DISCLAIMER

Bald Eagle Monitoring Report for Fiscal Year 2012

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

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Bald Eagle Monitoring Report for Fiscal Year 2012

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The cover photo is courtesy of Cole Lindsey.

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1.0 Introduction

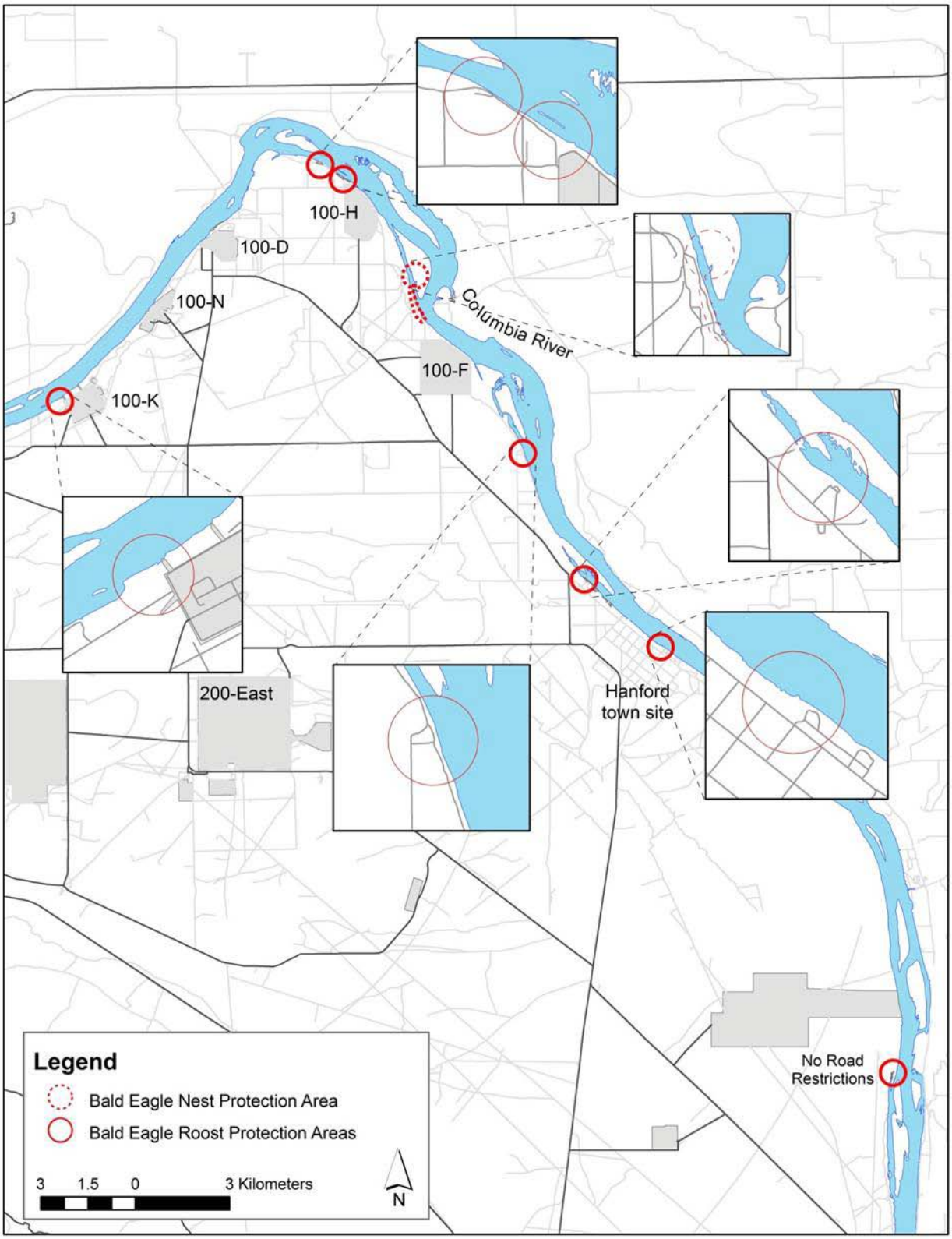
The Bald Eagle (*Haliaeetus leucocephalus)* plays an important predatory role in the ecosystem and serves as a national symbol for the United States of America. In 2007 the U.S. Fish and Wildlife Service (USFWS) determined that the population of bald eagles in the lower 48 States had sufficiently recovered, so the species could be removed from the federal endangered and threatened species list. The State of Washington also down-listed Bald Eagles from threatened to sensitive. However, 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. The U.S. Fish and Wildlife Service, *The National Bald Eagle Management Guidelines* (USFWS 2007), provides monitoring and management guidance for Bald Eagles. The U.S. Department of Energy (DOE), Richland Operations Office (RL) has a Hanford Site bald eagle management plan (DOE 2009) that defines appropriate protection measures for nests and roost sites based on federal and state guidelines. 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.

Bald eagles primarily use the Hanford Reach of the Columbia River as a wintering area, and are attracted to the abundant fish and waterfowl found along the river. Bald eagles arrive on the Hanford site in mid-November to forage and are usually present until mid-March. Nest building has occurred most years; however, nests on the Hanford Site are usually abandoned by mid-March, as the eagles begin to migrate toward summer feeding areas. In other portions of Washington State, nesting begins as early as December and the young may fledge as late as August (DOE 2009).

Wintering eagles use different habitats for various activities such as perching, foraging, and roosting. Protecting roosting locations is important, because the locations provide shelter from winter weather and serve a social function. The *Hanford Site Bald Eagle Management Plan* (DOE 2009) relies on a roost-site definition developed by the Washington Department of Fish and Wildlife (WDFW) under its former management policies; a roost site is defined as a tree or a group of trees in which at least three eagles roost for at least two nights during more than one year.

Seven bald eagle night roost locations on the Hanford Site are currently protected from disturbance with 400-meter (0.25 mile) buffers (Figure 1). These exclusion buffers are enforced from November 15 through March 15. In addition to these locations, one nest area in the White Bluffs Slough, is protected until March 15, or longer if eagles exhibit signs of nesting (Figure 1). The purpose of the FY2012 monitoring was to determine whether eagles are using the current protected roost locations, and whether there are any new roost locations along the Hanford shoreline of the Columbia River. Nesting activity was documented, and potential nest sites were monitored to determine whether any new nest protection areas were needed.

Figure 1. Protected Bald Eagle Night Roost and Nest Buffer Areas (DOE 2009)



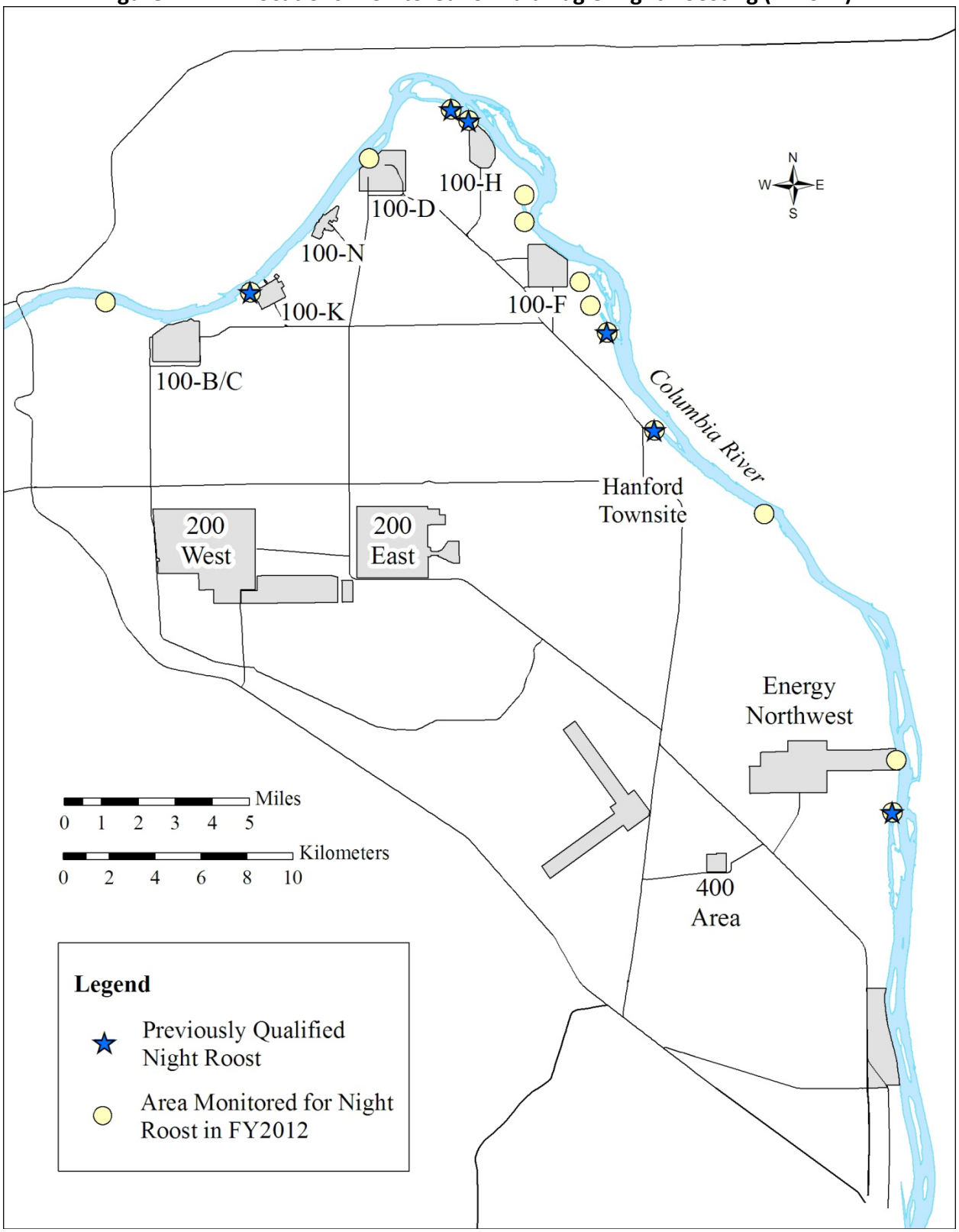
2.0 Methods

Night roost surveys were performed at the seven protected night roost locations and seven additional locations identified as potential roost locations (Figure 2). Surveys were conducted at dusk (from one-half hour prior to sunset until dark) and dawn (from daybreak to one-half hour after sunrise). Surveyors approached each location in a vehicle, maintaining the designated 400 meter (0.25 mile) buffer zone. Spotting scopes and binoculars were used to determine the number of eagles present, age (adult vs. juvenile), and activity. Surveyors then marked on an aerial photo the specific location where the eagles were roosting. After recording the data from a roost location, surveyors quickly proceeded to the next location in order to maximize the number of surveys per night.

Nest surveys were performed at several potential nest locations along the Hanford Reach, including the Hanford Townsite, Whitebluffs Slough, 100-H, and south of the 100-F Area at an old homestead. One-hour nest surveys were conducted in areas of eagle activity, and any signs of nesting activity (e.g., territory defense, nest tending, pair bonding behaviors, etc.) was documented.

Boat surveys were performed to determine the, age class, distribution, and number of eagles on the Hanford Reach. The entire length of the Columbia River along the Hanford Site was surveyed, beginning immediately upstream of Vernita Bridge and ending at the 300 Area. Portions of the boat surveys were conducted within one-hour of sunrise or sunset, and were used to confirm night roost status. In addition, the boat surveys were used to identify additional potential night roosts and nest locations.

Figure 2. Locations Monitored for Bald Eagle Night Roosting (FY2012)



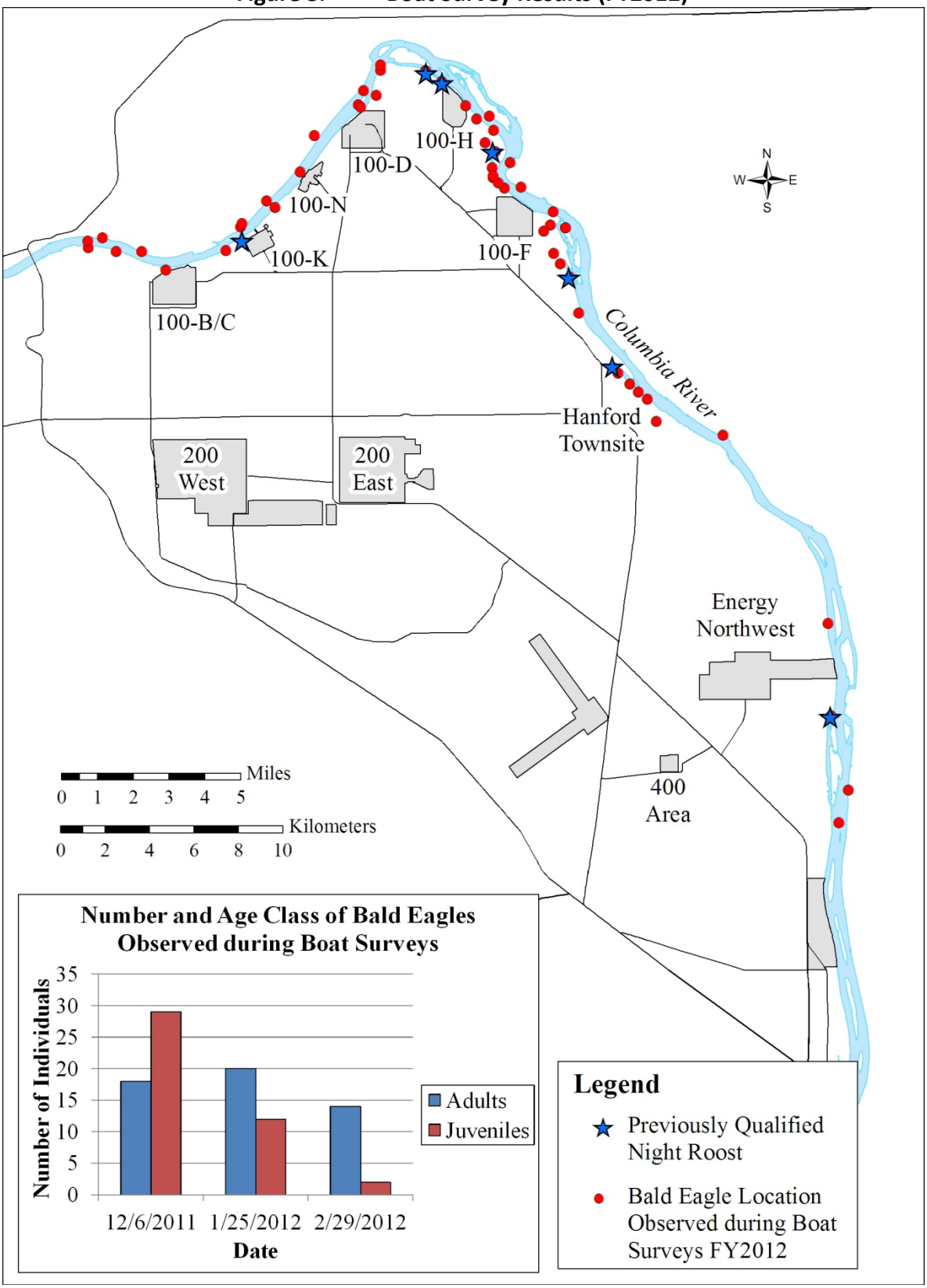
3.0 Results

During FY2012 monitoring season (November 17 through April 12), 157-night roost surveys, 3-boat surveys, and 11-nest surveys were completed. There was 122 nights in the roosting period (November 15 through March 15), with between 9 and 13 night roost surveys performed at each location. This means that each location was surveyed on between 7 percent and 10 percent of the available nights. Table 1 summarizes the night roost surveys. The boat surveys were performed on December 7, January 25, and February 29. Figure 3 summarizes the total counts and location information for the boat surveys. Nest surveys were conducted on November 29, December 28, January 13, February 1, and April 12. No nesting activity was observed by the surveyors. All spatial data collected during the surveys were transferred from the hard copy maps into the ArcGIS program for analysis.

Table 1. Night Roost Monitoring Data (FY2012)

Roost Location	Total Roost Surveys	≥ 3 Eagles	1 or 2 Eagles	% with Eagles
100-B/C*	10	0	1	10%
100-K	10	0	2	20%
100-D*	11	0	1	9%
100-H Upstream	12	7	4	92%
100-H Downstream	12	1	3	33%
Upstream Whitebluffs*	10	9	0	90%
Downstream Whitebluffs*	9	4	1	56%
100-F Island Upstream*	13	6	3	69%
100-F Island Downstream*	10	0	0	0%
100-F Slough	13	2	7	69%
Upstream Hanford Townsite	13	0	6	46%
Downstream Hanford Townsite	12	0	1	8%
ENW Outfall*	11	0	0	0%
Upstream of Wooded Island	11	1	5	55%
* Potential Roost for 2012				

Figure 3. Boat Survey Results (FY2012)



4.0 Discussion

Bald eagle use was documented at 12 of the 14 locations monitored during FY2012. Varying degrees of usage was observed between the sites, and at given locations as the season progressed. The majority of the eagles that were present during the early season (November-December) were juveniles, who grouped in large numbers in areas where spawned out fall Chinook carcasses are known to accumulate. As the season progressed, the number of juveniles on the Hanford Reach dropped dramatically while the number of adults remained relatively constant. This is likely due to juvenile eagles taking advantage of the fall Chinook food resource, but then leaving after the food source is no longer available. Adult eagles continue to use the Reach, likely feeding on waterfowl.

Based on direct observations, and on the definition developed by the WDFW of a night roost (defined as a tree or a group of trees in which at least 3-eagles roost, for at least 2- nights, during more than 1-year), the previously identified 100-H Upstream and 100-F Slough roost sites qualified as a roost site during the FY2012 survey. In addition, the potential roost sites for FY2012: Upstream Whitebluffs (Whitebluffs Slough), Downstream Whitebluffs, and 100-F Island Upstream, were observed to have 3 or more eagles, for 2 or more nights. The Upstream Whitebluffs site has been classified as a nest site rather than a communal roost site since 1997, and the downstream Whitebluffs site was within the defended nest territory whenever an eagle pair attempted to nest at the upstream Whitebluffs Site. Historically, both of these sites were considered to be communal night roost sites (e. g. Eisner 1991). The direct observations occurred on 7-10 percent of the available nights during the roosting timeframe. Thus, some method of extrapolation is necessary to estimate the number of nights eagles were present at each location for the entire monitoring season. For example, three or more eagles were observed at the 100-H Downstream location one time; however, it is likely that three or more eagles were present at that roost location on at least one un-surveyed night, which would result in this location qualifying as a night roost. Linear interpolation was used to estimate the number of qualifying roosting events at the identified roost locations. The formula used is as follows:

$$y = y_1 + (x-x_1)\frac{y_2-y_1}{x_2-x_1}$$

In the linear interpolation equation above, y_1 is the first observed number of eagles, y_2 is the second observed number of eagles, and x_1 and x_2 are the corresponding dates. The resulting data were used to estimate the number of qualifying nights at each location; with a qualifying night being ≥3 eagles present (Table 2).

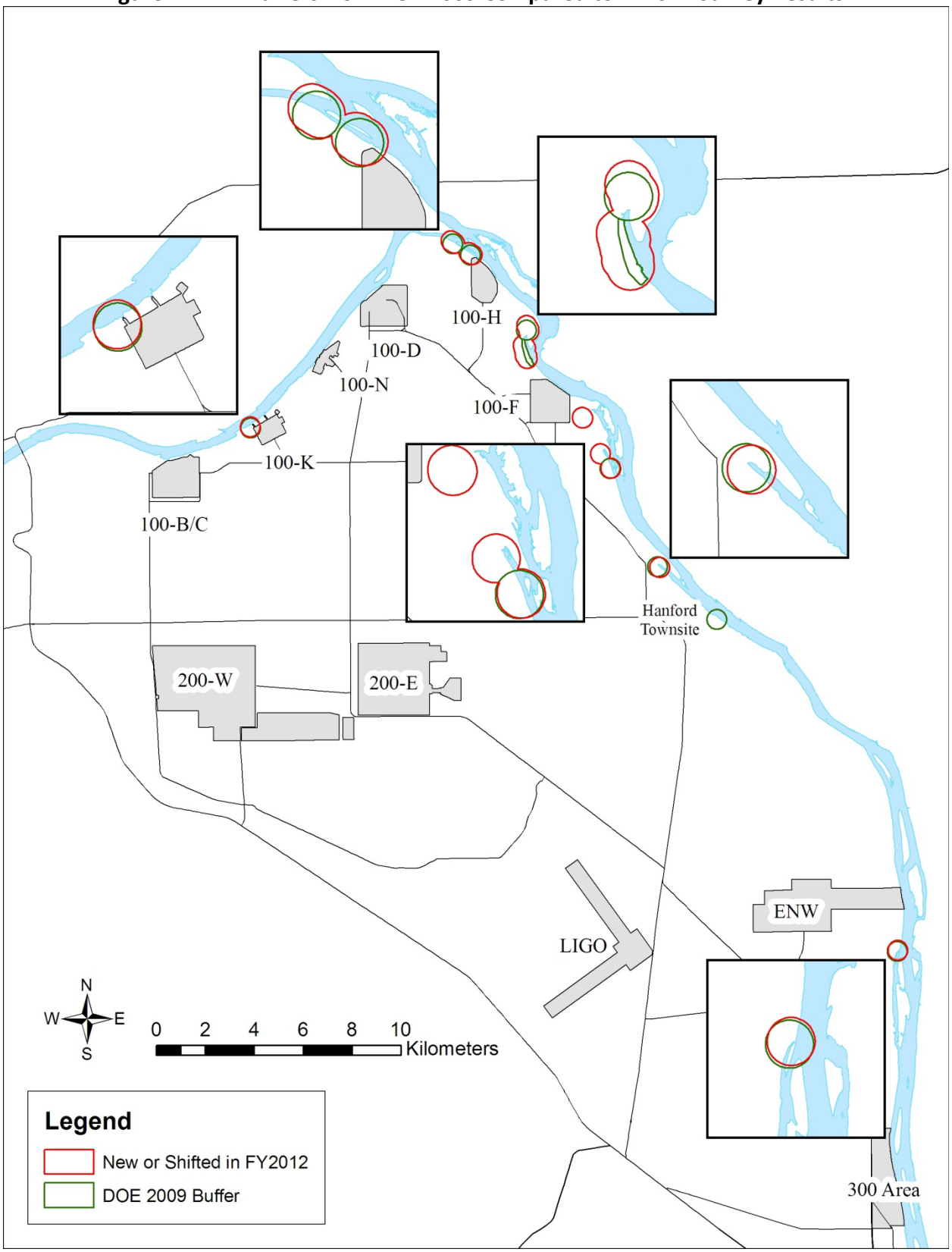
Table 2. Linear Interpolation of Night Roost Monitoring Data (FY2012)

Roost Surveys	Qualifying Nights	Nights With Eagles Present	Total Nights**
100-B/C*	0	1	93
100-K	0	12	93
100-D*	0	2	93
100-H Upstream	42	96	101
100-H Downstream	8	31	101
*Upstream Whitebluffs**	96	99	101
*Downstream Whitebluffs**	44	59	101
*100-F Island Upstream**	41	63	95
100-F Island Downstream*	0	0	86
100-F Slough	10	65	101
Upstream Hanford Townsite	0	41	101
Downstream Hanford Townsite	0	1	86
ENW Outfall*	0	0	113
Upstream of Wooded Island	24	42	113
*Potential roost for FY2012			
**Number of nights from the first through the last survey at each location			
Qualified night roost during FY2012			

Thus, based on the interpolated results, previously identified roosts that qualified during FY2012 were the 100-H Upstream, 100-H Downstream, 100-F Slough, and Upstream of Hanford Townsite. Previously identified roosts that did not qualify during FY2012, were the 100-K, Upstream Hanford Townsite, and Downstream Hanford Townsite. New potential roosts for FY2012 that qualified based on interpolated results, were 100-F Island Upstream, Upstream Whitebluffs, and Downstream Whitebluffs. In addition, new potential roosts that did not qualify were the 100-B/C, 100-D, 100-F Island Downstream, and the Energy Northwest Outfall.

The current buffer areas shown in the *Bald Eagle Management Plan for the Hanford Site* (DOE 2009) are based on points located at the center of the roost locations. However, some roosts include several trees that occur over a large area, resulting in eagles roosting close to the edges of the current buffers. Thus, the current buffers do not keep vehicular traffic or project activities from complying with the 400 meter (0.25 mile) buffer area of the roosting eagles. After removing some outlying points, the point-locations of eagles roosting within each identified roost were mapped using ArcGIS, and a 400-meter (0.25 mile) buffer zone was placed around these points to more accurately buffer the actual extents of the roosts (Figure 4). This process shifted the existing 100-K roost buffer north approximately 50 meters. The two 100-H buffers were merged and-extended upstream and downstream. New buffers were created at Whitebluffs Slough and at the 100-F Island Upstream roost locations. The 100-F Slough buffer shifted east (due to the original roost tree falling down and eagles roosting in trees along the river) and an additional lobe was connected to the northwest of the shifted buffer. The Upstream Hanford Townsite buffer was shifted southwest approximately 90 meters, while the Upstream of Wooded Island buffer was shifted north approximately 50 meters.

Figure 4. Buffers from DOE 2009 Compared to FY2012 Survey Results



Specific details and observations for each roost location are described below. Each roost has been classified into one of five categories, to better describe eagle use at each location. The categories are 1) high density-high frequency, 2) high density-low frequency, 3) low density-high frequency, 4) low density-low frequency, and 5) no use. For this purpose, density refers to the number of eagles, and frequency refers to how often eagles occur at a location.

- 100-B/C (low density-low frequency)

  This roost location was not important to eagles during the FY2012 surveys. However, it was noted that eagles were present on the north shore of the river in trees directly across from the 100-B/C Potential roost during many surveys, and that location may function as a night roost. All of the trees in this stand have relatively closed canopies, which appear to be less suitable for eagle roosting than trees with more open structure or canopies (Eisner 1991). The Eagles were observed in open structured trees on the north side of the river.

- 100-K (low density-low frequency)

  Eagles did not use this location regularly during FY2012, and only 1 or 2 birds were ever present. This may be due to the high level of remediation and demolition activity occurring within 400 meters (0.25 miles) of the roost location. A permit was also granted in this location by USFWS to allow vehicles to drive through the roost buffer to support remediation performed by Washington Closure Hanford. This location may function as a night roost in the future, if activity levels drop.

- 100-D (low density-low frequency)

  Although eagles were observed on the 100-D Island, the 100-D roost location was not important to eagles during the FY2012 surveys. The 100-D Area was highly active with remediation activity by the Washington Closure Hanford contractor during FY2012, so eagle use could increase when activity levels decrease in the future. The canopy in this stand is relatively closed.

- 100-H Upstream (high density-high frequency)

  This location was used extensively throughout the roosting season and was one of the most important roosts observed during FY2012. This is the longest known communal roost site on the Hanford Reach (Fitzner and Hanson 1979).

- 100-H Downstream (low density-high frequency)

  This location qualified during the FY2012 survey but was not used as extensively as the 100-H Upstream location. The 100-H area had active remediation and groundwater activities occurring which may affect the level of use. The potential nest location observed within this roost area during 2011 was not occupied or defended during FY2012.

- Upstream White Bluffs (high density-high frequency)

  Eagles attempted to nest at this location in the past, but during FY2012, this location was an extremely important communal night roost. As many as 19 eagles were observed roosting at this location, and the roost was occupied throughout the season.

- Downstream White Bluffs (high density-high frequency)

  Although not used by as many eagles as the Upstream White Bluffs location, this roost was used regularly throughout the season, especially during the early season when fall Chinook carcasses were available. The number of eagles using this location dropped significantly during February and March.

- 100-F Island Upstream (high density-high frequency)

  This location was identified as a new night roost during FY2012 and was used regularly by 4-9 eagles, especially early in the roosting season.

- 100-F Island Downstream (no use)

  Although this location was identified as a potential roost, no eagles were observed using these trees during the FY2012 surveys.

- 100-F Slough (low density-high frequency)

  The main roost tree for this historical roost location, located approximately 150 meters (492 feet) inland, fell down at some undocumented time. However, eagles were observed utilizing trees on the shoreline of the river immediately adjacent to and within the original 100-F Slough buffer. 1 to 2 eagles used this location regularly.

- Upstream Hanford Townsite (low density-high frequency)

  One or two eagles used this location regularly. It was observed that the trees used stretch outside of the currently identified buffers, with eagles often roosting up to 1000 meters (0.62 miles) downstream near the Hanford Townsite Electrical Substation (aka Cornelius Pumphouse).

- Downstream Hanford Townsite (low density-low frequency)

  This location was used extremely infrequently, with only one eagle observed roosting on a single night throughout the entire season.

- ENW Outfall (no use)

  Although the trees at this location appear to be suitable for roosting, no eagles were observed during any of the surveys. There is a light present at one of the ENW intake buildings that may dissuade eagles from roosting at this location (Figure 5).

Figure 5. Potential Roost Trees behind Energy Northwest Building

- Upstream of Wooded Island (high density-high frequency)

  Greater than three eagles were only observed at this location once during FY2012, but that observation was of 10 eagles. That observation was the only one made during a 27-day period, with 2 eagles observed on the survey prior and 2 eagles on the subsequent survey. For this reason, based on the interpolated data, the observation of 10 eagles carried considerable weight, which could potentially overestimate usage at this location. With additional observations, the roost might be reclassified as high density-low frequency. Use at this location increased late in the roosting season.

Roost monitoring is planned to continue in FY2013. Additional surveys will further establish qualified roosts by confirming the, greater than one year, portion of the qualification guideline.

5.0 References

Bald and Golden Eagle Protection Act of 1940, US Code Title 16 Chapter 5A Subchapter II Section 668.

DOE/RL-94-150, Rev. 1. 2009. *Bald Eagle Management Plan for the Hanford Site, South-Central Washington*. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Eisner, Sherry A. 1991. *Bald Eagles Wintering Along the Columbia River in South Central Washington: Factors Influencing Distribution and Characteristics of Perch and Roost Trees*. Masters Thesis, University of Montana.

Fitzner, R. E. and W. C. Hanson. 1979. *A Congregation of Wintering Bald Eagles*. Condor 81:311-313.

16 USC – United States Code, Chapter 7,Sec. 703. *Migratory Bird Treaty Act of 1918.*

RCW. 77.15.130. *Protected Fish or Wildlife – Unlawful Taking*. Revised Code of Washington. Online at http://apps.leg.wa.gov/RCW/default.aspx?cite=77.15.130.

USFWS – U.S. Fish and Wildlife Service, Midwest Region. 2007. *National Bald Eagle Management Guidelines*. Online at http://www.fws.gov/Midwest/eagle/guidelines/guidelines.html.

WAC 232-12-292. *Bald Eagle Protection Rules*. Washington Administrative Code, Olympia, Washington. Online at http://apps.leg.wa.gov/WAC/default.aspx?cite=232-12-292.

WDFW – Washington Department of Fish and Wildlife. 2011. *Bald Eagle Management and Protection in Washington State*. Olympia, Washington. Online at http://wdfw.wa.gov/conservation/bald_eagle/.