

11.0 Resource Protection

11.1 Ecological Protection

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Ecological monitoring is performed on the Hanford Site to collect and track data needed to ensure compliance with an array of environmental laws, regulations, and policies governing DOE activities. Ecological monitoring data provide baseline information about the plants, animals, and habitat under RL stewardship at Hanford that is required for decision-making under NEPA and CERCLA.

The Comprehensive Land Use Plan-Environmental Impact Statement ([CLUP] [DOE/EIS-0222-F](#)) evaluated the impacts associated with future land-use planning at the Hanford Site. The purpose of this land-use plan and its implementing procedures is to facilitate decision-making about the site's uses and facilities over at least the next 50 years. The DOE decision to adopt the CLUP seeks to balance continuing land-use needs at Hanford with the preservation of important ecological and cultural values of the site and future economic development in the area.

The *Hanford Site Biological Resource Management Plan* ([BRMP] [DOE/RL-96-32, Rev. 1](#)) is identified by the CLUP as the primary implementation control for managing and protecting natural resources on the Hanford Site. According to the CLUP, the BRMP:

Provides a mechanism for ensuring compliance with laws protecting biological resources; provides a framework for ensuring that appropriate biological resource goals, objectives, and tools are in place to make DOE an effective steward of the Hanford biological resources; and implements an ecosystem management approach for biological resources on the Site. The BRMP provides a comprehensive direction that specifies DOE biological resource policies, goals, and objectives.

RL places priority on monitoring those plant and animal species or habitats with specific regulatory protections or requirements; that are rare and/or declining (federal or state listed endangered, threatened, or sensitive species); or are of significant interest to federal, state, or tribal governments or the public. The BRMP ranks wildlife species and habitats (Levels 0-5), providing a graded approach to monitoring biological resources based on the level of concern for each resource.

Ecological monitoring and ecological compliance support the Hanford Site's waste management and environmental restoration mission through the following activities:

- ◊ Ensuring the Hanford Site's operational compliance with laws and regulations including the Endangered Species Act of 1973 ([16 USC 1531](#)), Bald and Golden Eagle Protection Act ([16 USC 668-668c](#)), and Migratory Bird Treaty Act of 1918 ([16 USC 703](#)), as well as compliance with executive orders, DOE orders, and RL resource management guidance
- ◊ Providing data for environmental impact and ecological risk assessments
- ◊ Providing information and maps of the distribution and condition of biological resources at the Hanford Site
- ◊ Supporting Hanford Site land-use planning and stewardship.

Hanford Site ecological monitoring activities provide information useful to the Hanford Site natural resource stakeholders and the public on the status of some of the site's most highly valued biological

resources. Population level surveys are conducted to monitor fish, wildlife, and plants and are used to develop baseline information and monitor any changes resulting from Hanford Site operations. Population data collection and analysis are integrated with data from environmental surveillance monitoring of biotic and abiotic media, and analytical results are used to characterize any potential risk or impact to the biota.

11.1.1 Fish and Wildlife Monitoring

This section provides inventory, monitoring, and survey information for species evaluated at the Hanford Site during 2014. This information is provided in context with historical data and trend information. Historically, four fish and wildlife species on the Hanford Site have been monitored annually: fall Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), bald eagles (*Haliaeetus leucocephalus*), and mule deer (*Odocoileus hemionus*). These species are either regulatory protected or of special interest to the public and stakeholders, with the exception of mule deer. Monitoring consisted of estimating numbers of fall Chinook salmon redds, surveying for steelhead redds, and assessing bald eagle nesting and night roosting activity because the species have the potential to be impacted by Hanford Site operations. Yearly monitoring provides occurrence and distribution data to ensure their protection from Hanford Site operations. Additional monitoring efforts included nesting raptors and migratory birds. The sections below provide summaries of the monitoring results; the detailed monitoring reports are available at <http://www.hanford.gov/page.cfm/ecologicalmonitoring>.

11.1.1.1 Fall Chinook Salmon

Chinook salmon, commonly referred to as king salmon, are the largest of the Pacific salmon (Myers et al. 1998, Netboy 1958). Adult fall Chinook salmon destined for the Hanford Reach enter the Columbia River in late summer and spawn from mid-October through November. Females fan out nests or redds in suitable gravel substrate and deposit eggs in an egg pocket while males simultaneously extrude milt to fertilize the eggs. Redds are readily identifiable at this time and appear as clean swept gravel patches amidst darker undisturbed substrate that is covered by algae (periphyton).

The population of fall Chinook salmon that spawns in the Hanford Reach of the Columbia River is the largest run remaining in the Pacific Northwest and has regional ecological and cultural significance as well as economic importance that extends down the Columbia River and into the Pacific Ocean as far as southeast Alaska (Dauble and Watson 1997). These fall Chinook salmon have been vital in efforts to preserve and restore other depleted Chinook salmon stocks in the Columbia Basin (Anglin et al. 2006). Aerial counts of fall Chinook salmon redds have been conducted since 1948 at Hanford to provide an index of relative abundance among spawning areas and years (Wagner et al. 2012, Wagner et al. 2013, Lindsey and Nugent 2014, MSA 2015). The counts are also used to document the onset of spawning, locate spawning areas, and determine intervals of peak spawning activity. These data also allow for planning to avoid impacts, such as disturbance or siltation, to redds from Hanford Site activities. Understanding the location and abundance of spawning is a critical part of the management of this important population. The information collected during the surveys that are the focus of this report is vitally important for the implementation of the Hanford Reach Fall Chinook Protection Program (USACE 2006). Prior to 2011, the Hanford Reach was divided into 11 sections, which have been maintained in the current monitoring campaign. In 2011, eight additional sections (100-B/C, 100-K, 100-N, 100-D, 100-H, 100-F, the dunes, and 300 Area) were defined to better monitor the abundance and distribution of fall Chinook redds in areas of potential upwelling of contaminated groundwater. The original 11 sections and

the newer 8 sections are not mutually exclusive areas; they simply represent different divisions of the Hanford Reach.

In 2014, four aerial surveys were completed along the length of the Hanford Reach (October 20, November 10, November 24, and December 1). Table 11.1 summarizes the results of visual aerial surveys for fall Chinook salmon redds in the originally defined 11 sections. The results for the same surveys, organized into the eight operational areas are shown in Table 11.2. The peak annual visual redd count for 2014 (15,951) was less than last year's (2013) all time highest count of 17,398 but was well in excess of the previous 10 year average (8,065) (see Figure 11.1). Additional information detailing the 2014 monitoring effort is available in [HNF-58823](#), *Hanford Reach Fall Chinook Redd Monitoring Report for Calendar Year 2014*.

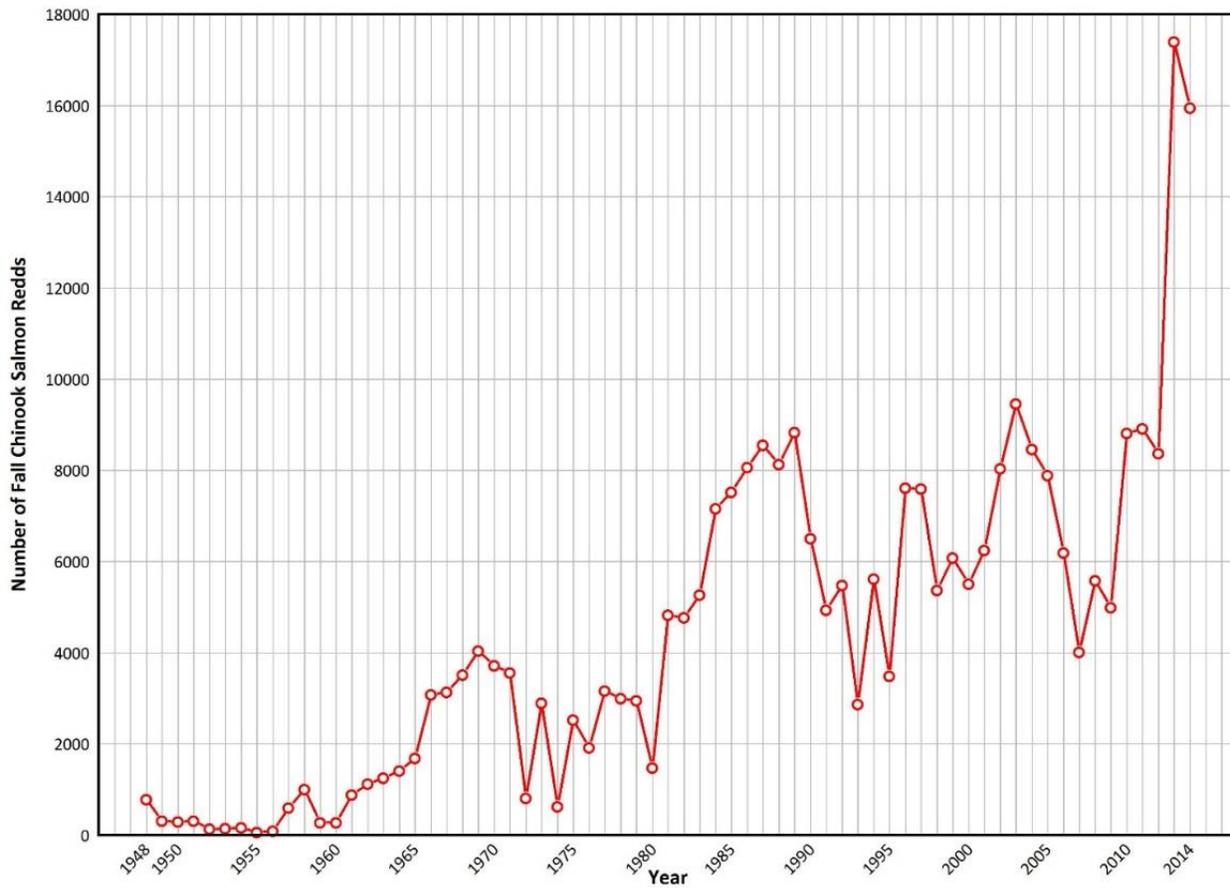
Table 11.1. Summary of the Aerial Surveys for Fall Chinook Salmon Redd Counts in the Hanford Reach, Columbia River

Area	Description	2014				Maximum Count
		10/20	11/10	11/24	12/1	
0	Islands 17-21 (Richland)	0	0	0	0	0
1	Islands 11-16	0	76	767	906	906
1a	Savage Island/Hanford Slough	0	0	0	0	0
2	Islands 8-10	0	427	1,470	1,565	1,565
3	Near Island 7	0	400	1,100	1,100	1,100
4	Island 6 (lower half)	10	1,020	2,230	2,530	2,530
5	Island 4, 5 and upper 6	25	730	2,030	2,080	2,080
6	Near Island 3	0	100	900	1,000	1,000
7	Near Island 2	23	1,010	2,030	2,050	2,050
8	Near Island 1	0	200	400	500	500
8a	Upstream of Island 1 to Coyote Rapids	0	0	0	0	0
9	Near Coyote Rapids	25	255	400	500	500
9a	Upstream of Coyote Rapids to China Bar	0	0	0	0	0
China Bar	China Bar/Midway	0	20	50	60	60
10	Near Vernita Bar	55	1,830	3,600	3,650	3,650
11	Upstream of Vernita Bar to Priest Rapids Dam	0	5	10	10	10
Total		138	6,073	14,987	15,951	15,951

Table 11.2. Summary of the Aerial Surveys for Fall Chinook Salmon Redd Counts by Potential Contaminated Groundwater Upwelling Subsections in the Hanford Reach, Columbia River (2014)

Sub-Area	10/20	11/10	11/24	12/1	Count
300	0	0	0	0	0
Dunes	0	0	0	0	0
100-F	0	400	1,100	1,100	1,100
100-H	25	730	2,030	2,080	2,080
100-D	0	200	400	500	500
100-N	0	0	0	0	0
100-K	0	0	0	0	0
100-BC	25	255	400	500	500
Totals	50	1,585	3,930	4,180	4,180

Figure 11.1. Fall Chinook Salmon Redd Counts (1948-2014)



11.1.1.2 Steelhead

Steelhead use the Hanford Reach for rearing as juveniles, as a migratory corridor for juveniles and adults, and for spawning as adults. Upper Columbia Summer-run Steelhead are currently listed as federally threatened under the Endangered Species Act of 1973 in [16 USC 1531](#) and as a state candidate in Washington ([WDFW 2015](#)). Because of their listing status and importance to recreational and tribal fisheries, steelhead were selected for monitoring under this program.

Steelhead build nests termed “redds,” in gravel or cobble substrate and spawn in the spring; the steelhead fry emerge from the gravel later that same spring. Adult steelhead generally use smaller tributary habitat and substrate; however, adult steelhead will spawn in larger mainstream rivers with suitable habitat, such as the Columbia River. Suitable spawning conditions within the Hanford Reach, occur between February and early June, with peak spawning in mid-May (Eldred 1970, *Steelhead Spawning in the Columbia River, Ringold to Priest Rapids Dam, September 1970 Progress Report*; (Watson 1973), *Estimate of Steelhead Trout Spawning in the Hanford Reach of the Columbia River*; [PNL-5371 and DOE/RL-2000-27](#), *Anadromous Salmonids of the Hanford Reach, Columbia River: 1984 Status*

Aerial surveys for steelhead redds are conducted on the Hanford Reach in the spring of each year to identify potential spawning areas and timing as well as to provide an annual index of relative abundance among spawning areas. Although few redds have been counted in recent years, the surveys document any change in the status of steelhead spawning in the Hanford Reach and could help plan project activities to avoid redds, if any are identified. Similar to the methods used to document fall Chinook salmon spawning, the survey area is divided into 11 sections, with the number of redds being totaled by section. Eight additional sub-sections (100-B/C, 100-K, 100-N, 100-D, 100-H, 100-F, the dunes, and 300 Area) were added in 2012 to monitor the abundance and distribution of steelhead redds in areas of potential upwelling of contaminated groundwater. The original 11 sections and the newer 8 sections are not mutually exclusive areas; they simply represent different divisions of the Hanford Reach area.

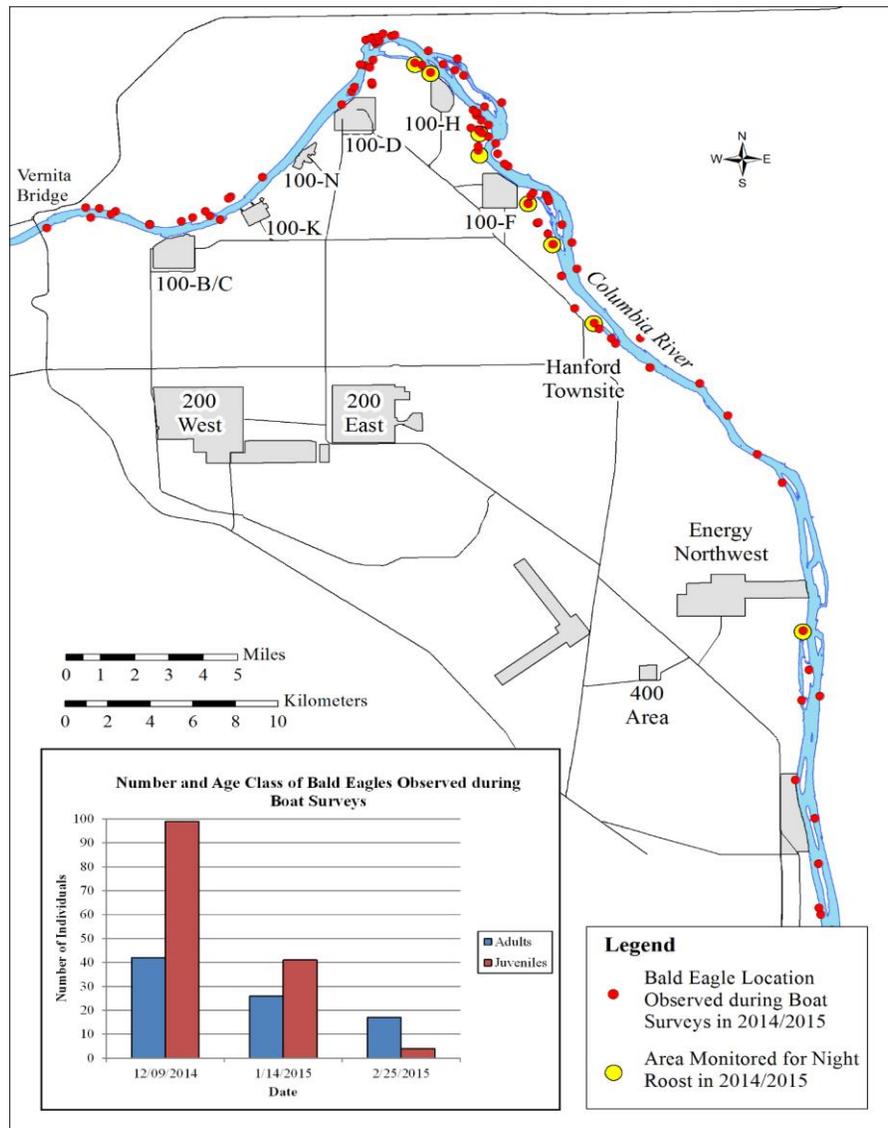
One aerial survey was completed along the length of the Hanford Reach for the 2014 survey season. The survey was performed on April 8, 2014. Viewing conditions were good. Weather was clear and warm with light and variable winds. River discharge from Priest Rapids Dam for the eight hours prior to the survey ranged from 121 to 131 thousand cubic feet per second (ft³/s) (3426 to 3710 thousand cubic meters/second [m³/s]). No steelhead redds were observed during the April 8 flight. River flows on the Hanford Reach increased above 160 thousand cubic feet per second (ft³/s) (4,531 thousand cubic meters/second [m³/s]) by mid-April and remained high for the remainder of the steelhead spawning season. No other steelhead redd survey flight was made in 2014.

11.1.1.3 Bald Eagle

Bald eagles were removed from the federal endangered and threatened species list in July 2007, and were down-listed from threatened to sensitive by the WDFW in January 2008. Federal laws including the *Bald and Golden Eagle Protection Act of 1940* and the *Migratory Bird Treaty Act of 1918* still provide protection for eagles, their nest trees, and communal night roosts.

[DOE/RL-94-150](#) sets temporal and spatial restrictions on Hanford Site work activities to protect eagles and their habitats in accordance with current federal and state guidelines. Under the plan, communal night roosts and nest sites are protected with a 0.25 mile (400 meter) buffer zone. Night roost buffers are enforced from November 15 until March 15, and nest exclusion buffers are maintained until nest

Figure 11.2 Bald Eagle Boat Survey Results for the 2014-2015 Season



abandonment or fledging of young, whichever is later. Work-related access into roost areas is allowed between 10 a.m. and 2 p.m. after notification of Hanford Site Ecological Compliance staff.

Monitoring bald eagles is essential to maintaining current biological information about their abundance and distribution on the Hanford Site, ensuring compliance with protection regulations, and informing future protection and management efforts and decisions. During the 2014-2015 season (as of March 24, 2015), 24 night roost surveys, 3 boat surveys, and 5 nest surveys were conducted. WDFW defines a communal or night roost as “a tree or a group of trees in which at least 3 eagles roost for at least two nights and during more than one year.” Night roost surveys were conducted at dusk, from ten minutes prior to sunset until dark. On three separate days between mid-December 2014 and late February 2015, night roost surveys were conducted at 8 locations.

The entire Hanford Reach was surveyed by boat three times during the 2014-2015 season (mid-December, mid-January, and late February). Boat surveys are used to determine the number, age class, and distribution of eagles present on the Hanford Reach. Boat surveys also are used to identify additional potential night roosts and nest sites and to identify the primary foraging areas along the Hanford Reach. The maximum count of 141 bald eagles on the Hanford Reach for the 2014-2015 season (on December 9, 2014) was nearly double the previous record of 75 in 1996. This was most likely a result of the record number of adult fall Chinook salmon spawning in the Hanford Reach in 2013 and 2014. Spawning-out salmon carcasses that accumulate along the Hanford Reach provide bald eagles their primary food source. During 2014-2015 boat surveys, adult eagles were observed sitting on nests at both the upstream of Wooded Island location (on December 9, 2014) and the White Bluffs Peninsula (on February 25, 2015).

Nest site surveys were conducted in two locations (White Bluffs Peninsula and upstream of Wooded Island). Nest sites were monitored for nesting activities (e.g., a pair defending the nest from other eagles, nest tending, pair bonding behaviors). As of March 24, 2015, eagles appeared to be using both the White Bluffs Peninsula and the upstream of Wooded Island nests. The area is posted with a nest protection sign to ensure that no vehicular traffic approaches the nest within 436 yards (400 meters), as required by [DOE/RL-94-150](#). MSA staff will continue to monitor the nest to determine the outcome of the nesting attempt. Later in 2015, a complete bald eagle monitoring report will be available online at <http://www.hanford.gov/page.cfm/ecologicalmonitoring>.

11.1.1.4 Raptor Nest Monitoring

The Hanford Site supports a large and diverse community of raptorial birds ([Fitzner and Gray 1991](#)), with 26 species of raptors observed on the Hanford Site. Thirteen raptor species have been recorded nesting on the Hanford Site, including eight species of diurnal raptors and five species of owls. Several of these species are on state and federal threatened and endangered species lists ([WDFW 2015](#)). The ferruginous hawk (*Buteo regalis*) is a Washington State threatened species. The bald eagle is a Washington State sensitive species and a federal species of concern. The burrowing owl (*Athene cunicularia*) is a Washington State candidate species. And Swainson's hawks (*Buteo swainsoni*), prairie falcons (*Falco mexicanus*), and ospreys (*Pandion haliaetus*) are Washington State monitored species. Because of the status of these species, DOE-RL documents and protects nest locations to avoid disturbance during the nesting season and tracks populations over time to determine potential impacts of Hanford operations on these species and provide a level of protection afforded to them under the *Migratory Bird Treaty Act* (MBTA). Common ravens also nest on the Hanford Site, and although they are not considered raptors, they perform a similar ecological role.

Nest surveys for raptors and common ravens were conducted on DOE-managed lands, including central Hanford, McGee Ranch/Riverlands, the dunes, and southern shoreline of the Columbia River. Nests were located using vehicular and foot surveys. Nest searches occurred in late May and early June when all species occupy nesting territories. Survey methods used in 2014 were consistent with the methods used in 2012 and 2013 (Nugent et al. 2013, Nugent et al. 2014).

A total of 122 raptor nest sites were recorded in 2014 including 3 ferruginous hawks, 18 Swainson’s hawks, 9-red-tailed hawks, 2 prairie falcons, 1 American kestrel, 1 bald eagle, 1 osprey, 1 great horned owl, 5 long-eared owls, 11 burrowing owls, and 70 common ravens. Nest substrates used by raptors and ravens on DOE-RL managed lands are shown in Table 11.3. All raptor and raven nest sites located in 2014 are displayed in Figure 11.3. A comparison of the number of raptor nest sites located from 2012 through 2014 is presented in Figure 11.4.

Figure 11.3. Raptor and Common Raven Nests (2014-2015 Season)

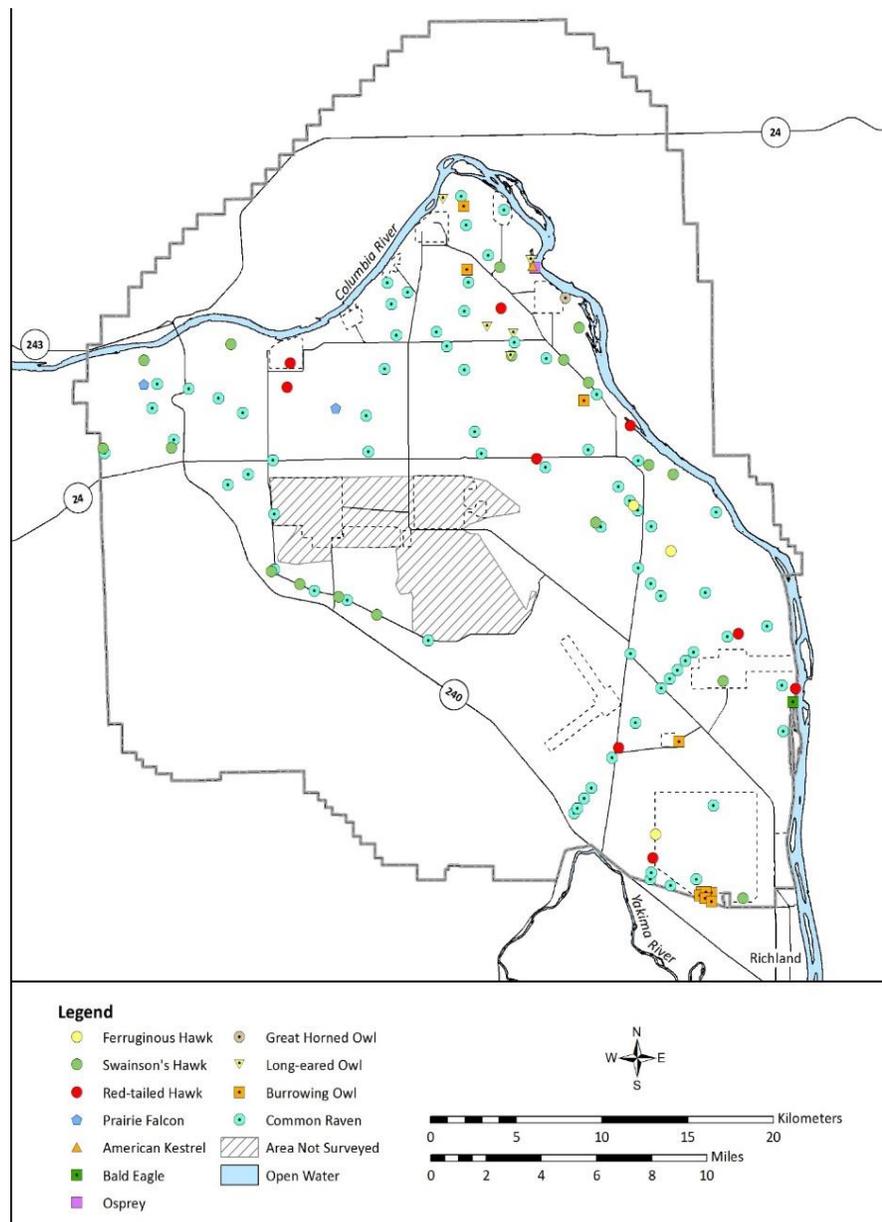


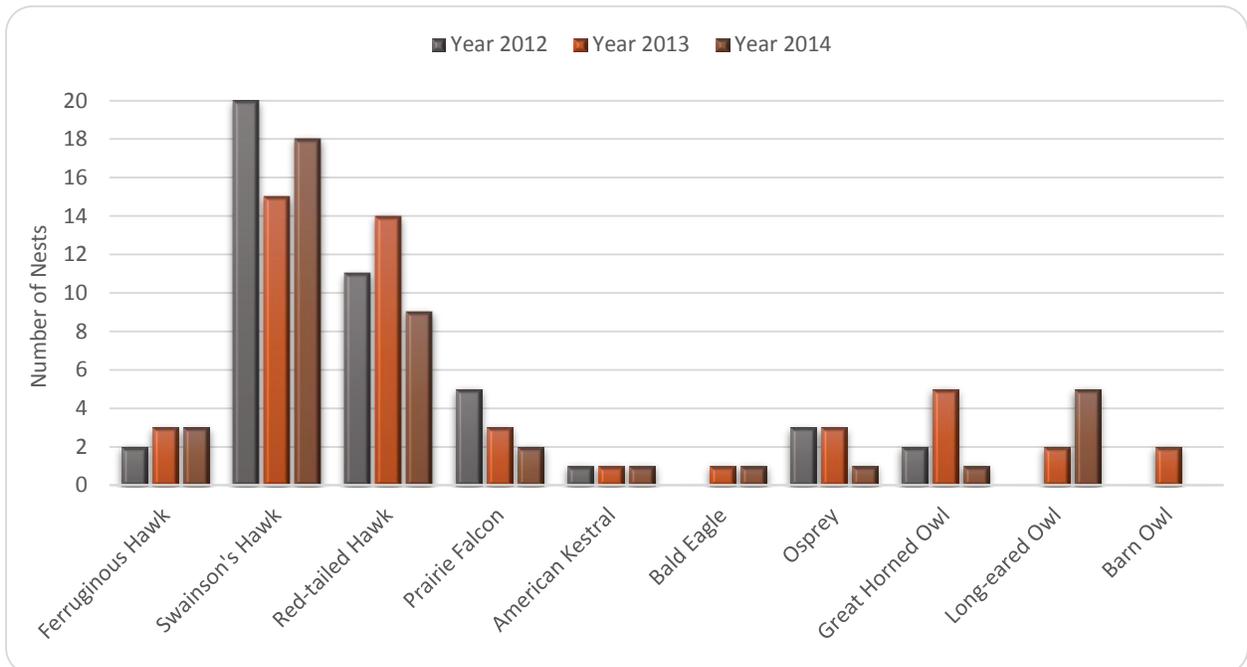
Table 11.2. Nest Substrates Used by Raptors and Ravens

Species	Tree	Cliff	Transmission Tower	Utility Pole	Electrical Substation	Nest Platform	Instrument Tower	Communications Tower	Building	Irrigation Pipe	Mammal Burrow	Artificial Burrow	Total
Ferruginous hawk			3										3
Swainson's hawk	15		1	2									18
Red-tailed hawk	3	1	4										9
Prairie falcon		2											2
American kestrel	1												1
Bald eagle	1												1
Osprey						1							1
Great horned owl	1												1
Long-eared owl	5												5
Burrowing owl ¹										2	3	6	11
Common raven ²	12	1	45	7	2		1	1	1				70
Total	38	4	53	9	2	1	1	1	2	2	3	6	122

¹ Burrowing owls were recorded in separate monitoring reports in 2012 and 2013.

² Common ravens are not technically raptors but occupy a similar ecological niche.

Figure 11.4. Number of Raptor Species Nest Sites



The first known successful bald eagle nest was documented on the Hanford Site upstream of Wooded Island in 2013. This bald eagle nest was successful again in 2014. In 2014, ferruginous hawks were observed at the same three nest sites that were occupied in 2013. In addition, 18 Swainson’s hawk nests

were located, similar to observations the previous two years (20 in 2012 and 15 in 2013). These numbers were within the range (9 to 23 nests) found in the last 41 years. The number of red-tailed hawk nests located in 2014 (9) was fewer than observed the previous two years (11 in 2012 and 14 in 2013), but within the range (7 to 19 nests) located in the last 41 years. The 2 prairie falcon nests located were also fewer than observed the previous two years (5 in 2012 and 3 in 2013). American kestrel nest site numbers were expected to be much greater than the 1 nest detected during the survey; however, as secondary cavity nesters, American kestrels have many opportunities for nesting (holes and crevices on trees, cliffs, buildings, and other structures) on the Hanford Site that make locating their nests a considerable effort. In 2014, one osprey nest was observed on the nest platform near White Bluffs boat launch. Three nests were found in 2012 and 2013; it is unclear why the nest platforms in the 300 Area and the Hanford Townsite were not occupied in 2014 as they were in 2012 and 2013. Ospreys were first observed nesting on the Hanford Site in 2000 (Poston et al. 2001).

One great horned owl nest was located in 2014, which was a decrease from the 5 located in 2013 and the 2 found in 2012. Five long-eared owl nests were located, an increase from the 2 located in 2013, and 0 located in 2012. Barn owl nesting on the Hanford Site has been infrequent. No barn owl nests were located in 2014, although 2 nests were located in 2013. No nests were located in 2012. Short-eared owls rarely nest on the Hanford Site, and no nests were located from 2012 through 2014.

All burrowing owl nests located in 2014 were incidental observations; therefore, the number of burrowing owl nests recorded in 2014 should be considered incomplete. The incidental observations located 11 burrowing owl nest sites; 2 nest sites were located during one survey and an additional 9 were located during other ecological surveys. In 2012, 39 active burrows were located ([Wilde et al. 2012](#)), and in 2013, 50 active burrows were located ([Wilde et al. 2014](#)).

The number of common raven nest sites found on the Hanford Site has steadily increased in the last three years: 70 raven nests were located in 2014, 66 in 2013, and 63 in 2012. Additional details from this research are available in the *Hanford Site Raptor Nest Monitoring Report for Calendar Year 2014* ([HNF-58717](#)).

11.1.1.5 Hanford Bird Surveys

The Hanford Site contains a wide expanse of bird habitat, including basalt outcrops, riparian streams and springs, shrub-steppe on slopes and plains, sand dunes and blowouts, and abandoned fields or disturbed areas. Because of its large size, the site provides habitat for shrub-steppe birds that are entirely dependent on large expanses of sagebrush or areas with native grasses in the understory ([TNC 1999](#), *Biodiversity Inventory and Analysis of the Hanford Site*). In the majority of the Columbia Basin, human activities such as farming, urbanization, and industrial development have greatly decreased the amount of natural sagebrush-grass habitat and disturbance-free riparian zones that many endemic birds require for survival. Ultimately, human activities have caused the populations of a number of shrub-steppe birds to decrease, and some, such as the greater sage grouse (*Centrocercus urophasianus*), have been locally extirpated. Several sagebrush-steppe dependent species, such as the sagebrush sparrow (*Artemisiospiza nevadensis*), sage thrasher (*Oreoscoptes montanus*), and loggerhead shrike (*Lanius ludovicianus*) are currently listed by WDFW as candidate species and have the potential to be listed as threatened or endangered in the future ([WDFW 2015](#)).

In addition, the Hanford Site and surrounding area provide refuge to potentially 17 state-listed species including numerous birds: ferruginous hawks, state threatened; American white pelican (*Pelecanus erythrorhynchos*), state endangered; and bald eagle, state sensitive and federal species of concern ([WDFW 2015](#)).

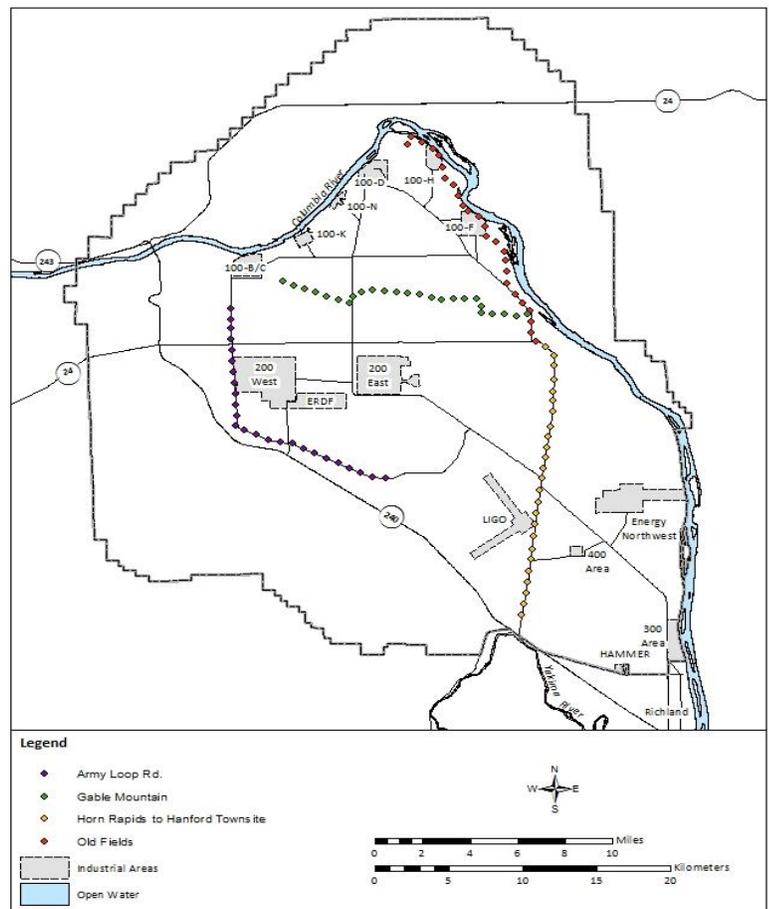
Ecological monitoring staff conduct road surveys to monitor changes in species richness and relative abundance of shrub-steppe birds over time and in response to various types of land-use changes. In 2014, roadside surveys were performed on June 9, 10, and 12. Three complete routes and a partial route from the four Hanford annual routes were surveyed in 2014 (Figure 11.5). The survey documented 1,332 individual birds, similar to the 1,264 individuals counted during the similar period on June 2013. A total of 51 bird species were documented, which was higher than the 47 species recorded in similar June 2013 surveys.

The Old Fields survey route had the highest species diversity, and the Army Loop Road survey route—where only one-half the points were surveyed—had the lowest species diversity (Table 11.3). The horned lark (*Eremophila alpestris*) was the most abundant species documented along all routes. Surveys documented 334 horned larks, 25.08 percent of all individuals counted.

The second most abundant species counted, the western meadowlark (*Sturnella neglecta*) documented 249 individuals (18.69 percent of birds surveyed). Horned larks were counted on 75 survey points (86.21 percent), and the western meadowlark was documented on 74 survey points (85.06 percent). These two species were counted at nearly three times as many survey points as any other species documented in 2014.

The Hanford bird monitoring program documents the presence, abundance, and distribution of species of concern on the Hanford Site. Both the USFWS and the WDFW maintain lists of species that are of management concern because populations or habitat availability are limited. In Washington, those listings include (in order of least to greatest concern) state candidate, state sensitive, state threatened, and state endangered. The WDFW also maintains a list of state monitor species, a group of birds that are not considered species of concern, but for which status and distribution data are document. There are currently no avian species listed as federally threatened or endangered on the Hanford Site, although several are considered federal species of concern in eastern Washington. Six state-listed species were recorded on the Hanford Site in the 2014 surveys: American white pelican, state endangered; bald eagle

Figure 11.5 Roadside Bird Survey Routes



state sensitive; ferruginous hawk, state threatened; loggerhead shrike, state candidate; sagebrush sparrow, state candidate; and sage thrasher, state candidate. Additional information detailing migratory bird monitoring efforts is available at <http://www.hanford.gov/page.cfm/ecologicalmonitoring>.

Table 11.3. Species Richness and Abundance During 2014 Roadside Bird Surveys

Route Name	Number of Surveys Performed	Number of Species	Abundance
Army Loop Road	0.5	8	116
Gable Mountain	1	13	214
Horn Rapids to Townsite	1	17	283
Old Fields	1	41	719
Total	3.5	51 ^a	1332

^a Unique species identified.

11.2 Endangered and Threatened Species

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This section describes federal and state endangered and threatened species, candidate or sensitive plant and animal species, and other species of concern potentially found at the Hanford Site. Endangered species are those in danger of extinction within all or a significant portion of their range. Threatened species are those likely to become endangered in the near future. Sensitive species are species that are vulnerable or declining and could become endangered or threatened without active management or removal of threats. The federal list of endangered and threatened species is maintained by the USFWS in [50 CFR 17.11](#), “Endangered and Threatened Wildlife” and [50 CFR 17.12](#), “Endangered and Threatened Plants.” The Washington Natural Heritage Program ([WNHP 2014](#)) and WDFW ([WDFW 2015](#)) maintain state lists.

The purposes of the *Endangered Species Act of 1973* ([16 USC 1531](#)), as amended, are to: 1) provide a means to conserve critical ecosystems; 2) provide a program for the conservation of endangered and threatened species; and 3) ensure appropriate steps are taken to achieve the purposes of the treaties and conventions established under the Act. Washington State regulations also list species as endangered and threatened, but such a listing does not carry the protection of the federal Endangered Species Act. The National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service ([NOAA 2015](#), *Endangered and Threatened Marine Species*) has the responsibility for federal listing of anadromous fish (i.e., fish that require both saltwater and freshwater to complete a lifecycle). The USFWS is responsible for all other federally listed species at the Hanford Site. Table 11.4 lists the federal species of plants and animals that occur or potentially occur on the Hanford Site and are listed as endangered, threatened, sensitive, or candidate by either the federal or state government.

Two federally listed fish species (spring-run Chinook salmon [*Oncorhynchus tshawytscha*] and steelhead [*Oncorhynchus mykiss*]) are known to occur regularly on the Hanford Site (Table 11.4). One additional fish species (bull trout [*Salvelinus confluentus*]) was recorded at the Hanford Site, but scientists believe this species is transient. Two plant species, Umtanum desert buckwheat (*Eriogonum codium*) and White Bluffs bladderpod (*Physaria douglasii* ssp. *tuplashensis*) were listed as threatened species under the federal *Endangered Species Act* in April 2013 ([78 FR 23984](#), “Endangered and Threatened Wildlife and Plants”); the rule was reaffirmed late in 2013 and was effective as of December 20, 2013 ([78 FR 23984](#), *Endangered*

and Threatened Wildlife and Plants). No other plants or animals known to occur on the Hanford Site are currently on the federal list of endangered and threatened species (<http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=50:2.0.1.1.1>), but one mammal species (Washington ground squirrel) and one bird species (greater sage grouse) are currently candidates for federal listing (Table 11.4). In addition, 12 plant species and 4 bird species have been listed as either endangered or threatened by Washington State. Numerous additional species of animals and plants are listed as candidate or sensitive species by Washington State. There are 33 state-level sensitive and candidate species of animals and 18 sensitive plant species occurring or potentially occurring on the Hanford Site (Table 11.4).

Table 11.4 Federal and State Endangered, Threatened, Sensitive, and Candidate Species

Common Name	Scientific Name	Federal Status ^a	State Status ^a
Plants			
Annual sandwort	<i>Minuartia pusilla</i> var. <i>pusilla</i>		Sensitive
Awned halfchaff sedge	<i>Lipocarpha (Hemicarpha) aristulata</i>		Threatened
Beaked spike-rush	<i>Eleocharis rostellata</i>		Sensitive
Canadian St. John's wort	<i>Hypericum majus</i>		Sensitive
Columbia milkvetch	<i>Astragalus columbianus</i>	Species of concern	Sensitive
Columbia yellowcress	<i>Rorippa columbiae</i>	Species of concern	Threatened
Coyote tobacco	<i>Nicotiana attenuata</i>		Sensitive
Desert cryptantha	<i>Cryptantha scoparia</i>		Sensitive
Desert dodder	<i>Cuscuta denticulata</i>		Threatened
Desert evening-primrose	<i>Oenothera cespitosa</i> ssp. <i>cespitosa</i>		Sensitive
Dwarf evening primrose	<i>Eremothera (Camissonia) pygmaea</i>		Sensitive
Fuzzytongue penstemon	<i>Penstemon eriantherus</i> var. <i>whitedii</i>		Sensitive
Geyer's milkvetch	<i>Astragalus geyeri</i> var. <i>geyeri</i>		Threatened
Grand redstem	<i>Ammannia robusta</i>		Threatened
Gray cryptantha	<i>Cryptantha leucophaea</i>	Species of concern	Sensitive
Great Basin gilia	<i>Aliciella (Gilia) leptomeria</i>		Threatened
Hairy bugseed	<i>Corispermum villosum</i>		Sensitive
Hedgehog cactus	<i>Pediocactus nigrispinus</i> (<i>P. simpsonii</i> var. <i>robustior</i>)		Sensitive
Hoover's desert parsley	<i>Lomatium tuberosum</i>	Species of concern	Sensitive
Loeflingia	<i>Loeflingia squarrosa</i>		Threatened
Lowland toothcup	<i>Rotala ramosior</i>		Threatened
Piper's daisy	<i>Erigeron piperianus</i>		Sensitive
Rosy pussypaws	<i>Cistanthe (Calyptridium) rosea</i>		Threatened
Small-flowered evening-primrose	<i>Eremothera (Camissonia) minor</i>		Sensitive
Snake River cryptantha	<i>Cryptantha spiculifera</i> (<i>C. interrupta</i>)		Sensitive
Suksdorf's monkey flower	<i>Erythranthe (Mimulus) suksdorfii</i>		Sensitive
Thompson's sandwort	<i>Eremogone (Arenaria) franklinii</i> var. <i>thompsonii</i>		Sensitive
Umtanum desert buckwheat	<i>Eriogonum codium</i>	Threatened	Endangered
White Bluffs bladderpod	<i>Physaria (Lesquerella) douglasii</i> ssp. <i>tuplashensis</i>	Threatened	Threatened
White eatonella	<i>Eatonella nivea</i>		Threatened
Mollusks			
California floater	<i>Anodonta californiensis</i>		Candidate
Columbia pebblesnail	<i>Fluminicola columbiana</i>		Candidate
Giant Columbia River limpet	<i>Fisherola nuttalli</i>		Candidate
Insects			
Columbia clubtail (Dragonfly)	<i>Gomphus lynnae</i>		Candidate
Columbia River tiger beetle ^b	<i>Cicindela columbica</i>		Candidate

Table 11.4 Federal and State Endangered, Threatened, Sensitive, and Candidate Species

Common Name	Scientific Name	Federal Status ^a	State Status ^a
Silver-bordered fritillary	<i>Boloria selene atrocotalis</i>		Candidate
Fish			
Bull trout ^c	<i>Salvelinus confluentus</i>	Threatened	Candidate
Leopard dace ^c	<i>Rhinichthys flacatus</i>		Candidate
Mountain sucker ^c	<i>Catostomus platyrhynchus</i>		Candidate
River lamprey ^c	<i>Lampetra ayresi</i>	Species of concern	Candidate
Chinook salmon (Upper Columbia Spring-Run)	<i>Oncorhynchus tshawytscha</i>	Endangered	Candidate
Steelhead (Upper Columbia)	<i>Oncorhynchus mykiss</i>	Threatened	Candidate
Birds			
American white pelican	<i>Pelecanus erythrorhynchos</i>		Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Species of concern	Sensitive
Burrowingowl	<i>Athene cunicularia</i>		Candidate
Clark's grebe	<i>Aechmophorus clarkii</i>		Candidate
Common loon	<i>Gavia immer</i>		Sensitive
Ferruginous hawk	<i>Buteo regalis</i>		Threatened
Flamulated owl ^c	<i>Otus flammeolus</i>		Candidate
Golden eagle	<i>Aquila chrysaetos</i>		Candidate
Greater sage grouse	<i>Centrocercus urophasianus</i>	Candidate	Threatened
Lewis's woodpecker ^c	<i>Melanerpes lewis</i>		Candidate
Loggerhead shrike	<i>Lanius ludovicianus</i>		Candidate
Northern goshawk ^c	<i>Accipter gentilis</i>	Species of concern	Candidate
Peregrine falcon	<i>Falco peregrinus</i>	Species of concern	Sensitive
Sagebrush sparrow	<i>Artemisiospiza nevadensis (Amphispiza belli)</i>		Candidate
Sage thrasher	<i>Oreoscoptes montanus</i>		Candidate
Sandhill crane	<i>Grus canadensis</i>		Endangered
Western grebe	<i>Aechmophorus occidentalis</i>		Candidate
Amphibians and Reptiles			
Sagebrush lizard	<i>Sceloporus graciosus</i>		Candidate
Striped whipsnake	<i>Masticophis taeniatus</i>		Candidate
Western toad	<i>Bufo boreas</i>		Candidate
Mammals			
Black-tailed jackrabbit	<i>Lepus californicus</i>		Candidate
Merriam's shrew	<i>Sorex merriami</i>		Candidate
Townsend's ground squirrel	<i>Urocitellus townsendii</i>		Candidate
Washington ground squirrel ^c	<i>Urocitellus washingtoni</i>	Candidate	Candidate
White-tailed jackrabbit	<i>Lepus townsendii</i>		Candidate

^a Endangered - Species in danger of extinction within all or a significant portion of its range.

Threatened - Species likely to become endangered in the near future.

Candidate - Species that are believed to qualify for threatened or endangered species status, but for which listing proposals have not been prepared.

Sensitive - Taxa that are vulnerable or declining and could become endangered or threatened without active management or removal of threats.

Species of concern - Species that are not currently listed or candidates under the Endangered Species Act of 1973, but are of conservation concern within specific USFWS regions.

^b Probable, but not observed on the Hanford Site.

^c Reported, but seldom observed on the Hanford Site.

Washington State officials maintain additional lower level lists of species, including a monitor list for animals ([WDFW 2015](#)) and review and watch lists for plants ([WNHP 2014](#)). Species on the state monitor, watch, and review lists are not considered species of concern, but are monitored for status and distribution

(Table 11.5). These species are managed as needed by the state to prevent them from becoming endangered, threatened, or sensitive; however, an abundance of these species may be indicative of an ecosystem with relatively high native diversity. Approximately 50 state monitor list animal species occur or potentially occur on the Hanford Site (Table 11.5), as well as 24 watch or review list plant species (Table 11.6).

Table 11.5 Washington State Monitored Animal Species

Common Name	Scientific Name	Common Name	Scientific Name
Birds		Fish	
Arctic tern ^a	<i>Sterna paradisaea</i>	Pacific lamprey ^b	<i>Lampetra tridentata</i>
Ash-throated flycatcher ^a	<i>Myiarchus cinerascens</i>	Paiute sculpin	<i>Cottus beldingi</i>
Black tern ^a	<i>Chlidonias niger</i>	Reticulate sculpin	<i>Cottus perplexus</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	Sand roller	<i>Percopsis transmontana</i>
Black-necked stilt	<i>Himantopus mexicanus</i>	Amphibians and Reptiles	
Bobolink ^a	<i>Dolichonyx oryzivorus</i>	Night snake	<i>Hypsiglena torquata</i>
Caspian tern	<i>Sterna caspia</i>	Racer	<i>Coluber constrictor</i>
Forster's tern	<i>Sterna forsteri</i>	Short-horned lizard	<i>Phrynosoma douglasii</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Tiger salamander	<i>Ambystoma tigrinum</i>
Gray flycatcher	<i>Empidonax wrightii</i>	Woodhouse's toad	<i>Anaxyrus woodhousii</i>
Great blue heron	<i>Ardea herodias</i>	Mollusks	
Great egret	<i>Ardea alba</i>	Oregon floater	<i>Anodonta oregonensis</i>
Gyrfalcon ^a	<i>Falco rusticolus</i>	Western floater	<i>Anodonta kennerlyi</i>
Horned grebe	<i>Podiceps auritus</i>	Western pearlshell	<i>Margaritifera falcata</i>
Lesser goldfinch	<i>Spinus psaltria</i>	Winged floater	<i>Anodonta nuttalliana</i>
Long-billed curlew	<i>Numenius americanus</i>		
Osprey	<i>Pandion haliaetus</i>		
Prairie falcon	<i>Falco mexicanus</i>		
Red-necked grebe ^a	<i>Podiceps griseigena</i>		
Snowy owl	<i>Nyctea scandiaca</i>		
Swainson's hawk	<i>Buteo swainsoni</i>		
Turkey vulture ^a	<i>Cathartes aura</i>		
Western bluebird	<i>Sialia mexicana</i>		
Insects			
Juba skipper	<i>Hesperia juba</i>		
Nevada skipper	<i>Hesperia nevada</i>		
Pasco pearl crescent	<i>Phyciodes tharos pascoensis</i>		
Persius' duskywing	<i>Erynnis persius</i>		
Purplish copper	<i>Lycaena helloides</i>		
Ruddy copper	<i>Lycaena rubida perkinsorum</i>		
Viceroy	<i>Limenitis archippus lahontani</i>		
Mammals			
American badger	<i>Taxidea taxus</i>		
Canyon bat	<i>Parastrellus hesperus</i>		
Long-legged myotis ^b	<i>Myotis volans</i>		
Northern grasshopper mouse	<i>Onychomys leucogaster</i>		
Pallid bat	<i>Antrozous pallidus</i>		
Sagebrush vole	<i>Lemmiscus curtatus</i>		
Western small-footed myotis ^b	<i>Myotis ciliolabrum</i>		

^a Reported, but seldom observed on the Hanford Site.

^b Federal species of concern.

Table 11.6. Hanford Site Washington State Review and Watch List Plant Species

Common Name	Scientific Name	State Listing ^a
Annual paintbrush	<i>Castilleja exilis</i>	Watch List
Basalt milkvetch	<i>Astragalus conjunctus</i> var. <i>rickardii</i>	Watch List
Bristly combseed	<i>Pectocarya setosa</i>	Watch List
Chaffweed	<i>Anagallis (Centunculus) minima</i>	Watch List
Columbia River mugwort	<i>Artemisia lindleyana</i>	Watch List
Crouching milkvetch	<i>Astragalus succumbens</i>	Watch List
False pimpernel	<i>Lindernia dubia</i> var. <i>anagallidea</i>	Watch List
Giant helleborine	<i>Epipactis gigantea</i>	Watch List
Kittitas larkspur	<i>Delphinium multiplex</i>	Watch List
Medic milkvetch	<i>Astragalus speirocarpus</i>	Watch List
Pigmy-weed	<i>Crassula aquatica</i>	Watch List
Porcupine sedge	<i>Carex hystericina</i>	Watch List
Robinson's onion	<i>Allium robinsonii</i>	Watch List
Rosy balsamroot	<i>Balsamorhiza rosea</i>	Watch List
Scilla onion	<i>Allium scilloides</i>	Watch List
Shining flatsedge	<i>Cyperus bipartitus (C. rivularis)</i>	Watch List
Shy gilly-flower	<i>Gilia inconspicua</i>	Review Group 1
Small-flowered nama	<i>Nama densum</i> var. <i>parviflorum</i>	Watch List
Smooth cliffbrake	<i>Pellaea glabella</i> var. <i>simplex</i>	Watch List
Smooth willowherb	<i>Epilobium pygmaeum</i>	Review Group
Southern mudwort	<i>Limosella acaulis</i>	Watch List
Stalked-pod milkvetch	<i>Astragalus sclerocarpus</i>	Watch List
Vanilla grass	<i>Anthoxanthum hirtum (Hierchloe odorata)</i>	Review Group 1
Winged combseed	<i>Pectocarya penicillata</i>	Watch List

^a Watch List: Taxa that are of conservation concern, but are more abundant and/or less threatened than previously assumed. Review Group 1: Taxa for which currently there are insufficient data available to support listing as threatened, endangered, or sensitive.

11.3 Cultural and Historic Resource Protection

MC Petrich-Guy, CD Currie, AP Fergusson, and KM Mendez

Cultural and historic resources protection on the portions of the Hanford Site is conducted under the auspices of the RL Cultural Resources Program to ensure site compliance with federal cultural resources laws and regulations (Section 2.5). Program activities in 2014 included the following:

- ⊗ Performed Cultural Resource Reviews (CRR) for federal undertakings conducted at the Hanford Site in accordance with Section 106 of the NHPA ([16 USC 470](#)) and NEPA
- ⊗ Monitored site conditions to ensure important cultural resources are protected
- ⊗ Maintained a database of cultural resources site records, project records, and regional ethno-history
- ⊗ Maintained archaeological and historical collections
- ⊗ Identified and evaluated new cultural resources to ensure they are appropriately managed
- ⊗ Consulted with Native American Tribes and other stakeholders to gather input on the identification, documentation, and management of cultural resources important to them.

RL's Cultural Resources Program personnel oversee all cultural resource activities at the Hanford Site. NHPA Section 106 compliance work scope in 2014 was performed by staff archaeologists from MSA and WCH.

The RL Cultural Resources Program also schedules monthly meetings with all archaeological staff from the Hanford Site contractors to discuss and resolve issues relating to Cultural Resources Management (including survey procedures, site testing, site evaluation, consultations with external parties, etc.), with the objective of establishing and maintaining consistency among contractors.

11.3.1 Cultural Resources Reviews

Pursuant to the NEPA, and Section 106 of the *National Historic Preservation Act of 1966*, RL conducts cultural resources reviews of federal undertakings at the Hanford Site. The Section 106 regulations are also addressed as ARAR ([Section 121\(d\)](#)) under the [CERCLA](#), requiring remedial actions to identify and take into account the effects of activities on historic properties included on or eligible for inclusion on the National Register of Historic Places (NRHP). Section 106 cultural resource reviews ensure that important cultural resources are identified and effects to those resources are evaluated prior to project initiation so that mitigation measures can be conducted, if necessary.

Hanford Site archaeologists completed 122 Section 106 cultural resource reviews, including 73 proposed projects that did not involve ground disturbance. These projects were determined exempt by Hanford Site archaeologists after meeting the RL-approved [Historic Buildings Programmatic Agreement](#) (DOE/RL-96-77) exemption criteria following an initial review, or had satisfied the requirements of *National Historic Preservation Act* Section 106 under a prior review (Previously Reviewed Project Analyses Reviewed Project Analysis). Hanford Site archaeologists reviewed and completed five projects under an emergency declaration (Post Reviews) in accordance with Section 5.1.1 of the *Hanford Cultural Resources Management Plan* ([DOE/RL-98-10](#)). Most projects cleared under these expedited reviews occurred in the 200 Areas of the Hanford Site (Figure 11.6).

Hanford Site archaeologists also reviewed 17 undertakings in 2014 that had the potential to affect cultural resources, which included efforts to identify cultural resources that might be affected by project activity, an assessment of potential impacts, and the development of mitigation measures, if necessary³. Of the 17 undertakings, 13 were identified as *No Historic Properties Affected*, while four were determined to have *No Adverse Effects* to historic properties. One project identified as having *Adverse Effects* required mitigation measures as documented in a resulting project-specific Memorandum of Agreement. Adverse effects were avoided by taking specific actions to minimize impacts, including avoidance, following treatment plan guidelines, and archaeological monitoring. Approximately 1,566 acres (634 hectares) of new ground was surveyed for cultural resources, because of the 17 undertakings that had the potential to physically affect cultural resources. In addition, some undertakings required NRHP ([36 CFR 60](#)) eligibility evaluations, including sub-surface archaeological testing.

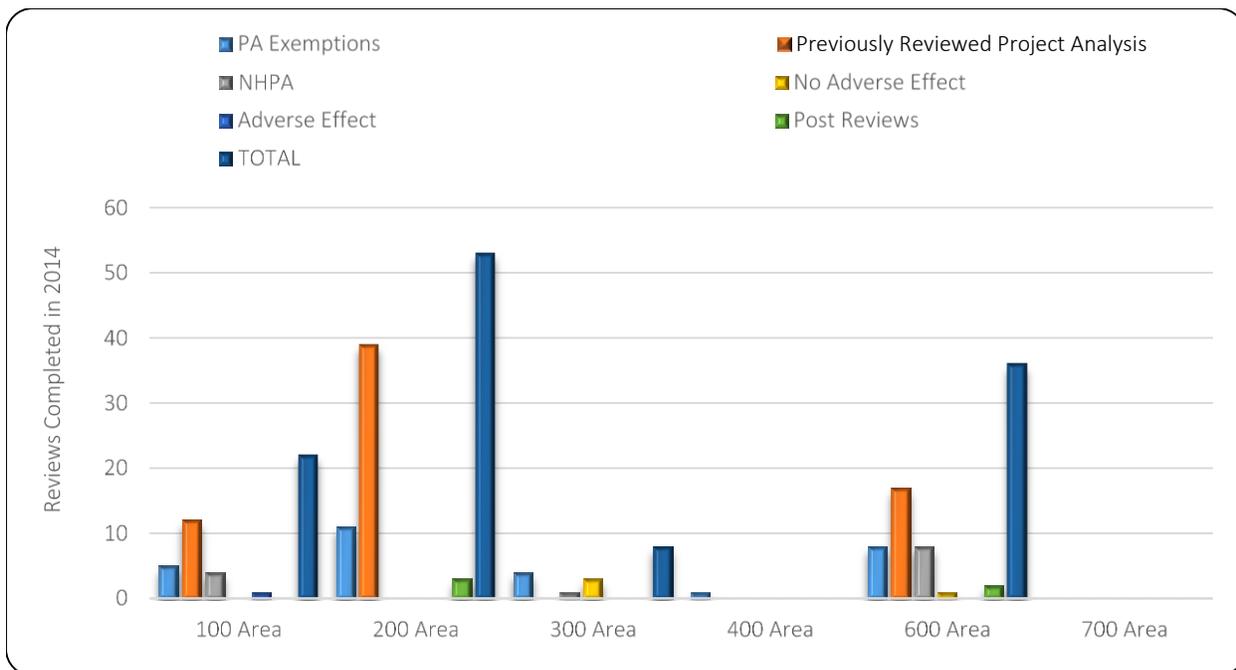
During CY 2014, DOE-RL completed the Section 106 work for proposed radiological characterization sampling of sediments within the area being evaluated for a proposed land conveyance on the Hanford

³ This number does not reflect all full cultural resources reviews initiated in 2013. Additional reviews were initiated in 2014, but completed in 2015, and are not included in this report.

Site. The radiological characterization sampling activities included collecting surface soil samples at 165 locations and 8 landscape features and ground scanning with an all-terrain vehicle-mounted gamma spectrometer. The area being evaluated contains a number of archaeological sites and isolates, including three properties that are eligible for listing in the NRHP.

An archaeological survey was conducted as part of the Section 106 review of this activity. During that survey, five previously unrecorded archaeological sites were identified. Subsurface testing was conducted at each of the newly identified sites to aid in the completion of NRHP evaluations. All subsurface testing results were negative, and the five newly discovered sites were found to be not eligible for listing in the NRHP. The radiological sampling plan was revised to relocate samples outside of archaeological sites, and monitoring of sample locations was conducted to avoid affecting historic properties. Through archaeological survey, testing, and monitoring and project design DOE was able to make a finding of No Historic Properties Affected, and the Washington State Department of Archaeology and Historic Preservation (DAHP) concurred with this finding.

Figure 11.6. Hanford Site National Historic Preservation Act Section 106 Reviews by Area



Cultural Resources staff completed Section 106 work for proposed radiological and chemical characterization sampling of sediments at two large waste sites on the Columbia River floodplain of the Hanford Site. These waste sites were associated with discharged water from the cooling of the 100-K Area reactor cores during Hanford Site operations and overlapped with areas of both significance and importance to area tribes and NRHP- ([36 CFR 60](#)) eligible properties. DOE, along with several other state and federal agencies (including Ecology and EPA) and tribal leaders, worked together to incorporate tribal preference in soil sampling techniques into protocols to be implemented in these culturally sensitive areas. Soil characterization sampling activities would generally include invasive and extensive excavations using heavy machinery; however, in consultation with area tribes, the working group was able to design minimally invasive sampling techniques to recover characterization samples from these waste sites.

Specifically, characterization samples were collected from shovel test units excavated using archaeological excavation techniques with the assistance of tribal monitors and elders. Artifacts encountered in the test units were documented and analyzed in the field and reburied. Archaeological information collected during these field efforts is being compiled into a technical report, which will be shared with consulting parties and maintained in the records of both DOE and the DAHP. Performing the work in this way, with the archaeological testing and characterization sampling completed in tandem, ensured that data on the sites of cultural and religious significance were appropriately documented for future use, while also ensuring that soil for characterization was collected with minimum impacts to this culturally sensitive area.

11.3.2 Cultural Resources Protections and Section 110 Activities

To ensure protection of the cultural and historic resources located on the Hanford Site, monitoring activities are conducted to comply with Section 110 of the NHPA ([36 CFR 60](#)), and the *Archaeological Resources Protection Act* (ARPA) ([54 USC 312501](#)). ARPA was enacted “...to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals” (Sec. 2(4)(b)). A monitoring program has been in place since 1989 to assess the effects of weathering and erosion and/or unauthorized excavation and collection of significant cultural resources on the Hanford Site. Activities include onsite inspections to monitor site conditions, assess impacts, and identify protective measures, if necessary.

In 2014, nine pre-contact archaeological sites were monitored under the Section 110 Site Conditions Monitoring program. Site visits are conducted with the participation of tribal cultural resources personnel. In addition, the Section 110 program was adjusted to ensure compliance with applicable regulations. A work plan was established that will ensure all components of Section 110 are addressed, including identification, nomination, and protection of historic properties. A five-year plan was established that, if implemented, will allow all sites included in the monitoring program to be evaluated for National Register eligibility by 2020. The changes made to the monitoring program will ensure that site condition monitoring is completed in a comprehensive and efficient manner that can be helpful in making resource management decisions.

11.3.2.1 Identification and Evaluation Activities

Identification and evaluation activities are performed to comply with Sections 106 and 110 of the NHPA. In 2014, eight new archaeological sites were recorded, and no new isolated finds were located (Table 11.7). National Register evaluations were completed on three newly discovered sites; two were determined eligible for listing in the National Register. Five new sites were not evaluated. Archaeological site forms for three previously recorded archaeological sites were updated, of which two were evaluated for National Register eligibility; one was determined eligible for listing. No Historic Property Inventory Forms (HPIF) were completed during the reporting period for components of Hanford’s built environment.

Table 11.7. Sites and Isolates Recorded or Updated

2014	Eligible	Not Eligible	Unevaluated	Total
Site updates	1	1	1	3
New sites	2	1	5	8
New isolates	0	0	0	0
Historic Property Inventory Form	0	0	0	0
Total	3	2	6	11

11.3.2.2 Data and Artifact Collections Management.

In 2014, the Cultural Resources Program transitioned to a paperless record keeping system. The Hanford Site Section 106 database tracks all cultural resource reviews conducted on the Hanford Site. The Section 106 database tracks dates, actions, letters, and results of the cultural resource reviews. Once a project is complete, it is closed out in the database and accessioned into the MSA digital archives for use by all Hanford Site Cultural Resource contractors and other interested researchers. Maintenance of these files is essential to the completion of all cultural resource compliance activities conducted on the Hanford Site.

In 2014, 174 new projects were opened, with pertinent information entered as acquired into the Section 106 database, and 143 projects were closed out after data entry was complete, with a digital copy of the project documentation added to the digital archive.

The cultural resources Geographic Information System (GIS) database contains cultural resource data collected from Hanford Site contractors, including new archaeological surveys completed as part of Section 106 work, newly recorded, and updated archaeological site locations, and contextual information describing the survey or site. All Hanford Site contractors use the GIS database for literature reviews, cultural resource compliance reporting, and documentation, and research by RL approved users. In 2014, as part of ongoing database management, a total of 20 polygons delineating completed archaeological surveys were added to the Hanford Site Survey Master shapefiles (map file), and five new archaeological sites/isolates, together with associated spatial and contextual information, were added to the GIS Archaeological Site and Isolate database. Spatial and contextual information for four archaeological sites/isolates were updated in this database based on information gathered during recent re-visits to these locations.

Largely due to excavations conducted as mitigation for adverse effects on archaeological sites, the Cultural and Historic Resources Program manages a collection of artifacts relating to the Native American settlement of the area within the mid-Columbia Basin that would become the Hanford Site. Similarly, a small collection of artifacts that mark the pre-1943 Euro-American settlement of the Priest Rapids Valley, later designated as the Hanford Site, is also maintained. These artifacts are stored at the Washington State University Tri-Cities Campus, Central Information Center, which maintains a climate controlled, restricted access facility. The forms and reports that document the excavations and interpret these sites also are held by the Cultural and Historic Resources Program. No new artifacts were added to either the prehistoric or the pre-Hanford collections in 2014.

11.3.3 Cultural Resources Consultations and Public Involvement

DOE conducts formal consultations with the Washington State Historic Preservation Officer (SHPO) within the DAHP, Native American tribes, and other interested parties for cultural resource reviews to

comply with Section 106 of the NHPA and NEPA (Section 2.1.4). RL consulted with the Washington SHPO and Native American tribes on all 17 projects that required a full review because of their potential to affect cultural resources within the project area.

DOE Cultural Resources Program staff held 10 meetings in 2014 with Tribal Cultural Resources staff from the [CTUIR](#), the Confederated Tribes and Bands of the Yakama Nation, the Nez Perce Tribe, and the Wanapum. Discussions focused on the cultural resource reviews both completed and initiated in 2014; proposed undertakings within traditional cultural property (TCP) boundaries and view sheds; and approaches to protecting threatened archaeological sites and places containing Native American human remains.

11.4 Hanford Site Manhattan Project and Cold War Era Collection Management

TE Marceau

The Hanford Collection comprises artifacts from the Manhattan Project and Cold War era. These artifacts were obtained in compliance with the *Programmatic Agreement among the U.S. Department of Energy, Richland Operations Office, the Advisory Council on Historic Preservation, and the Washington State Historic Preservation Office for the Maintenance, Deactivation, Alteration, and Demolition of the Built Environment on the Hanford Site, Washington* ([DOE/RL-96-77](#)). This programmatic agreement directs RL to identify and preserve any artifacts that may have value as interpretive or educational exhibits within national, state, or local museums. During 2014, 47 artifacts were picked up from Hanford Site facilities and delivered to the 4732-A Artifact Staging Facility, leaving 42 (5.7 percent) of the 743 tagged artifacts to be collected. Of the final 42 artifacts remaining to be collected, 3 were determined to be unfeasible to collect, 12 have radiological concerns that must be resolved before release, and 27 are scheduled for collection between 2015 and 2048.

To address the risks of releasing radiologically controlled artifacts (artifacts within or known to have been within radiologically controlled areas), a museum scenario was developed to evaluate these artifacts and the technical and administrative feasibility of releasing them. The museum scenario uses a graded approach to determine the level of radiological survey required. It also uses the existing Hanford Site pre-approved authorized limits and dose constraints identified in [DOE O 458.1](#) to determine whether the radiologically controlled artifacts can be released for public clearance/viewing without additional conditions or restrictions on the storage, handling, or display.

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