Protection of shorebirds and their habitats on Alaska's North Slope

Michelle Gilders

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BP Exploration (Alaska) Inc., PO Box 196612, 900 E. Benson Blvd, Anchorage, Alaska 99519-6612, USA.

To minimize environmental effects on tundra wildlife and habitat, oil exploration activities on the North Slope of Alaska are conducted during the winter, using ice pads and ice roads. However, the construction of gravel roads and pads needed to support the infrastructure of the oilfields results in unavoidable alterations to local habitats. These include the impoundment of water along roads and possible disturbance effects from humans, vehicles and noise. Gravel 'habitats' created in the five currently producing fields (Prudhoe Bay, Kuparuk, Milne Point, Endicott and Lisburne) now cover 2,660 ha, or 0.0001% of approximately 23 million hectares in the North Slope region classified as wetlands. By examining the changes associated with site development, it is possible to evaluate their effects on individual species.

In intensive studies of shorebirds in the Prudhoe Bay oilfield in 1986, D. Troy (unpubl. data) reported the same species that would be expected to occur in undeveloped regions: Semipalmated Sandpiper *Calidris pusilla*, Pectoral Sandpiper *C. melanotos*, Dunlin *C. alpina*, Stilt Sandpiper *C. himantopus*, Long-billed Dowitcher *Limnodromus scolopaceus*, Red-necked Phalarope *Phalaropus lobatus* and Red Phalarope *P. fulicaria*. He found no changes owing to fragmentation of habitat, although the use of areas near roads was somewhat affected by altered habitat. In narrow corridors along the roads, the density of some species was reduced, but this had no detectable population effect.

D. Troy and T.A. Carpenter (unpubl. data) mapped nest sites at the new production pad location in 1988, before the production pad was built. The principal species of interest were Semipalmated and Pectoral sandpipers, Dunlin and Buff-breasted Sandpiper *Tryngites subruficollis*. Nest success of birds displaced was similar to that of undisturbed individuals. Baird's Sandpiper *C. bairdii*, absent before construction, nested in altered habitats in 1989. On a population basis, effects from gravel displacement and pipeline construction were limited and probably transitory.

D. Troy also examined bird use of abandoned peat roads, which were built in the 1960s and are susceptible to thermal subsidence (now all roads rest on gravel, to insulate the permafrost layer). He found that shorebird densities were often higher and more stable than in undisturbed areas and that some species appeared to prefer disturbed sites. The increased diversity of terrain, resulting from the peat roads and subsequent thermokarst, was attractive to birds, as it provided a variety of habitats for foraging and nesting that are unavailable or relatively rare in undisturbed areas.

Another study found that more shorebird species (and individuals) used abandoned gravel pads for feeding and resting than used undisturbed tundra or river-bar sites; these pads also created nesting habitat for Baird's Sandpipers. Impoundment areas with the emergent grass *Arctophile fulva* were particularly attractive to Red Phalaropes. These impoundments appear to be highly productive, particularly with respect to chironomids, and thus may represent significant habitat for shorebirds.

These studies demonstrated that the presence of oilfield structures and activities changes the local boundaries of available habitats but has no discernible effect on the regional population levels of shorebirds. Shorebirds use habitats within operational oilfields, and their numbers fluctuate within the bounds of natural variability.