

**ANNUAL REPORT of the  
CENTRE FOR WILDLIFE ECOLOGY  
2012-**

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### III. PERSONNEL

#### **A. Research Team**

##### *1. Faculty and Research Associates*

<i>Name</i>	<i>Position</i>
Ron Ydenberg	Director,

**B. Steering Committee**

<i>Name</i>	<i>Position</i>	<i>Affiliation</i>
Elizabeth Elle	Assistant Professor	SFU
Arne Mooers	Assistant Professor	SFU
Robert Elner	Emeritus Scientist	EC
David Green	CWE faculty (non-voting)	SFU
Paul Kluckner	Regional Director, ECB PYR	EC
Barry Smith	Wildlife Research, Hyn	

## IV. INTRODUCTION

The aim of this Annual Report is to give an overview of our activities, outline the progress on new and continuing projects, describe the personnel involved, and to give some indication of our scientific and community involvement. Previous Annual Reports are available from the CWE. Contact us via our website

<http://www.sfu.ca/biology/wildberg/index.html>

or contact Ron Ydenberg at [ydenberg@sfu.ca](mailto:ydenberg@sfu.ca).

## V. THE CWE IN ACTION

The accounts that follow give brief overviews of the major projects run by the CWE. More detail is available on our website (<http://www.sfu.ca/biology/wildberg>). Publications and theses are listed at the end of this report. The personnel also can be contacted via the website.

### **A. The Triangle Island Seabird Research Station**

Coastal British Columbia supports large populations of many species of seabirds, for which Environment Canada has an important stewardship responsibility. The Triangle Island Seabird Research and Monitoring Station was established in 1994 as a centre for research devoted to understanding seabird biology, aimed particularly at identifying and understanding environmental and demographic causes of population change so as to recommend appropriate conservation actions. The Anne Vallée Ecological Reserve on Triangle Island supports the largest and most diverse seabird colony in BC, including the world's largest population of Cassin's Auklets, BC's largest populations of Tufted Puffins and Common Murres, and a large population of Rhinoceros Auklets, among others. As part of the Scott Island Group, Triangle Island is recognized as an Important Bird Area (IBA). Moreover, waters around the Scott Islands are being developed as a Marine Wildlife Area (MWA) under the Canada Wildlife Act, to protect critical habitat for the millions of seabirds that depend on these waters throughout the year.

Our ongoing investigations examine breeding propensity and chronology, reproductive performance, nestling diet and development, parental foraging and provisioning patterns, attendance patterns, and adult survival, among other topics. Of particular interest is the issue of how climate-induced fluctuations in the timing and availability of marine prey populations affect seabird reproduction and survival.

The 2012 season: We opened our research station on Triangle Island for year 19 on 27 May 2012. Scientific research was conducted under the direction of Mark Hipfner. We maintained our time series focus on Cassin's Auklets, Rhinoceros Auklets, Glaucous-winged Gulls and Black Oystercatchers.

The 2012 season continued the recent string of years (since 2007-2008, but excluding 2010) characterized by cold ocean conditions. This again created favourable conditions for breeding by Black Oystercatchers, which bred at high density, and for Cassin's Auklets, whose phenology was well matched to that of their most important prey, the copepod *Neocalanus cristatus*.

However, Rhinoceros Auklets had a poor breeding season due to the scarcity of juvenile sand lance.

In 2012 we also completed the fifth year of a project to band Rhinoceros Auklets at the large colonies at Pine Island (central coast) and Lucy Island (north coast). The objectives of the work are to obtain estimates of adult survival rates at these colonies to enable us to assess the potential effects of mortality in gill-net fisheries on local populations; to quantify geographic and yearly variation in this species' diet and productivity; to quantify spatial and temporal variation in diets of Pacific sand lance, a key prey species for Rhinoceros Auklets at all BC colonies. And finally, in 2012 we began a collaborative project with scientists from the Department of Fisheries and Oceans to quantify the consumption of salmon, especially Fraser River sockeye, by seabirds. Of interest, with juvenile sand lance relatively scarce, Rhinoceros Auklets delivered unusually large amounts of salmon to nestlings on Triangle and Pine islands.

## **B. Integrated Shorebird Research**

Populations of many species of shorebirds travel half the globe in the course of their annual migrations. Great concern has been raised about apparent population declines of many species over the past two decades. The CWE is studying small calidrid sandpipers - Western and Least sandpipers, and Dunlin - to better understand the causes of these apparent declines.

The majority of the world's 3.5 – 4.0 million Western Sandpipers stop briefly to refuel in Boundary Bay or on Robert's Bank during their annual northward migration, providing a thrilling sight for local residents. Much of the species' population also stops over on southward migration, following a flight over the Gulf of Alaska. Because of this, the species is ranked in the highest priority class in the draft BC-Yukon region CWS Shorebird Management Plan. Each winter, the Fraser River Delta (FRD) hosts the most northerly wintering population of Pacific Dunlin – some 30,000-50,000. Local information on shorebird habitat usage, including western sandpipers and dunlin, contributes information useful for Environment Canada's environmental assessments as Port of Vancouver and ferry operations continue and expand.

Since its inception in 1993, the CWE has nurtured the development of the Western Sandpiper Research Network, including current CWE staff Ron Ydenberg, Dov Lank, and Tony Williams, EC's Barry Smith, and recent retirees Bob Elner and Rob Butler, as a platform for research on a hemispheric scale that can address migratory bird issues. We are now cooperating with Mark Drever, recently hired by CWS to address shorebird issues. The CWE maintains substantial science capacity for this group of birds. Our multifaceted research is documenting and modeling the factors controlling the population size, migratory routes and timing, ecological relationships with predators and prey, habitat use, and physiological ecology of these long-distance Neotropical migrants. We have pursued and aided fieldwork at three breeding sites, several migration locations, and five wintering sites. We have organized twelve workshops to help keep researchers in touch, and we run a list-server for this purpose.

Our integrated approach allows us to examine how factors at one location affect events at another. How do events in the wintering grounds, migration sites, and breeding grounds interconnect? Where are population bottlenecks? How do changes in environmental danger and food availability affect migration and stopover strategies? Of direct conservation concern is the consequence of the removal or deterioration of one or more locations on survival and reproduc-





site contributes towards an arctic-wide collaborative program dubbed the Arctic Shorebird Demographic Network, which includes a dozen sites in Alaska and arctic Canada utilizing comparable protocols.

Sarah Jamieson (PhD CWE 2009) published thesis papers on dunlin breeding biology; one remaining publication with Ydenberg and Lank, relating the duration of parental care to migration strategies of sympatric dunlin and Western sandpipers, was refined for journal submission.

Migratory Connectivity Project: The Western Sandpiper migratory connectivity project designed to develop the use of intrinsic markers – information present in the body of the bird – as tools for establishing the connections among the suite of sites utilized by migrants, is being completed. This international project involved Environment Canada as a partner, plus faculty from UBC (Darrin Irwin), Queen's (Kurt Kyser) and Guelph (D Ryan Norris), three universities in Mexico, Kansas State University, and the Point Reyes Bird Observatory, with additional cooperators in Alaska, Russia, Texas, Florida, South Carolina, Puerto Rico, Panama and Ecuador. PhD student Samantha Franks defended her PhD thesis in spring 2012. The thesis

Regional Division for the Environment (DIREN), a local ornithological NGO (the Society of Polynesian Ornithologists, SOP-MANU), and the Critical Ecosystems Partnership Fund (CEPF), administered by Conservation International.

Once widespread across the South Pacific, this species is now found on only 4 atolls, with a world population of ca. 1200 individuals. PhD student Marie-Hélène Burle has now >15 months conducting the first study of the species' biology, including 5 months during 2012. The information on habitat usage, diet, and social behaviour is being used to support reintroduction planning for the species onto atolls where rats have or will be removed.

### **C. The Marbled Murrelet Project**

SFU's research on threatened Marbled Murrelets continues to address issues of direct conservation concern for this listed species. This ground-breaking and high profile project examining the biology of the threatened and elusive marbled murrelet, started by CWE chair emeritus Fred Cooke, continued for its eighteenth year lead by Dov Lank, addressing evolving questions of management interest for this threatened species.

Following the completion of student projects in 2011, in 2012 Lank and CWE technician Jenn Barrett continued data analyses of the extensive radar traffic rate data sets that have been gathered in BC to address (1) the utility of several methods of habitat suitability classification, and (2) the magnitude of fragmentation effects on local breeding population size. This work will be completed in 2013.

Lank continued to serve on the Canadian Marbled Murrelet Recovery Team and participated in calls with the Habitat Implementation Group. After several years of reduced activity, the CMMRT has become reanimated following the Federal government's kg

2. Winter and Spring-migration Ecology of Surf and White-winged Scoters – Our research group has been studying various aspects of scoter winter and migration ecology since 2001, as part of a flyway-wide collaboration including Environment Canada, U.S. federal agencies, and Washington Department of Fish and Wildlife. This has included specific evaluations of local anthropogenic effects such as shellfish aquaculture, as well as flyway-wide considerations of factors related to winter site selection and spring migration strategies. Field work is complete and efforts are now focused entirely on analysis and write-up of findings. The last graduate student on the project, MSc candidate Brian Uher-Koch, has completed his thesis addressing variation in winter survival of surf scoters at a continental scale and will defend summer 2013. In addition to nearly 20 papers that have been published from this work, several new papers are in journal review, or in preparation for submission. Collectively, our work has led to significant advances in understanding of scoter wintering and spring migration ecology, and identifies habitat and demographic features that may influence population dynamics.

3. Barrow's Goldeneye Population Delineation – In collaboration with Sean Boyd of Environment Canada, we are using satellite telemetry to evaluate population structure, movements, site fidelity, and habitat use of Barrow's goldeneyes in western North America. Goldeneyes have been marked at a breeding site (Riske Creek, BC), 4 wintering sites (Indian Arm, BC; Prince William Sound, Alaska; Juneau, Alaska; and Kachemak Bay, Alaska), and a molt site (Cardinal Lake, Alberta). This work will have important implications for understanding population level effects of factors at different annual cycle stages (e.g., oil pollution on coastal wintering areas, changes to interior breeding areas) and will provide the first insights into migratory connectivity for the species.

4. Barrow's Goldeneye Wing Moult and Staging in Alberta – As a result, in part, of satellite telemetry work described above, an important molting and staging site was discovered in northwestern Alberta. In collaboration with Jonathan Thompson of Ducks Unlimited Canada and Sean Boyd of EC, we document oil



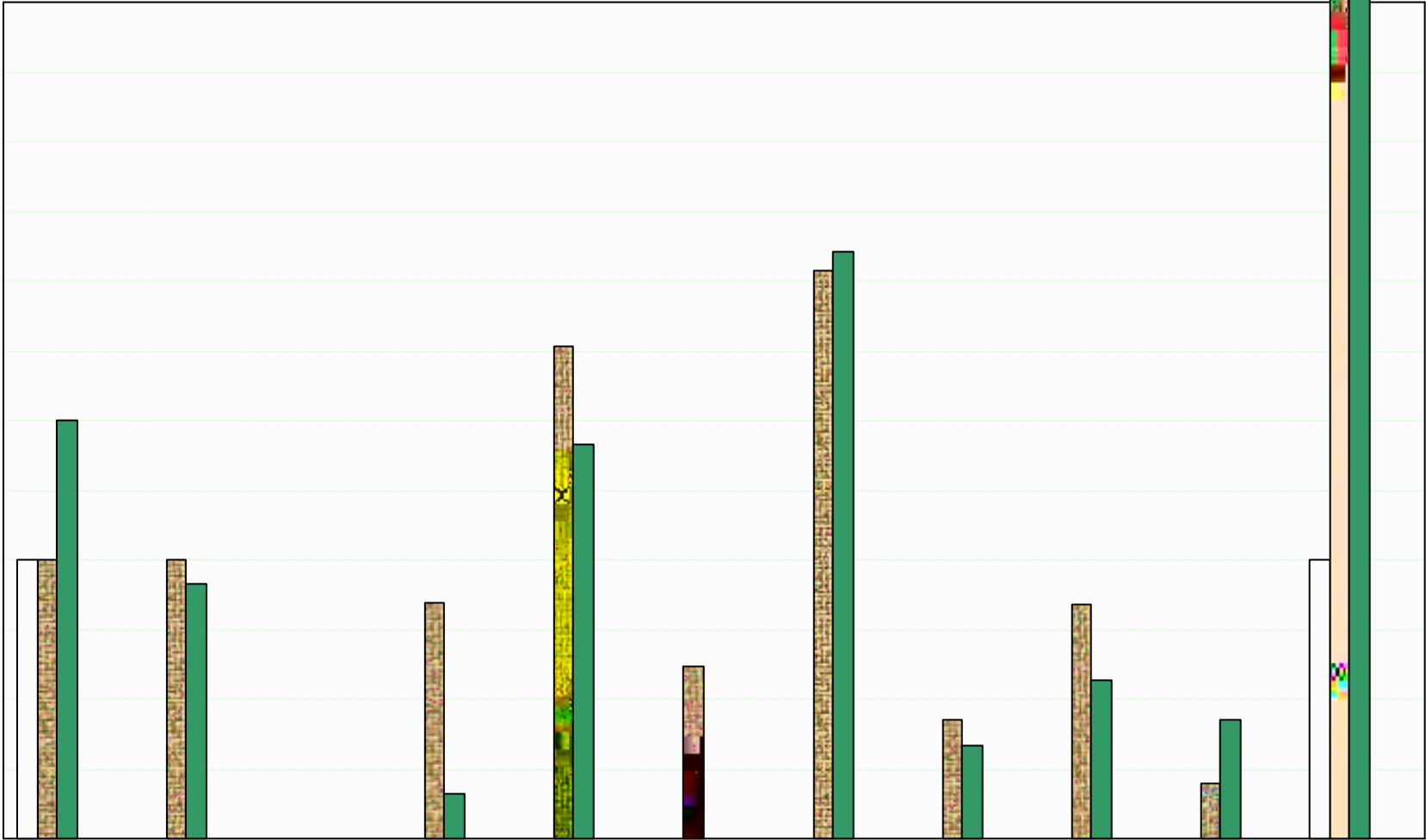












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Jonker, R.M., R.H.J.M. Kurvers, A. van de Bilt, M. Faber, S.E. Van Wieren, H.H.T. Prins and R.C.



**Submitted:**

- Agüero, M.L., P.G. Borboroglu and D. Esler. Submitted. Trophic ecology of Chubut Steamerducks. J. Field Ornithol.
- Burg, T., C. Abbott, R. Millikin, Y. Watanuki, M. Ito, S.A. Hatch and J.M. Hipfner. Submitted. Are Rhinoceros Auklets from Canada, Alaska and Japan genetically distinct? J. Marine Biol.
- Hipfner, J.M., L.A. McFarlane-Tranquilla, B. Addison and K.A. Hobson. Submitted. Seasonal variation in the foraging ecology of a zooplanktivorous seabird assessed with stable isotope analysis. Marine Biol. Res.
- Jones, I.M., R.W. Butler and R.C. Ydenberg. Submitted. Recent switch by great blue herons in the Pacific northwest to associative nesting with bald eagles to gain predator protection. Can. J. Zool.
- Middleton, H.A., R.W. Butler, D. Esler and P. Davidson. Submitted. Waterbirds alter their distribution and behavior in response to presence of Bald Eagles (*Haliaeetus leucocephalus*). Waterbirds.
- Rock, C.A., S.P. Quinlan, M. Martin and D.J. Green. Submitted. Costs of cowbird parasitism do not vary with host age in yellow warblers. Can. J. Zool.
- Thomsen, S.K., C.E. Kroeger, P.H. Bloom and A.L. Harvey. Submitted. Radio telemetry and color-banding of Barn Owls on Santa Barbara Island, Channel Islands National Park. W. North Amer. Natural.
- Uher-Koch, B.D., D. Esler, R.D. Dickson, J.W. Hupp, J.R. Evenson, E.M. Anderson, J. Barrett and J.A. Schmutz. Submitted. Survival of surf scoters and white-winged scoters during remigial molt. J. Wildl. Manage.
- VanStratt, C.S., D. Esler, D.H. Ward, K.M. Brodhead, B.D. Uher-Koch and J.W. Hupp. Submitted. Latitudinal variation in foraging effort of wintering surf scoters. Condor.

University, Burnaby, BC. pp.

Jiménez Reyes, A. 2013. The "secret garden": microphytobenthic biofilms and the foraging ecology of calidridine sandpipers. PhD, Simon Fraser University, Burnaby, BC. 158 pp.