Umtanum desert buckwheat population. Wildfire raises the percent cover of weedy species, thereby increasing the availability of ground fuels, which enhances the ability to carry wildfire across the landscape into previously fire-resistant cover types, including habitat for Umtanum desert buckwheat. Accordingly, nonnative weedy species represent an ongoing threat to the species.

Off-road Vehicles and Hikers: Trespassing by hikers and people driving off-road vehicles (ORVs) has occurred in the vicinity of and within the Umtanum desert buckwheat population (Caplow 2005, pers. comm.). The open cliff edge where the plants grow is an attractive place for human traffic because of the compact substrate, sparse vegetative cover, and the view overlooking the Columbia River. In 2004 and 2005, the Bonneville Power Administration (BPA) reopened and improved a steep road on the top of a ridge to the substation on China Bar below. The road was then passable to two-wheel drive vehicles and, up until the summer of 2005, was inadequately fenced and gated to prevent trespass (Caplow 2005, pers. com.). The entire known population exists within a narrow corridor where human traffic could be expected to concentrate. Umtanum desert buckwheat plants are easily damaged by trampling or crushing by ORVs, are sensitive to physical damage, and are very slow to recover if capable of recovering at all. Within 2 days of being run over by trespassing dirt bikes, portions of damaged plants showed signs of further decline, and some of the damaged plants subsequently died (TNC 1998, p. 62).

This threat appears to have been reduced since direct access to the site has been gradually fenced off over time, the site has been marked with prohibited entry signage, and consistent enforcement is taking place. Although unauthorized access is prohibited, there remains a potential for trespass since an open road is located approximately 0.5 km (0.3 mi) (slope distance) below the population through lands commonly used for recreation. A fence, located between the road and the Umtanum desert buckwheat population, should further discourage ORV or hiker trespass incidents. Based on the available evidence, we have no substantive information that would indicate ORV or hiking activities represent ongoing threats to the species, provided current security and boundary integrity efforts are maintained. We will continue to monitor these activities as additional information becomes available.

Livestock: A potential threat of trampling to Umtanum desert buckwheat could occur if livestock were to escape from a pasture area on China Bar, approximately 0.4 km (0.25 mi) (slope distance) below the population, although such an occurrence has not been observed or documented to date. If an escape were to happen, it could impact the species by direct means such as crushing and mortality through grazing, and indirect means, including soil disturbance, compaction, and importation of invasive species by seed carried on the body or through feces. In addition, areas disturbed by livestock could increase bare soil areas, making them more suitable for the establishment of invasive plant species. This potential threat has been reduced under the terms of a DOE permit issued to the rancher who conducts the seasonal pasturing operations. The DOE permit restricts the seasonal movement of livestock between pastures by way of a paved road directly below the Umtanum desert buckwheat population (Hathaway 2001, pers. comm.). In addition, there is a fence between the paved road and the population. Based on the available evidence regarding permit requirements and boundary integrity, we have no substantive information indicating livestock trespass represents an ongoing threat to the species.

Prospecting: Prospecting by rock collectors was initially thought to be a potential threat to Umtanum desert buckwheat. Excavations up to 1.5 m (5 ft) in diameter and 1.2 m (4 ft) deep occur throughout the area occupied by the species (Caplow 2005, pers. comm.), although their age is uncertain. Some may predate 1943, when the DOE acquired the land as part of the Hanford installation, and others may reflect more recent activity. Continuation of this activity could threaten a large portion of the Umtanum desert buckwheat population by trampling, uprooting, or burial of plants during these activities. Although prospecting could be a threat, it has not been observed since the species' discovery in 1995, likely because of increased boundary integrity, improved fencing, restrictive signage, and enforcement. We have no information that would indicate any recent prospecting or other unauthorized entry into the site has occurred. Therefore, based on the available evidence, we have no substantive information that would indicate prospecting activities represent an ongoing threat to the species.

Based on the information above, the specific activities discussed under Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range present a threat to Umtanum desert buckwheat and its habitat. These include wildfire, nonnative plant fuel sources, and potentially wildfire suppression activities. Trespassing by off-road vehicles, hikers, and mineral prospectors are not considered ongoing threats at this time, based on permit requirements, access restrictions,

boundary fencing, signage, and enforcement actions that are in effect for the area where this population occurs.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The regulations at 50 CFR 27.51 prohibit collecting any plant on any national wildlife refuge without a special use permit. Evidence of overutilization has not been documented since the discovery of Umtanum desert buckwheat in 1996. In order to maintain a secure source for seed and provide some assurance of maintaining the genome of Umtanum desert buckwheat over time, Berry Botanic Garden in Portland, Oregon, has collected and stored several seed accessions for the species. The facility currently has 401 seeds that were collected in 1997, and 1,108 seeds collected in 2001 and 2002 from an unknown number of plants (Gibble 2011, pers. comm.). Based on a thorough accounting of all activities on the site by researchers and DOE, there is no evidence that commercial, recreational, scientific, or educational use of this species is occurring at a level that would threaten the population.

C. Disease or Predation

Evidence of disease has not been documented in Umtanum desert buckwheat; however, predation of seeds by ants and removal of flower heads by an unknown species has been observed by researchers during demographic monitoring trips.

Researchers from The Nature Conservancy observed western harvester ants (*Pogonomyrmex occidentalis*), a common native species, gathering mature achenes (seeds) of Umtanum desert buckwheat plants and transporting them to their underground colonies (Dunwiddie *et al.* 2001, p. 66). Ants have also been observed discarding the inedible remains of achenes above ground, near the colony. Evidence of seed predation by ants was commonly observed by different researchers between 1999 and 2004 in numerous locations, although it has not been observed on Umtanum desert buckwheat in recent years (Arnett 2011c, pers. comm.). The percentage of achenes consumed by ants and other insects, and the degree of impact this activity may be having on the available seed bank is unknown, although no Umtanum desert buckwheat seedlings have been observed successfully germinating or becoming established near ant colonies. Ant predation of seeds has been shown to be a significant factor in the viability of at least one other rare *Eriogonum* taxon *(Eriogonum umbellatum* var. *torreyanum* (sulfur flower buckwheat)) (TNC 1998, p. 9).

Because ants have been observed moving on and between flowers, they may also be contributing to the pollination of Umtanum desert buckwheat. Whether seed predation by ants is a significant threat to the species based on its current demographic status, or to what degree the threat is offset by potential benefits of pollination is unclear. During the 2011 census of Umtanum desert buckwheat, numerous flower heads that had been clipped off and were lying on top of or very near the plants were observed. The species responsible is unknown, although there was no evidence of mutilation or consumption of the flower structure (Arnett 2011c, pers. comm.). As stated earlier, no Umtanum desert buckwheat seedlings have been observed successfully germinating or becoming established near ant colonies. Because seed predation and the removal of flowering structures could significantly reduce the reproductive potential of the species, which is already in gradual decline based on the results of the PVA, we consider these activities to be ongoing threats to Umtanum desert buckwheat. We are unaware of any other disease or predation interactions that represent potential threats to this species.

D. The Inadequacy of Existing Regulatory Mechanisms

Umtanum desert buckwheat is designated as endangered under the State of Washington's list of endangered, threatened, and sensitive vascular plants (WDNR 2011a, p. 5). The WDNR Status and Ranking System of the Washington Natural Heritage Program (*http://www1.dnr.wa.gov/nhp/refdesk/lists/stat_rank.html*) identifies the State ranking for buckwheat as (1) G1 (critically imperiled globally and at very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors); (2) S1 (critically imperiled in the State because of extreme rarity or other factors making it especially vulnerable to extirpation (typically 5 or fewer occurrences or very few remaining individuals or acres)); and (3) endangered (any taxon in danger of becoming extinct or extirpated from Washington). Populations of these taxa are at critically low levels or their habitats have been degraded or depleted to a significant degree. Listing the species as threatened will invoke the protections under the Act, including consultation and development of a recovery plan. The State ranking does not provide any protections, whereas Federally listing the species will impose legal and regulatory requirements directed toward recovery. Therefore, the factors contributing to the species' decline with regard to the State ranking will be addressed and mitigated, over time. Further, some actions are already being taken to protect the population, as has been discussed earlier (e.g., fencing, prohibited entry signs, permit conditions for livestock movement, enforcement, etc.). We coordinated the proposed rule with the Washington Department of Natural Resources, who did not identify any concerns with regard to the proposed threatened status for this species under the Act.

The State of Washington's endangered, threatened, and sensitive plant program is administered through the Washington Natural Heritage Program (WNHP), which was created to provide an objective basis for establishing priorities for a broad array of conservation actions (WDNR 2011b, p. 2). Prioritizing ecosystems and species for conservation offers a means to evaluate proposed natural areas and other conservation activities (WDNR 2011b, p. 3). The WNHP is a participant in the Arid Lands Initiative, which is a public/private partnership attempting to develop strategies to conserve the species and ecosystems found within Washington's arid landscape. The WNHP assists in identifying conservation targets, major threats, and potential strategies to address them (WDNR 2011b, p. 4). The DOE does not have a rare plant policy that provides specific protection for the species, and presently retains management responsibility for the lands where Umtanum desert buckwheat occurs. Once contaminant issues are resolved in this area, management responsibility will be conveyed to the Service, as a part of the Monument, who would take the status of the species into account in their management strategies where the population occurs.

Agricultural development and livestock grazing reduced the light fuels that would normally carry a fire, and allowed nonnative invasive species like cheatgrass to increase (USFWS 2008, p. 3–15). The establishment of highly flammable cheatgrass within the Umtanum desert buckwheat population increases competition for space and moisture, and the likelihood that a wildfire could negatively impact the species. As fires become larger, the opportunity for seed dispersal is also increased as nonnative species invade burned areas. Nonnative species like cheatgrass can be dispersed in several

ways, including long-distance dispersal facilitated by humans and animals. The barbed florets are ideally adapted to being picked up by clothing, feathers, and fur. Seeds can also be dispersed by machinery or vehicles. Animals may carry cheatgrass seed in their feces and hooves, and seed-caching rodents and harvester ants can disperse seeds intermediate distances through caching activity. Cropland, particularly fields of winter wheat and dryland hay, may also be potential seed sources to nearby natural areas and rangelands, as cheatgrass is a common weed (*http://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html*).

The Hanford Fire Department maintains four fire stations on the Hanford Reservation (USFWS 2001, Appendix D, p. 74). The Service and the Hanford Fire Department have entered into a cooperative agreement, under which either organization can provide firefighting support (USFWS 2001, Appendix D, p. 75) on lands under the jurisdiction or responsibility of the other party (DOE 2011, p. 84). The concept of closest forces is the guiding principle of initial attack suppression. This agreement does not provide specific conservation measures for the protection of Umtanum desert buckwheat, but does acknowledge the presence of plants unique to the site. The objective for this area states that ''except on existing roads, the use of any equipment (including light engines) within ¼ mile of the escarpment edge of the Umtanum Ridge is prohibited because of surface instability and potential for sloughing at the escarpment. Protection of sensitive resources is an objective unless achieving this objective jeopardizes either firefighter or public safety'' (USFWS 2001, p. 36).

Numerous wildland fires occur annually on lands in and surrounding the Monument. Many are human-caused resulting from vehicle ignitions from roads and highways, unattended campfires, burning of adjacent agricultural lands and irrigation ditches, and arson. Fires of natural origin (lightning caused) also occur on lands within and adjacent to the Monument (USFWS 2001, p. 171). Since wildfires are unpredictable with regard to their location and intensity, a fire management plan is necessarily designed to be a response, rather than a regulatory activity. Appendix R in the CCP identifies the National Wildlife Refuge System Strategic Goals and the Monument RONS and MMS Project Lists. The Refuge Operating Needs System (RONS) documents and prioritizes staffing and operational needs, and reports accomplishments when projects are completed. The Maintenance Management System (MMS) documents and prioritizes field facility and equipment needs, and also includes a reporting component. The CCP identifies several activities and projects that would be implemented to reduce wildfire risks as funds become available, including conducting fire history studies, purchasing firefighting equipment, establishing a fire bunkhouse, and conducting fire effects/rehabilitation monitoring studies (USFWS 2008, Appendix R–6).

All collecting is prohibited on the Monument, including antlers, bones, rocks, artifacts, and plant life. Regulations also prohibit fires on Monument lands (Hanford Reach National Monument Hunting Regulations, 2011). The Revised Hanford Site 2011Wildland Fire Management Plan (DOE 2011, p. 176) addresses Umtanum desert buckwheat briefly in a specific accounting of sensitive resources located on the site. The plan states that ''due to the sensitive nature of the biology of the Hanford Site, an on-call Mission Support Alliance biologist will be requested to assist the command staff in protecting the environment during suppression efforts.'' This requirement does not remove the wildfire threat to the species, but may make damage during active fire suppression less probable.

The 1997 wildfire initiated by the U.S. Army Yakima Training Center fire resulted in mortality to 10–20 percent of the population (see Factor A and Table 1). The threat of wildfire originating on the nearby U.S. Army Yakima Training Center and spreading to the Umtanum desert buckwheat site remains, as does the potential for ignition to occur along the BPA transmission line corridor, which crosses the population. Fire could also originate below the Umtanum desert buckwheat site on China Bar and rapidly burn upslope, since this area is commonly used by recreationists. The Hanford Reach National Monument CCP acknowledges that wildland fire will be suppressed when possible, suppression techniques will be designed to minimize surface disturbance in the vicinity of sensitive resources, and fire control policies will be implemented to reduce the risk of human-caused wildland fire (USFWS 2008, p. 4–8). However, based on the recent wildfire history and acreage affected (see Table 3), fire planning documents are not able to address all possible scenarios. In addition, numerous agencies must coordinate firefighting on this landscape, ignitions from recreationists remain a risk, and timely and effective initial firefighting responses may be difficult. For example, before it was contained, the 24 Command Wildfire (discussed in Factor A above) charred nearly 66,256 ha (164,000 ac) of land both on and off the Hanford site, even though the Hanford Fire Department arrived on scene approximately 20 minutes after the incident was reported. At that time the fire was approximately 4 ha (10 ac) in size (DOE 2000, pp. ES–2–ES–3).

Although the WNHP and Monument CCP are important tools for identifying conservation actions that would benefit Umtanum desert buckwheat, these programs are not adequate to completely eliminate threats to the species. For example, the threat of wildfire cannot be completely eliminated because of the numerous potential ignition scenarios, including lightning, arson, recreational carelessness, cigarettes, motor vehicle accidents, or other actions. In addition, a fire management plan is necessarily designed to be a response, rather than prescriptive strategy, since wildfires are unpredictable with regard to their location and severity. Accordingly, the impact of wildfire to Umtanum desert buckwheat is not being eliminated by existing regulatory mechanisms, because of the many potential ignition scenarios on the lands within and surrounding the area where the species occurs.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Umtanum desert buckwheat has a small population size and distribution, and suffers from low recruitment (Kaye 2007, p. 3; Caplow 2005, p. 3). These features make it particularly susceptible to potentially changing climate conditions. For instance, regional climate change models indicate a rise in hotter and drier conditions, which may increase stress on individuals as well as increase wildfire frequency and intensity.

Population structure: The typical size distribution of perennial plants consists of more individuals in smaller and presumably younger size-classes, than in larger or older ones. However, Umtanum desert buckwheat has fewer plants in smaller size-classes than in larger ones. The only known population of this species is dominated by mature plants with little successful establishment of seedlings. The majority of individual plants have a strong tendency to remain in the same size class, and presumably age class, from 1 year to the next. In addition, adult mortality averages 2 percent annually (Kaye 2007, p. 3). Between 1997 and

2006, only five to six seedlings in all demographic monitoring plots were observed to survive longer than 1 year, and in 2005, which was preceded by a dry winter, no germination was observed (Caplow 2005, p. 3).

The lack of establishment and survival of seedlings is a threat, as few plants are becoming established as replacements for plants that die. Several factors may be responsible, such as exposure of young plants to high winds and temperatures and very low spring and summer precipitation. Other possible factors include low seed production, low seed or pollen viability, low seedling vigor and survival, impacts to plant pollinators or dispersal mechanisms, and flowering structure removal/insect predation of seeds (as described under Factor C). Researchers have had some success in germinating and growing Umtanum desert buckwheat in containers, which may indicate that the failure to establish seedlings in the wild may not be due to low fertility, but may be related to conditions necessary for survival after germination (Arnett 2011c, pers. comm.). Long-term monitoring and research may determine the cause of the population's skewed size distribution. A seed bank study has shown that viability of buried seed decreases dramatically after the first year, suggesting a very small and short-lived seed bank for Umtanum desert buckwheat (Caplow 2005, p. 6).

Considered in total, these factors likely combine effects to create negative recruitment for Umtanum desert buckwheat. This theory is supported by Kaye's findings (2007, p. 5) that the population appears to be in a gradual decline of approximately ⅔ of 1 percent per year. Negative recruitment due to the factors described above combined with a small population size present a significant threat to the species.

Climate change: Our analyses under the Endangered Species Act include consideration of ongoing and projected changes in climate. The terms ''climate'' and ''climate change'' are defined by the Intergovernmental Panel on Climate Change (IPCC). ''Climate'' refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term ''climate change'' thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78).

Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change. The potential impacts of a changing global climate to Umtanum desert buckwheat are presently unclear. All regional models of climate change indicate that future climate in the Pacific Northwest will be warmer than the past. Together they suggest that rates of warming will be greater in the 21st century than those observed in the 20th century. Projected changes in annual precipitation, averaged over all models, are small (+1 to +2 percent), but some models project an enhanced seasonal precipitation cycle with changes toward wetter autumns and winters and drier summers (Littell, *et al.* 2009a, p. 1).

At a regional scale, two different temperature prediction models are presented in Stockle *et al.* (2009, p. 199), yet show similar results. Outputs from both models predict increases in mean annual temperature for eastern Washington State. Specifically, the Community Climate System Model General Circulation Model projects temperature increase as 1.4, 2.3 and 3.2 °C (2.5, 4.1, and 5.8 °F) at Lind, Washington, which is 64 km (40 mi) northeast of the Umtanum desert buckwheat population; approximately 1.7, 2.7, and 3.5 °C (3.1, 4.9, and 6.3 °F) at both Pullman, Washington, which is 169 km (105 mi) east of the population, as well as Sunnyside, Washington, which is 50 km (31 mi) southwest of the population, for the 2020, 2040, and 2080 modeling scenarios, respectively. For the Parallel Climate Model effort, the temperature change is expected to be 0.8, 1.7, and 2.6 °C (1.4, 3.1, and 4.7 °F) at Lind, Washington; 1.1, 2.0, and 2.9 °C (2.0, 3.6, and 5.2 °F) at Pullman, Washington; and 1.3, 2.2, and 3 °C (2.3, 4.0, and 5.5 °F) at Sunnyside, Washington, in the 2020, 2040, and 2080 scenarios, respectively.

The projected warming trend will increase the length of the frost-free period throughout the State, increasing the available growing season for plants, which will continue to be limited in eastern Washington by water availability, and likely by extreme heat events in some instances. This will continue the trend observed from 1948 to 2002, during which the frost-free period has lengthened by 29 days in the Columbia Valley (Jones, 2005 *in* Stockle *et al.* 2009, p. 199). Weeds and insects will adapt to the longer season with more favorable conditions (Stockle *et al.* 2009, p. 200).

Given the importance of water availability to plants, precipitation change needs to be included in predictions of climate change effects on invasive plants (Bradley 2009, p. 197). Regional climate models suggest that some local changes in temperature and precipitation may be quite different than average regional changes projected by the global models (Littell *et al.* 2009a, p. 6). Precipitation uncertainties are particularly problematic in the western United States, where complex topography coupled with the difficulty of modeling El Niño result in highly variable climate projections (Bradley 2009, p. 197). Cheatgrass, an invasive species, competes with native species by growing early in the spring season and using available water resources. It senesces in late spring, sets seed, and remains dormant through the summer (Rice *et al.,* 1992; Peterson, 2005; *in* Bradley 2009, p. 197; Bradley 2009, pp. 204–205). If summer precipitation were to increase, native perennial shrubs and grasses could be more competitive because they would be able to use water resources while cheatgrass is dormant (Loik, 2007 *in* Bradley 2009, pp. 204–205).

Littell *et al.* (2009b, p. 270) were successful in developing statistical models of the area burned by wildfire for six regions in Washington for the period 1980 to 2006. Future projections from these six models project mean-area-burned increases of between 0 and 600 percent, depending on the ecosystem in question, the sensitivity of the fire model, emissions scenario, and the timeframe of the projection. By the 2040s, the area burned in nonforested ecosystems (Columbia Basin and Palouse Prairie) increased on average by a factor of 2.2. Notably, the increase in area burned is accompanied by an increase in variability in some of the more arid systems, such as the Palouse Prairie and Columbia Basin (Littell *et al.* 2009b, p. 270).

We do not know what the future holds with regard to climate change; however, this species has a very limited distribution, small population size, and low recruitment. Despite the lack of site-specific data, increased average temperatures and reduced seasonal rainfall may further influence the current decline of the species and result

in a loss of habitat. Hotter and drier summer conditions may also increase the frequency and intensity of fires in the area, as cheatgrass and other invasive plants would become better competitors for resources than Umtanum desert buckwheat. Alternatively, warmer and wetter winter conditions could potentially benefit the species by extending the growing season and providing additional moisture to the soil in the spring. However, if the frequency, intensity, and timing of the predicted changes in climate for eastern Washington are not aligned with the phenology of Umtanum desert buckwheat, the survival and reproduction of the species could be threatened over time. Accordingly, although climate change represents a potential ongoing threat based on the best available information, more thorough investigations are needed to better understand the potential impacts of climate change to this species.

Conservation Efforts To Reduce Other Natural or Manmade Factors Affecting Its Continued Existence

Because Umtanum desert buckwheat was recently discovered and exists within a controlled perimeter, large-scale conservation or recovery efforts have not yet been undertaken. Due to firmly controlled access at the site, the only research currently occurring is the annual demographic monitoring of a subpopulation and periodic censuses estimated by the Washington National Heritage Program (WNHP). In addition to the protection of habitat described in Factor D above, a locked gate has been installed along BPA power lines right-of-way to prevent motorized access to the bluff area, thus reducing potential impacts to Umtanum desert buckwheat from unauthorized trespass by livestock, or vehicles. Umtanum desert buckwheat has been germinated by Monument staff and grown in pots to a size suitable for reintroduction during dormancy. The initial outplanting test was undertaken in December 2011 (Newsome 2012, pers. comm.).

Cumulative Impacts

Cumulative Effects From Factors A Through E

Some of the threats discussed in this finding could work in concert with one another to cumulatively create situations that potentially impact Umtanum desert buckwheat beyond the scope of the combined threats that we have already analyzed. Threats described in Factors A and E above would likely increase in timing or intensity when occurring at the same time or location. Additional ground fuels due to the presence of nonnative species are likely to increase the capacity of the landscape to carry wildfires (Factor A) and intensify their overall size and impact (Link *et al.* 2010, p 1). The occurrence of larger fires increases the potential for (1) the fire reaching the Umtanum desert buckwheat population, and (2) the impacts to the species of the wildfire itself and related firefighting activities. Although this relationship represents a significant threat to the species, the threats to the population are clearly increased when combined with a small and declining population size, limited spatial extent, and low recruitment described under Factor E. Any enhancement or reduction of the cumulative threats through climate change is unknown at this time, but could be significant under drier annual, or reduced seasonal, precipitation conditions.

Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to Umtanum desert buckwheat (see Table 4). The 1997 fire that escaped from the Yakima Training Center killed 813 plants, or approximately 10–20 percent of the population (Dunwiddie *et al.,* 2001, pp. 61–62). The Revised Hanford Site 2011 Wildland Fire Management Plan (DOE 2011) acknowledges the sensitive nature of the biology of the Hanford Site, and provides for environmental protection during fire suppression activities. This plan may reduce the likelihood of a wildfire event within or near the population, but cannot remove the threat completely since wildfire locations, severity, and response needs are unpredictable. The 2007 unpublished draft Population Viability Analysis (PVA) estimated a 72 percent chance of a decline of 50 percent of the population within the next 100 years (Kaye 2007, p. 5). The PVA, which incorporated observed environmental variability, determined the Umtanum desert buckwheat population was in very gradual decline. The decline is very close to stable, but still suggests an annual decline of about ⅔ of one percent, which will take several decades to accumulate significant impacts (Kaye 2007, p. 5). The steady decline observed through demographic monitoring of numbers and recruitment since 1997 may be directly attributable to several of the known threats, although some have been reduced because of increased boundary integrity and access control. Because the population is small, limited to a single site, at risk of invasive species, and sensitive to fire and disturbance in a high fire-risk location, the species remains vulnerable to the threats summarized in Table 4.

TABLE 4—SUMMARY OF THREAT FACTORS UNDER THE ESA TO UMTANUM DESERT BUCKWHEAT

Factor	Threat	Timing*	Scope*	Intensity*
A	Wildfire	High	High	High.
	Fire suppression activities	High**	High	High.
	Harm by recreational activities and/or ORV use	Low***	Low	Low.
	Direct harm and habitat modification by livestock	Low***	Low	Low.
	Mineral prospecting	Low***	Low	Low.
	Competition, fuels load from nonnative plants	High	High	High.
C	Seed predation	Unknown	Unknown	Unknown.
	Flower predation	Unknown	Unknown	Unknown.
E	Small population size	High	High	High.
	Limited geographic range	High	High	High.
	Low recruitment	High	High	High.
	Climate change	Unknown	Unknown	Unknown.

*Timing: The likelihood of the threat currently affecting the species.
Scope: The extent of species numbers or habitat affected by the threat.
Intensity: The intensity of effect by the threat on the species or habitat.
**If avoidance is not possible due to fire direction or safety needs.
***Based on ongoing restricted access, fencing, and enforcement.

As described above, Umtanum desert buckwheat is currently at risk throughout all of its range due to ongoing threats of habitat destruction and modification (Factor A), predation (Factor C), and other natural or manmade factors affecting its continued existence (Factor E). Specifically, these factors include the existing degradation or fragmentation of habitat resulting from wildfire, nonnative invasive vegetation that provides fuel for wildfires, predation of seed and flower structures, and potentially changing environmental conditions resulting from global climate change (although its magnitude and intensity are uncertain). Wildfire suppression activities could also threaten the species if they were to occur within the population, since this species appears to be highly sensitive to any physical damage. However, whether this potential threat would actually occur is unknown, given the unpredictable nature of wildfire events. Impacts to Umtanum desert buckwheat from livestock moving through the population, off-road vehicle use, hikers, and prospecting are conceivable, but unlikely, provided DOE permit conditions for livestock movement are followed, access to the site is effectively controlled, boundary integrity is monitored and maintained, and enforcement actions are taken as needed, each of which is presently occurring.

The area where Umtanum desert buckwheat is found is at high risk of frequent fire and is fully exposed to the elements. The population is extremely small, isolated, and in slow but steady decline, notwithstanding the somewhat higher count in the 2011 population census (which may be attributable to the way individual plants were counted as described earlier). These population demographics make the species particularly susceptible to extinction due to threats described in this final rule. The scope of the wildfire threat is high; other threats are moderate to low in scope. Because of the limited range of Umtanum desert buckwheat, any one of the threats may threaten its continued existence at any time. Since these threats are ongoing, they are also imminent.

The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' Since Umtanum desert buckwheat is highly restricted in its range and the threats occur uniformly throughout its range, we assessed the status of the species throughout its entire range. The number of individuals in the single population is very small and declining. Although some threats are more severe than others, the entire population is being affected by small population size, limited range, low recruitment, invasive cheatgrass presence that can fuel wildfire, wildfire (Table 4), seed predation, and flower predation. We find that Umtanum desert buckwheat is likely to become in danger of extinction throughout its entire range within the foreseeable future, based on the timing, intensity, and scope of the threats described above (see Table 4). As stated earlier, the Hanford Reach National Monument CCP was developed to protect and conserve the biological, geological, paleontological, and cultural resources described in the Monument Proclamation by creating and maintaining extensive areas within the Monument free of facility development (USFWS 2008, p. v). Several management objectives are identified that could benefit the Umtanum desert buckwheat population and result in reduction of threats; these include treating invasive species and restoring upland habitat (USFWS 2008, pp. 19–22).

As stated earlier, because the population is declining gradually, significant impacts will take several decades to accumulate (Kaye 2007, p. 5). Given the fact that (1) the population is in a very gradual decline; (2) the management objectives of the CCP will be beneficial to the species; (3) access is prohibited without special authorization from the DOE; (4) security fencing surrounds the population; (4) ''entry prohibited'' signs are in place; and (5) boundary enforcement is ongoing, the species is not presently in danger of extinction throughout all or a significant portion of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing Umtanum desert buckwheat as threatened in accordance with sections 3(6) and 4(a)(1) of the Act.

Summary of Factors: White Bluffs bladderpod

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.

Caplow and Beck (1996, p. 42) and others state that the threats to White Bluffs bladderpod and its habitat are primarily landslides caused by subsurface water seepage, invasive species, and ORV use (TNC 1998, p. 5; Evans *et al.* 2003, p. 67, Newsome 2007, p. 4). Of these threats, landslides and invasive species competition is of primary concern (Caplow and Beck 1996, p. 42; Newsome 2007, p. 4). Below is a detailed discussion of these threats and their potential effects on survival and recovery of the subspecies.

Landslides: Groundwater movement from adjacent, up-slope agricultural activities has caused mass-failure landslides in portions of the White Bluffs. As a result, the habitat in approximately 6.0 km (3.7 mi), or about 35 percent of the known range of White Bluffs bladderpod has been moderately to severely altered (Brown 1990, pp. 4, 39; Cannon *et al.* 2005, p. 4.25; Caplow *et al.* 1996, p. 65; Drost *et al.* 1997, pp. 48, 96; Lindsey 1997, pp. 4, 10, 11, 12, 14; U.S. Congress (H.R. 1031), 1999, p. 2; USFWS 1996, p. 1). White Bluffs bladderpod plants have not been observed in areas that have undergone recent landslides, regardless of whether the landslide disturbance is moderate or severe. They have not been observed to survive small slumping events, possibly because the mixed soils downslope post-event no longer have the soil horizon that White Bluffs bladderpod plants seem to require. Additionally, these slumped soils are typically more saturated because they end up below the groundwater seep zone. In the arid environment, White Bluffs bladderpod appears to be unable to successfully compete with the host of weedy and invasive drought-intolerant species in the seed bank. Where natural weathering has eroded occupied habitat, White Bluffs bladderpod plants have been observed to occasionally become established on the more gentle slopes. In very large events of rotational slumping or landslides, parts of the original surface horizon may remain somewhat undisturbed on the crest of the slumped block, preserving White Bluffs bladderpod plants, at least for the short term (Caplow *et al.* 1996, p. 42). All mass-failures occurring along the White Bluffs, with one historical exception, are found in association with water seepage (Bjornstad and Fecht 2002, p. 16).

In the 1960s, the Washington State Department of Game (currently known as the Washington Department of Fish and Wildlife) constructed artificial wetlands using irrigation water delivered to unlined wastewater ponds and canals in the vicinity of the White Bluffs for wildlife enhancement (Bjornstad 2006, p. 1). Water entered a preferential pathway for movement along a buried paleochannel, which connected the artificial wetlands with the White Bluffs escarpment near Locke Island 4.8 km (3 mi) to the southwest. Water percolating from artificial wetlands moved quickly down through

highly transmissive flood deposits, and then encountered the low-permeability soils of the Ringold Formation. The water then flowed laterally along the impermeable layer, and discharged through springs along the White Bluffs. Where they were wet, the unstable Ringold Formation sediments have slumped and slid along the steep White Bluffs escarpment (Bjornstad and Fecht 2002, p. 14). Although water flow to the pond has been halted due to concerns about landslides and the artificial wetlands no longer exist, water continues to seep out along the bluffs, apparently due to the large volume that accumulated in the underlying sediments over years of infiltration (Bjornstad and Fecht 2002, p. 15).

The erosional processes at work in the northern White Bluffs vicinity are somewhat different than those of the southern White Bluffs area, where White Bluffs bladderpod occurs. A record of slumping exists along the White Bluffs, beginning with periodic high-recharge, Ice Age flood events. Since the Pleistocene Epoch, landsliding on the southern bluffs where White Bluffs bladderpod is found was dormant until the 1970s, when increased infiltration of moisture from agricultural activities caused a resurgence of slumping (Bjornstad and Peterson 2009b; Cannon *et al.* 2005, p. 4.25; Bjornstad and Fecht 2002, p. 17; Drost *et al.* 1997, p. 76; Brown 1990, pp. 4, 38, 39). Excess irrigation water percolates downward before moving laterally upon lower-permeability Ringold strata. Spring water that discharges in the vicinity of the bluff face greatly reduces internal soil strength, and leads to slope failure. Heads of landslides characteristically consist of back-rotated slump blocks that transition to debris flows and often fan out into the Columbia River. Landslides and their damaging effects will likely continue until water that is currently being introduced subsurface through unlined irrigation canals, ponds, and over-irrigation is significantly reduced or eliminated (Bjornstad and Peterson 2009b).

The entire population of White Bluffs bladderpod is down-slope of irrigated agricultural land and is at risk of landslides induced by water seepage. The threat is greater in the southern portion of the subspecies' distribution where irrigated agriculture is closest in proximity, and in several locations directly adjacent to the bluffs (Bjornstad *et al.,* 2009a, p. 8; Lindsey 1997, p. 12). Wetted soils visible on the cliff faces directly below the private lands indicate that irrigation of the fields above is affecting the bluff. Irrigation water moves a considerable distance laterally across some of the more impermeable beds of the Ringold Formation, as described earlier, and also percolates downward. As the water increases the pore pressure between sediment grains, it reduces the soil material strength. At the steep bluff face, the loss of material strength results in slope failure and resultant landslides (Bjornstad and Fecht 2002, p. 17), which permanently destroy White Bluffs bladderpod habitat. The areas subject to mass-failure landslides are somewhat predictable, and appear as horizontal wetted zones in the cliff face. This threat is imminent and ongoing, potentially affecting most of the population, although to differing degrees.

Off-road vehicles: ORVs also threaten the subspecies by crushing plants, destabilizing the soil, increasing erosion, and spreading the seeds of invasive plants. Although ORV activity is prohibited on the Monument (USFWS 2008, p. 1–5), it occurs intermittently on the Federal lands that constitute approximately 85 percent of the subspecies' distribution. Currently, ORV activity is more common within the private portion (approx. 15 percent of the area) at the southern end of the subspecies distribution. The location and extent of this threat has been mapped by Monument staff on the land under their management (Newsome 2011, pers. comm.). Based on the best available information, ORV use is considered to be an ongoing threat to White Bluffs bladderpod, particularly within the southern extent of the subspecies' distribution.

Invasive species: An infestation of *Centaurea solstitialis* (yellow starthistle), a nonnative weed that is known as a rapid invader of arid environments even in the absence of disturbance, was discovered during 2003 within a portion of the range of White Bluffs bladderpod (Evans *et al.* 2003, p. 67). Invasive plants compete with White Bluffs bladderpod for space and moisture and increase the effects of fire. The infestation was mapped, plants were treated using aerial means, and the weeds are currently being controlled. Continued monitoring and timely followup treatment of this ongoing threat is necessary to protect White Bluffs bladderpod habitat. In addition, a portion of the White Bluffs bladderpod population is adjacent to a public access point along the Columbia River. Visitors could potentially transport invasive plant material or seeds into the area, increasing the risk of impacts of establishment of invasive species. Based on the best available information, nonnative invasive species represent an ongoing threat to White Bluffs bladderpod.

Pesticide or Herbicide Use: We initially considered whether White Bluffs bladderpod pollinators could potentially be negatively affected by pesticide or herbicide applications on orchards and other irrigated crops located adjacent to the population along the southern portion of its distribution. However, specific information on whether this situation poses a threat is not available, and we are not identifying it as an ongoing threat at this time.

Wildfire: In July 2007, a large wildfire burned through the northern portion of the White Bluffs bladderpod population and within the area of the monitoring transects after monitoring was completed for that year. Fire is considered to be a threat to White Bluffs bladderpod, although the decline in population numbers after the 2007 fire indicated the population estimate was still within the known range of variability. The 2008–2011 monitoring results demonstrated the negative impacts of the fire to be less than expected, as approximately 76 percent of the population remained viable the following year (Newsome and Goldie, 2008). Notwithstanding the subspecies' apparent ability to recover somewhat from the 2007 wildfire event, we believe that wildfire continues to be a threat to the existing population. This is because fire events tend to be large and unpredictable in the Hanford Reach (see Table 3) and can potentially affect large numbers of plants and significant areas of pollinator habitat.

In addition, wildfire also impacts pollinator communities by directly causing mortality, altering habitat, and reducing native plant species diversity. Since an increase in cheatgrass was observed within the White Bluffs bladderpod population and the surrounding areas affected by the 2007 fire, we presume a larger scale fire event would have similar results. Because of its invasive nature (see discussion below), cheatgrass may compete seasonally with native species and, once established, increase wildfire fuel availability (Link *et al.* 2006, p 10). White Bluffs bladderpod may be somewhat fire-tolerant based on the post-2007 wildfire response monitoring. However, the establishment and growth of highly flammable cheatgrass increases the likelihood of fire as well as its intensity, potentially elevating the risk of impacting the White Bluffs bladderpod population in the future. Given the invasive nature of cheatgrass, the increased fire frequency and wildfire history within and around the Monument (see Table 3), the increased

fuel that becomes available for future wildfire events as cheatgrass proliferates, and observations that cheatgrass presence increased within and around the population after the 2007 wildfire, wildfire is considered to be an ongoing threat to White Bluffs bladderpod.

Nonnative Plant Competition and Fuel Sources: A common consequence of fire is the displacement of native vegetation by nonnative weedy species, particularly cheatgrass. As a result of the 2007 fire, a higher percent cover of weedy plant species, including cheatgrass, has become established within and around the White Bluffs bladderpod population. Cheatgrass is an introduced annual grass that is widely distributed in the western United States, and has been documented in the White Bluffs bladderpod population. The plant is believed to have been introduced in contaminated grain from southwestern Asia via Europe in the 1890's. The species is adapted to climate and soils similar to those found in the Great Basin Desert (parts of Idaho, Nevada, Oregon, and Utah). This opportunistic grass is able to maintain superiority over native plants in part because it is a prolific seed producer, able to germinate in the autumn or spring, giving it a competitive advantage over native perennials, and is tolerant of increased fire frequency. Cheatgrass can outcompete native plants for water and nutrients in the early spring, since it is actively growing when native plants are initiating growth. It also completes its reproductive process and becomes senescent before most native plants (Pellant 1996, p. 1–2).

An infestation of yellow starthistle *(Centaurea solstitialis)* discovered during 2003 within a portion of the White Bluffs bladderpod range was mapped and treated aerially (TNC 2003, p. 67). Yellow starthistle infestations can reduce wildlife habitat and forage, displace native plants, and reduce native plant and animal diversity. It significantly depletes soil moisture reserves in both annual and perennial grasslands, and is able to invade and coexist within cheatgrass-dominated annual grasslands (TNC 2003, p. 55). Accordingly, nonnative plants that increase fuel availability for wildfires are considered an ongoing threat to White Bluffs bladderpod.

Fire Suppression Activities: Fire suppression activities, which often damage or remove native plants from the habitat and disturb soils, could potentially be as damaging as the wildfire itself. The Monument Fire Management Plan (USFWS 2001, p. 27) briefly addresses White Bluffs bladderpod by providing guidance for fire suppression activities on the White Bluffs. The plan states ''Fire Management will protect these sensitive resources by suppressing fires in this area either from existing roads or the use of flappers and water use. The use of hand tools that break the surface will be avoided when possible, and the use of any off-road equipment in these areas requires concurrence by the Project Leader.'' Protection of sensitive resources during a fire response is an objective unless achieving this objective jeopardizes either firefighter safety or public safety (USFWS 2001, p. 40). In the 2007 fire, damage to habitat from fire suppression activities within the White Bluffs bladderpod population was avoided by limiting soil disturbance to areas outside a 50–100 m (164–228 ft) buffer (Goldie 2012, pers. comm.).

However, the ability to avoid fire suppression impacts to the White Bluffs bladderpod population during future wildfire events would take into account the location, direction, magnitude, and intensity of the event, firefighter safety considerations, and proximity of the fire to the plant population. If a wildfire were to occur in the surrounding area, protection of the White Bluffs bladderpod population may not be possible if wildfire circumstances necessitate establishing fire lines or response equipment staging areas within or near the population. A potential consequence of fire or any soil disturbance during fire suppression activities is the displacement of native vegetation by nonnative weedy species, which increases intraspecific competition for resources and increases the accumulation of fuels. When these conditions occur, they contribute to increases in wildfire frequency and severity in a frequent fire landscape. Accordingly, although the need for wildfire suppression activities near or within the White Bluffs bladderpod population is unpredictable, this activity is considered a potential threat to this subspecies based on the Monument's wildfire history (see Table 3).

Based on the information above, the specific activities discussed under Factor A: The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range present a threat to White Bluffs bladderpod and its habitat. These activities include landslides, invasive species, wildfire, off-road vehicle use, and potentially fire suppression activities.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The regulations at 50 CFR 27.51 prohibit collecting any plant material on any national wildlife refuge. There is no evidence of commercial, recreational, scientific, or educational use of White Bluffs bladderpod, other than occasional collection of relatively few specimens (e.g., dead plants and seed collection). The subspecies is very showy while flowering and may be subject to occasional collection by the public. The University of Washington Rare Care staff collected approximately 2,000 White Bluffs bladderpod seeds from 60 plants on July 29, 2011, and Berry Botanic Garden in Portland, Oregon, currently has 1,800 seeds collected in 1997 from 45 plants (Gibble 2011, pers. comm.). Because the public has access to the subspecies, and it occurs on private land, occasional collection may be expected. Collection for scientific purposes combined with sporadic collection by private individuals remains a possible, but unlikely, threat.

C. Disease or Predation

Evidence of disease has not been documented in White Bluffs bladderpod; however, predation of developing fruits and infestations on flowering buds has been observed.

Seed predation: Since 1996, some predation by larval insects on developing fruits of White Bluffs bladderpod has been observed. Larvae of a species of Cecidomyiid fly have been observed infesting and destroying flowering buds, and an unidentified insect species has been documented boring small holes into young seed capsules and feeding on developing ovules. However, the overall effect of these insect species on the plants or population is not known (TNC 1998, p. 5). Although insect predation may be a potential threat to White Bluffs bladderpod, more thorough investigations are necessary to determine its significance to seed production. Accordingly, we do not consider insect predation to be a threat to White Bluffs bladderpod at this time. We are unaware of any other disease or predation interactions that represent potential threats to the subspecies.

D. The Inadequacy of Existing Regulatory Mechanisms

White Bluffs bladderpod was added to the State of Washington's list of endangered, threatened, and sensitive vascular plants in 1997 (as *Lesquerella tuplashensis),* and is designated as threatened by the Washington

Department of Natural Resources (WDNR, 2011). The WDNR Status and Ranking System of the Washington Natural Heritage Program (*http://www1.dnr.wa.gov/nhp/refdesk/lists/stat_rank.html*) identifies the State ranking for White Bluffs bladderpod as (1) G4 (apparently secure globally and at fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors); (2) S2 (imperiled and at high risk of extirpation in the State due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors); and (3) threatened (likely to become endangered within the near future in Washington if the factors contributing to population decline or habitat loss continue).

Listing the species as threatened will invoke the protections under the Act, including consultation and development of a recovery plan. The State ranking does not provide any protections, whereas Federally listing the species will impose legal and regulatory requirements directed toward recovery. Therefore, the factors contributing to the species' decline with regard to the State ranking will be addressed and mitigated, over time. The State of Washington's endangered, threatened, and sensitive plant program is administered through the WNHP, and was created to provide an objective basis for establishing priorities for a broad array of conservation actions (WDNR 2011, p. 2). Prioritizing ecosystems and species for conservation offers a means to evaluate proposed natural areas and other conservation activities (WDNR p. 3). The WNHP is a participant in the Arid Lands Initiative, which is a public/private partnership attempting to develop strategies to conserve the species and ecosystems found within Washington's arid landscape. The WHNP assists in identifying conservation targets, major threats, and potential strategies to address them (WDNR 2011 p. 4).

The DOE does not have a rare plant policy that provides specific protection for the species, and the Service manages DOE lands where White Bluffs bladderpod is found as a part of the Hanford National Monument. A comprehensive conservation plan (CCP) for the Monument has been completed that provides a strategy and general conservation measures for rare plants that may benefit White Bluffs bladderpod. This strategy includes support for monitoring, inventory and control of invasive species, fire prevention, propagation, reintroduction, and Geographical Information Systems (GIS) support to map the impact area (USFWS 2008, pp. 2–64–2–65), but does not prescribe mandatory conservation elements. Although specific actions to conserve the subspecies are not identified, the plan acknowledges that protection of the population is needed, and that management actions are required to address its protection (USFWS 2008, p. 3–95).

The CCP states that fire control policies will be implemented to reduce the risk of human-caused wildland fire (USFWS 2008, p. 4–13). The CCP also identifies strategies to mitigate the potential for increased human-caused wildfire as a result of increased visitation, through informational signing educating visitors on the danger of wildfire, the adverse effects of wildfire on the shrub-steppe habitat, and how visitors can contribute to fire prevention. Seasonal closure of interpretive trails through high-risk areas would be established and enforced to mitigate the potential of visitor-caused wildfire (USFWS 2008, pp. 4–43–4–44). The CCP states that best management practices and current regulations that prohibit campfires, open fires, fireworks, and other sources of fire ignition on the Monument will be adequate to prevent human-caused wildfires that could potentially result from hunting activity (USFWS 2008, p. 4–46). During the recovery planning process, the specific management actions necessary to address each of the threats to the species (see Table 5) will be prioritized, costs will be estimated, and responsible parties will be identified. The recovery plan will build on the existing conservation actions identified in the CCP.

A Spotlight Species Action Plan has been developed for White Bluffs bladderpod, which briefly describes the subspecies and the major threats and identifies actions to conserve the subspecies (USFWS 2009). These actions include working with adjacent landowners to restore, manage, and reduce threats to the population, installation of fencing to eliminate ORV use, invasive species studies and potential eradication efforts, seed collection for augmentation/restoration purposes, pollinator species studies, wildfire studies, and climate change studies. However, many of these actions have not been implemented as funding sources have not been identified (Newsome 2011, pers. comm.).

Numerous wildland fires occur annually on lands in and surrounding the Monument. Many are human-caused resulting from vehicle ignitions from roads and highways, unattended campfires, burning of adjacent agricultural lands and irrigation ditches, and arson. Fires of natural origin (lightning caused) also occur on lands within and adjacent to the monument/refuge (USFWS 2001, p. 171). Since wildfires are unpredictable with regard to their location and intensity, a fire management plan is necessarily designed to be a response, rather than a regulatory strategy. The Wildland Fire Management Plan for the Monument 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, and restore and perpetuate natural processes, given current understanding of the complex relationships in natural ecosystems (USFWS 2001, p. 9). The Monument CCP also has an educational and enforcement program in place that reduces the likelihood of human-caused wildfires.

An invasive plant species inventory and management plan has been developed by the Monument (Evans *et al.* 2003, entire). The plan 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. Invasive species management presents significant management challenges because of the Monument's large size (78,780 ha) (195,000 ac), and the large number of documented or potential invasive plant species present (Evans *et al.* 2003, p. 5). The introduction and spread of invasive plant species is enhanced by the existence of disturbed lands and corridors; potential introduction pathways include the Columbia River, active irrigation canals, wasteways, and impoundments, State highways, and paved and unpaved secondary roads. In addition, recurrent wildfires, powerline development and maintenance, and slumping of the White Bluffs continually create new habitats for invasive species to colonize (Evans *et al.* 2003, p. 5).

Although the Hanford Monument Proclamation prohibits off-road vehicle (ORV) use, ORV use has been documented in the publicly accessible Wahluke Unit (where White Bluffs bladderpod occurs). Some of these violators enter the Monument from long-established access routes from adjacent private lands (USFWS 2002, p. 17), causing physical damage to plants and creating ruts in slopes that increase erosion (USFWS 2008, p. 3-57).

Although ORV trespass incidents have been documented on Monument lands, and are affecting some White Bluffs bladderpod individuals, we have no information indicating that they are occurring with significant frequency or are affecting a substantial portion of the population. The Presidential proclamation establishing the Monument states, in part, ''* * * the Secretary of the Interior and the Secretary of Energy shall prohibit all motorized and mechanized vehicle use off road, except for emergency or other federally authorized purposes, including remediation purposes.'' (White House 2000, p. 3). We have no information that would indicate ORV trespass incidents on Monument lands are taking place over a large area within the White Bluffs bladderpod population, although increased enforcement could further reduce the likelihood of such events. ORV use has been documented, and is more common, on private property where the southern extent of the population occurs. However, there are no constraints on ORV use on private property, and as such, this activity on private lands is not being controlled by existing regulatory mechanisms.

As described under Factor A, groundwater movement from adjacent, up-slope agricultural activities has caused mass-failure landslides caused by subsurface water seepage, which is a threat to White Bluffs bladderpod. This threat is greatest in the southern portion of the subspecies' distribution where irrigated agriculture is close in proximity, and in several locations directly adjacent to the bluffs (Bjornstat *et al.,* 2009a, p. 8; Lindsey 1997, p. 12). No existing regulatory mechanisms address this threat.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Small Population Size: As stated earlier, since 1997 to 1998 when the monitoring transects currently used were selected, the population has ranged between an estimated low of 9,650 plants in 2010 and an estimated high of 58,887 plants in 2011 (see Table 2). Additionally, the subspecies is known from only a single population that occurs intermittently in a narrow band (usually less than 10 m (33 ft) wide) along an approximately 17-km (10.6-mi) stretch of the river bluffs (Rollins *et al.* 1996, p. 205), and approximately 35 percent of the known range has been moderately to severely affected by landslides. Accordingly, the subspecies is susceptible to being negatively impacted by the activities described in Factors A and C above, particularly if those threats are of a scope that affects a significant portion of the population. Therefore, based on the best available information, we consider White Bluffs bladderpod's small population size and limited geographic distribution to represent an ongoing threat to the subspecies.

Climate Change: Our analyses under the Endangered Species Act include consideration of ongoing and projected changes in climate. The terms ''climate'' and ''climate change'' are defined by the Intergovernmental Panel on Climate Change (IPCC). ''Climate'' refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term ''climate change'' thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

Regional climate change modeling indicates a potential threat to White Bluffs bladderpod if hotter and drier conditions increase stress on individual plants, or increase the effects of wildfire frequency and intensity (See discussion under Factor A). As described for Umtanum desert buckwheat above (see Factor E), the potential impacts of a changing global climate to White Bluffs bladderpod are presently unclear. All regional models of climate change indicate that future climate in the Pacific Northwest will be warmer than the past, and, together, they suggest that rates of warming will be greater in the 21st century than those observed in the 20th century. Projected changes in annual precipitation, averaged over all models, are small (+1 to +2 percent), but some models project an enhanced seasonal precipitation cycle with changes toward wetter autumns and winters and drier summers (Littell *et al.* 2009a, p. 1). Regional climate models suggest that some local changes in temperature and precipitation may be quite different than average regional changes projected by the global models (Littell *et al.* 2009a, p. 6). Precipitation uncertainties are particularly problematic in the western United States, where complex topography coupled with the difficulty of modeling El Niño result in highly variable climate projections (Bradley 2009, p. 197).

We do not know what the future holds with regard to climate change. Despite a lack of site-specific data, increased average temperatures and reduced average rainfall may promote a decline of the subspecies and result in a loss of habitat. Hotter and drier summer conditions could increase the frequency and intensity of fires in the area as cheatgrass or other invasive plants compete for resources with White Bluffs bladderpod. However, if summer precipitation were to increase, some native perennial shrubs and grasses could be more competitive if they are able to use water resources when cheatgrass or other nonnative species are dormant (Loik, 2007 *in* Bradley 2009, pp. 204–205). Nevertheless, if the frequency, intensity, and timing of the predicted changes in climate for eastern Washington are not aligned with the phenology of White Bluffs bladderpod, the survival and reproduction of the subspecies could be threatened over time. Although climate change represents a potential threat based on the available information, more thorough investigations are needed to determine the degree to which climate change may be affecting the subspecies.

Conservation Efforts To Reduce Other Natural or Manmade Factors Affecting Its Continued Existence

Certain conservation efforts that are not described above in Factor D are occurring at the Monument in the vicinity of the White Bluffs bladderpod, including fencing, placement of signs controlling human foot traffic, ongoing invasive weed treatments, and future planning for targeted treatments of *Centaurea solstitialis* (yellow starthistle). A Monument CCP has been developed (USFWS 2008), which includes management and monitoring actions for White Bluffs bladderpod based on the priorities of the refuge. The CCP states that protection of this population, and thus the species, requires that these issues be addressed in any management action. Long-term demographic monitoring was initiated on this species in 1997 (USFWS 2008, p. 3–95) and periodic aerial monitoring has been undertaken by the Monument since then. Other management actions may include restoration of priority areas, access control, and bluff

stabilization. There currently is a need for improved monitoring of White Bluffs bladderpod at the northern locations, where access is more difficult. White Bluffs bladderpod has been germinated by Monument staff and grown in pots to a size suitable for the first dormant outplanting project, planned for December 2012 or January 2013 (Newsome 2012, pers. comm.).

Cumulative Impacts

Cumulative Effects From Factors A Through E

Some of the threats discussed in this finding could interact to cumulatively create scenarios that potentially impact the White Bluffs bladderpod beyond the scope of the combined threats that we have already analyzed. Threats described in Factor A above could likely increase their timing or intensity when combined at the same time or location. Available ground fuels are increased in areas near the White Bluffs bladderpod. The presence of nonnative species increase the ability of wildfires to spread (Factor A) and can amplify their overall size (Link *et al.* 2010, p 1). The occurrence of larger fires may increase their potential to reach the White Bluffs bladderpod population, thereby impacting the species. Larger fires may also increase the potential for impacts to the population related to fire response activities. A higher fire frequency could also result in the expansion of ground cover by invasive species, which could (1) increase the cumulative risk of direct loss of plants by fire, (2) increase competition for available resources and space, and (3) result in negative impacts to pollinator species. Any additional increase or reduction of these cumulative threats through climate change is currently unknown, but could be significant under drier annual, or reduced seasonal, precipitation conditions.

TABLE 5—SUMMARY OF THREAT FACTORS UNDER THE ESA TO WHITE BLUFFS BLADDERPOD

Factor	Threat	Timing*	Scope*	Intensity*
A	Wildfire	High	High	Moderate.
	Fire suppression activities	High **	Moderate	High.
	Slope failure, landslides	High	High	High.
	Harm by recreational activities and/or ORV use	Moderate	Moderate	Low.
	Competition, fuels load from nonnative plants	Moderate	Moderate	Moderate.
E	Small population size	Moderate	Low	Low.
	Limited geographic range	Moderate	Low	Low.
	Climate change	Unknown	Unknown	Unknown.

* Timing: The extent of species' numbers or habitat affected by the threat.
Scope: The intensity of effect by the threat on the species or habitat.
Intensity: The likelihood of the threat currently affecting the species.
** If avoidance is not possible due to fire direction or safety needs.

Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to White Bluffs bladderpod (see Table 5). Under the Act and our implementing regulations, a species may warrant listing if it is threatened or endangered throughout all or a significant portion of its range. We assessed the status of White Bluffs bladderpod throughout its entire range and found it to be highly restricted within that range. The threats to the survival of the subspecies occur throughout the subspecies' range and are not restricted to any particular significant portion of that range. Accordingly, our assessment and listing determination applies to the subspecies throughout its entire range.

Approximately 35 percent of the known range of the subspecies has been moderately to severely affected by landslides, resulting in an apparently permanent destruction of the habitat. The entire population of the subspecies is down-slope of irrigated agricultural land, the source of the water seepage causing the mass-failures and landslides, but the southern portion of the population is the closest to the agricultural land and most affected. Other significant threats include use of the habitat by recreational ORVs, which destroy plants, and the presence of invasive nonnative plants that compete with White Bluffs bladderpod for limited resources (light, water, nutrients). Additionally, the increasing presence of invasive nonnative plants may alter fire regimes and potentially increase the threat of fire to the White Bluffs bladderpod population.

Fire suppression activities could potentially be as great a threat as the fire itself, given the location of the subspecies on the tops of bluffs where firelines are often constructed. In addition, firefighting equipment and personnel are commonly staged on ridge tops for safety and strategic purposes (Whitehall 2012, pers. comm.), although this has not been necessary within the White Bluffs bladderpod population to date. During a wildfire response effort in 2007, responders were able to avoid damage to White Bluffs bladderpod habitat during suppression activities by limiting soil disturbance to areas outside a 50–100 m (164–228 ft) buffer around the population. The threats to the population from landslides, ORV use, and potentially fire suppression (contingent on location, safety, the ability to avoid, and other particulars) are ongoing, and will continue to occur in the future. In addition, invasion by nonnative plants is a common occurrence post-fire in the Hanford vicinity, and will likely spread or increase throughout the areas that were burned during the 2007 fire that occurred in the area of the existing population or in future events.

As described above, White Bluffs bladderpod is currently at risk throughout all of its range due to ongoing threats of habitat destruction and modification (Factor A), and other natural or manmade factors affecting its continued existence (Factor E). Specifically, these factors include the existing degradation or fragmentation of habitat resulting from landslides due to water seepage, invasive species establishment, ORV use, wildfire, potential fire suppression activities, and potential global climate change. Most of these threats are ongoing and projected to continue and potentially worsen in the future. The population is small and apparently restricted to a unique geological setting, making it vulnerable to extinction due to threats described in the final rule if they are not addressed. The scope of the threat of wildfire is high, while other threats are moderate to low in scope (see Table 5). Because of the limited range of the subspecies, any one of the threats could affect its continued existence at any time.

The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range,'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' We find that White Bluffs bladderpod is likely to become endangered throughout all or a significant portion of its range within the foreseeable future, based on the immediacy and scope of the threats described above and, therefore, meets the definition of a threatened species under the Act. There are no portions of the species' range where threats are geographically concentrated such that the species is in imminent danger of extinction within that portion of its range. White Bluffs bladderpod is primarily surrounded by Federal ownership, where the lands are managed as an overlay national wildlife refuge for general conservation purposes.

The Monument CCP was developed to protect and conserve the biological, geological, paleontological, and cultural resources described in the Monument Proclamation by creating and maintaining extensive areas within the Monument free of facility development (USFWS 2008, p. v). Several management objectives are identified that could benefit the White Bluffs bladderpod population, including treating invasive species and restoring upland habitat (USFWS 2008, pp. 19–22). The subspecies is also fairly numerous and continuous where it occurs over 17 km (10.6 mi); however, the threats are not all acting with uniform timing, scope, or intensity throughout the subspecies' distribution. Although landslides are occurring within approximately 35 percent of the linear extent of the subspecies, plants are persisting, at present, in some areas where landslides have occurred. The risk to the overall population is proportional, as about 65 percent of the subspecies' habitat exists at a lower risk of landslides. The remaining primary threats to White Bluffs bladderpod, including wildfire, nonnative plants, and increased fuel loading from nonnative plants appear to be acting with uniform magnitude, intensity, and severity throughout the subspecies' distribution. Since a majority (85 percent) of the subspecies' distribution is on Federal lands managed as a national wildlife refuge for conservation purposes, and refuge management plans are in place to help protect and conserve the subspecies, we do not believe the subspecies is presently in danger of extinction throughout all or a significant portion of its range. Therefore, on the basis of the best available scientific and commercial information, we are listing White Bluffs bladderpod as threatened in accordance with sections 3(6) and 4(a)(1) of the Act.

Significant Portion of the Range Analysis for Umtanum Desert Buckwheat and White Bluffs Bladderpod

We evaluated the current range of Umtanum desert buckwheat and White Bluffs bladderpod to determine if there are any apparent geographic concentrations of potential threats for either species. Both species are highly restricted in their ranges, and the threats occur throughout their ranges. For Umtanum desert buckwheat, we considered the potential threats due to wildfire, competition and fuel loads from nonnative plants, seed predation, flower predation, small population size, limited geographic range, and low recruitment. For White Bluffs bladderpod, we considered the potential threats due to wildfire, irrigation-induced slope failure and landslides, harm by recreational activities and ORV use, competition and fuel loads from nonnative plants, small population size, and limited geographic range. We found no concentration of threats because of the species' limited and curtailed ranges, and a generally consistent level of threats throughout their entire range.

With regard to White Bluffs bladderpod, although the threat of groundwater-induced landslides affects the species' entire range, it is more noticeable along the southern extent of the population where the population occurs closest to areas that are irrigated for agricultural purposes. If all plants closest to the irrigated areas were to be lost, White Bluffs bladderpod would not be in danger of extinction throughout all or a significant portion of its range. Plants are persisting at present in some of the erosion-prone and eroded areas, which represent approximately 35 percent of the linear extent of the subspecies range. The plants are also fairly numerous and continuous along the entire 10.6-mile section of the White Bluffs where they occur. Having determined that Umtanum desert buckwheat and White Bluffs bladderpod are threatened throughout their entire range, we must next consider whether there are any significant portions of their range where they are in danger of extinction or likely to become endangered in the foreseeable future.

We found no portion of the range of either species where potential threats are significantly concentrated or substantially greater than in other portions of their range. Therefore, we find that factors affecting Umtanum desert buckwheat and White Bluffs bladderpod are essentially uniform throughout their range, indicating no portion of the range of either species warrants further consideration of possible endangered or threatened status under the Act. Therefore, we find there is no significant portion of the species' range that may warrant a different status.

Available Conservation Measures for Umtanum Desert Buckwheat and White Bluffs Bladderpod

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, the development of a recovery plan (including implementation of recovery actions), requirements for Federal protection, and prohibitions against certain practices. Recognition through listing actions results in public awareness and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection measures required of Federal agencies and the prohibitions against certain activities involving listed wildlife are discussed in Effects of Critical Habitat Designation and are further discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Section 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed, preparation of a draft and final recovery plan, and revisions to the plan as significant new information becomes available. The recovery outline guides the immediate implementation of urgent recovery actions and describes the

process to be used to develop a recovery plan. The recovery plan identifies site-specific management actions that will achieve recovery of the species, measurable criteria that determine when a species may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our Web site (*http://www.fws.gov/endangered*), or from our Washington Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribal, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

The Monument CCP (2008, p. 4–31), identifies several strategies that will support recovery efforts, including (1) continuing ongoing partnerships for monitoring Umtanum desert buckwheat and White Bluffs bladderpod populations; (2) inventory and control of nonnative plant species; (3) consideration of rare plant species and locations when planning management, recreational, access, and other actions; (4) wildfire prevention when possible, and limiting their size; and (5) development of propagation techniques for rare species for reintroductions if populations go below thresholds.

Once these species are listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Washington would be eligible for Federal funds to implement management actions that promote the protection and recovery of Umtanum desert buckwheat and White Bluffs bladderpod. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Please let us know if you are interested in participating in recovery efforts for Umtanum desert buckwheat and White Bluffs bladderpod. Additionally, we invite you to submit any new information on these species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the Department of Energy, Department of Defense, U.S. Fish and Wildlife Service, Bureau of Reclamation, Bureau of Land Management, Army Corps of Engineers, and construction and management of gas pipeline and power line rights-of-way by the Federal Energy Regulatory Commission.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all threatened plants. For threatened plants, it is unlawful to commit, to attempt to commit, to cause to be committed, or to solicit another to commit the following acts: (1) Import or export (into, out of, or through the United States); (2) remove and reduce to possession from Federal property; and (3) engage in interstate or foreign commerce. At this time, no existing regulatory mechanisms provide protection for State-listed plants in Washington, even if endangered. In addition, since Umtanum desert buckwheat occurs entirely on Federal land, and White Bluffs bladderpod occurs predominantly on Federal land, all Monument regulations that have protective or conservation relevance to either species would be applicable.

We may issue permits to carry out otherwise prohibited activities involving endangered and threatened plant species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.62 for endangered plants, and at 50 CFR 17.72 for threatened plants. With regard to endangered plants, a permit may be issued for the following purposes: for scientific purposes or to enhance the propagation or survival of the species.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies may sometimes need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to our Washington Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). Requests for copies of the regulations concerning listed animals and general inquiries regarding prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Endangered Species Permits, Eastside Federal Complex, 911 NE 11th Avenue, Portland, Oregon 97232–4181 (telephone (503) 231–6158; facsimile (503) 231–6243).

Required Determinations

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements

on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA: 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as endangered or threatened under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

References Cited

A complete list of all references cited in this final rule is available on the Internet at *http://www.regulations.gov,* or upon request from the Manager, Washington Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT** section).

Author(s)

The primary authors of this final rule are the staff members of the Central Washington Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Regulation Promulgation

Accordingly, we hereby amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.12(h) by adding entries for *''Eriogonum codium''* (Umtanum desert buckwheat) and ''*Physaria douglasii* subsp. *tuplashensis''* (White Bluffs bladderpod) to the List of Endangered and Threatened Plants in alphabetical order under Flowering Plants to read as follows:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*		*
Eriogonum codium ...	Umtanum desert buckwheat.	U.S.A. (WA)	Polygonaceae	T	811	17.96(a)	NA
*	*	*	*	*	*		*
Physaria douglasii subsp. *tuplashensis.*	White Bluffs bladderpod.	U.S.A. (WA)	Brassicaceae	T	811	17.96(a)	NA
*	*	*	*	*	*		*

Dated: April 8, 2013.

Rowan Gould,

Director, U.S. Fish and Wildlife Service.

[FR Doc. 2013–09409 Filed 4–22–13; 8:45 am]

BILLING CODE 4310–55–P