

**SHAY HOWLIN, *Biometrician*****EDUCATION**

M.S.	Oregon State University, Corvallis, Oregon	1999	<i>Statistics</i>
B.S.	The Pennsylvania State University, University Park, Pennsylvania	1993	<i>Wildlife and Fisheries Science</i>

**PROFESSIONAL EXPERIENCE**

1999-Present	<i>Biometrician</i> , Western EcoSystems Technology, Inc., Cheyenne, Wyoming
1997-1999	<i>Research Assistant</i> , Environmental Protection Agency, Western Ecology Branch
1998-1999	<i>Teaching Assistant</i> , Department of Statistics, Oregon State University, Eugene, Oregon
1997	<i>Research Field Assistant</i> , Forest Science Department, Oregon State University, Eugene, Oregon
1995-1996	<i>Palila Intern</i> , National Biological Service, Hawaii Field Station
1995	<i>Field Technician</i> , Point Reyes Bird Observatory, NWSSTF Boardman Bombing Range
1994-1995	<i>Biological Technician</i> , U.S. Forest Service, Chiloquin Ranger District
1992-1994	<i>Wildlife Biologist</i> , Bureau of Land Management, Klamath Falls Resource Area

**SPECIALTY AREAS**

**Ecosystem Monitoring:** Shay has experience designing study plans and analyzing data from ecological monitoring studies. This work has generally involved either the estimation of status and trend or before-after control-impact assessment. While working with the Technical Committee of the Platte River Endangered Species Partnership, Shay designed and tested study protocols for monitoring reproduction by least tern and piping plover, for monitoring habitat use of migrating whooping cranes, and for documenting changes in physical and biological habitat on the central Platte River.

**Resource Selection Functions:** Shay has been involved in designing resource selection studies and estimating resource selection functions using data from field observations and data extracted from GIS layers. Specific examples include studies of habitat selection by brown bears on the Chugach National Forest, habitat selection by sand lance in Prince William Sound, nest selection by passerines in Eastern Oregon, and den selection by polar bears on Wrangel Island, the Chukotka Coast of Russia, and the North Coast of Alaska.

**Data Analysis:** Shay has conducted extensive data analysis as a consultant for WEST. She has applied numerous statistical techniques to ecology including generalized linear models, multivariate methods and sampling. Using proportional hazard survival models, Shay has estimated the effects of blood parameters on the survival of juvenile sea otters in Prince William Sound, and she has conducted analysis that incorporated covariates into the estimation of bird density. Other work includes simulation and programming in SAS, S-Plus, and Matlab.

**Database Creation and Management:** Shay has extensive consulting experience in the design and use of relational databases for statistical analysis. Shay primarily uses SAS, Arcview, Microsoft Access, and Microsoft Excel to manage data and visually display information. Shay has been involved in the creation of databases and data entry forms in Microsoft Access.

**Analysis Planning:** Shay has provided statistical advice in research design and analysis for clients through WEST and the Department of Statistics consulting service at Oregon State University. These plans outline the statistical analysis procedure(s) to be used and provide assistance with the interpretation of results for a particular analysis technique. These plans are developed through interviews with clients during which the study objectives are clarified and the data collection techniques are discussed.

**Wildlife Research:** Shay has experience conducting avian research throughout the U.S. Field sites have included Pennsylvania, Oregon, Hawaii, and Wyoming. Specific studies have included grouse in Eastern forests, birds in Old-growth Douglas Fir forests, passerines in shrub steppe land, honeycreepers in Mamane/Naio forests, and birds in the grasslands of Wyoming. This experience has imparted to Shay an understanding of the practical and technical issues associated with implementing research protocols in the field.

**PROFESSIONAL PUBLICATIONS**

- Nielson, R.M., L.L. McDonald, J.P. Sullivan, C. Burgess, D.S. Johnson, D.H. Johnson, S. Bucholtz, S. Hyberg, and S. Howlin. 2008. Estimating the response of ring-necked pheasants (*Phasianus colchicus*) to the Conservation Reserve Program. *The Auk* 125(2): 434-444.
- Suring, L.H., S.D. Farley, G.V. Hilderbrand, M.I. Goldstein, S. Howlin, W.P. Erickson. 2006. Patterns of landscape use by female brown bears on the Kenai Peninsula, Alaska. *Journal of Wildlife Management*. 70(6) 1580-1587.
- Lance, E.W., S.M. Howell, B.K. Lance, S. Howlin, L.H. Suring and M.I. Goldstein. 2006. Spruce beetles and timber harvest in Alaska: implications for northern red-backed voles. *Forest Ecology and Management* 222: 476-479.
- Ostrand, W. D., T.A. Gotthardt, S. Howlin and M.D. Robards. 2005. Habitat selection models for Pacific Sand Lance (*Ammodytes hexapterous*) in Prince William Sound, Alaska. *Northwestern Naturalist*. 86(3): 131-143.

- Hughes, R.M., **S. Howlin**, and P.R. Kaufmann. 2004. A biointegrity index (IBI) for coldwater streams of Western Oregon and Washington. *Transactions of the American Fisheries Society* 133:1407-1515.
- Ostrand, W. D., **S. Howlin**, and T. A. Gotthardt. 2004. Fish School Selection by Marbled Murrelets in Prince William Sound, Alaska: Responses to Changes in Availability. *Marine Ornithology*. 32: 69-76.
- Hagar, J., **S. Howlin**, and L. Ganio. 2004. Short-term Response of Songbirds to Experimental Thinning of Young Douglas-fir Forests in the Oregon Cascades. *Forest Ecology and Management* 199: 333-347.
- Ballachey, B.E., J.L. Bodkin, **S. Howlin**, A.M. Doroff, and A.H. Rebar. 2003. Correlates to survival of juvenile sea otters in Prince William Sound, Alaska, 1992-93. *Canadian Journal of Zoology* 81: 1494-1510.
- Erickson, W.P., T.L. McDonald, K. Gerow, J. Kern and **S. Howlin**. 2001. Statistical issues in resource selection studies with radio-marked animals. Pages 209-242 in J. J. Millspaugh and J. M. Marzluff, editors. *Radio Tracking and Animal Populations*. Academic Press, San Diego, California, USA.

### PROCEEDINGS PAPERS

- Howlin, S.**, W.P. Erickson, and R.M. Nielson. 2004. A proposed validation technique for assessing predictive abilities of resource selection functions. Pp. 40-51 in S. Huzurbazar, editor. *Resource selection methods and applications: Proceedings of the 1st International Conference on Resource Selection*, Laramie Wyoming; January 13-15, 2003.
- Suring, L.H, W.P. Erickson, **S. Howlin**, K. Preston, and M.I. Goldstein. 2004. Estimating resource selection functions using spatially explicit data. Pp. 86-93 in S. Huzurbazar, editor. *Resource selection methods and applications: Proceedings of the 1st International Conference on Resource Selection*, Laramie Wyoming; January 13-15, 2003.
- Howlin, S.**, M. Stishov, L.L. McDonald, and S.L. Schliebe. 2002. Den site selection by polar bears on Wrangel Island. Pp. 127-138 in N.J. Lunn, S. Schliebe, and E.W. Born. eds. *Polar Bears: Proceedings of the 13th Working Meeting of the IUCN/SSC Polar Bear Specialist Group*, Nuuk, Greenland. IUCN, Gland Switzerland and Cambridge, UK. vii + 153pp.

### PROFESSIONAL REPORTS

- Howlin, S.**, C. Derby, and D. Strickland. 2008. Whooping crane migrational habitat use in the central Platte River during the Cooperative Agreement period, 2001-2006. Technical report prepared for the Platte River Endangered Species Partnership.
- Derby, C., and **S. Howlin**. 2007. Wamsutter Expansion Project Pygmy Rabbit Monitoring Plan. Technical report prepared for NRG, and Questar Overthrust Pipeline Company.
- Derby, C., **S. Howlin**, T. Rintz, and K. Taylor. 2007. Overthrust Expansion Project 2007 pygmy rabbit year one post-construction monitoring survey. Technical report prepared for Natural Resource Group, LLC, and Questar Overthrust Pipeline Company.
- Bilbrough, C.J., **S. Howlin**, and L.L. McDonald. 2006. The Effects of Seed Mix Species Composition and Seeding Rates on Attaining Species Diversity for Reclaimed Areas. Prepared for Abandoned Coal Mine Lands Research Program, Laramie, Wyoming.
- Burger, A.E., B. Hansen, E.A. Stewart, D. Bellefleur, D. Edwards, H.R. Carter, **S. Howlin**, and A.J. Gaston. 2006. Population trends of the Marbled Murrelet Evident from At-Sea Surveys in British Columbia. Appendix E in Status Review of the Marbled Murrelet (*Brachyramphus marmoratus*) in Alaska and British Columbia. USGS Open file report 2006-1387.
- Derby, C., and **S. Howlin**. 2006. Overland Pass Pipeline Project Pygmy Rabbit Monitoring Plan. Technical report prepared for Natural Resource Group, Wilbros Engineers, and Overland Pass Pipeline Company.
- Derby, C., and **S. Howlin**. 2006. Overthrust Expansion Project 2006 Pygmy Rabbit Monitoring Plan. Technical report prepared for Natural Resource Group and Questar Overthrust Pipeline Company.
- McKnight, A., K.M. Sullivan, D.B. Irons, S.W. Stephensen, and **S. Howlin**. 2006. Marine bird and sea otter population abundance of Prince William Sound, Alaska: trends following the T/V Exxon Valdez oil spill, 1989-2005. Exxon Valdez Oil Spill Restoration Project Annual Report (Restoration Project 050751), U. S. Fish and Wildlife Service, Anchorage, Alaska.
- Nielson, R. M., L. L. McDonald, J. P. Sullivan, C. Burgess, D. S. Johnson, and **S. Howlin**. 2006. Estimating response of ring-necked pheasant (*Phasianus colchicus*) to the Conservation Reserve Program. Technical report prepared for US Department of Agriculture Farm Service Agency, Contract Number 53-3151-5-8059, Western EcoSystems Technology, Inc., 2003 Central Avenue, Cheyenne, WY 82001.
- Piatt, J., G. Drew, M. Arimistu, **S. Howlin**, and L. McDonald. 2006. Comparison of Two Large-Scale Surveys for *Brachyramphus* Murrelets in Southeast Alaska. Appendix F in Status Review of the Marbled Murrelet (*Brachyramphus marmoratus*) in Alaska and British Columbia. USGS Open file report 2006-1387.
- Piatt, J., G. Drew, J. Lindell, L. McDonald, **S. Howlin**, and Kirsten Bixler. 2006. Population trends of the Marbled Murrelet in Icy Strait, Southeast Alaska. Appendix G in Status Review of the Marbled Murrelet (*Brachyramphus marmoratus*) in Alaska and British Columbia. USGS Open file report 2006-1387.

- Piatt, J., G. Drew, J. Lindell, **S. Howlin**, and L. McDonald. 2006. Population trends of Brachyrampus Murrelets in Glacier Bay, Alaska. Appendix H in Status Review of the Marbled Murrelet (*Brachyrampus marmoratus*) in Alaska and British Columbia. USGS Open file report 2006-1387.
- McDonald, L.L., **S. Howlin**, J. Polyakova, C.J. Bilbrough. 2003. Evaluation and Comparison of Hypothesis Testing Techniques for Bond Release Applications. Prepared for Abandoned Coal Mine Lands Research Program, Laramie, Wyoming.
- Suring, L.H., K.A. Murphy, A. Iliff, **S. Howlin**, and K. Preston. 2003. Western Prince William Sound human use and wildlife disturbance model, Exxon Valdez Oil Spill Restoration Project Final Report - Part B (Restoration Project 98339), Chugach National Forest, Anchorage, Alaska.