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Hanford Site Bald Eagle Monitoring Report for Fiscal Year 2022

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
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Hanford Site Bald Eagle Monitoring Report for Fiscal Year 2022

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1.0 INTRODUCTION

A national symbol of the United States, the Bald Eagle (*Haliaeetus leucocephalus)* plays an important role in the riverine ecosystem at the U. S. Department of Energy's (DOE) Hanford Site. Historically, Bald Eagles have occupied the Hanford Site during the winter and early spring and have more recently remained through the nesting season. Monitoring is essential to maintain current biological information about Bald Eagle abundance and distribution on the Hanford Site, to ensure compliance with protection regulations, and to inform future protection and management efforts. This monitoring report provides an overview of Bald Eagle activity on the Hanford Site, along with Bald Eagle management guidelines and monitoring objectives between November 2021 and June 2022.

1.1 Bald Eagle Protection and Management at Hanford

Bald Eagles are a success story for species protection under the *Endangered Species Act of 1975* (ESA). In 2007, 40 years after the Bald Eagle was listed as endangered and given protection under the ESA, the U.S. Fish and Wildlife Service (USFWS) determined that the population of Bald Eagles in the lower 48 states had recovered sufficiently to be removed from the ESA list. Although significant recovery of Bald Eagle populations has occurred, federal laws including the *Bald and Golden Eagle Protection Act of 1940* and the *Migratory Bird Treaty Act of 1918* still provide protection for Bald Eagles, their nest trees, and communal night roosts. In addition, following delisting, the USFWS developed the *National Bald Eagle Management Guidelines* (USFWS 2007), which provides monitoring and management guidance for Bald Eagles. At Hanford, DOE has developed the *Bald Eagle Management Plan for the Hanford Site* (DOE/RL-94-150), which gives an overview of Bald Eagle distribution, behavior, and ecology on the site and defines DOE policy regarding protection and management of the species. Key elements of this policy are protective measures for roost sites and nests based on federal and state guidelines.

Bald Eagles are attracted to the abundant fish and waterfowl found along the river and use the Hanford Reach of the Columbia River for wintering, and more recently for nesting and raising young. Most Bald Eagles arrive on the Hanford Site in mid-November to forage for spawning fall Chinook salmon (*Oncorhynchus tshawytscha*) and wintering waterfowl and are usually present until mid-March. Wintering Bald Eagles use different habitats for various activities such as perching, foraging, and roosting. Although Bald Eagles may be observed far from water, on Hanford they typically occupy habitats within 400 m (1,320 ft) of the Columbia River and use trees growing along the shoreline for perching and roosting (DOE/RL-94-150).

The *Bald Eagle Management Plan for the Hanford Site* (DOE/RL-94-150) relies on a roost-site definition developed by the Washington State Department of Fish and Wildlife (WDFW). WDFW defined a roost site under its former management policies as a tree or a group of trees in which at least three Bald Eagles roost for at least two nights during more than one year (Stinson et al. 2007). These roosting locations provide shelter from winter weather and serve a social function. Administrative protection in the form of roost site buffers and access restrictions is initiated at a new roost site if monitoring meets the WDFW definition, or if continued monitoring

over two or more years determines the site is occupied at night by one or more Bald Eagles at least 30% of the time (DOE/RL-94-150). These administrative buffers and restrictions are discontinued at sites where monitoring over two or more years indicates night roost occupancy by one or more Bald Eagles is less than 30% of the time and there is little or no indication of use by more than two Bald Eagles (DOE/RL-94-150). Bald Eagle night roost locations on the Hanford Site are protected from disturbance from November 15 through March 15 with 200-m (660-ft) buffers (Table 1, Figure 1).

Nest building has occurred most years, but historically the adults abandoned most nests on the Hanford Site by mid-March prior to producing young. The timing of this abandonment coincides with the Bald Eagles migrating toward summer feeding areas or other nesting territories. Bald Eagles were first observed successfully producing fledged young from nests on the Hanford Site in 2013. In Washington State, nesting may begin as early as December and young may fledge as late as August (DOE/RL-94-150). Bald Eagle nests are monitored for occupancy (adults present) and productivity (production of young). A successful nest is described as a nest from which at least one young fledged, or one in which at least one young was raised to an advanced stage of development (Postupalsky 1974). Potential nest sites are monitored to determine if new nest protection areas are necessary. When a new nest is identified, nesting exclusion buffers of 200 m (660 ft) are enforced until the nest is abandoned or the young Bald Eagles have fledged (Table 1).

Table 1. Administrative Buffers Used for Bald Eagle Night Roost and Nesting Locations per the *Bald Eagle Management Plan for the Hanford Site* (DOE/RL-94-150)

Bald Eagle Use Area	**Buffer Zone**	**Access Restrictions**
Communal night roost (Terrestrial and Aircraft)	200 m (660 ft)	Restricted access from November 15 to March 15. Work-related access granted between 9 a.m. and 3 p.m. after notification of Hanford Site ecological compliance staff.
Perch	No restrictions	No restrictions.
Forage	No restrictions	No restrictions unless major foraging areas are identified.
Nest (Terrestrial Primary Zone)	200 m (660 ft)	Restricted access from November 15 until nest is abandoned or young fledge, leaving the nest unoccupied.
Nest (Terrestrial with additional Conditioned Zone protection)	200 m (660 ft) + any determined conditioned zone(s)	Restricted access from November 15 until nest is abandoned or young fledge, leaving the nest unoccupied. The conditioned zone buffers will be active until the protected resource is no longer necessary to success of the nest (e.g., a Bald Eagle feeding zone would only be buffered during active salmon spawning periods and when carcasses are present).
Nest (Aircraft)	305 m (1,000 ft) slant distance	With helicopters and fixed winged aircraft, except for authorized biologists trained in survey techniques, avoid operating aircraft within the buffer zone.

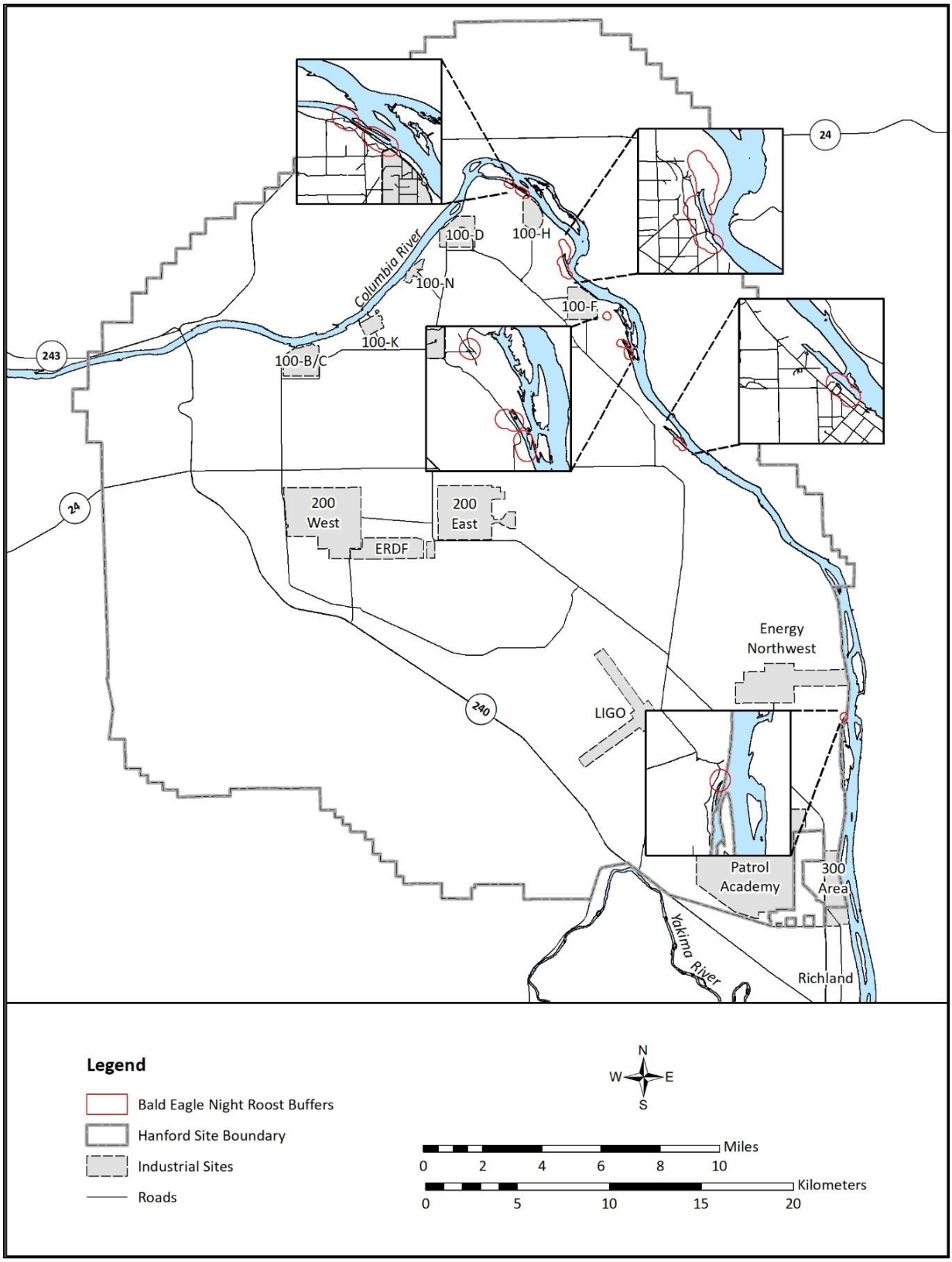

Figure 1. Protected Bald Eagle Night Roosts for FY 2022

1.2 Objectives of Monitoring Bald Eagles on Hanford

The continued monitoring of Bald Eagles on the Hanford Site is important to understanding the recovery of this species in the area. Bald Eagle monitoring efforts provide long term abundance trends, effects of Hanford Site operations on the species, relationships between the species and other resources (e.g., Chinook salmon), and nest occupancy and productivity.

Beginning in 2013, two levels of effort were established for annual Hanford Site Bald Eagle monitoring: an extensive "Management Monitoring" effort to support management decisions for Bald Eagles every three to five years, often preceding a revision to the *Bald Eagle Management Plan for the Hanford Site* (DOE/RL-94-150), and a less intensive "Status and Trend Monitoring" effort for all other years to follow Bald Eagle roosting/nesting trends and possible conflicts with Hanford Site operations. The level of effort for any given year may be modified based on budget constraints, federal or state agency information requests, and/or Hanford Site remediation projects occurring near or within Bald Eagle nest or night roost protection buffers. Night roost surveys are performed weekly to bi-weekly (Management Monitoring) or monthly (Status and Trend Monitoring) November through March to document the continued usage of the currently protected communal night roosts and to record incidental sightings of Bald Eagles outside of known roost areas that may lead to the identification of new roost sites. Boat surveys are performed as part of both levels of monitoring efforts. During the Management Monitoring years, boat surveys are often performed monthly (December through February) to document the abundance, age class, distribution, and activities of Bald Eagles using the Hanford Reach. Status and Trend Monitoring years include at least one boat survey in late November or early December to document the demographics of the peak Hanford Reach Bald Eagle wintering population and another boat survey in March to record late season demographics and nest occupancy. Boat surveys are performed on the same dates as night roost surveys to compare diurnal and nocturnal abundance and distribution. The dataset produced from annual Bald Eagle communal roost monitoring is used to provide guidelines and management goals for Bald Eagles on the Hanford Site. Bald Eagle nest monitoring begins following the conclusion of the communal night roost survey season (mid-March) regardless of the level of monitoring effort for the year.

Bald Eagles can be a relatively long-lived species, usually living anywhere from 20 to 30 years in the wild and in one rare instance making it to 38 years of age (Schempf 1997; USGS 2020). As with many large raptors, survivorship of young birds is often lower with survival increasing as birds approach adulthood. Monitoring Bald Eagle nests on the Hanford Site provides information on nest locations for administrative protections, site fidelity, and nest productivity.

The objective of this report is to present the methods and results from the fiscal year (FY) 2022 Status and Trend Monitoring effort. The effort included night roost, boat, and nest surveys performed from November 2021 through June 2022.

2.0 METHODS

Bald Eagle Status and Trend Monitoring was conducted during FY 2022, consisting of night roost, boat, and nest surveys. The types of surveys are described in further detail in the following subsections.

2.1 Night Roost Surveys

Night roost surveys were conducted at the eight protected night roost sites from November through March (Figure 2). The eight areas were divided into three monitoring routes each with two to four night roost monitoring locations. Performing three separate routes allows staff time to monitor roosts and travel between roost locations while still having adequate light to count birds. The direction that the routes were driven were alternated to reduce bias. Surveys were initiated 15 minutes prior to sunset and continued until completed or there was insufficient light to see individual birds. Surveyors approached each location in a vehicle and remained outside of the designated 200-m (660-ft) protection buffer zones (DOE/RL-94-150). Binoculars and spotting scopes were used to determine the number of Bald Eagles present, age class (adult vs. juvenile), and activity of individual birds. Adults are distinguished from juveniles by their white head and tail feathers, features the birds gain at around the age of five years (Buehler 2020). Surveyors recorded additional relevant notes such as the presence of other large birds. Surveyors used an aerial photograph to mark the estimated location of the birds. After a night roost site was adequately assessed, generally less than 10 minutes, a surveyor proceeded to the next night roost location until all locations had been surveyed. Surveyors made sure to scan the roost areas for a short duration upon arrival to the site to account for birds still shifting and settling in for the night.

2.2 Boat Surveys

Boat surveys were performed to determine the age class, distribution, and number of Bald Eagles on the Hanford Reach. Both shorelines of the Columbia River along the Hanford Site were surveyed, beginning immediately upstream of Vernita Bridge and ending at the 300 Area (Figure 3). All boat surveys were performed on the same date as a night roost survey. By performing the two surveys in succession, correlations of day and night counts and distributions can be used to determine additional potential night roost areas and nest sites for future Bald Eagle monitoring efforts. Surveyors collected numbers, age class (adult or juvenile), and activity of the Bald Eagles observed during the survey and estimated their locations on aerial photographs. All spatial data collected during the surveys were transferred into a geographic information system for analysis.

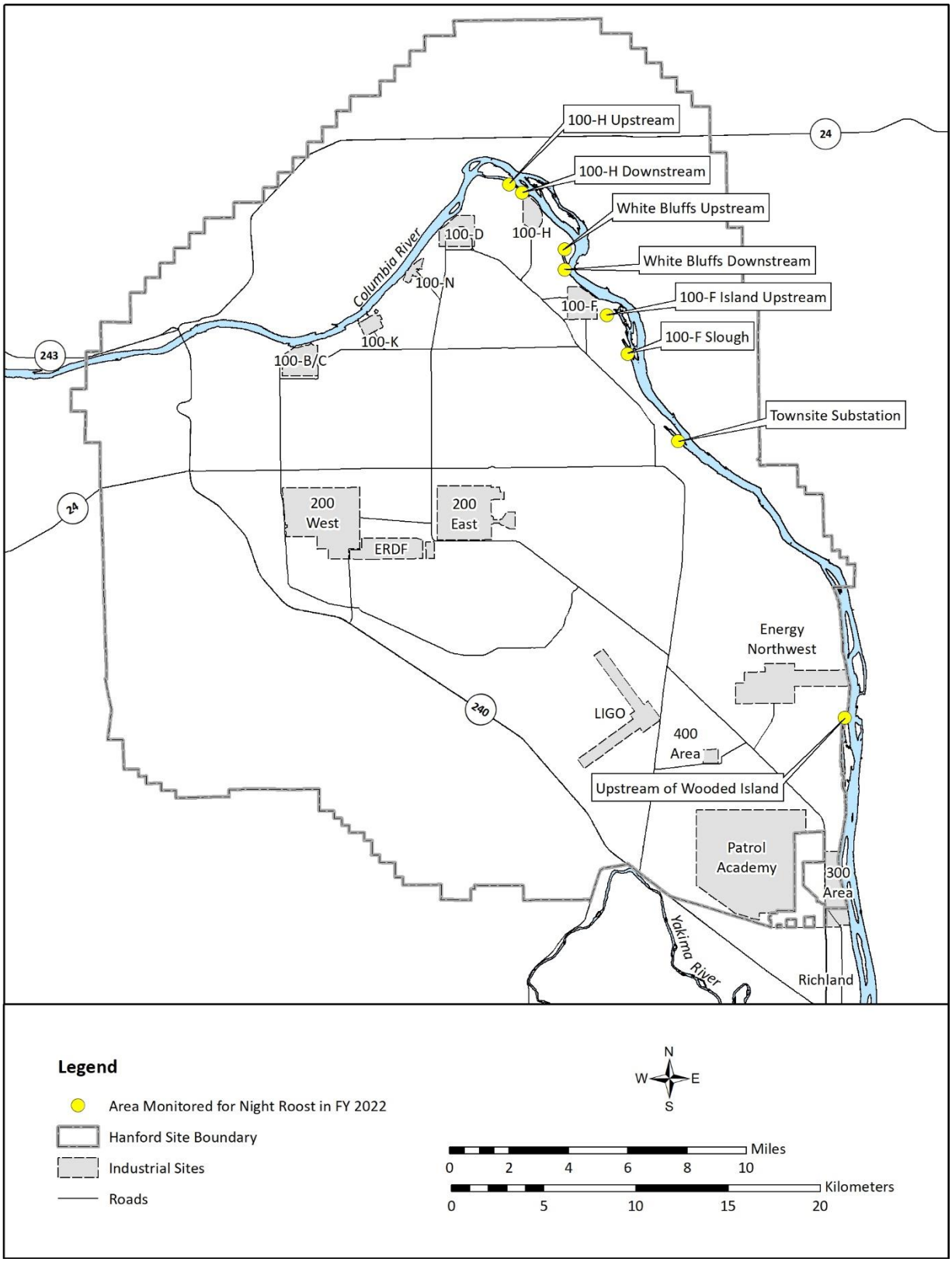

Figure 2. Locations Monitored for Bald Eagle Night Roosting during FY 2022

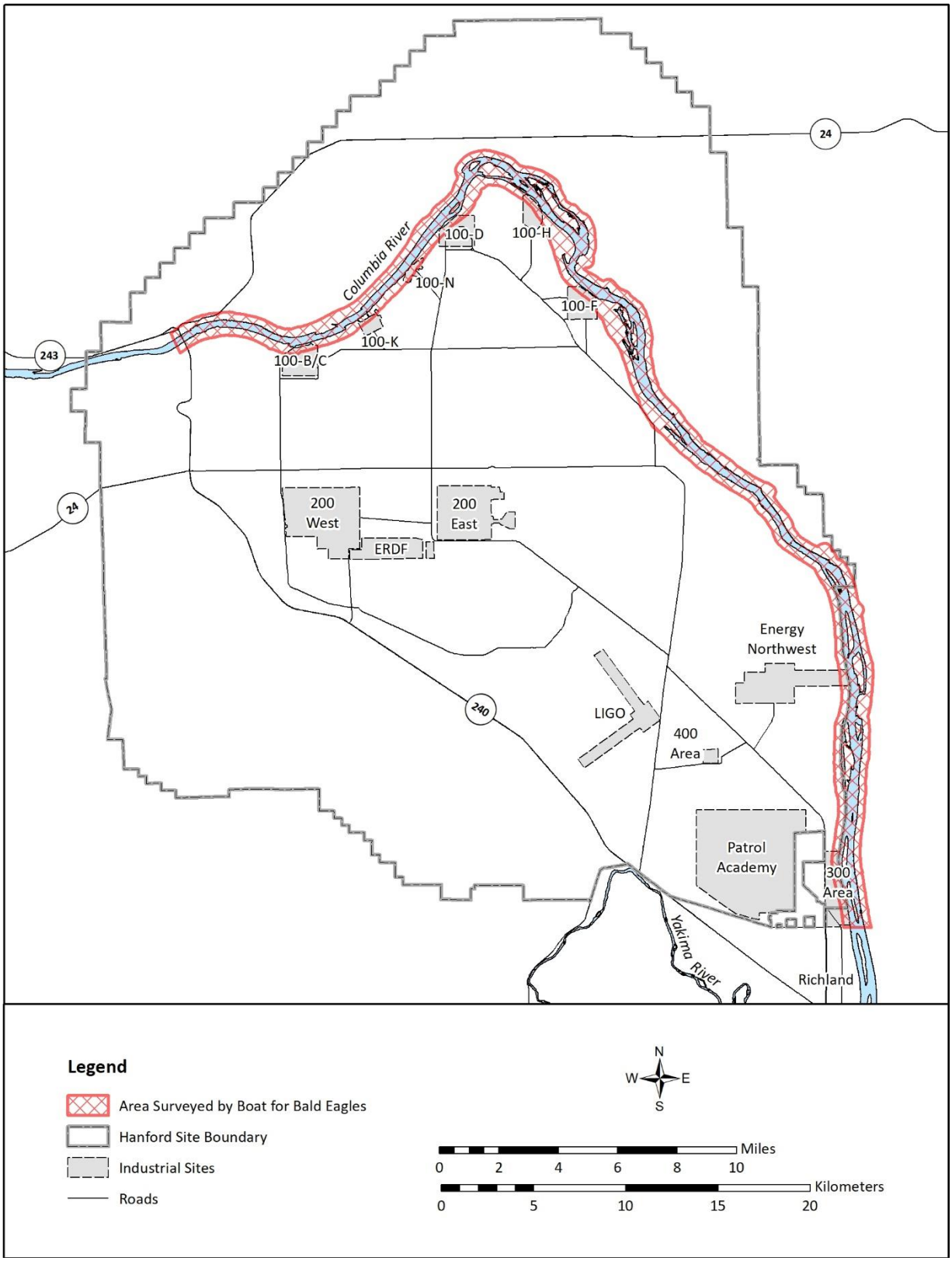

Figure 3. Area Surveyed by Boat

2.3 Nest Surveys

Nest surveys were performed at all known potential nest locations. Nest surveys were performed at seven locations in 2022 (Figure 4). An observation location was chosen at an appropriate distance, generally at least 200 m (660 ft) from the nest. Staff viewed the nest area with binoculars or spotting scope, and nesting behaviors were documented during the observation period. Nest surveys typically consisted of one-hour observations in the area of interest, documenting any signs of nesting activity (e.g., territory defense, nest tending, pair bonding behaviors). Nest surveys were concluded as soon as the nest was determined to be active, for example, if a pair of Bald Eagles was observed sitting on a nest 30 minutes into the survey the survey was concluded.

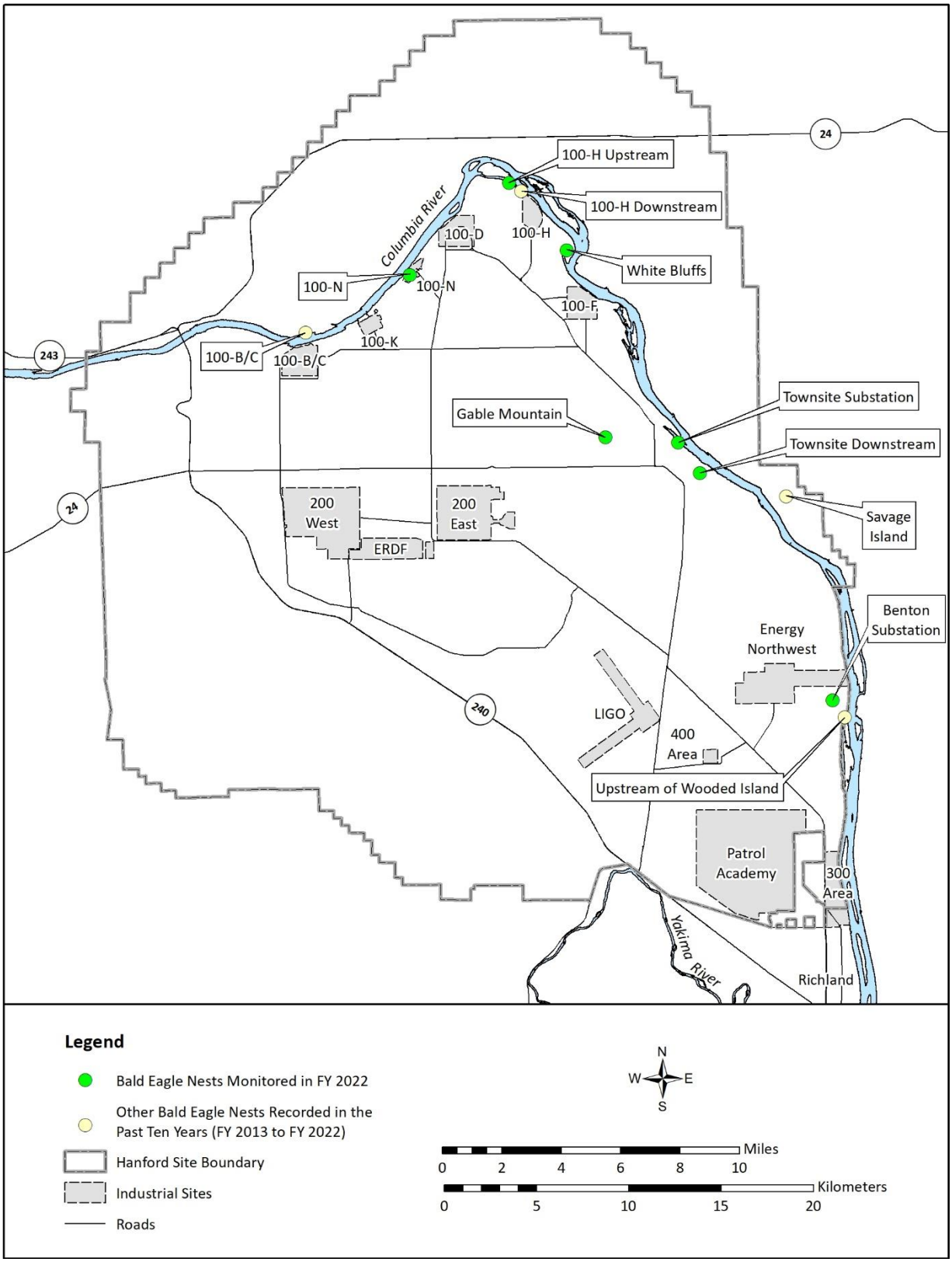

Figure 4. Bald Eagle Nest Locations Monitored in FY 2022

3.0 RESULTS AND DISCUSSION

3.1 Night Roost Surveys

Eight night roost surveys at the eight currently protected night roost monitoring locations were completed during the FY 2022 season with two boat surveys being conducted in concurrence with the third (December 13, 2021) and the final (March 15, 2022) night roost surveys. The second boat survey was completed on the morning of March 16, 2022, following the final night roost survey. Bald Eagle use was documented at all the night roost locations monitored during FY 2022 (Table 2). Larger numbers of adult and juvenile Bald Eagles were present in November and early December when spawned out fall Chinook salmon carcasses were more available. As the season progressed, the number of juveniles on the Hanford Reach dropped off more quickly while the number of adults declined at a slower rate (Figure 5). The adult Bald Eagles continued to use the Hanford Reach, likely feeding on waterfowl.

Table 2. Bald Eagle Night Roost Monitoring Data for FY 2022

Night Roost Location	Number of Bald Eagles Present								
	11/16/2021	**11/29/2021**	**12/13/2021**	**12/27/2021**	**1/10/2022**	**1/24/2022**	**2/7/2022**	**2/28/2022**	**3/15/2022**
100-H Upstream	14	21	5	3	3	0	0	1	0
100-H Downstream	0	0	0	2	0	3	0	0	0
White Bluffs Upstream	3	13	4	10	8	9	6	6	0
White Bluffs Downstream	0	0	0	0	1	0	0	0	0
100-F Island Upstream	6	5	0	2	5	1	2	0	0
100-F Slough	6	1	0	0	3	1	0	0	0
Townsite Substation	0	1	0	1	0	0	2	0	0
Upstream of Wooded/Nest Site Area	0	0	0	0	0	0	1	0	2
Total	**29**	**41**	**9**	**18**	**20**	**14**	**11**	**7**	**2**

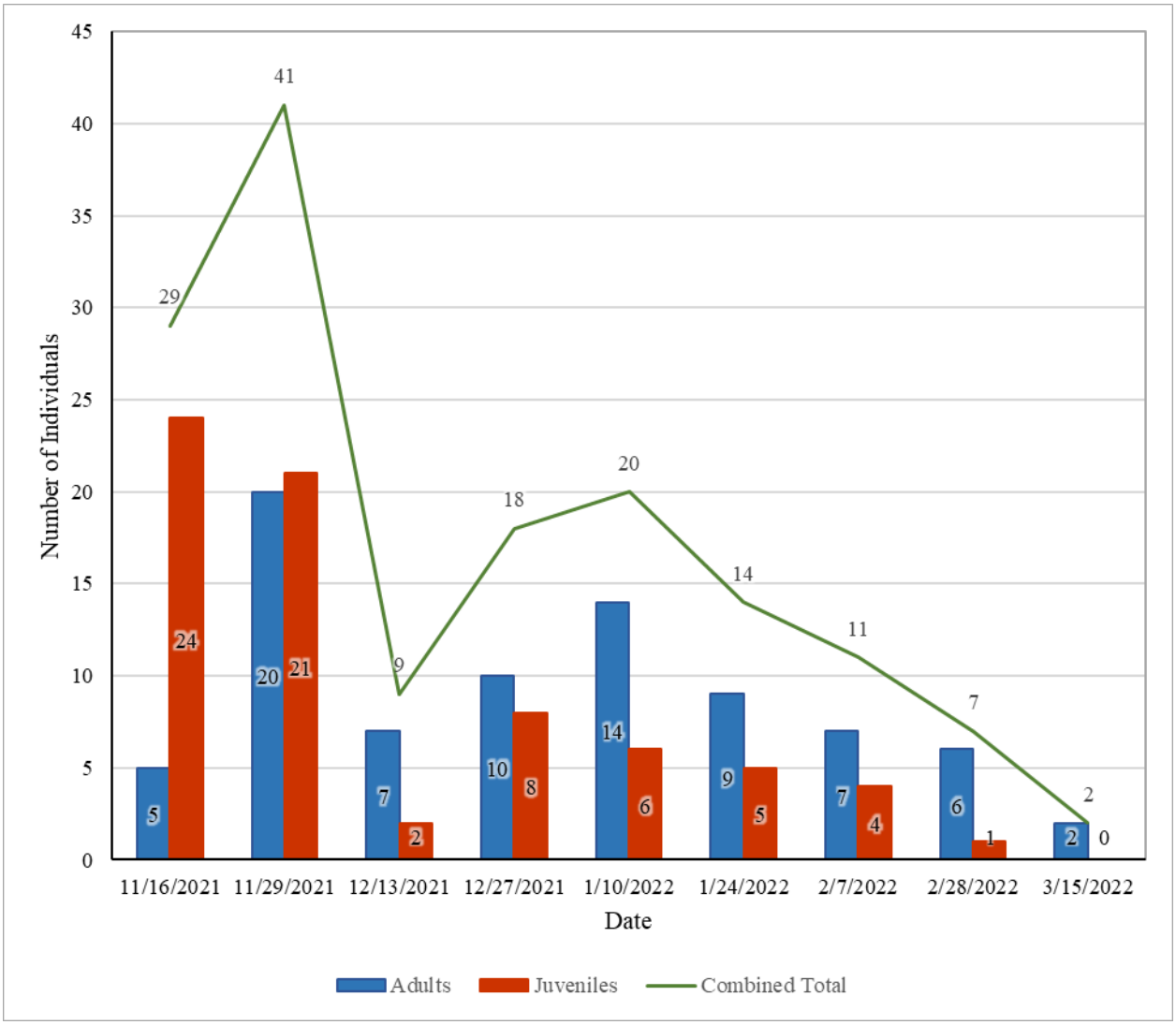

Figure 5. Number and Age Class of Bald Eagles Seen During Night Roost Surveys in FY 2022

There were 151 Bald Eagle observations at night roost sites during the FY 2022 monitoring effort, with 70.2% (106 Bald Eagles) seen at two major roost sites: the 100-H Upstream site (31.1% [47 Bald Eagles]) and the White Bluffs Upstream site (39.1% [59 Bald Eagles]). Two night roost sites that were moderately used in FY 2022 included the 100-F Island Upstream site (13.9% [21 Bald Eagles]) and the 100-F Slough site (7.3% [11 Bald Eagles]). The other four night roost sites were used in low numbers: the 100-H Downstream site (3.3% [five Bald Eagles]), the White Bluffs Downstream site (0.7% [one Bald Eagle]), the Townsite Substation site (2.6% [four Bald Eagles]), and the Upstream of Wooded/Nest Site Area (2.0% [three Bald Eagles]). The night roost survey dates and results are shown in Table 2 with summaries of observations described in the paragraphs following. Figure 5 displays the total number of Bald Eagles by age class observed during each survey.

100-H Upstream
The100-H Upstream site was the second most used night roost monitored during the FY 2022 season. A total of 47 Bald Eagles were observed during five of the nine conducted night roost surveys. The maximum count of 21 Bald Eagles was recorded during the survey on November 29, 2021. This location was used as a nest site later in the season.

100-H Downstream
The 100-H Downstream night roost site was used in low numbers during the FY 2022 season. A total of five Bald Eagles were observed throughout the monitoring season. Three or more Bald Eagles were seen in one of the nine conducted surveys in FY 2022. In the past, it has been noted that Bald Eagles appeared to move back and forth between this site and 100-H Upstream site as twilight approached (HNF-60744).

White Bluffs Upstream
The White Bluffs Upstream site was the most active night roost site during the FY 2022 monitoring season. A total of 59 Bald Eagle observations were made throughout the season with a maximum count of 13 Bald Eagles being recorded during the November 29, 2021 survey. Three or more Bald Eagles were documented using this night roost site during eight of the nine surveys conducted during FY 2022.

White Bluffs Downstream
The White Bluffs Downstream night roost site had only one Bald Eagle observed in the FY 2022 monitoring season. The sighting occurred on January 10, 2022.

100-F Island Upstream
The 100-F Island Upstream site was the third most used night roost site surveyed during the FY 2022 monitoring season. A total of 21 Bald Eagle observations were documented at this site during the monitoring season. Three or more Bald Eagles were recorded using this night roost site during three of the nine surveys conducted during FY 2022.

100-F Slough
The 100-F Slough site had a total of 11 Bald Eagle observations during the FY 2022 monitoring season. Three or more Bald Eagles were recorded using this night roost site during two of the nine surveys conducted during FY 2022.

Townsite Substation
A total of four Bald Eagle observations were documented at the Townsite Substation night roost site during the FY 2022 monitoring season. Three or more Bald Eagles were not observed at this site during any one night roost survey in FY 2022. This location was used as a nest site in previous years and, with the one or two Bald Eagles observed at the site during roosting season, was expected to be occupied again in FY 2022 but was abandoned early in the nesting season.

Upstream of Wooded Island/Benton Substation Nest Site Area
Three Bald Eagle observations were recorded at the Upstream of Wooded Island night roost and Benton Substation nest site during the FY 2021 monitoring season. Three or more Bald Eagles were not observed at this site during night roost surveys in FY 2022. This location was also used

as a nest site in previous years and was expected to be occupied again in FY 2022 but was abandoned early in the nesting season.

Maximum Count

The FY 2022 single day maximum count on the Hanford Reach of 41 Bald Eagles (20 adults and 21 juveniles) was observed during the second night roost survey conducted November 29, 2021. The maximum count of Bald Eagles for the year (41) was below the range of maximum counts in the previous 10 years. The lowest maximum count in the previous ten years was 47 Bald Eagles [18 adults and 29 juveniles] in FY 2012 and the highest maximum count was 141 Bald Eagles [42 adults and 99 juveniles] in FY 2015. The maximum count of Bald Eagles on the Hanford Reach from year to year generally follows the number of spawning fall Chinook salmon, a major food source during the fall and early winter. The maximum count of Bald Eagles and fall Chinook salmon redds observed on the Hanford Reach by year (1961 to 2021 [FY 2022]) is displayed in Figure 6.

3.2 Boat Surveys

Two boat surveys were performed in FY 2022 in concurrence with the second (December 13, 2021) and the final (March 15, 2022) night roost surveys. The second boat survey was completed on the morning of March 16, 2022, following the final night roost survey. Generally, the first boat survey of the year records the single day maximum count on the Hanford Reach, but this was not the case in FY 2022. A total of 21 Bald Eagles (13 adults and 8 juveniles) were observed on the first boat survey on December 13, 2021. This count was the lowest recorded in recent years. The previous range of first boat survey counts was a low of 47 Bald Eagles [18 adults and 29 juveniles] in FY 2012 and a high of 141 Bald Eagles [42 adults and 99 juveniles] in FY 2015.

The second boat survey was completed on March 16, 2022, to gain late season demographics and to search for potential nesting locations. A total of 13 Bald Eagles (9 adults and 4 juveniles) were recorded during the mid-March survey. The total number of Bald Eagles observed during the second boat survey in FY 2022 was similar to other late winter boat surveys in recent years (8 Bald Eagles [6 adults and 2 juveniles] in FY 2017 and 24 Bald Eagles [17 adults and 7 juveniles] in FY 2014). The specific locations of Bald Eagles observed during the FY 2022 boat survey are displayed in Figure 7.

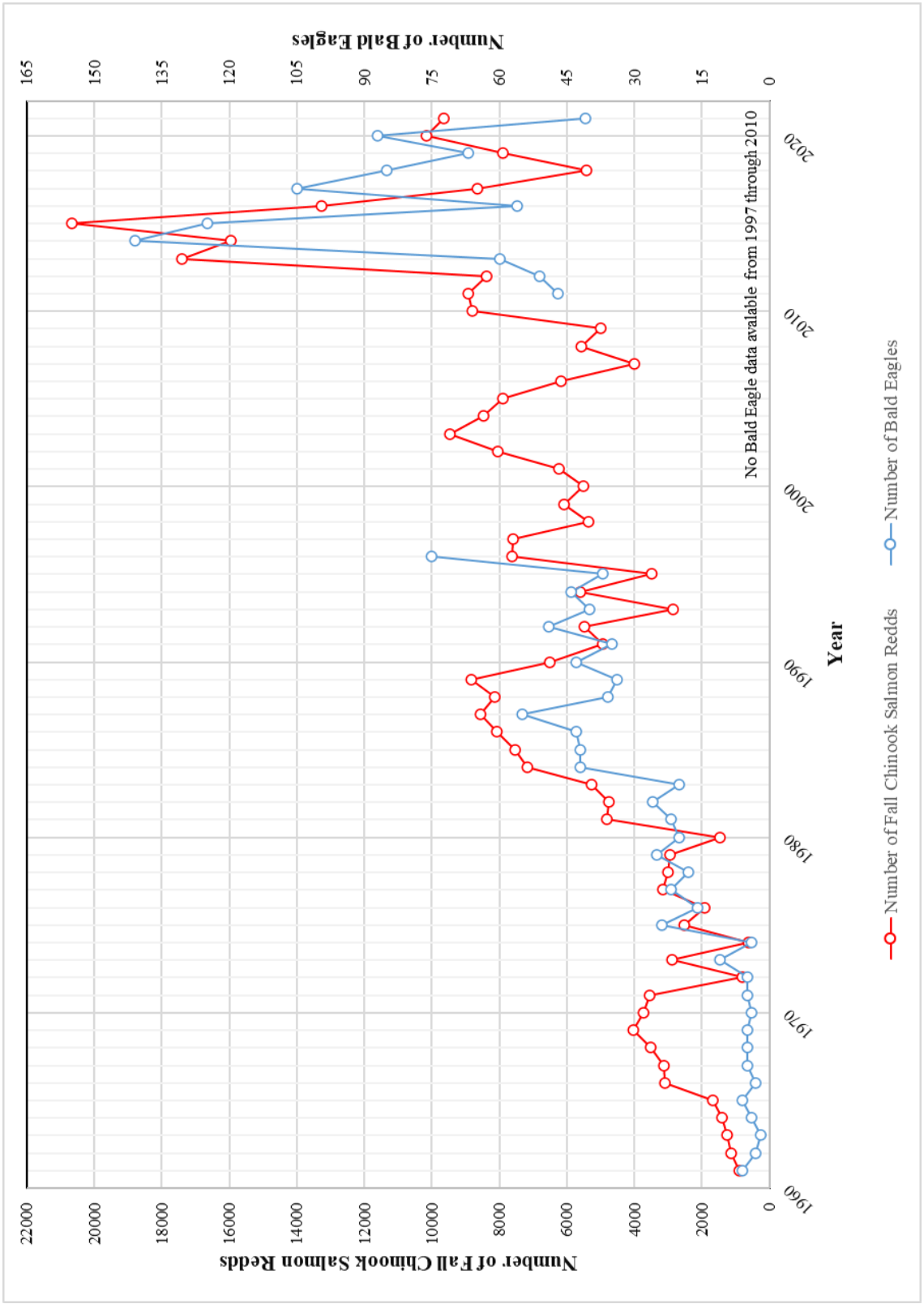

Figure 6. Annual Maximum Count Bald Eagles and Fall Chinook Redds from 1961 to 2021 (FY 2022)

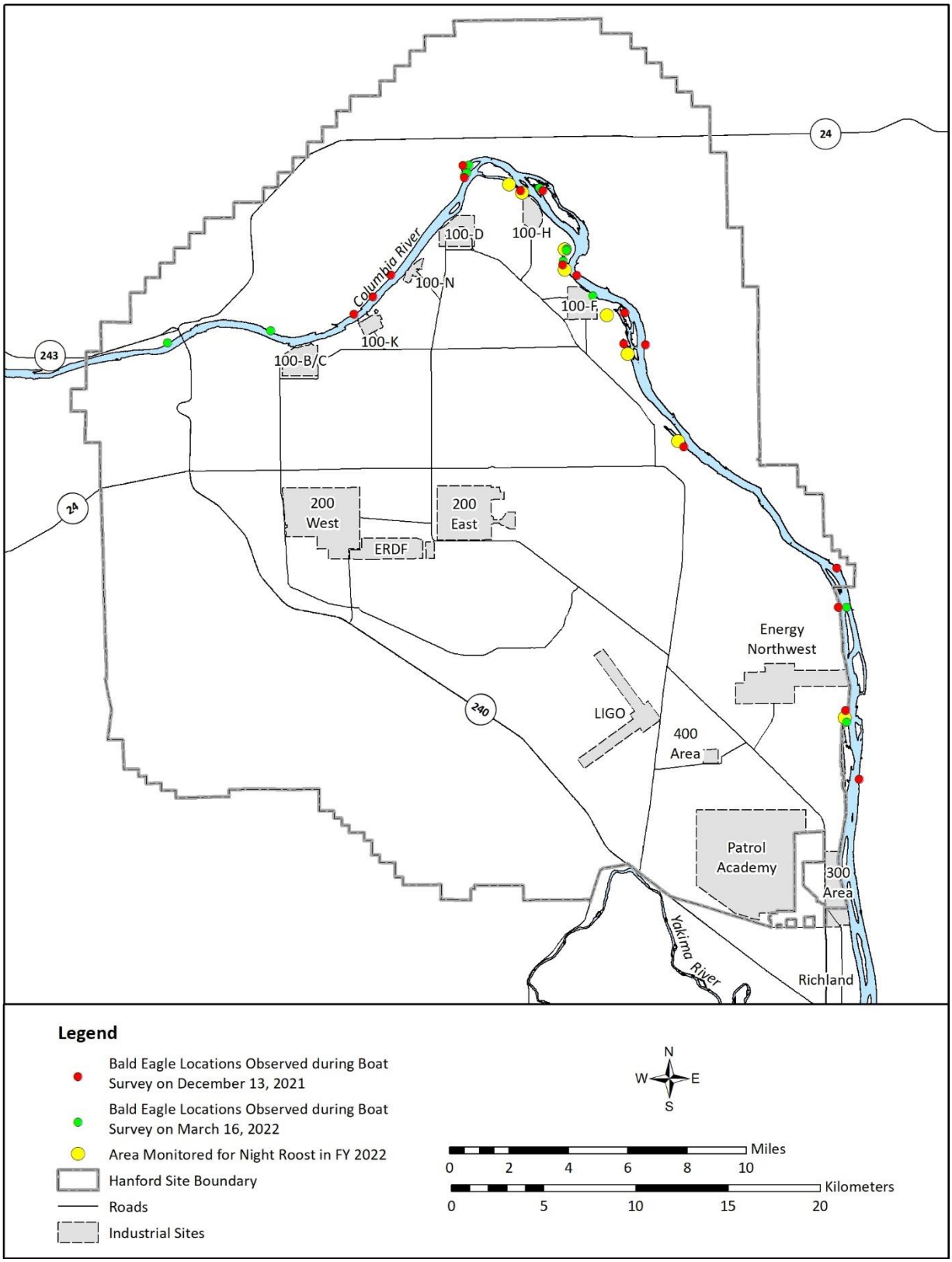

Figure 7. Locations of Bald Eagles Observed During FY 2022 Boat Survey

3.3 Nest Surveys

Bald Eagle nesting attempts have been documented on the Hanford Site dating back to the 1960s, but the first successful Bald Eagle nest was not observed on the Hanford Site until 2013. Seven potentially occupied Bald Eagle nests were found by boat, night roost, and other ecological surveys during the FY 2022 monitoring season. These nests were located at the Benton Substation, Townsite Downstream, Townsite Substation, Gable Mountain, White Bluffs Slough, 100-H Upstream, and 100-N (Figure 4). Nest surveys on May 16, 2022, found that five of the seven nests remained active (Townsite Downstream, Gable Mountain, White Bluffs Slough, 100-H Upstream, and 100-N). The Benton Substation nest and Townsite Substation nest were inactive. Productivity surveys were conducted on the five active nests on May 23. 2022. The Townsite Downstream nest and the Gable Mountain nest contained one young each. The White Bluffs nest, the 100-H upstream nest, and the 100-N nest had two young each. All young were estimated to be 50 days old or older. Successful nesting based on the definition by Postupalsky (1974) is a nest from which at least one young fledged, or one in which at least one young was raised to an advanced stage of development. All five of the active nests (Townsite Downstream, Gable Mountain, White Bluffs Slough, 100-H Upstream, and 100-N) were considered successful in FY 2022. A brief history of the nest sites monitored in FY 2022 is provided below.

In FY 2013, a pair of Bald Eagles constructed a nest in the Upstream of Wooded Island night roost area and successfully raised two young. This successful Bald Eagle nest was the first recorded on the Hanford Site. The Upstream of Wooded Island nest was again occupied and successful the following two years, producing two young in FY 2014 and three young in FY 2015. In FY 2016, the pair of Bald Eagles occupying this territory moved the nest to a transmission tower approximately 1,100 m (3609 ft) to the northwest of the Upstream of Wooded Island nest. This nest, known as the Benton Substation nest, was occupied and successful in FY 2016 (two young), FY 2017 (two young), FY 2018 (one young), FY 2019 (two young), and FY 2020 (two young). The Benton Substation nest was occupied early in FY 2021 but was abandoned later in the season. The nest site was thought to be occupied again in FY 2022 but was found to be inactive later in the season.

A pair of Bald Eagles briefly occupied then abandoned a nest in the Townsite Substation night roost area in FY 2017. A pair was again observed using the nest in FY 2018 during the night roost surveys. While conducting a nest survey on May 10, 2018, two young with mature feathers were observed in the nest, while one adult perched nearby. During the final nest survey on June 14, 2018, the two young were observed exercising their wings and conducting short hover flights in the nest. In FY 2019, a pair of Bald Eagles were observed in this nest during the March 28 survey. Later in the season, during the May 14, 2019, survey, one adult was observed along with two young chicks. The Townsite Substation nest was considered successful in FY 2020 with one young observed in the nest on June 2, 2020. The nest site was again successful in FY 2021 with two young seen in the nest on June 8, 2021. The Townsite Substation nest was presumed to be occupied in FY 2022 but was later found to be inactive.

The White Bluffs Peninsula nest, which was occupied then abandoned in previous years, was used, and thought to be successful in FY 2015 and FY 2016 but dense foliage prevented staff from confirming the presence of young in the nest. The nest was occupied and successful in FY

2017 and FY 2018 with one young observed each year. The nest was again considered occupied and successful in FY 2019 with two young observed in the nest during the May 16, 2019, survey. In FY 2020, the White Bluffs Peninsula nest was assessed as occupied during the March 17, 2020, boat survey but was deemed inactive during the nest survey on June 2, 2020. The observations were similar in FY 2021 where the nest site was occupied during the March 15, 2021, boat survey but found abandoned on the May 26, 2021, nest survey. The nest site was successful in FY 2022 with two young seen in the nest on June 23, 2022.

During FY 2019, a nest was monitored in the 100-N Area. One adult was observed at this nest during the April 3, 2019 survey and an adult along with two young were observed during the May 2, 2019, survey. The 100-N nest was judged successful in FY 2020 with at least one young recorded in the nest on June 2, 2020. The nest site was considered successful in FY 2021 with one young, however, the young was found dead near the nest tree on June 28, 2021, after fledging. The 100-N nest was successful in FY 2022 with two young observed in the nest on June 23, 2022.

The Townsite Downstream nest was observed as a possible nest site in FY 2018 during a boat survey on March 19, 2018. Two adult Bald Eagles were recorded occupying the nest site during a survey on April 9, 2018, but the nest appeared abandoned during a follow-up survey on May 10, 2018. The Townsite Downstream nest appeared to be used for a brief period again in FY 2019 with documented use by one adult during a survey on March 28, 2019. A subsequent survey on May 14, 2019, found no birds in the nest itself, with only one adult being flushed from a nearby tree. The nest site was successful in FY 2022 with one young observed in the nest on June 23, 2022.

Two new nest sites were documented in FY 2022, Gable Mountain and 100-H Upstream. The Gable Mountain nest site is located on a steel transmission tower on the eastern flank of Gable Mountain and was first observed on March 14, 2022. The nest site was successful in FY 2022 with one young seen in the nest on June 23, 2022. The 100-H Upstream nest site is situated in a tree in the 100-H Upstream night roost site. The nest site was first verified on April 6, 2022 and was successful in FY 2022 with two young observed in the nest on June 23, 2022.

Bald Eagle nests have continued to increase on the Hanford Site since the first successful nest was recorded in FY 2013. Table 3 provides the known fate of all documented Bald Eagle nests on the Hanford Site in the past 10 years (FY 2013 to FY 2022).

Table 3. Known Fate of All Documented Bald Eagle Nests on the Hanford Site in the Past Ten Years (FY 2013 to FY 2022)

Nest Site	Nest Structure	FY 2013 Fate/Young	FY 2014 Fate/Young	FY 2015 Fate/Young	FY 2016 Fate/Young	FY 2017 Fate/Young	FY 2018 Fate/Young	FY 2019 Fate/Young	FY 2020 Fate/Young	FY 2021 Fate/Young	FY 2022 Fate/Young
Upstream of Wooded Island	Tree	● (2)	● (2)	● (3)	-	-	-	-	-	-	-
Benton Substation	Transmission Tower	-	-	-	● (2)	● (2)	● (1)	● (2)	● (2)	○	-
Savage Island	Tree	-	-	-	-	◌	-	-	-	-	-
Townsite Downstream	Tree	-	-	-	-	-	○	○	-	-	● (1)
Townsite Substation	Tree	-	-	-	-	○	● (2)	● (2)	● (1)	● (2)	-
Gable Mountain	Transmission Tower	-	-	-	-	-	-	-	-	-	● (1)
White Bluffs	Tree	-	-	◌	◌	● (1)	● (1)	● (2)	○	○	● (2)
100-H Downstream	Tree	○	-	-	-	-	-	-	-	-	-
100-H Upstream	Tree	-	-	-	-	-	-	-	-	-	● (2)
100-N	Tree	-	-	-	-	-	-	● (2)	● (1)	● (1)[a]	● (2)
100-B/C	Tree	-	-	-	-	○	-	-	-	-	-

● Nest occupied and successful

○ Nest occupied and abandoned or unsuccessful

◌ Nest occupied but fate of nest unknown

\- No occupied nest

[a] Young was found dead after fledging

FY Fiscal Year

4.0 REFERENCES

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