

ENVIRONMENTAL BASELINE STUDIES

PRELIMINARY SUMMARY STUDIES PERFORMED BY ABR, INC. WATERBIRD SURVEYS

1. MINE STUDY AREA

The Alaska Peninsula and the Iliamna Lake region are known to be used during migration by many bird species moving to and from breeding areas in western and northern Alaska and eastern Asia. Waterbird species of conservation concern in the area include Tundra Swans and, possibly, Trumpeter Swans, Common Loons, Black Scoters, Long-tailed Ducks, and Harlequin Ducks.

The goal of the waterbird surveys is to provide an adequate baseline data set that describes the existing breeding and migrant waterbird populations in the area. These goals have been achieved by conducting the following activities:

- Conducting aerial surveys of all waterbodies to determine the distribution and abundance of waterbirds during spring and fall migration, nesting, and brood-rearing.
- Describing waterbird species composition and the selected use of lakes, rivers, and wetland areas in the mine study area.
- Reviewing the published literature and unpublished agency files to collect historical information on waterbird use of the region.

A combination of fixed-wing-aircraft, helicopter, and ground-based surveys have been used to determine the composition of breeding waterbirds in the area and to identify areas of high use during nesting, brood-rearing, molting, and migration/staging in the mine study area. Several field surveys for waterbirds were conducted in 2004 and 2005 (Figure ABR-5). During each survey, researchers mapped the distribution and abundance of waterbirds observed on lakes, rivers, and wetlands in the mine study area.

1.1 MIGRATION AND MOLTING SURVEYS

Low-level, aerial surveys were flown for flocks of migrant (staging) waterbirds during spring and fall migration in 2004 and 2005. In 2004, four migration surveys were conducted in the spring between April 21 and May 23, and five surveys were conducted in the fall between September 2 and October 21. In 2005, five migration surveys were conducted in the spring between April 21 and May 23, and seven surveys were conducted in the fall between August 17 and October 12. In both years, surveys occurred every 7 to 10 days. The first migration survey in 2004 was conducted with two observers and a pilot in a Cessna 206. All subsequent surveys, except for one, were conducted with one observer and a pilot in a Piper SuperCub. One survey in 2005 was conducted in a Robinson R44 helicopter. Lakes or groups of lakes and sections of rivers were delineated and assigned identification numbers prior to surveying. Lakes were grouped and rivers were divided into sections based on geographic features and proposed development plans. During the survey, lakes were circled or bisected and rivers were flown parallel to their course to view waterfowl on the water and along the shore. The observers recorded all data on a tape recorder. Data from tapes were transcribed onto data sheets and entered in a computer database for analysis.

Fixed-wing aerial surveys were flown for flightless waterbirds during the summer molting period in 2005. Two surveys were conducted, one on July 26 and the other on August 11. The molting surveys were flown in a SuperCub with one observer and a pilot and covered the same lake groups in the mine study area as the migration surveys. The observer recorded all data on a tape recorder, and the voice data were transcribed and entered in a computer database for analysis.

1.2 WATERFOWL BREEDING POPULATION SURVEYS

Waterfowl breeding-pair surveys were conducted on June 2, 2004, and May 27, 2005, with two observers and a pilot in a Cessna 206. The observers, sitting on either side of the aircraft, each surveyed a 0.2-kilometer band extending out from the aircraft along 21 preselected transects. Transects were aligned to cover the largest possible number of waterbodies and wetlands in the mine study area. Each observer recorded data on a hand-held tape recorder, and data were transcribed upon completion of the survey. The survey and data analysis protocols followed the current U.S. Fish and Wildlife Service standards. The data are used to calculate an estimated density of nesting waterfowl pairs for each species observed in the survey area.

1.3 SWAN NESTING SURVEYS

On June 3, 2004, and May 28, 2005, an aerial survey for swan nests was conducted. Although swan nests were recorded on all avian surveys, the migration and breeding-pair surveys (see above) focused primarily on water surfaces and shorelines and did not provide adequate coverage between lakes and ponds where swans can nest. The swan survey was designed to cover both wetlands and the upland terrain surrounding wetlands. The survey was flown with two observers, one on each side of the aircraft, and a pilot in a Cessna 206. Researchers surveyed transects in such a way as to provide 100 percent coverage for the wetlands surveyed. In 2004, transects were designed during flight, while in 2005, transects were designed before the surveys and loaded as a route into the pilot's GPS receiver. Researchers deviated from transects to circle swans when additional observation was needed. Nest locations were recorded on 1:63,360 topographic maps or recorded with a hand-held GPS receiver.

1.4 HARLEQUIN DUCK NESTING AND BROOD-REARING SURVEYS

One low-level aerial survey of stream courses for pre-nesting Harlequin Ducks was flown in May 2004 and two surveys were flown in May 2005. Surveys for nesting Harlequin Ducks must be conducted during the pre-nesting period when the more brightly plumaged males are present. Two aerial surveys for brood-rearing Harlequin Ducks were conducted in each year. In 2004, brood-rearing surveys were conducted in mid-July and early August. In 2005, one brood-rearing survey was flown in late July and the other in mid-August. Upper and Lower Talarik creeks, the West Kaskanak drainage, and the north and south forks of the Kuktuli River were surveyed each year during the Harlequin Duck pre-nesting season. Additionally, in 2005, the East Kaskanak drainage and a northeastern headwater drainage of Upper Talarik Creek were surveyed. During brood-rearing surveys in 2004, only the north and south forks of the Kuktuli River and a section of Upper Talarik Creek were surveyed. The brood-rearing surveys in 2005 covered the same drainages as the 2005 pre-nesting surveys, except for the addition of a creek between Upper and Lower Talarik creeks. All surveys were flown with two observers seated on the same side of a helicopter, except for the August 2 survey in 2004, which was flown with only one observer. Surveys were generally flown upriver. The helicopter was positioned over the bank of the river to give the observers a clear view of the entire width of the watercourse. GPS locations were recorded for all observations.

1.5 WATERBIRD BROOD-REARING SURVEYS

Ground-based surveys for brood-rearing waterbirds were conducted July 9 through 13, 2004, and July 8 through 14, 2005. The survey area for brood-rearing waterbirds included wetlands, ponds, and lakes in selected locations in the mine study area. Selection criteria for survey sites included the proximity of the waterbody to the ore body and/or projected impact scenarios, the relative abundance of birds recorded in the area during the breeding-pair survey, and logistics considerations. A few lakes were surveyed by helicopter because logistical constraints prevented accessing those lakes on foot. Two or three observers traversed wetlands and circumnavigated ponds and lakes on foot to search for waterbird broods. GPS locations were recorded at each waterbody during the survey for site verification. Brood ages for waterfowl (primarily ducks) were classified into one of seven age classes. Researchers carried reference diagrams of brood age classes and chick plumage patterns to confirm age classification and species identification.

1.6 GULL NESTING SURVEY

Because of the possibility of an increase in gull populations following development, a survey for nesting gulls in the mine study area was conducted on June 2, 2005. One observer in a helicopter flew throughout the mine study area in a back-and-forth pattern over lakes, ponds, and wetlands. All gull observations, including nests, were recorded on 1:63,360 topographic maps.

2. TRANSPORTATION CORRIDOR

The objectives and methods for the waterbird surveys in the transportation corridor are identical to those described for the mine study area (above). The study area for the waterbird surveys in the transportation corridor is a corridor of at least 1.6 kilometers on either side of the centerline of the proposed linear features (access road, powerline, etc.). To this corridor were added expansions to encompass some of the

larger river drainages (for Harlequin Ducks), an expansion to the south to encompass river outlet areas on Iliamna Lake, an expansion to a portion of the southern shore of Iliamna Lake, and an expansion into the marine environments near the proposed port site and near the submarine powerline landfall area to survey for migrant and molting waterbirds. For presentation in the environmental baseline document, waterbird survey data for the transportation corridor will be reported separately for those areas that ultimately drain into Bristol Bay (Figure ABR-13) and those that drain into Cook Inlet (Figure ABR-14).

The field effort for waterbird surveys in the transportation corridor comprised the following activities:

- Aerial surveys in spring (April through May) and fall (August through October) to identify areas of high use by migrating and flightless molting waterfowl.
- A waterfowl breeding-pair survey in early June to determine distribution, abundance, and breeding status of waterfowl.
- A survey for nesting swans in early June.
- Aerial surveys for pre-nesting (late May) and brood-rearing (July/August) Harlequin Ducks to determine their abundance and distribution along drainages crossing the proposed road alignment and near the proposed port site.