Northwest Science Notes

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Observations on the Nesting Distribution of Great Blue Herons on the Hanford Reach of the Columbia River

Introduction

The Hanford Reach is an 80-km segment of the Columbia River extending downstream from Priest Rapids Dam to near Richland in southcentral Washington (Figure 1). This segment differs from the rest of the river upstream from tidewater because it is not impounded by a dam (Geist 1995). Here most of the river flows through federal property (Hanford Site) but the eastern shore downstream from Savage Island is private (Figure 1). Land use on the Hanford Site differs from surrounding landscapes because towns and irrigated fields have been abandoned since 1944. Public access to the river shore has been restricted because of the presence of nine plutonium production reactors at six separate locations along the western rivershore (Figure 1). Since 1944, the Hanford Site has served as a refugium for native plants and wildlife in a larger surrounding region devoted to cultivation agriculture and urbanization (Gray and Rickard 1989). The purpose of this note is to summarize observations concerning the distribution of great blue herons (*Ardea herodias*) along the Hanford Reach. This is important because it provides some insight as to the ability of great blue herons to adapt to an environment changing in response to the activities of people.

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Methods

Information concerning the distribution of heron nests along the Reach was obtained from published literature and personal observations since the 1970s. In the years 1994 to 2001 counts of active nests were made by visiting colonies all along the reach in July and August when the active nests were identified by the presence of preflight nestlings. Because road access to the shoreline is limited the colonies were accessed by boat.

Results

In 1950 twelve great blue heron (*Ardea herodias*), nests were placed in two mulberry trees (*Morus alba*), on Locke Island (Figure 1). At that time these were the only great blue heron nests on the Reach (Hanson 1968).

Most of the heron nests on the Reach since 1950 have been placed in trees planted at now abandoned farmhouses near the river shore in the early 1900s (Figure 1). These trees, mostly black locust (*Robinia pseudo-acacia*), and Siberian elm (*Ulmus pumila*), have survived in this dry climate (16 cm annually) in the absence of irrigation water because they have root access to a water table <10 m below the ground surface (Rickard and Price 1989). These trees are senescent and vulnerable to wildfire, windfall and insect infestation. Their future is limited. Many recently selfestablished native and alien trees now grow

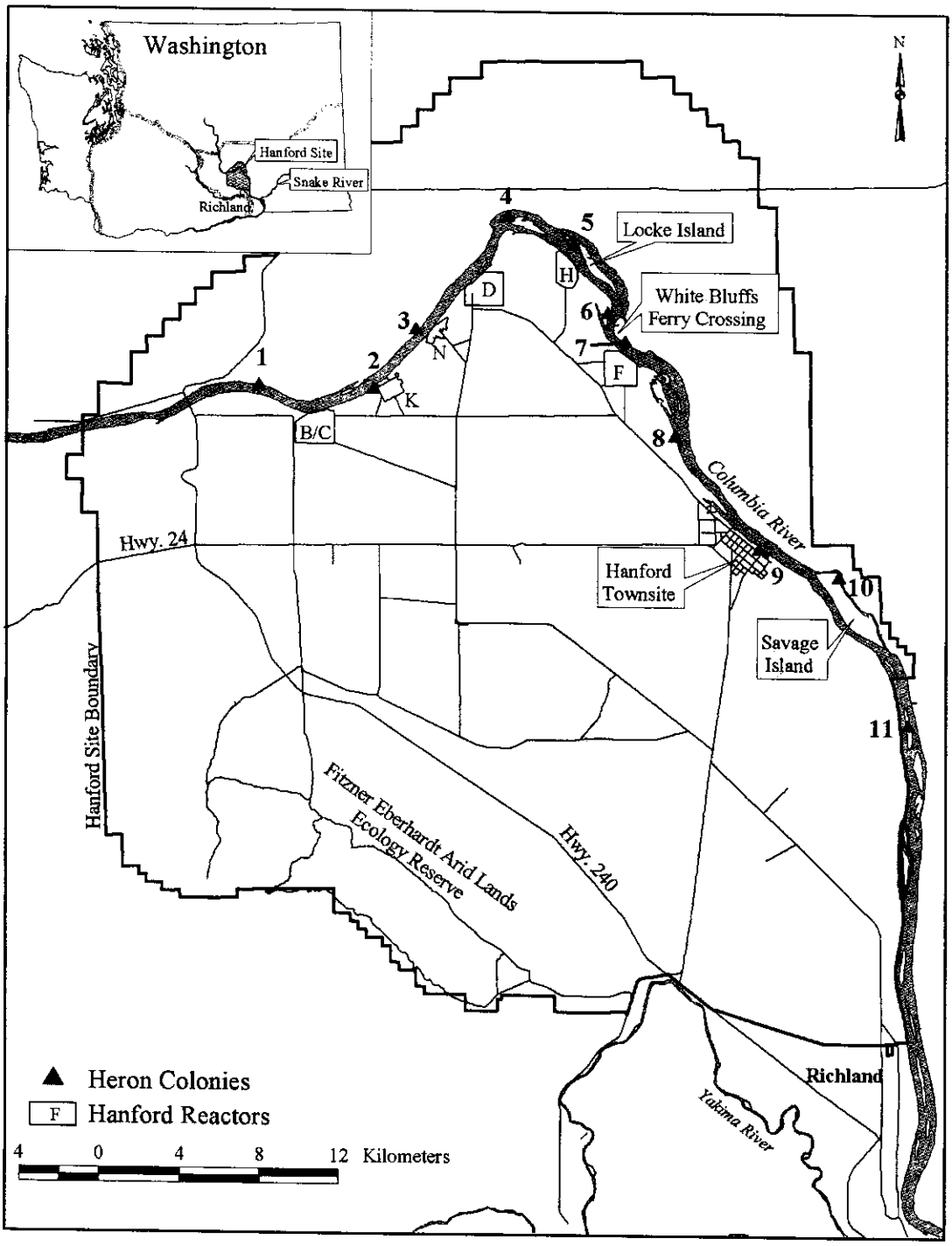

Figure 1. Map of the Hanford Reach of the Columbia River, showing the distribution of heron colonies.

on riverine beaches that historically were devoid of trees (Snodgrass 1904). The spread of these self established trees is apparently encouraged by the diurnally fluctuating river flow regulated by upriver hydroelectric dams (Rickard and Poole 1989). These newly established trees may provide heron nest sites in the future but observations show that only self-established trees on island shores have been selected as nesting sites. No heron nests have been placed in shoreline trees planted on private land.

The number of active great blue heron nests along the Reach has declined from 75 to 34 since 1994 (Table 1). The decline has occurred at 6 of the 11 colonies monitored between 1994 and 2001. The greatest number of nesting great blue herons occurred at Colony 7, however, total nests observed there each year also steadily declined throughout the 1990s. The cause(s) of the decline at colony 7 are not known, but they are not likely related to a decline in fledging success (Marco 1997). Interspecific competition for suitable nesting sites was also not likely related to great blue heron nest declines at colony 7 because no other piscivorous avian species such as the black-crowned night heron (*Nycticorax nycticorax*), double-crested cormorant (*Phalacrocorax auritus*), or great egret (*Casmerodius albus*), have nested there. Vehicle, pedestrian, and boat traffic occur regularly during the nesting season near colony 7. Great blue heron nests at colony 10 declined from 16 pairs in 1994 to 6 in 1995 and 1996, and 7 in 1999. This decline coincided with the loss of a few trees at this colony caused by a wild fire during the summer of 1994. Heron nests at the island colony 11 were located in a tall, steel transmission line tower (Table 1). In 1994 there were 16 active nests in the tower and 12 in 1995 (Table 1). In 1996 a red-tailed hawk (*Buteo jamaicensis*) nested in the tower and there were no active heron nests in 1998, 1999, and 2001. Colony 6 was used until 1998 when a pair of bald eagles (*Haliaeetus leucocephalus*) began nesting there. Since then, there have been no active heron nests at this site. A nest tree at heron colony 8 that historically contained more than 20 nests toppled after 1990. To date no herons have nested in the surviving trees there. The number of great blue herons nesting at colonies 2 and 9 appear to have increased between 1994 and 2001. Public access to these colony sites is limited to boat traffic only.

Table 1. Number of active great blue heron nests at colonies along the Hanford Reach of the Columbia River 1994, 1995, 1998, 1999, and 2001

Colony	1994	1995	1998	1999	2001
1		3			
2				1	5
3	5				1
4	2	5			1
5		5	2	1	1
6	9	6	8		
7	31	30	25	23	21
8					
9	3	2	2		5
10	16	6	6	7	
11	16	12			
Total	75	69	45	37	34

Discussion

The general decline in great blue heron nests found along the Hanford Reach of the Columbia River is not likely from reduced fledging success at the colonies there. The general decline in large trees found along the Columbia river where public access is restricted during the breeding period may be the most limiting physical characteristics for great blue heron nesting habitat there. The two colonies that have been established on telephone-line towers support the premise that natural colony trees were limiting resources. The observations also suggest these man-made structures can supplement nesting habitat for great blue herons, but competition for nesting sites with raptors may be an issue. Low sub-adult or adult survival and immigration rates may also be limiting factors for nesting great blue herons along the Hanford Reach of the Columbia River. During the mid-1990s many tags from juveniles and adults were returned to PNNL researchers by staff of the Wildlife Services Division of the United States Department of Agriculture. Legal shooting of the sub-adult and adult great blue herons at the nearby Ringold hatchery supports the premise that this source of mortality may have contributed to the observed population decline of great blue herons along the Hanford Reach of the Columbia River.

Acknowledgements

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