

Marine Birds

Bird species of concern

Thirty-three marine bird species or subspecies occurring in the Queen Charlotte Basin have been listed as species of conservation concern by the BC Conservation Data Centre (BCCDC), Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or the International Union for Conservation of Nature and Natural Resources (IUCN).¹ These include 21 seabird species, 4 waterfowl species and 2 subspecies; 2 shorebird species and 2 subspecies; and 2 raptor species (McFarlane Tranquilla et al. 2007). With several marine bird species currently on the COSEWIC Candidate List, the number of species of urgent conservation concern is anticipated to grow. Species of heightened conservation concern include but are not limited to: Marbled Murrelet, Ancient Murrelet, Cassin's Auklet, Common Murre, Black-footed Albatross, Pink-footed Shearwater, Sooty Shearwater, Short-tailed Albatross, Buller's Shearwater, Peale's Peregrine Falcon, Yellow-billed Loon

What risk does the Northern Gateway project present to marine bird?

In answering this question, it is important to note that a large scientific body of literature is available for the impacts of oil and associated activities on marine birds. A thorough review of the consequences of oil to marine birds in the project area should be considered critical to better understanding the risk the project poses to marine birds.

Briefly, oil in the marine environment can be devastating to marine birds. As birds are among the most conspicuous and abundant members of marine communities, they are similarly among the most conspicuous and abundant victims of oil spills in the marine environment. Oil in the marine environment is a serious threat to seabirds (Burger and Fry 1993²) and other marine birds (Peterson

¹ McFarlane Tranquilla, L., Truman, K., Johannessen, D., and Hooper, T. 2007. Appendix K: Marine Birds. *In* Ecosystem overview: Pacific North Coast Integrated Management Area (PNCIMA). Lucas, BG, Verrin, S, Brown, R. (Eds.). Canadian Technical Report for Fisheries and Aquatic Sciences. 2667.

² Burger, AE, Fry, DM. 1993. Effects of oil pollution on seabirds in the northeast Pacific. *In* Vermeer, K, Briggs, KT, Morgan, KH, Siegel-Causey, D (Eds.). 1993. The status, ecology and conservation of marine birds of the North Pacific. Canadian Wildlife Service Special Publication.

et al. 2003³). In addition to short-term consequences, which are known to include marine bird mortalities, marine oil pollution may also have persistent, long-term effects (Esler *et al.* 2002⁴, Peterson *et al.* 2003).

Oil affects birds in a number of ways, including plumage oiling, ingestion, egg oiling and changes to their ecosystems (reviewed in Albers 1991⁵, Leighton 1991⁶, Burger and Fry 1993⁷). The primary cause of mortality and stress in oiled birds is fouled plumage (Albers 1991, Leighton 1991). Oiled feathers lose their insulative and waterproofing properties, with a concurrent loss of buoyancy, and often results in hypothermia and increased metabolic rates (Albers 1991, Leighton 1991). Ingestion of even small amounts (e.g. oil droplets) may cause a number of physiological changes and death (Albers 1991, Leighton 1991). Long-term effects are harder to monitor, but may include altered breeding success and survival rates, with potential negative implications for populations (Esler *et al.* 2002⁸). Oil pollution also influences ecosystems, which, in turn, can indirectly affect high trophic level marine birds (Peterson *et al.* 2003).

Scale is also important and was not touched upon in Enbridge's assessment. Millions of marine birds have died from catastrophic oil spills in recent decades. Large spills, including the recent BP spill in the Gulf of Mexico, often result in tremendous bird mortalities. For example, in the aftermath of EVOS, an estimated 100,000 to 690,000 birds were killed (Piatt and Ford 1996⁹) and

³ Peterson, CH, Rice, SD, Short, JW, Esler, D, Bodkin, JL, Ballachey, BE, Irons, DB. 2003. Long-term ecosystem response to the Exxon Valdez oil spill. *Science*. 302: 2082-2086. (<http://www.sciencemag.org/content/302/5653/2082.abstract>).

⁴ Esler, D, Bowman, TD, Trust, KA, Ballachey, BE, Dean, TA, Jewett, SC, O'Clair, CE. 2002. Harlequin duck population recovery following the 'Exxon Valdez' oil spill: progress, process and constraints. *Marine Ecology Progress Series*. 241:271-286. (<http://www.int-res.com/articles/theme/m241p271.pdf>).

⁵ Albers, PH. 1991. Oil spill and the environment: a review of chemical fate and biological effects of petroleum. *In* White, J, Frink F. (Eds). *The effects of oil on wildlife: research, rehabilitation, and general concerns*, pp. 1-12. Sheridan Press, Pennsylvania. 210 pp.

⁶ Leighton, FA. 1991. The Toxicity of Petroleum Oils to Birds: An Overview. *In* White, J., Frink F. (Eds). *The effects of oil on wildlife: research, rehabilitation, and general concerns*, pp. 1-12. Sheridan Press, Pennsylvania. 210 pp.

⁷ Burger, AE, Fry, DM. 1993. Effects of oil pollution on seabirds in the northeast Pacific. *In* Vermeer, K, Briggs, KT, Morgan, KH, Siegel-Causey, D (Eds.). 1993. *The status, ecology and conservation of marine birds of the North Pacific*. Canadian Wildlife Service Special Publication.

⁸ Esler, D, Bowman, TD, Trust, KA, Ballachey, BE, Dean, TA, Jewett, SC, O'Clair, CE. 2002. Harlequin duck population recovery following the 'Exxon Valdez' oil spill: progress, process and constraints. *Marine Ecology Progress Series*. 241:271-286. (<http://www.int-res.com/articles/theme/m241p271.pdf>).

⁹ Piatt, JF, Ford, RG. 1996. How many seabirds were killed by the Exxon Valdez oil spill? *In* Rice, SD, Spies, RB, Wolfe, DA, and Wright, BA. (Eds). 1996. *Proceedings of the Exxon Valdez oil spill symposium*. American Fisheries Society Symposium 18. Bethesda, MD: American Fisheries Society. pp. 712-719. (http://alaska.usgs.gov/science/biology/seabirds_foragefish/products/publications/How_many_Sb_killed_by_Spill.pdf).

long-term consequences have been detected (e.g. Golet *et al.* 2003¹⁰). Although large spills can cause large mortalities, there is evidence that cumulative mortalities associated with small, chronic and often unreported spills may be higher (Camphuysen 1989¹¹) and that the effects of chronic oil pollution on bird survival and reproductive success may be equal to or perhaps even more detrimental to long-term population stability than large spills, which occur at a much lower frequency (Burger and Fry 1993¹²).

In addition to issues of scale, marine bird species are not equally affected by oil. For example, birds that cannot readily escape (e.g. flightless young) and birds that form large flocks or otherwise aggregate (e.g. important foraging grounds in proximity to a colony) are thought to be more susceptible to oil spills. Diving birds, including alcids, seabirds and loons, are also more vulnerable to oil than surface feeding birds (e.g. storm petrels and gulls).

Oil is not the only element of risk. Project impacts may also include disturbance from shipping activity. For example, Marbled Murrelets, which are listed as Threatened in Canada, are disturbed by small boats; from a management perspective this disturbance may result in an “apparent loss of habitat” via alienation (Bellefleur *et al.* 2009¹³). This issue was not addressed for Marbled Murrelets or any other marine bird species in Enbridge’s assessment.

¹⁰ Golet, GH, Seiser, PE, McGuire, AD, Roby, DD, Fischer, JB, Kuletz, KJ, Irons, DB, Dean, TA, Jewett, SC, Newman, SH. 2002. Long-term direct and indirect effects of the 'Exxon Valdez' oil spill on pigeon guillemots in Prince William Sound, Alaska. *Marine Ecology Progress series* 241:287-304. (<http://www.int-res.com/articles/theme/m241p287.pdf>).

¹¹ Camphuysen, CJ. 1989. Beached bird surveys in the Netherlands 1915-1988: seabird mortality in the southern North Sea since the early days of oil pollution. Technical Rapport Vogelbescherming 1, Werkgroep Noordzee, Amsterdam.

¹² Burger, AE, Fry, DM. 1993. Effects of oil pollution on seabirds in the northeast Pacific. *In* Vermeer, K, Briggs, KT, Morgan, KH, Siegel-Causey, D (Eds.). 1993. The status, ecology and conservation of marine birds of the North Pacific. Canadian Wildlife Service Special Publication.

¹³ Bellefleur, B, Lee, P, Ronconi, RA. 2009. The impact of recreational boat traffic on Marbled Murrelets (*Brachyramphus marmoratus*). *Journal of Environmental Management*. 90(1): 531-538. (<http://www.sciencedirect.com/science/article/pii/S0301479707004124>)