# Inventory and Monitoring of Bald Eagles and Other Stick-nesting Birds on Yukon Flats NWR

## 2017 Progress Report

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### Background:

Bald eagles steeply declined by the mid-20th century due to egg shell thinning from DDT, widespread habitat loss, and harvest (legal and illegal). Alaska maintained the highest densities relative to the lower 48 states due to its expanse and remoteness, however populations were significantly depressed due to impacts from their wintering grounds, and an Alaska bounty (128,000 bounties paid) to reduce their competition with the fishing and fur-farming industry (Buehler 2000). In 1967 bald eagles were declared an endangered species in most of the lower 48 states, and following strict laws and regulations on harvest and the ban on DDT, the population rebounded. Bald eagles' status was changed from Endangered to Threatened in 1995, and they were delisted in 2007. The Bald and Golden Eagle Protection Act (BEPA, 1940) currently prohibits killing, selling or otherwise harming eagles, their nests (active and inactive), roosting and foraging sites, and requires permits for take, which includes disturbance.

Bald eagles are top predators sensitive to environmental change and contaminants. They are opportunistic feeders that subsist primarily on fish and waterbirds. In interior Alaska they likely rely on waterfowl in spring and early summer, switching to salmon in late summer and fall (Ritchie and Ambrose 2008). In interior Alaska they nest in mature stands of white spruce and cottonwood trees that are located along shorelines of rivers and large lakes likely to have fish and waterfowl. Bald eagle nesting habitat may become threatened with climate change if 1) fires and insect infestations become more extensive and frequent, affecting mature spruce and cottonwood stands, or 2) wetlands and/or rivers drain, dry or change character, affecting prey habitat.

Data on bald eagles in Yukon Flats is very limited. Ritchie and Ambrose (2008) suggest that bald eagles are uncommon and dispersed in the Upper and Lower Yukon, estimating a total number of 125 – 175 pairs. However, 56 active bald eagles nests (81 total) were identified in 2012 within Koyukuk, Nowitna, and Upper Innoko Refuges combined (roughly < 20% of the upper and lower Yukon; Bryant and Scotton 2013), emphasizing the need for better data in these areas. Previous surveys have been conducted on the Black River and Birch Creek, with higher densities found on the former (35 active and inactive nests on the Black River in 1994 and 1995, 27 of which were on a 65-mile stretch, Ritchie et al 1996). Additionally, incidental observations of congregations of bald eagles feeding on the Chandalar River during fall chum spawning have been reported.

Inventorying and monitoring bald eagle nests and foraging sites will provide information on their local densities, trends, and habitat use, and will provide a database needed for responsible management. Federal law (Federal Register: 50 Part 22) requires permits to disturb bald eagles. As management activities arise, such as requests for right-of-ways, special use permits, mining activities, land exchanges, etc., we are required to protect nests (active and inactive) and foraging sites. This project is an effort to acquire data to properly support such actions.

**Objectives:**

1. Identify nest sites and determine occupancy of bald eagles and other stick nesting raptors along major river corridors in Yukon Flats. Monitor trends in site use.
2. Determine nest productivity of bald eagles and other stick nesting raptors in Yukon Flats. Monitor trends in productivity.
3. Determine factors influencing nest site selection (e.g. presence of mature cottonwood and spruce stands, proximity to clear water, proximity to salmon, whitefish, waterfowl), and predict suitable nest site habitat in Yukon Flats.
4. Examine environmental factors affecting nest success, such as nest collapse and weather events.
5. Identify and monitor the use of potential fall foraging sites, such as the Chandalar River.

**Methods and Results:**

The bald eagle and stick-nesting bird survey is in the inventory stage under Objectives 1 and 5 above. Low-level surveys (100 – 150 ft AGL) to identify stick nests were flown in a tandem aircraft along the Black, Porcupine, Chandalar, Hodzana and Yukon Rivers, and Beaver and Birch Creeks between 2014 and 2017 (Figures 1 and 2). Nest site surveys were flown between 9 and 27 May to find nests and determine occupancy, and occupied nests were revisited on the Black River to determine presence and number of chicks in July (productivity survey) (Table 1). Occupancy surveys on the Black River included all river channels from the confluence of Kevinjik Creek to the mouth of the Black River (336 flight miles searched). The Porcupine River was surveyed from the Yukon Flats eastern border to the mouth of the Sheenjek River (266 flight miles searched), and the lower Chandalar River was surveyed from the confluence of the East Fork of the Chandalar to the mouth of the main stem (234 flight miles searched) in 2014. Beaver Creek was surveyed from the lower section in Mud Flats (147° 00’00”, 66° 12’50”) to the mouth of Victoria Creek (189 flight miles searched), and Birch Creek was surveyed from where the Steese Highway crosses Birch Creek to approximately 5 miles upstream from the confluence with Preacher Creek (144° 45’18”, 66° 06’10”) in 2015. The Hodzana River was surveyed from Caribou Bar (149° 15’, 66° 39’15”) to its mouth on the Yukon River in 2016, and the Yukon River was surveyed from Chetlechak Island, where the Yukon River leaves the flats, to the lower mouth of Birch Creek in 2017. Additionally, stick nests were observed during other project flights, and the lower Chandalar River (same section as above) was flown on 25 and 26

September 2014 during the Fall Chum salmon spawning survey, and observations of bald eagles foraging on chum carcasses were documented.

All stick nest sites were marked precisely, at low-level, with a GPS waypoint, and were assigned a unique identifier. Bird species, number and location of birds (incubating, in nest and not incubating, perched in nearby tree, etc.), number of eggs (occupancy survey) or chicks (productivity survey) observed, nest tree species, and distance to water were recorded. A narrative description of the nest site was recorded to insure ease of location in subsequent surveys. All data were entered into a GIS database of raptor nests.

Nine to 18 active nests were observed on the Black River between 2014 and 2016 (Table 2, Figure 1). The Yukon River had the second highest density of active stick nests (15), while other surveyed drainages had few nests (Table 3, Figure 2).

Eleven bald eagles were observed perched and foraging on the Chandalar River during the Fall 2014 Chum Salmon survey (Figure 3).

**Future efforts:**

The inventory phase will continue, with a new area being covered each year. The Yukon River inventory will be completed from the lower mouth of Birch Creek to Circle in 2018.

Following the inventory, a monitoring plan will be established depending on the distribution and density of nests identified during the inventory phase. Monitoring efforts will document annual trends in stick nest occupancy and productivity; frequency of use of stick nests, stick nest longevity, and stick nest rebuild frequency; and interspecies interactions of stick nesting birds at individual nest sights.

A GIS database of active and inactive stick nests and foraging sites will be maintained for use by management.

**References Cited:**

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Table 1. Survey dates by river.

| River | Date Surveyed |
|---|---|
| Black River | 5/12/2014, 7/10/2014, 5/12 – 5/14/2015, 5/27/2016, 5/17/2017 (incomplete) |
| Chandalar River | 5/15/2014 |
| Porcupine River | 5/14/2014 |
| Birch Creek | 5/14/2015 |
| Beaver Creek | 5/14/2015 |
| Hodzana River | 5/13/2016 |
| Yukon River | 5/9 – 5/10/2017 |

Table 2. Number of active nests on the Black River by species and year. Empty nests were not active.

| | **2014** | **2015** | **2016** | **2017*** | **Total # of nests used** |
|---|---|---|---|---|---|
| Bald eagle | 5 | 10 | 8 | 5 | 23 |
| Raven | 1 | | 3 | | 4 |
| Empty | 18 | 23 | 19 | 3 | 36 |
| Great horned owl | | 1 | | | 1 |
| Northern goshawk | 2 | | | | 2 |
| Osprey | 1 | 5 | 6 | | 8 |
| Owl | | | 1 | | 1 |
| Red-tailed hawk | | | | 1 | 1 |
| **Total** | **27** | **39** | **37** | **9** | **58** |

*The 2017 survey of the Black River was not completed due to aircraft problems. The 2017 survey included the Black River and Salmon Fork of the Black River, all upstream from Chalkytsik Village.

Table 3. Number of active nests on Beaver and Birch Creeks (2015), and the Chandalar (2014), Hodzana (2016), Porcupine (2014) and Yukon Rivers (2017) during mid-May occupancy surveys. Empty nests were not active.

| **Species** | **Beaver** | **Birch** | **Chandalar** | **Hodzana** | **Porcupine** | **Yukon** |
|---|---|---|---|---|---|---|
| Bald eagle | 3 | 2 | 1 | 4 | 2 | 12 |
| Raven | | | | | | 2 |
| Empty | 5 | 3 | 3 | 4 | 1 | 11 |
| Northern goshawk | | | | 1 | | |
| Osprey | | | | | 1 | |
| Red-tailed hawk | | | | 1 | | 1 |
| **Total** | **8** | **5** | **4** | **10** | **4** | **26** |

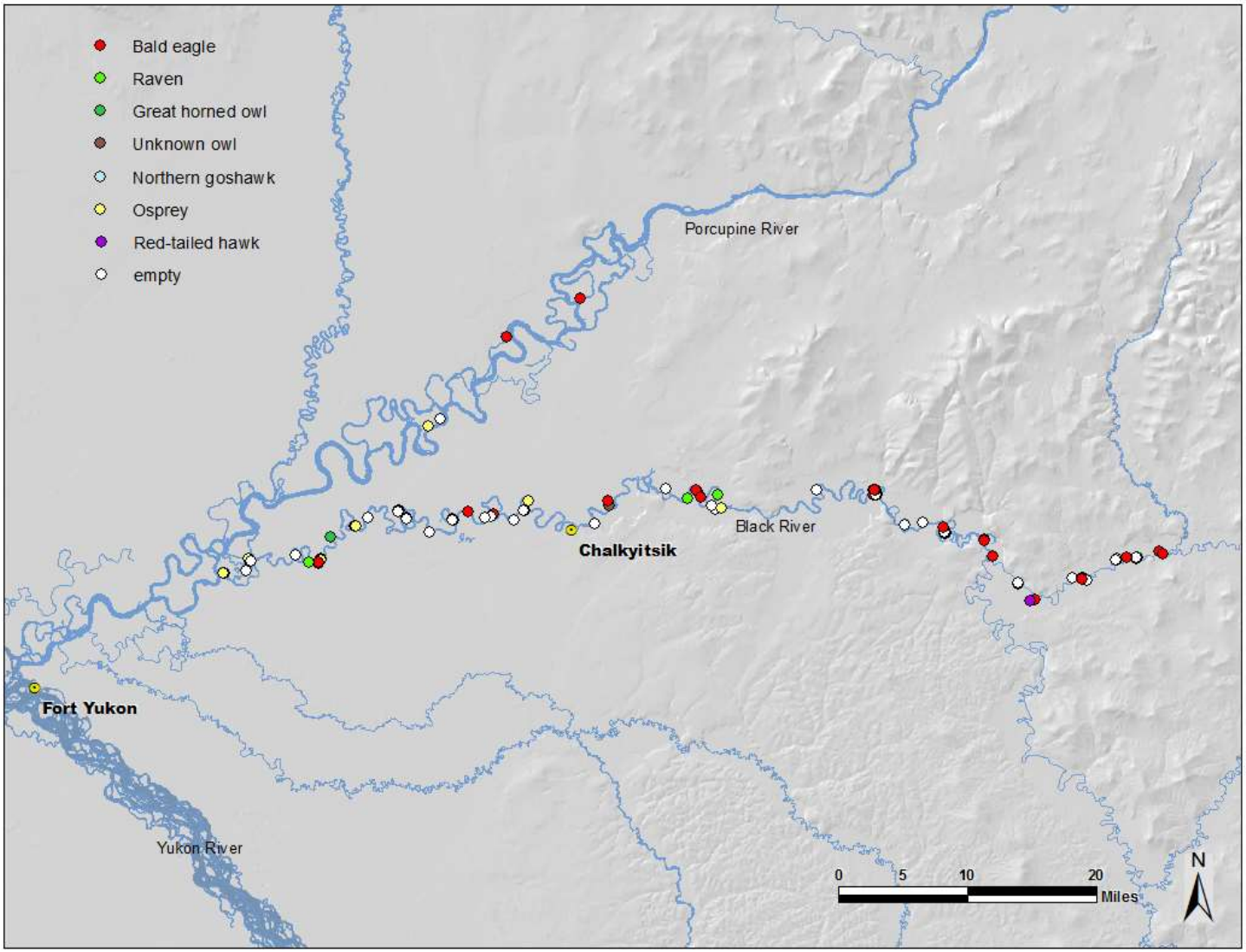


Figure 1. Stick nest locations along the Porcupine (2014) and Black Rivers (2014 – 2017).

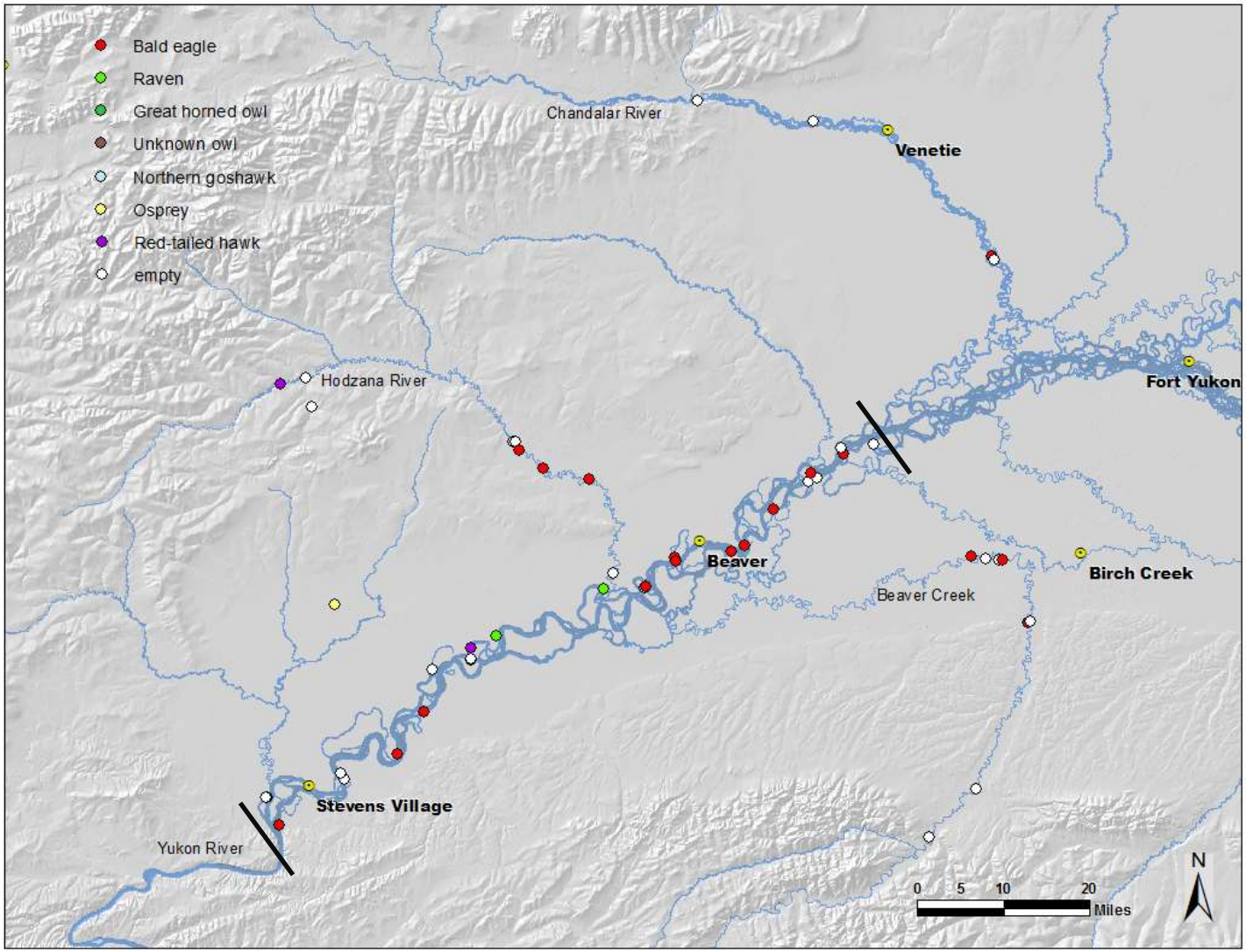


Figure 2. Stick nest locations from the Beaver Creek (2014), Chandalar (2014), Hodzana (2016), and Yukon (2017) river surveys. Black lines depict the survey area boundaries along the Yukon River.

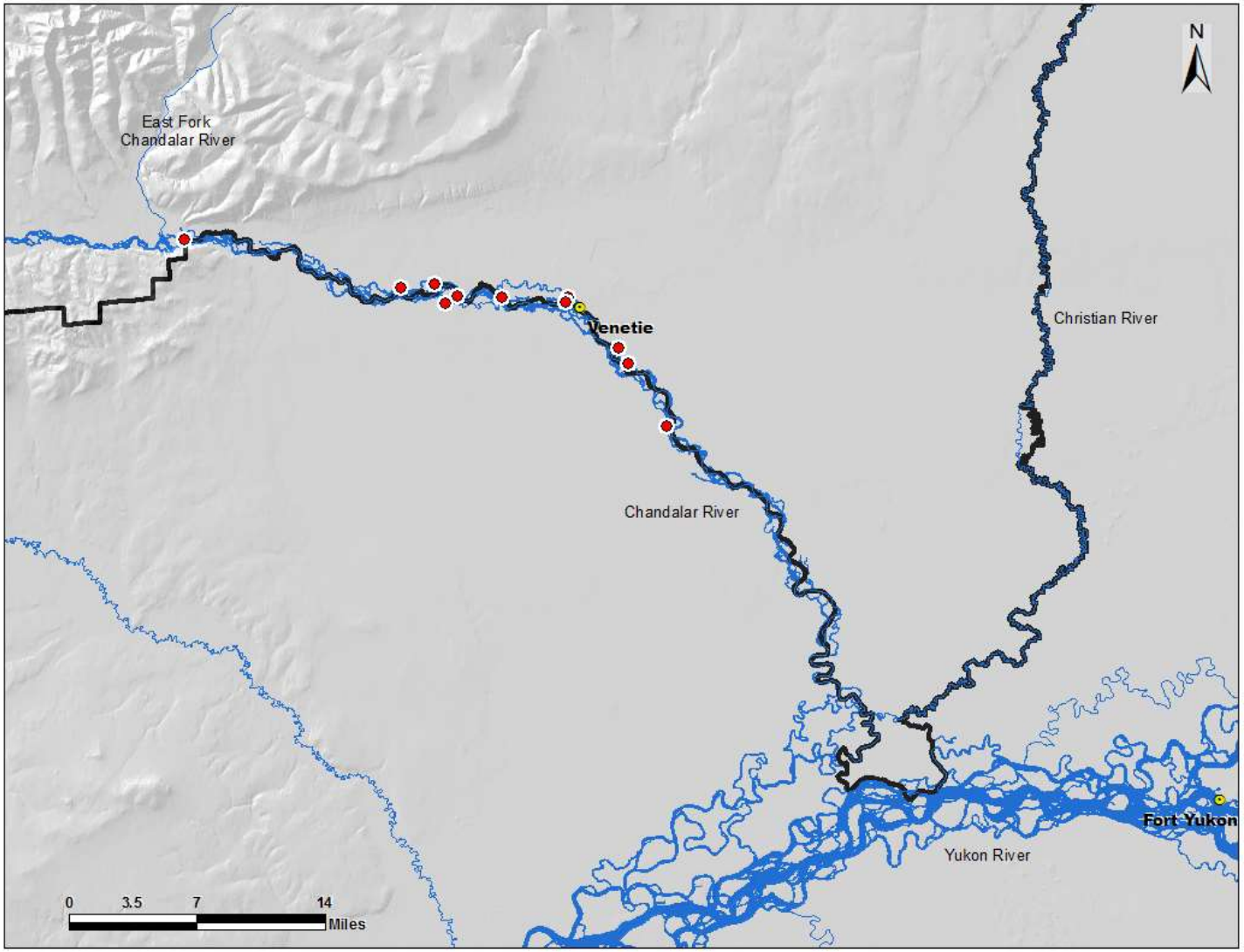


Figure 3. Bald eagle locations recorded during a September 2014 Chum Salmon survey. All observations were during peak spawning, and were of adult eagles perched or feeding.