

## DARREN IRELAND

*Senior Wildlife Biologist, Vice President*  
*LGL Ecological Research Associates, Inc.*



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## EDUCATION

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| 2004 | Master of Science ( <i>Fish and Wildlife Management</i> ), Montana State University, Bozeman, MT |
| 2000 | Bachelor of Arts ( <i>Biology</i> ), Colby College, Waterville, ME                               |

## PROFESSIONAL EXPERIENCE

### Senior Wildlife Biologist, VP – LGL

**2005 – Present**

Project manager for permitting and monitoring projects related to Marine Mammal Protection Act (MMPA), National Environmental Protection Act (NEPA), and Endangered Species Act (ESA) compliance during offshore activities in Alaska, Gulf of Mexico, and Atlantic regions.

- Authored or co-authored more than 40 MMPA permit applications and supporting NEPA and ESA documents, including the calculation of marine mammal densities and the use of sound propagation and sound exposure modeling outputs for estimating takes related to various activities such as 2D and 3D seismic surveys, high-resolution geophysical surveys, geotechnical investigations, exploration drilling programs, as well as pile driving related to offshore wind and port development projects.
- Developed and managed the implementation of multi-disciplinary monitoring plans to record and estimate potential impacts from industrial operations around permitted activities including the use of vessel-based observers, aerial surveys, unmanned aerial systems, static and towed passive acoustic recorders, and infrared camera systems.
- Worked closely with client management and planning teams to develop operational plans and monitoring programs to reduce and document potential impacts to marine mammals, subsistence users and other stakeholders.
- Traveled to remote Alaska villages to support clients during public and stakeholder meetings.
- Directed Protected Species Observer (PSO) field operations including vessel and aerial survey programs involving over 60 observers simultaneously deployed across 20 vessels and aircraft as well as acoustic monitoring activities.
- Supervised and conducted daily reporting from monitoring programs to clients and regulatory agencies to meet multiple levels of reporting requirements with different notification timelines.
- Directed and conducted end-of-season data analysis and report writing to meet client's MMPA authorization requirements (90-day, annual, and comprehensive reports).
- Presented significant results at numerous scientific conferences.
- Major clients have included Shell, Chevron, Equinor (Statoil), ConocoPhillips, Eni, ION/GX Technology, Vineyard Wind, Ørsted, Mayflower Wind, U.S. Geological Survey, National Science Foundation/Lamont-Doherty Earth Observatory, and the Bureau of Ocean Energy Management.

Team lead for various technology development efforts associated with projects including the evaluation of fixed-wing unmanned aircraft for marine mammal surveys, automated software for the detection of marine mammals in aerial digital imagery, evaluation of infrared camera systems for the detection of marine mammals, and the development of observer data entry software to streamline collection, QA/QC and reporting procedures.

**Graduate Research Assistant****2002 – 2004**

Developed methods for estimating the mass of adult female and pup Weddell seals in Antarctica from digital photographs. Tagged adult and pup Weddell seals as part of an ongoing population study. Assisted in the collection of blood and blubber samples and the application of time-depth recorders. Wrote annual progress reports and coordinated efforts in the field with other research teams studying Weddell seals.

*\* Department of Ecology, Montana State University, Bozeman, Montana*

**Graduate Teaching Assistant****Fall 2004**

Taught three laboratory sections of Introductory Biology to undergraduate students. Prepared brief lectures and introductory materials for weekly lab assignments and assisted students with the development of critical thinking skills integral to the scientific method, as well as experimental design, data collection and analysis, presentation, and report writing skills.

*\* Department of Ecology, Montana State University, Bozeman, Montana*

**Biological Science Technician****1999 – 2002**

Assisted with and supervised data collection including hair samples for DNA analysis using barbed wire hair snares, identification and measurement of bear tracks, aerial and ground radio telemetry of radio-collared animals, scat collection, and annual surveys of food abundance.

Assisted and supervised the locating, trapping, and handling of grizzly and black bears in and around Yellowstone N.P. Conducted roadside crowd control and removed carcasses along roadsides. Analyzed data and created maps for the Fish and Wildlife Service during ESA consultations concerning effects of road building on grizzly bear habitat. Wrote a grant proposal and procured funding for a study of fire effects on grizzly bear vegetal foods. Designed, conducted, and wrote a biological assessment on the presence of Canada lynx along roads scheduled for re-construction.

*\* Bear Management Office, Yellowstone National Park, Wyoming*

**Field Technician****2000 – 2001**

Located mountain lions and wolves using radio telemetry from the ground as well as in small aircraft across the northern range of Yellowstone. Tracked mountain lions to study behavior and locate kills as well as interactions with wolves and elk. Investigated, performed necropsies, and collected samples from wolf and cougar kills which included elk, mule deer, and bighorn sheep. Conducted track surveys looking for other forest predators. Assisted with the capture and handling of kitten and adult mountain lions. Supervised and instructed co-workers on use of radio-telemetry equipment, winter backcountry survival and first aid.

*\* Hornocker Wildlife Institute/Wildlife Conservation Society, Gardiner, Montana*

**PUBLICATIONS**

- Rickard, M.E., K.S. Lomac-MacNair, **D.S. Ireland**, S.M. Leiter, M.D. Poster, A.M. Zoidis. 2022. Evidence of Large Whale Socio-Sexual Behavior in the New York Bight. *Aquatic Mammals*: 48(5) pg 401-417. DOI 10.1578/AM.48.5.2022.401.
- Lomac-MacNair, K.S., A.M. Zoidis, **D.S. Ireland**, M.E. Rickard, K.A. McKown. 2021. New York Bight; a foraging area for humpback, fin, and minke whales. *Aquatic Mammals*: 48(5) pg 142-158. DOI 10.1578/AM.48.2.2022.142.

- Zoidis, A.M., K.S. Lomac-MacNair, **D.S. Ireland**, K.A. McKown, M.E. Rickard, M.D. Schlesinger. 2021. Distribution and density of six large whale species in the New York Bight from monthly aerial surveys 2017 to 2020. *Continental Shelf Research*. 230. 18 pp. DOI 10.1016/j.csr.2021.104572.
- Matthews, M.-N. R., **D.S. Ireland**, D.G. Zeddies, R.H. Brune, C.D. Pyć. 2021. A modeling comparison of the potential effects on marine mammals from sounds produced by marine vibroseis and air gun seismic sources. *J. Mar. Sci. Eng.* 9:12 <https://dx.doi.org/10.3390/jmse9010012>.
- Ireland, D.S.**, W.R. Koski, T.A. Thomas, J. Beland, C.M. Reiser, D.W. Funk, and A.M. Macrander. 2009. Updated distribution and relative abundance of cetaceans in the eastern Chukchi Sea in 2006-8. Paper SC/61/BRG4 presented to the International Whaling Commission Scientific Committee, 2009. 14 pp.
- Koski, W.R., D.W. Funk, **D.S. Ireland**, C. Lyons, K. Christie, A.M. Macrander, S.B. Blackwell. 2009. An update on feeding by bowhead whales near an offshore seismic survey in the central Beaufort Sea. Paper SC/61/BRG3 presented to the International Whaling Commission Scientific Committee, 2009. 24 pp.
- Koski, W.R., T. Allen, **D. Ireland**, G. Buck, P. R. Smith, A. M. Macrander, M. A. Halick, C. Rushing, D. J. Sliwa, T. L. McDonald. 2009. Evaluation of an Unmanned Airborne System for Monitoring Marine Mammals. *Aquatic Mammals* 35(3): 347-357.
- Ireland, D.** W.R. Koski, T.A. Thomas, M. Jankowski, D.W. Funk, A.M. Macrander and C. Rea. 2008. Distribution and Relative abundance of cetaceans in the eastern Chukchi Sea in 2006 and 2007. Paper SC/60/BRG27 presented to the International Whaling Commission Scientific Committee, 2008. 11 pp.
- Koksi, W.R., D.W. Funk, **D.S. Ireland**, C. Lyons, A.M. Macrander, and I. Voparil. 2008. Feeding by bowhead whales near an offshore seismic survey in the Beaufort Sea. Paper SC/60/E14 presented to the International Whaling Commission Scientific Committee, 2008. 14 pp.
- Buck, G.B., **D. Ireland**, W.R. Koski, D.J. Sliwa, T. Allen, and C. Rushing. 2007. Strategies to improve UAS performance for marine mammal detection. Paper SC/59/E2 presented to the International Whaling Commission Scientific Committee, Anchorage, AK, May 2007. 15 pp.
- Ireland, D.**, R. A. Garrott, J. Rotella, J. Banfield. 2006. Development and application of a mass-estimation method for Weddell seals. *Marine Mammal Science*. 22(2): 361-378.
- Ireland, D.** 2004. Mass estimation of Weddell seals through photogrammetry. M.S. Thesis. Montana State University. Bozeman, MT.

## CONFERENCE PRESENTATIONS & POSTERS

- Zoidis, A.M., K. Lomac-MacNair, **D. Ireland**, M. Rickard. 2020. Large whale distribution and density in the New York Bight from monthly aerial surveys (2017-2020). (Poster) Society for Marine Mammalogy Biennial Conference. December 2021, Palm Beach, Florida.
- Zoidis, A.M., K. Lomac-MacNair, **D. Ireland**, M. Rickard. 2020. North Atlantic Right Whales in the New York Bight update: Comprehensive findings from monthly aerial surveys over three years. (Poster) North Atlantic Right Whale Consortium 2020 Annual Meeting. October 2020, Virtual.
- Ireland, D.**, M.-N.R. Matthews, D.G. Zeddies, R. Brune, C. Pyć. 2019. Comparison of potential acoustic impacts from marine vibrator technology and air guns. (Poster) Fifth International Conference on the Effects of Noise on Aquatic Life, June 2019. The Hague, Netherlands.
- Ireland, D.S.**, K. Leonard, G. Schaefer, G. Mercer, R. Jannarone, W.R. Koski, K. Broker. Automated detection of large whales and walrus in digital imagery from aerial surveys. (Presentation) Society for Marine Mammalogy Biennial Conference, Oct. 2017. Halifax, Nova Scotia, Canada.
- Leonard, K.E., **D.S. Ireland**, G. Schaefer, G. Mercer, R. Jannarone, C. Tombach Wright, K. Chellappan, M. Marcoux, L. Montsion, W.R. Koski. 2017. Automated detection of narwhal in aerial digital imagery: Application of existing software to novel targets. (Poster) Society for Marine Mammalogy Biennial Conference, Oct. 2017. Halifax, Nova Scotia, Canada.

- Patterson, H.M., L.N. Bisson, **D.S. Ireland**. 2017. Changes in ice seal and Pacific walrus sighting rates from vessel supporting petroleum exploration activities in the Alaskan Arctic. (Poster) Alaska Marine Science Symposium, Jan. 2017. Anchorage, Alaska.
- Leonard, K., **D.S. Ireland**, G. Schaefer, G. Mercer, R. Jannarone, C. Sparks, H. Patterson, W.R. Koski, A.M. Macrander, K. Broker. 2017. Automated detection of wildlife and aerial digital imagery: A case study of Arctic marine mammals. (Poster) Alaska Marine Science Symposium, Jan. 2017. Anchorage, Alaska.
- Bisson, L., H. Patterson, **D.S. Ireland**. 2017. Assessing changes in ice seal presence and estimating residency time near offshore drilling units in the Alaskan Beaufort and Chukchi seas. (Poster) Alaska Marine Science Symposium, Jan. 2017. Anchorage, Alaska.
- Ireland, D.S.**, K. Leonard, G. Schaefer, C. Sparks, R.J. Jannarone, W.R. Koski, D.W. Funk, A.M. Macrander, K. Broker. 2015. Automated detection of large cetaceans in aerial digital imagery. (Presentation) Society for Marine Mammalogy Biennial Conference, Dec. 2015. San Francisco, California.
- Reiser, C.M., J. Delarue, D.W. Funk, **D.S. Ireland**, D.M.S. Dickson. 2012. Recent visual and acoustic detections of fin and humpback whales in the Alaskan Chukchi Sea. (Poster) Alaska Marine Science Symposium, Jan. 2012. Anchorage, Alaska.
- Koski, W.R., J.R. Brandon, **D.S. Ireland**, D.W. Funk, C. Reiser, A.M. Macrander. 2012. Do bowhead whales avoid sound pressure levels of 120 dB re 1  $\mu$ Pa (rms) from seismic surveys during fall migration? (Poster) Alaska Marine Science Symposium, Jan. 2012. Anchorage, Alaska.
- Brandon, J.R., T. Thomas, S. Blackwell, W.R. Koski, **D.S. Ireland**, C. Reiser, M. Bourdon, D.W. Funk, A.M. Macrander. 2012. Ice, seismic activity and the 2010 fall migration of bowheads through Harrison Bay in the central Beaufort Sea. (Poster) Alaska Marine Science Symposium, Jan. 2012. Anchorage, Alaska.
- Reiser, C.M., S.W. Raborn, **D.S. Ireland**, D.W. Funk, J. Beland, D.M.S. Dickson. 2011. Factors affecting sighting rates of ice seals during vessel-based surveys in the Alaskan Chukchi and Beaufort seas. (Poster) Society for Marine Mammalogy Biennial Conference, Nov. 2011. Tampa, Florida.
- Weissenberger, J., K. Hartin, M. Blees, J. Christensen, **D. Ireland**. 2011. Monitoring for marine mammals in Alaska using a 360° infrared camera system. (Poster) Society for Marine Mammalogy Biennial Conference, Nov. 2011. Tampa, Florida.
- Dickson, D.M.S., C.M. Reiser, D.W. Funk, **D.S. Ireland**, T. Thomas, J.R. Brandon, W.R. Koski, and D. Hannay. Extralimital sightings of marine mammals in the Alaskan Chukchi and Beaufort seas. (Poster) Society for Marine Mammalogy Biennial Conference, Nov. 2011. Tampa, Florida.
- Koski, W.R., J.R. Brandon, **D.S. Ireland**, D.W. Funk, A.M. Macrander, and S.B. Blackwell. Aerial sighting distributions of bowhead whales in the central Beaufort Sea relative to seismic activity during 2007, 2008, and 2010. (Poster) Society for Marine Mammalogy Biennial Conference, Nov. 2011. Tampa, Florida.
- Koski, W.R., **D.S. Ireland** and J.M. Kendrick. 2010. Industry Sponsored Studies of UAS for Monitoring Marine Mammals. (Presentation) Unmanned Systems Canada Conference, 2-5 November 2010, Montreal, Quebec.
- Koski, W.R., **D.S. Ireland** and J.M. Kendrick. 2010. A Summary of Findings from Industry-sponsored Studies of UAS for Monitoring Marine Mammals. (Presentation) Unmanned Systems Canada Conference, 2-5 November 2010, Montreal, Quebec.
- Christie, K., C. Lyons, W.R. Koski, **D.S. Ireland**, and D.W. Funk. Patterns of bowhead whale occurrence and distribution during marine seismic operations in the Alaskan Beaufort Seas. (Poster) Society for Marine Mammalogy Biennial Conference, Oct. 2009. Quebec City, Canada.
- Savarese, D.M., B. Haley, J. Beland, C.M. Reiser, **D.S. Ireland**, R. Rodrigues, and D.W. Funk. Localized avoidance of marine seismic operations by cetaceans in the Chukchi and Beaufort seas. (Presentation; given by **D.S. Ireland**) Society for Marine Mammalogy Biennial Conference, Oct. 2009. Quebec City, Canada.
- Thomas, T.A., W.R. Koski, **D.S. Ireland**, D.W. Funk, M. Laurinolli, A.M. Macrander. 2009 Pacific walrus movements and use of terrestrial haul-out sites along the Alaskan Chukchi Sea coast in 2007. (Poster) Society for Marine Mammalogy Biennial Conference, Oct. 2009. Quebec City, Canada.

- Reiser, C.M., B. Haley, J. Beland, D.M. Savarese, **D.S. Ireland**, D.W. Funk. 2009. Evidence for short-range movements by phocid species in reaction to marine seismic surveys in the Alaskan Chukchi and Beaufort seas. (Poster) Society for Marine Mammalogy Biennial Conference, Oct. 2009. Quebec City, Canada.
- Beland, J., B. Haley, B., C.M. Reiser, D.M. Savarese, **D.S. Ireland**, and D.W. Funk. Effects of the presence of other vessels on marine mammal sightings during multi-vessel operations in the Alaskan Chukchi Sea. (Poster) Society for Marine Mammalogy Biennial Conference, Oct. 2009. Quebec City, Canada.
- Ireland, D.S.**, G. B. Buck, W. R. Koski, D. Sliwa, T. Allen, C. Rushing. 2007. Strategies to improve UAS performance for marine mammal detection. (Poster) Society for Marine Mammalogy Biennial Conference, Dec 2007. Cape Town, South Africa.

## SELECTED TECHNICAL REPORTS

- Matthews, M.-N. R., **D. Ireland**, R. Brune, D.G. Zeddies, J. Christian, G. Warner, T.J. Deveau, H. Frouin-Mouy, S. Denes, C. Pyć, V.D. Moulton, and D.E. Hannay. 2018. Determining the Environmental Impact of Marine Vibrator Technology: Final Report. Document number 01542, Version 1.0. Technical report by JASCO Applied Sciences, LGL Ecological Research Associates Inc., and Robert Brune LLC for the IOGP Marine Sound and Life Joint Industry Programme.
- Ireland, D.S.**, L. Bisson, S.B. Blackwell, M. Austin, D.E. Hannay, K. Bröker, A.M. Macrander (eds.). 2016. Comprehensive Report of Marine Mammal Monitoring and Mitigation in the Chukchi and Beaufort Seas, 2006–2015. LGL Alaska Report P1363-E. Report from LGL Alaska Research Associates, Inc., Greeneridge Sciences, Inc., and JASCO Applied Sciences Ltd., for Shell Gulf of Mexico, Inc. and National Marine Fisheries Service, U.S. Fish and Wildlife Service. 558 p. plus Appendices.
- Ireland, D.S.** and L.N. Bisson. (eds.) 2016. Marine mammal monitoring and mitigation during exploratory drilling by Shell in the Alaskan Chukchi Sea, July–October 2015: 90-Day Report. LGL Rep. P1363D. Rep. from LGL Alaska Research Associates Inc., Anchorage, AK, USA, and JASCO Applied Sciences, Victoria, BC, Canada, for Shell Gulf of Mexico Inc, Houston, TX, USA, Nat. Mar. Fish. Serv., Silver Spring, MD, USA, and U.S. Fish and Wild. Serv., Anchorage, AK, USA. 188 pp, plus appendices.
- Beland, J.A., **D.S. Ireland**, L.N. Bisson, and D. Hannay. (eds.) 2013. Marine mammal monitoring and mitigation during a marine seismic survey by ION Geophysical in the Arctic Ocean, October–November 2012: 90-day report. LGL Rep. P1236. Rep. from LGL Alaska Research Associates Inc., LGL Ltd., and JASCO Research Ltd. for ION Geophysical, Nat. Mar. Fish. Serv., and U.S. Fish and Wild. Serv. 156 pp, plus appendices.
- Hartin K.G., L.N. Bisson, S.A. Case, **D.S. Ireland**, and D. Hannay. (eds.) 2011. Marine mammal monitoring and mitigation during site clearance and geotechnical surveys by Statoil USA E&P Inc. in the Chukchi Sea, August–October 2011: 90-day report. LGL Rep. P1193. Rep. from LGL Alaska Research Associates Inc., LGL Ltd., and JASCO Research Ltd. for Statoil USA E&P Inc., Nat. Mar. Fish. Serv., and U.S. Fish and Wild. Serv. 202 pp, plus appendices.
- Funk, D.W. C.M. Reiser, **D.S. Ireland**, R. Rodrigues, and W.R. Koski (eds.). 2011. Joint Monitoring Program in the Chukchi and Beaufort seas, 2006–2010. LGL Alaska Draft Report P1213-1, Report from LGL Alaska Research Associates, Inc., LGL Ltd., Greeneridge Sciences, Inc., and JASCO Research, Ltd., for Shell Offshore, Inc. and Other Industry Contributors, and National Marine Fisheries Service, U.S. Fish and Wildlife Service. 529 p. plus Appendices.
- Funk, D.W., **D.S. Ireland**, R. Rodrigues, and W.R. Koski (eds.). 2011. Joint Monitoring Program in the Chukchi and Beaufort seas, open-water seasons, 2006–2009. LGL Alaska Draft Report P1050-2, Report from LGL Alaska Research Associates, Inc., LGL Ltd., Greeneridge Sciences, Inc., and JASCO Applied Sciences, for Shell Offshore, Inc. and Other Industry Contributors, and National Marine Fisheries Service, U.S. Fish and Wildlife Service. 462 p. plus Appendices.
- Blees, M.K., K.G. Hartin, **D.S. Ireland**, and D. Hannay. (eds.) 2010. Marine mammal monitoring and mitigation during open water seismic exploration by Statoil USA E&P Inc. in the Chukchi Sea, August–October 2010: 90-day report. LGL Rep. P1119. Rep. from LGL Alaska Research Associates Inc., LGL

- Ltd., and JASCO Research Ltd. for by Statoil USA E&P Inc., Nat. Mar. Fish. Serv., and U.S. Fish and Wild. Serv. 102 pp, plus appendices.
- Ireland, D. S., R. Rodrigues, D. Funk, W. Koski, D. Hannay.** (eds.) 2009. Marine mammal monitoring and mitigation during open water seismic exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July–October 2008: 90-day report. LGL Rep. P1049-1. Rep. from LGL Alaska Research Associates Inc., LGL Ltd., and JASCO Research Ltd. for Shell Offshore Inc, Nat. Mar. Fish. Serv., and U.S. Fish and Wild. Serv. 277 pp, plus appendices.
- Ireland, D. S., D. W. Funk. R. Rodrigues, and W.R. Koski** (eds.). 2009. Joint Monitoring Program in the Chukchi and Beaufort seas, open water seasons, 2006–2007. LGL Alaska Report P971–2, Report from LGL Alaska Research Associates, Inc., Anchorage, AK, LGL Ltd., environmental research associates, King City, Ont., JASCO Research, Ltd., Victoria, BC, and Greeneridge Sciences, Inc., Santa Barbara, CA, for Shell Offshore, Inc., Anchorage, AK, ConocoPhillips Alaska, Inc., Anchorage, AK, and the National Marine Fisheries Service, Silver Springs, MD, and the U.S. Fish and Wildlife Service, Anchorage, AK. 485 p. plus Appendices.
- Funk, D. W., D. Hannay, **D. Ireland**, R. Rodrigues, and W. R. Koski (eds.). 2008. Marine mammal monitoring and mitigation during open water seismic exploration by Shell Offshore Inc. in the Chukchi and Beaufort Seas, July– November 2007: 90-day report. LGL Rep. P969-1. Rep. from LGL Alaska Research Associates Inc., Anchorage, AK, LGL Ltd., and JASCO Research Ltd. for Shell Offshore Inc, Houston, TX, and Nat. Mar. Fish. Serv., Silver Spring, MD. 218 pp plus appendices.
- Funk, D. W., R. Rodrigues, **D. Ireland**, and W. R. Koski (eds.). 2007. Joint Monitoring Program in the Chukchi and Beaufort Seas, July–November 2006. LGL Rep. P891-2. Report from LGL Alaska Research Associates Inc., Anchorage, AK, LGL Ltd., King City, Ont., Greeneridge Sciences Inc., Santa Barbara, CA, Bioacoustics Research Program, Cornell University, and Biowaves Inc., for Shell Offshore Inc., Houston, TX, ConocoPhillips Alaska, Inc., GXT Corporation, and Nat. Mar. Fish. Serv., Silver Spring, MD. 316 p. plus appendices.
- Ireland, D., D. Hannay, R. Rodrigues, H. Patterson, B. Haley, A. Hunter, M. Jankowski, and D. W. Funk.** 2007. Marine mammal monitoring and mitigation during open water seismic exploration by GX Technology in the Chukchi Sea, October–November 2006: 90-day report. LGL Draft Rep. P891-1. Rep. from LGL Alaska Research Associates Inc., Anchorage, AK, LGL Ltd., King City, Ont., and JASCO Research, Ltd., Victoria, B.S., Can. for GX Technology, Houston, TX, and Nat. Mar. Fish. Serv., Silver Spring, MD. 118 p.
- Ireland, D., R. Rodrigues, D. Hannay, M. Jankowski, A. Hunter, H. Patterson, B. Haley, and D. W. Funk.** 2007. Marine mammal monitoring and mitigation during open water seismic exploration by ConocoPhillips Alaska Inc. in the Chukchi Sea, July–October 2006: 90-day report. LGL Draft Rep. P903-1. Rep. from LGL Alaska Research Associates Inc., Anchorage, AK, LGL Ltd., King City, Ont., and JASCO Research Ltd., Victoria, BC, for ConocoPhillips Alaska, Inc., Anchorage, AK, and Nat. Mar. Fish. Serv., Silver Spring, MD. 116 p.
- Ireland, D., M. Holst, and W.R. Koski.** 2005. Marine mammal monitoring during Lamont-Doherty Earth Observatory’s seismic program off the Aleutian Islands, Alaska, July–August 2005. LGL Rep. TA4089-3. Rep. from LGL Ltd., King City, Ont., for Lamont-Doherty Earth Observatory of Columbia Univ., Palisades, NY, and Nat. Mar. Fish. Serv., Silver Spring, MD. 67 p.
- Haley, B. and **D. Ireland.** 2005. Marine mammal monitoring during University of Alaska Fairbanks’ marine geophysical survey across the Arctic Ocean, August–September 2005. LGL Rep. TA4122-3. Rep. from LGL Ltd., King City, Ont., for University of Alaska Fairbanks, Fairbanks, AK, and Nat. Mar. Fish. Serv., Silver Spring, MD. 96 p.
- Ireland, D., T.M. Markowitz, D.W. Funk, C. Kaplan.** 2005. Beluga whale distribution and behavior in Eagle Bay and the Sixmile Area of upper Cook Inlet, Alaska, in September and October 2005. Rep. from LGL Alaska Research Associates, Inc., Anchorage, AK in association with HDR Alaska, Inc., Anchorage, AK,

for the Knik Arm Bridge and Toll Authority, Anchorage, AK, Department of Public Facilities, Anchorage, AK and the Federal Highways Administration, Juneau, AK.

**Ireland, D.,** S. McKendrick, D. W. Funk, T. M. Markowitz, A. P. Ramos, M. R. Link, and M. W. Demarchi. 2005. Spatial analysis of beluga whale distribution in Knik Arm. Chapter 7 *In:* Funk, D.W., T.M. Markowitz and R. Rodrigues (eds.) 2005. Baseline studies of beluga whale habitat use in Knik Arm, Upper Cook Inlet, Alaska, July 2004–July 2005. Rep. from LGL Alaska Research Associates, Inc., Anchorage, AK, in association with HDR Alaska, Inc., Anchorage, AK, for the Knik Arm Bridge and Toll Authority, Anchorage, AK, Department of Transportation and Public Facilities, Anchorage, AK, and the Federal Highway Administration, Juneau, AK.