
6.2 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 1995). 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 1995). 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 Fitzner/Eberhardt Arid Lands Ecology Reserve in the Rattlesnake Hills. These include Rattlesnake Springs, Dry Creek, Snively Springs, and West Lake, a small, natural pond near the 200 Areas.

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 currently are candidates for formal listing under the Endangered Species Act. Appendix F lists special-status species that could occur on the Hanford Site.

Results for Wildlife Resource Monitoring, 1995

Wildlife populations inhabiting the Hanford Site are monitored to measure the status and condition of the populations and to assess effects of Hanford operations. Particular attention is paid to species that are rare, threatened, or endangered nationally or statewide and 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 6.2.1). Following the passage of the Endangered Species Act in 1973, the 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

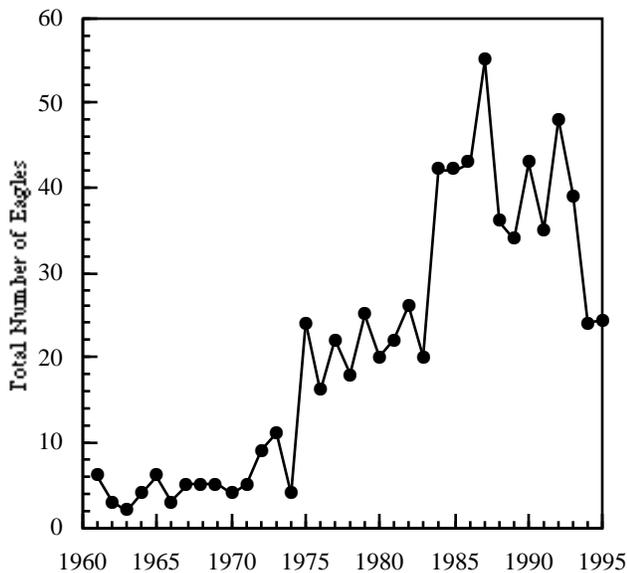


Figure 6.2.1. Bald Eagles Observed Along the Hanford Reach, Fall and Winter Months, 1961 Through 1995

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 nesting attempts has been successful.

Chinook Salmon

Chinook salmon are an important resource in the Pacific Northwest. Salmon are caught commercially and for recreation. The commercial and recreational catch is managed carefully 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 6.2.2). Between 1943 and 1971, a number of dams were constructed on the Columbia

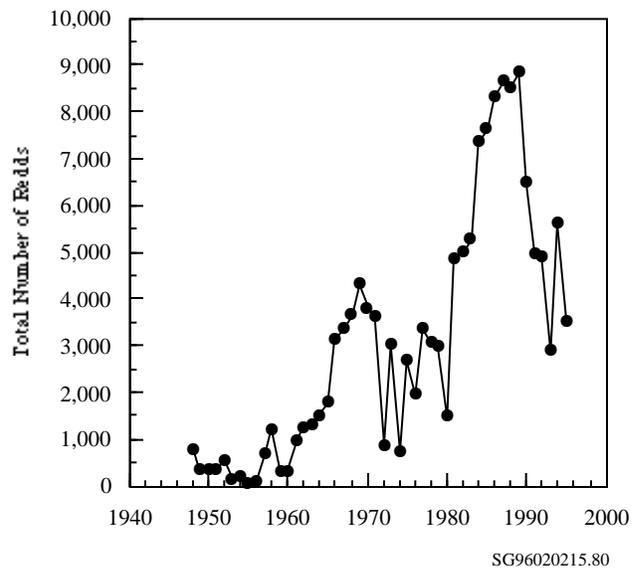


Figure 6.2.2. Chinook Salmon Spawning Redds in the Hanford Reach, 1948 Through 1995

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 also have 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. In 1994, low daytime discharges from Priest Rapids Dam also contributed to generally low water as far downstream as Ringold. In 1995, river flow reached 130,000 ft³/s when the final redd counts were being conducted. The high river flow caused reduced visibility and interfered with redd counting during the time when counts are normally highest. This resulted in a low overall redd count for 1995 relative to 1994. Because of the high river flows, the lower redd counts may not mean that adult numbers or spawning were reduced in 1995. The Hanford Reach under existing management practices continues to provide valuable salmon spawning habitat.

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 6.2.3). 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 total nest count increased in 1995 compared to 1994. In 1995 fewer surveys were conducted, which affected the count primarily because gulls used the abandoned goose nests making it difficult to relocate the nests and determine if hatching occurred. Coyote predation again eliminated or severely affected nesting on some islands. In 1995, the Canada goose nesting surveys were conducted biannually.

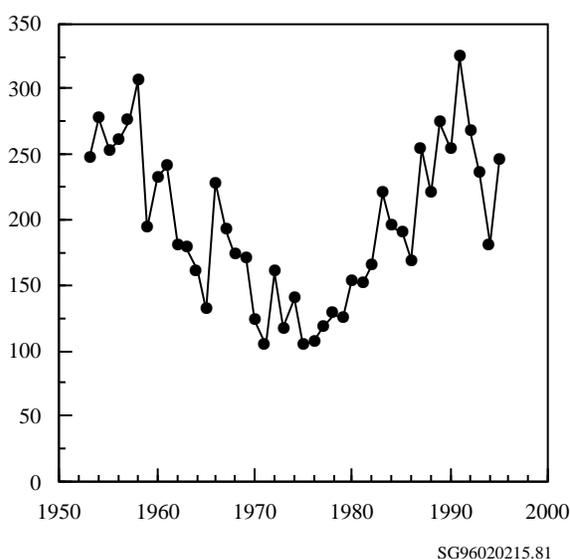


Figure 6.2.3. Canada Goose Nests on Islands in the Hanford Reach, 1952 Through 1995

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 6.2.4). The Site continues to provide hawk nesting habitats that are administratively protected from human intrusion, and also provides suitable foraging areas. The sharp declines in red-tailed and Swainson's hawk nests in the late 1980s probably are not a result of Hanford Site activities because the number of nests for the very sensitive ferruginous hawk did not decline (Figure 6.2.4). 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. A limited number of hawk surveys were conducted in 1993 and 1994; however, because survey methods differed from those used in previous years, the nest counts are not included in Figure 6.2.4. No surveys were conducted in 1995.

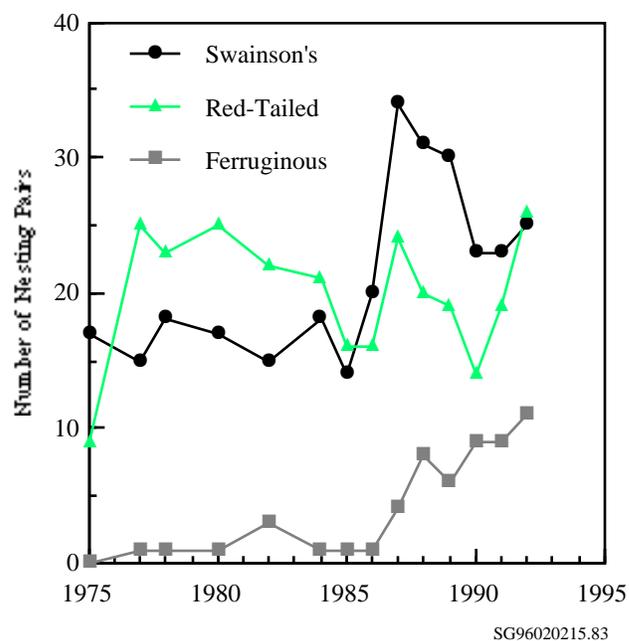


Figure 6.2.4. Red-Tailed, Swainson's, and Ferruginous Hawks on the Hanford Site, 1975 Through 1992

Rocky Mountain Elk

Rocky Mountain elk did not inhabit the Hanford Site when it was established in 1943. Elk appeared on the Fitzner/Eberhardt Arid Lands Ecology Reserve in the winter of 1972. A few animals stayed and reproduced. Over 300 elk were recorded in 1995 before the offsite hunting season began (Figure 6.2.5). During the 1995 hunting season, 20 elk (17 bulls and 3 cows) were known to have been harvested from the adjacent private lands.

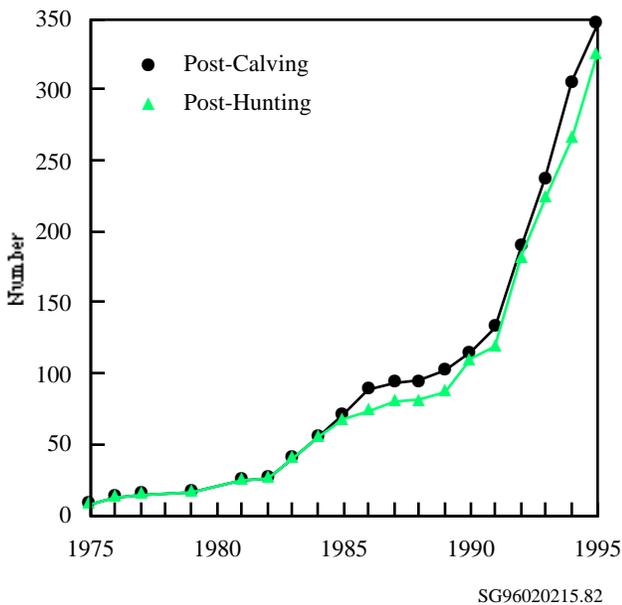


Figure 6.2.5. Elk on the Hanford Site Counted by Aerial Surveillance During the Post-Calving Period, August Through September, and the Post-Hunting Period, December Through January, 1975 Through 1995

A significant change in cow/calf ratios was observed from the 1980s to more recent times. An average of 79 calves per 100 cows was observed consistently through 1987. Since then, calf recruitment has been down, averaging 52 calves per 100 cows. A check on the status of 19 cow elk found that all but one were pregnant, indicating that the reduced calving rates may result from neonatal mortality or increased predation on newborn calves rather than from low fecundity.

Accurate demographic information on the Hanford Site herd is becoming more difficult to obtain as the elk population increases; however, cooperation with Washington State Department of Fish and Wildlife officials and private

land owners adjacent to the Site provides valuable information on the number of animals harvested each year.

Elk are successful on the Fitzner/Eberhardt Arid Lands Ecology Reserve because of 1) available forage without competition from domestic livestock; 2) unrestricted access to drinking water at springs located on the Fitzner/Eberhardt Arid Lands Ecology 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 4.5, "Fish and 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.

In the early 1990s, the deer population onsite was estimated by marking several Hanford deer and counting the ratio of marked to unmarked animals along the Columbia River. In addition, relative deer densities were determined throughout the remainder of the Hanford Site by comparing the frequency of fecal pellet groups found within each region. Over 300 deer were estimated to reside in the region of the Hanford Site bordering the Columbia River. The Fitzner/Eberhardt Arid Lands Ecology Reserve contains approximately half the number of deer found near the Columbia River, and less than 100 deer are estimated to reside within the central portion of the Hanford Site.

Offsite movement of deer was monitored by radiocollaring 53 animals (15 bucks and 38 does). Some deer frequently moved across the Columbia River or onto islands, particularly during the breeding (October-December) and fawning (May-July) seasons. Twenty-four of the 53 radiocollared animals were located at least once either across the river or on the islands. The most frequently visited offsite locations were the riparian areas along the Columbia River. Additional movement data collected in 1995 confirm these findings.

A total of 38 deer antlers were 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 in the 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.

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 more than 4 years old; 10 were between 8 and 12 years old. The unaffected animals were between 1 and 6 years old. Blood tests revealed no parasitic cause for the testicular atrophy, and radiation was ruled out because there were no effects found in other tissues. The condition has been reported in mule deer from other areas in the United States including Arizona, California, Texas, and Colorado. Analysis of the radiocollared normal and affected animals' movement on the Site suggests that the two groups readily intermix; however, affected animals are common only

along the Columbia River portions of the Site. Seasonal foraging patterns suggest that woody plants (principally bitterbrush and riverine shrubs such as mulberry, willow, and Russian olive) comprise a large portion of their diets, providing a direct pathway for ground-water contaminants to the deer. Several plants known to produce estrogen-like compounds also were found in deer diets during the summer and may influence their reproductive performance. To date, no single agent has been linked directly to the testicular atrophy observed in the Hanford Site deer.

Monitoring Northern Oriole Populations

During the 1980s, scientists noted declines in the number of North American migratory songbirds. 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 that 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 songbirds 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. Fifty nests were located in seven tree groups (Figure 6.2.6) in 1995 compared to 40 nests located in 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 any land use changes at the old Hanford Townsite if the land is used for other purposes in the future.



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Figure 6.2.6. Oriole Nesting Sites at the Old Hanford Townsite, 1995