

4.2 Wildlife

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The Hanford Site is a relatively large, undisturbed area of shrub-steppe that contains numerous plant and animal species adapted to the region's semiarid environment. The vegetation mosaic of the Site consists of ten major plant communities: 1) sagebrush/bluebunch wheatgrass, 2) sagebrush/cheatgrass or sagebrush/Sandberg's bluegrass, 3) sagebrush-bitterbrush/cheatgrass, 4) grease wood/cheatgrass-saltgrass, 5) winterfat/Sandberg's bluegrass, 6) thyme buckwheat/Sandberg's bluegrass, 7) cheatgrass-tumble mustard, 8) willow or riparian, 9) spiny hopsage, and 10) sand dunes (Cushing 1994). Nearly 600 species of plants have been identified on the Hanford Site (Sackschewsky et al. 1992). Cheatgrass is the dominant plant on old fields that were cultivated approximately 50 years ago.

More than 300 species of terrestrial and aquatic insects, 12 species of reptiles and amphibians, 44 species of fish, 187 species of birds, and 39 species of mammals have been found on the Hanford Site (Cushing 1994). Deer and elk are the major large mammals on the Site; coyotes are plentiful, and the Great Basin pocket mouse is the most abundant mammal. Waterfowl are numerous on the Columbia River, and the bald eagle is a regular winter visitor along the river. Salmon and steelhead are the fish species of most interest to sport fishermen and Native American tribal members.

There are two types of natural aquatic habitats on the Hanford Site; one is the Columbia River, and the other is provided by the small spring-streams and seeps located mainly on the ALE Reserve in the Rattlesnake Hills. These include Rattlesnake Springs, Dry Creek, Snively Springs, and West Lake, a small, natural pond near the 200 Areas. Several artificial water bodies, both ponds and ditches, have been formed as a result of waste-water disposal practices associated with the operation of the reactors and separation facilities; these water bodies form established aquatic ecosystems complete with representative flora and fauna (Emery and McShane 1980).

The Hanford Site contains no plant species listed on the federal list of threatened and endangered species. The federal government lists the peregrine falcon as endangered and the bald eagle and Aleutian Canada goose as threatened. The peregrine falcon and Aleutian Canada goose are migrants through the Hanford Site, and the bald eagle is a common winter resident. Several plant species, mammals, birds, molluscs, reptiles, and invertebrates occurring on the Hanford Site are currently candidates for formal listing under the Endangered Species Act. Appendix G lists special-status species that could occur on the Hanford Site.

Results for Wildlife Resource Monitoring, 1994

Wildlife populations inhabiting the Hanford Site are monitored to measure the status and condition of the populations and assess effects of Hanford operations. Particular attention is paid to species that are rare, threatened, or endangered nationally or statewide and those species that are of commercial, recreational, or aesthetic importance statewide or locally. These species include the bald eagle, chinook salmon, Canada goose, ferruginous hawk, Rocky Mountain elk, mule deer, loggerhead shrike, and other bird species.

Fluctuations in wildlife and plant species on the Hanford Site appear to be a result of natural ecological factors and management of the Columbia River system. The establishment and management of the Hanford Site has helped to maintain wildlife populations and overall biological diversity relative to probable alternative uses of the Site.

Bald Eagle

The bald eagle is listed as a federally threatened species and also a Washington state threatened species. Historically, bald eagles have wintered along the Hanford Reach of the Columbia River. However, when monitoring began in the early 1960s, numbers were very low (Figure 4.2.1). Following the passage of the Endangered Species Act in 1973, the

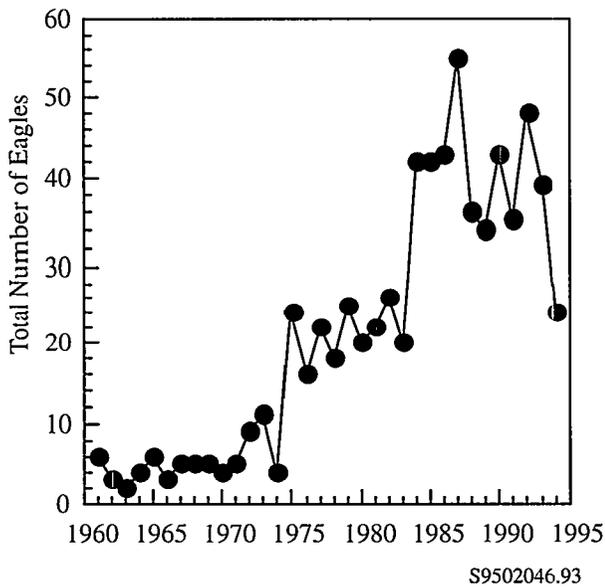


Figure 4.2.1 Bald Eagles Observed Along the Hanford Reach, Fall and Winter Months, 1961 Through 1994

number of wintering bald eagles increased. Possible reasons for the observed increase are the added protection of bald eagles at nesting locations off the Hanford Site and the nationwide elimination of dichlorodiphenyltrichloroethane (DDT) as an agricultural pesticide in 1972. On a local scale, changes in the number of eagles on the Hanford Site generally correspond to changes in the number of salmon, a major fall and winter food source for eagles. The recent decline in numbers is probably attributable to the recent decline in salmon in the area. Most of the eagles using the Hanford Reach are concentrated in the section between the old Hanford Townsite and the 100-K Area.

The Hanford Reach is expected to continue providing wintering habitat as long as critical resources such as food, perches, and relative freedom from human activities are maintained. Limited nest building by bald eagles has been observed at the Hanford Site in recent years although none of the attempts has been successful.

Chinook Salmon

Chinook salmon are an important resource to the citizens of the Pacific Northwest. Salmon are caught commercially and for recreation. The

commercial and recreational catch is carefully managed to sustain the resource. Today the most important natural spawning area in the mainstream Columbia River for the fall chinook salmon is found in the free-flowing Hanford Reach. In the early years of the Hanford Site, there were few spawning nests (redds) in the Hanford Reach (Figure 4.2.2). Between 1943 and 1971, a number of dams were constructed on the Columbia River. The reservoirs created behind the dams eliminated most mainstem spawning areas and increased salmon spawning in the Hanford Reach. Fisheries management strategies aimed at maintaining spawning populations in the mainstem Columbia River have also contributed to the observed increases. In recent years, numbers of fall chinook salmon spawning in the Hanford Reach have declined, consistent with reduced run sizes returning to the Columbia River. The larger 1994 redd count was partly the result of harvest restrictions directed at protecting Snake River stocks of fall chinook salmon under the Endangered Species Act. Also, for most of the surveys conditions were excellent for observing the redds. Additionally, low daytime discharges from Priest Rapids Dam contributed to generally low water as far downstream as Ringold. Redds were visible in the lower part of the Reach for the first time in many years. The Hanford Reach under existing management practices continues to provide valuable salmon spawning habitat.

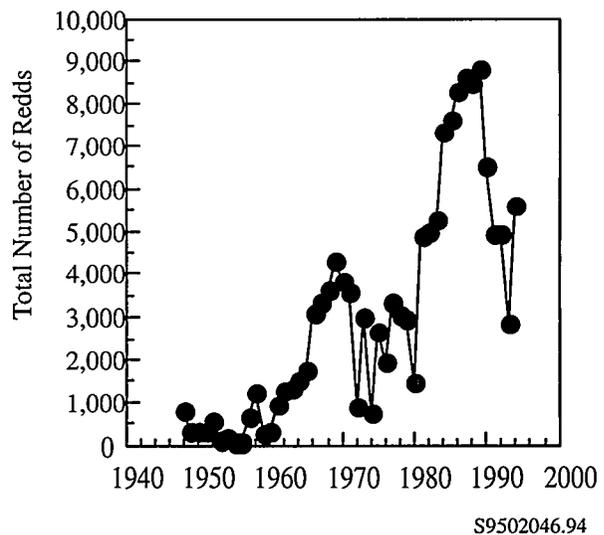


Figure 4.2.2 Chinook Salmon Spawning Redds in the Hanford Reach, 1948 Through 1994

Canada Goose

Nesting Canada geese are valuable recreational and aesthetic resources along the Snake and Columbia rivers in eastern Washington. Goose nesting surveys began in the 1950s to monitor changes in response to reactor operations (Figure 4.2.3). The gradual decline observed in the late 1960s and early 1970s is attributed to persistent coyote predation, mostly on the Columbia River islands upstream from the old Hanford Townsite. Since the 1970s, the center of the nesting population has shifted from upstream to downstream islands near Richland, which in recent years have been relatively free from coyote predation. The lower nest count in 1994 can be attributed to extensive coyote predation on Island 12 (a downstream island). In 1993, there were 60 nests on Island 12 while no nests were found in 1994.

Canada goose populations are successful on the Hanford Reach because the islands are restricted from human uses during the nesting period and because shoreline habitats provide adequate food and cover for broods (Eberhardt et al. 1989).

Hawks

The undeveloped land of the semiarid areas of the Hanford Site provides nest sites and food for three species of migratory buteo hawks: Swainson's, red-tailed, and ferruginous. Under natural conditions,

these hawks nest in trees, on cliffs, or on the ground. Powerline towers and poles also can serve as nest sites, and these structures are well used by nesting hawks on the Hanford Site because of the relative scarcity of trees and cliffs. The ferruginous hawk is a U.S. Fish and Wildlife Service candidate species for listing as threatened and/or endangered. In recent years, the number of ferruginous hawks nesting on the Hanford Site has increased (Figure 4.2.4). The Site continues to provide hawk nesting habitats administratively protected from human intrusions, as well as providing suitable foraging areas. The sharp declines in red-tailed and Swainson's hawk nests in the late 1980s are probably not a result of Hanford Site activities because the number of nests for the very sensitive ferruginous hawk did not decline (Figure 4.2.4). Decreases in nesting red-tailed and Swainson's hawks may have been related to impacts that occurred during their migration and/or while they were on their wintering grounds. Nesting pairs of red-tailed hawks increased in 1991 and 1992 to approximately 25, which represents a high for the species. Since 1993, no complete survey data are available for either red-tailed and Swainson's hawks.

Rocky Mountain Elk

Rocky Mountain elk did not inhabit the Hanford Site when it was established in 1943. Elk appeared

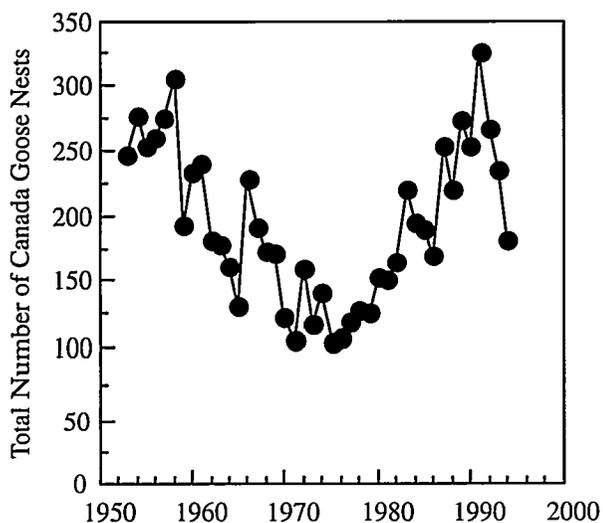


Figure 4.2.3 Canada Goose Nests on Islands in the Hanford Reach, 1952 Through 1994

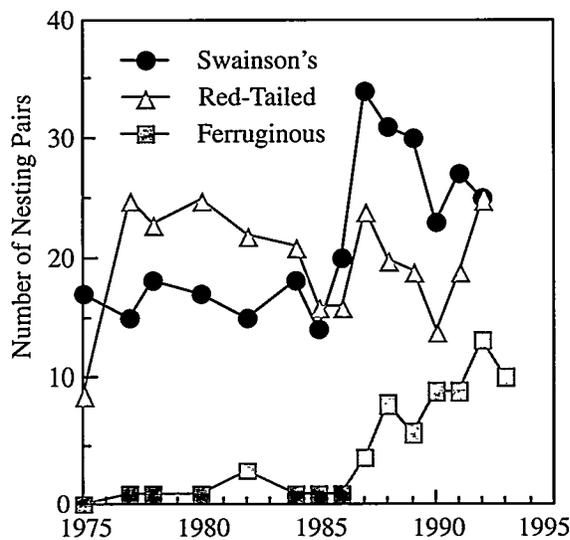


Figure 4.2.4 Red-Tailed, Swainson's, and Ferruginous Hawks on the Hanford Site, 1975 Through 1994

on the ALE Reserve in the winter of 1972. A few animals stayed and reproduced. Over 300 elk were recorded in 1994 before the offsite hunting season (Figure 4.2.5). With a regulated hunting season on private lands adjoining the ALE Reserve, the elk population appeared to be holding at less than 100 animals until the spring of 1990. During the 1994 hunting season, more than 40 elk were estimated to have been harvested.

Elk are successful on the ALE Reserve because of 1) available forage without competition from domestic livestock; 2) unrestricted access to drinking water at springs located on the ALE Reserve; 3) relatively mild winters; 4) ability to accommodate extreme summer temperatures, even in the absence of shade; and 5) absence of hunting on the Site.

Mule Deer

Mule deer are a common resident of the Hanford Site and are important because of the recreational (offsite hunting) and aesthetic values they provide. Because mule deer have been protected from hunting on the Hanford Site for approximately 50 years, the herd has developed a number of unique

population characteristics that are in contrast to most other herds in the semiarid region of the Northwest. These characteristics include a large proportion of old-age animals (older than 5 years) and large-antlered males. This herd provides a unique opportunity for comparison to other more heavily harvested herds in this region.

Because of the unique nature of the herd and high degree of public interest, a study was initiated in 1990 to 1) obtain estimates of the number of deer on the Hanford Site, 2) determine the extent and frequency of offsite movements by Hanford Site deer, and 3) evaluate the level of strontium-90 in deer from the 100 Areas (see Section 5.5, "Wildlife Surveillance"). Additional work was initiated in 1993 to identify possible causes for abnormal antler development and reduced testicle size observed in some mule deer residing along the Columbia River corridor. The condition was recently observed in old buck deer.

Offsite movement of deer was monitored by radiocollaring 53 animals (15 bucks and 38 does). Frequent movements across the river or onto islands were made by some deer, particularly during the breeding (October-December) and fawning (May-July) season. Twenty-four of the 53 radiocollared animals were located at least once either across the river or on the islands. The most frequently visited locations offsite locations are the riparian areas along the Columbia River and adjacent to the Hanford Site.

A total of 38 deer antlers was analyzed in 1994 for strontium-90 concentrations. Fourteen of the antler samples came from animals captured near the 100 Area reactor sites, 14 were collected from animals near or south of the old Hanford Townsite and 10 were collected from a reference site near Silver Lake, Oregon. Analysis of the antlers revealed that the mean concentration from 100 Area deer was 0.41 pCi/g, the mean concentration from old Hanford Townsite deer was 0.19 pCi/g, and the mean concentration in antlers collected near Silver Lake was 2.09 pCi/g. The elevated concentrations from Silver Lake samples are attributed to higher amounts of fallout-derived strontium-90 scavenged from the atmosphere by precipitation, which is greater in the mountainous regions of Oregon.

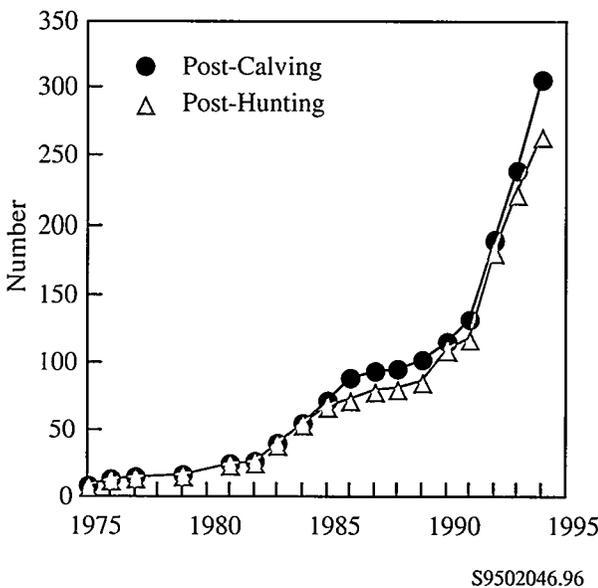


Figure 4.2.5 Elk on the Hanford Site Counted by Aerial Surveillance During the Post-Calving Period, August Through September, and the Post-Hunting Period, December Through January, 1975 Through 1994

A total of 25 deer (5 in 1993 and 20 in 1994) have been examined for testicular atrophy and abnormal antler development. All affected animals ($n=12$) were over 4 years old; 10 were between 8 and 12 years old. Age for the unaffected animals was between 1 and 6 years. Blood tests revealed no parasitic cause for the testicular atrophy and there were no endocrine abnormalities. PNL is currently conducting movement analysis of the normal and affected animals to examine areas of use for the two groups. We are also observing seasonal forage patterns and collecting fecal samples to identify diet.

Monitoring Northern Oriole Populations

During the 1980s, scientists noted declines in the number of North American migratory song birds. Habitat loss and degradation is partly responsible. Habitat needed for food and shelter is disappearing

in the neotropics. In the United States, there is not enough suitable nesting habitat to sustain populations of some species. In some cases, populations have diminished to the point where special protection is required to sustain them. Federal agencies are required to monitor numbers of threatened and endangered species and to devise and implement management plans.

The northern oriole (*Icterus galbula*) is one of the 120 species of migratory song birds that nest in Washington and Oregon. On the Hanford Site, northern orioles nest in deciduous trees. The nests are difficult to locate during spring, when trees are in full foliage, but are more conspicuous after leaf fall in autumn. The old Hanford Townsite was selected for monitoring in 1994 because it has more trees than other places on the Site. Forty nests were located in seven tree groups (Figure 4.2.6).

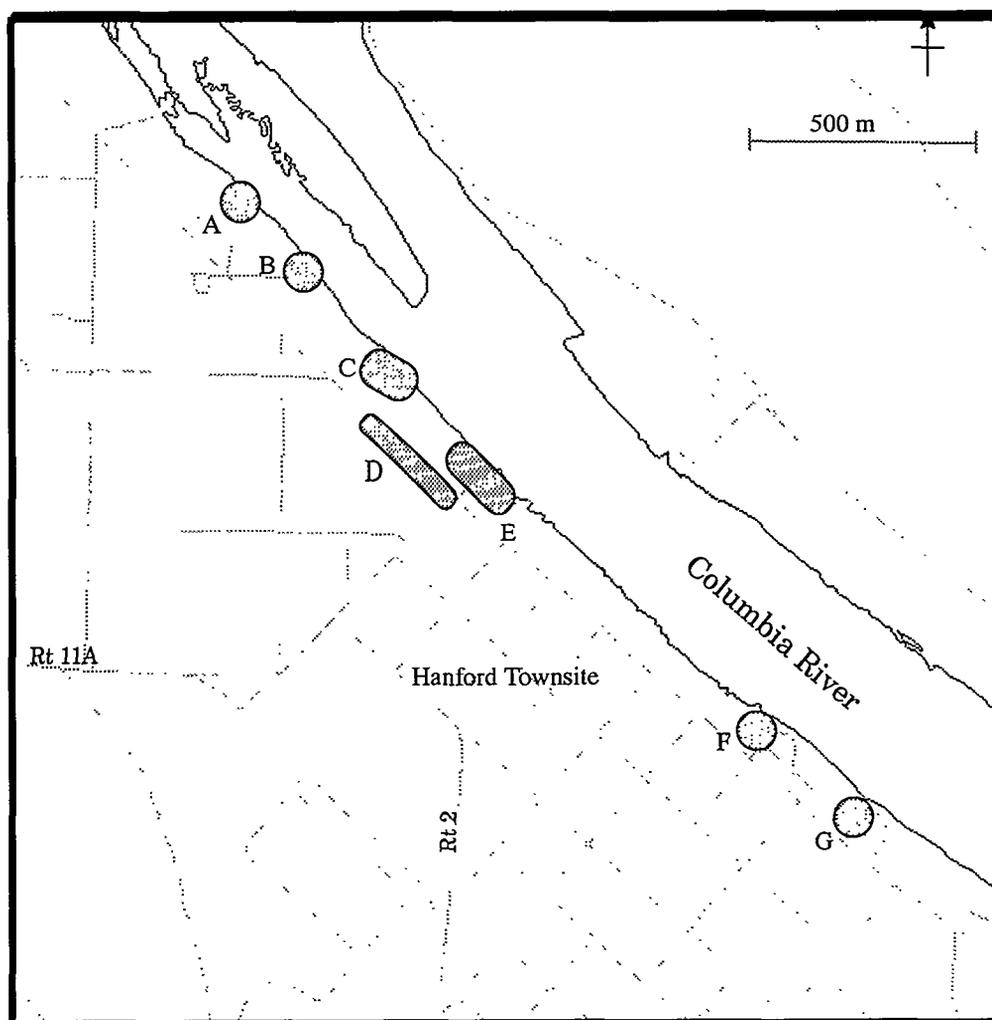


Figure 4.2.6 Oriole Nesting Sites at the old Hanford Townsite, 1994

Counting nests appears to be an efficient way to monitor breeding populations of northern orioles. These data will provide the basis for judging the impacts of land use changes at the old Hanford Townsite as the land is converted to other purposes in the future.

Special Plants

In 1994, The Nature Conservancy along with botanists from PNL initiated a survey of the Hanford Site for rare plant species. A total of 55 new populations were found of 10 plant taxa listed in Washington as Endangered, Threatened or Sensitive. These taxa are *Astragalus columbianus* (Columbia milkvetch), *Astragalus geyeri* (Geyer's milkvetch), *Camissonia pygmaea* (dwarf evening-primrose), *Cryptantha leucophaea* (gray cryptantha), *Cyperus bipartitus* (shining flatsedge), *Erigeron piperianus* (Piper's daisy), *Limosella acaulis* (southern mudwort), *Lindernia dubia* var. *anagallidea* (false-pimpernel), *Oenothera caespitosa* subsp. *caespitosa* (desert evening-primrose), and *Rorippa columbiana* (persistentsepal yellowcress).

Wildlife Monitoring on Non-DOE Managed Hanford Site Land

DOE property north of the Columbia River is managed for wildlife and recreation by two separate agencies. The Saddle Mountain National Wildlife Refuge is the westernmost portion of the North Slope area and is managed by the U.S. Fish and Wildlife Service through the Columbia National Wildlife Refuge Office located in Othello, Washington. The Wahluke Wildlife Area, which lies generally east and north of the Saddle Mountain refuge, is managed by the Washington Department of Fish and Wildlife as an outdoor recreation area. A third agency, the U.S. Army Corps of Engineers, was involved during 1994 in activities to clean-up any

residual contamination on all of the lands north of the Columbia River in anticipation of DOE's final decision to disposition those properties. That activity has commonly been referred to as North Slope cleanup.

The Saddle Mountain refuge is managed as a natural preserve with relatively little resources dedicated to habitat management. This management approach is being used because the refuge is deemed to be temporary as a result of the 30-day revocation clause in the U.S. Fish and Wildlife permit from DOE. Habitat management will likely be given a higher priority if Saddle Mountain becomes a permanent part of the refuge system.

Land management activities conducted on the Wahluke Wildlife Area by the Washington Department of Fish and Wildlife in 1994 included inspection of North Slope cleanup areas and participation in rehabilitation planning, assisting The Nature Conservancy with plant and bird inventories, assisting the U.S. Bureau of Reclamation contractor with White Bluffs road closure, spraying about 45 acres of noxious weeds on Wahluke units, and planting 7 acres of wildlife food crops at Ringold (volunteers planted an additional 15 acres at Ringold). Other activities included investigating low water in WB-10 ponds and searching the ponds and wastewater for Salt cedar and Purple loosestrife infestations. Two grazing permits and three agricultural leases were evaluated for the Wahluke units. The Washington Department of Fish and Wildlife also evaluated four fires including the 1500-acre Savage Island fire, seeded about 10 acres of fire breaks with winter wheat cover crop, and maintained eight winter feeders and one guzzler for upland birds. Maintenance activity included removing litter and replacing damaged and deteriorating signs. The only wildlife management activity was counting duck pairs which was done twice in May 1994 in Section 27, T14N, R27E and Section 9, T12N, R28E.