ANNUAL REPORT of the
CENTRE FOR WILDLIFE ECOLOGY

2014-2015

Department of Biological Sciences
Simon Fraser University

http://www.sfu.ca/biology/wildberg/NewCWEPage/CWEnewTestHome.htm

Dr. Ronald C. Ydenberg, Director

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I. HISTORY

Under the Migratory Birds Convention and Canada Wildlife Acts, the mandate of the Canadian Wildlife Service is to protect and conserve migratory bird populations. In the 21st century, this historical mandate is broadening to encompass other environmental concerns such as species at risk, biodiversity, sustainability and endangered habitats. To meet these broad and varied responsibilities, Environment Canada depends on sound science, and participates in cooperative ventures. In 1993, the Natural Sciences and Engineering Research Council of Canada, Simon Fraser University, and Environment Canada signed a ten year agreement to create the NSERC/CWS Chair in Wildlife Ecology at SFU. The Centre for Wildlife Ecology (CWE) described here is a revised administrative structure based on the Chair, formed after the retirement in 2002 of the original chairholder, Professor Fred Cooke.

II. MISSION STATEMENT

The mission of the Centre for Wildlife Ecology (CWE) is to foster high quality graduate training and research, conduct basic and applied research in wildlife ecology, and to provide knowledge and personnel that will help Environment Canada and other agencies meet the challenges of conservation in the 21st century. The central concept is to foster synergy between the mission-oriented research and management policies of Environment Canada (Canadian Wildlife Service, CWS, and Science and Technology, S&T) and the basic research agenda of the University. Information, ideas, expertise, resources and opportunity flow back and forth across this interface, giving government agencies access to a broad base of science capability that helps inform policy and decision making, while the university and its faculty and students benefit from enhanced opportunities for research and application of the ideas their disciplines generate.

III. PERSONNEL

A. Research Team

1. Faculty and Research Associates

Name	*Position*
Ron Ydenberg	Director, Professor
Tony Williams	Professor
David Green	Associate Director, Associate Professor
Dov Lank	University Research Associate / Adjunct Professor
Dan Esler	USGS Scientist / Adjunct Professor
Mark Hipfner	EC Research Scientist / Adjunct Professor
Doug Bertram	EC Research Scientist
Christine Bishop	EC Research Scientist / Adjunct Professor
Sean Boyd	EC Research Scientist / Adjunct Professor
Rob Butler	EC Research Scientist Emeritus / Adjunct Professor
Bob Elner	EC Research Scientist Emeritus/Adjunct Professor
John Elliott	EC Research Scientist / Adjunct Professor
Rhonda Millikin	EC Head, Population Assessment / Adjunct Professor
Fred Cooke (retired)	Emeritus Chairholder

2. Research Group

Postdoctoral

B. Steering Committee

Philina English, a PhD candidate co-supervised by Dr David Green and Joe Nocera (Ontario Ministry of Natural Resources), is examining how land use change and diet impact the distribution, abundance and breeding performance of Eastern WhipPoorWill in Ontario. She has demonstrated 1) that changes in the distribution of whippoorwill from the first and second Ontario Breeding Bird Atlas are not explained by increases in forest cover as forests regrow on abandoned agricultural land, 2) population declines over the last century are associated with changes in the nitrogen isotope signatures in winter grown and breeding ground tissues that reflect changes in their diet, and 3) prey abundance (beetle and moths) predicts the presence and abundance of whippoorwills at two spatial scales (the regional and local). In collaboration with Mike Cadman (CWS), she has used geolocators to determine the migration routes of whippoorwills breeding at three sites, (QUBS in the Frontenac arch, Torrance Barrens Dark Sky Reserve in the southern Muskoka, and Long Point on Lake Erie. She plans to write and defend her PhD thesis in 2015.

3. Lewis's Woodpecker (Threatened, COSEWIC)

Lewis's Woodpecker was designated as a Threatened species by COSEWIC in 2010. Lauren MacFarland, an MSc student in the Green lab co-supervised by Nancy Mahony (EC), completed a second year of fieldwork examining the habitat specific demography of Lewis's woodpeckers in 2014. She has demonstrated consistent differences in the productivity of Lewis's woodpeckers in riparian cottonwoods, open ponderosa pine and burned habitat within the Okanagan. Preliminary analyses suggest these differences can be attributed to differences in the predator communities within these habitats, rather than differences in the community of secondary cavity nesters (native and non-native), or differences in prey availability. Lauren is currently using a long-term Lewis's woodpecker nest monitoring dataset to examine differences in the loss and re-use of nest cavities among habitat types.

4. Yellow-breasted Chat (Endangered, COSEWIC)

Tim Forrester (MSc 2014) investigated how restoration efforts in riparian habitat within the Okanagan influenced the abundance and demography of chats and other riparian dependent songbirds over the last decade. His work, conducted in collaboration with Dr. Christine Bishop (EC) demonstrated that restoration efforts have led to an increase in the abundance of yellow-breasted chats, and that pairs in newly occupied habitat have similar productivity to other pairs. However, restoration efforts for chats did not lead to significant increases in the abundance of other riparian dependent songbirds.

5. Scripp's Murrelet (Vulnerable, IUCN)

Santa Barbara Island in the Channel Islands California provides breeding habitat for 20% of the world's population of Scripps murrelets (global population = 2800 pairs). Scripp's murrelets on Santa Barbara may be depredated by barn owls, but barn owls also prey on deer mice that are known to be a major cause of egg failure. Management of barn owls may therefore have unexpected and unintended consequences for murrelets. Sarah Thomsen (PhD student in the Green lab) used data collected from 2010-2014 to show that barn owls can have both direct (negative) and indirect (positive) effects on Scrip

were recovered from Western and Semipalmated sandpipers, demonstrating a non-stop flight from Alaska to, and wintering at, the Fraser River delta and elsewhere.

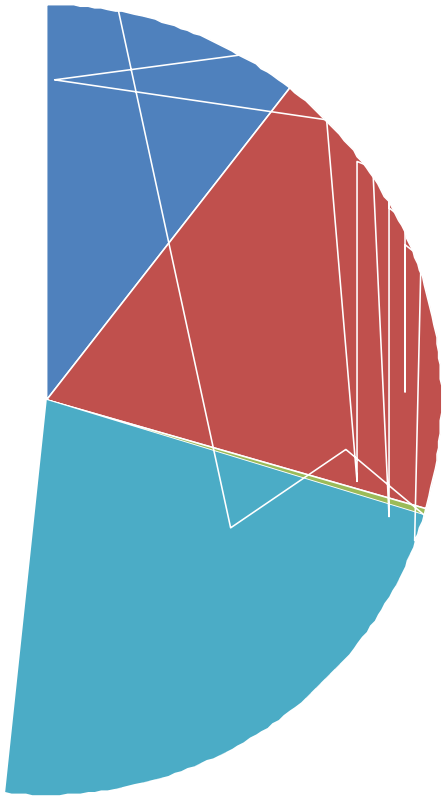
d. Population Biology

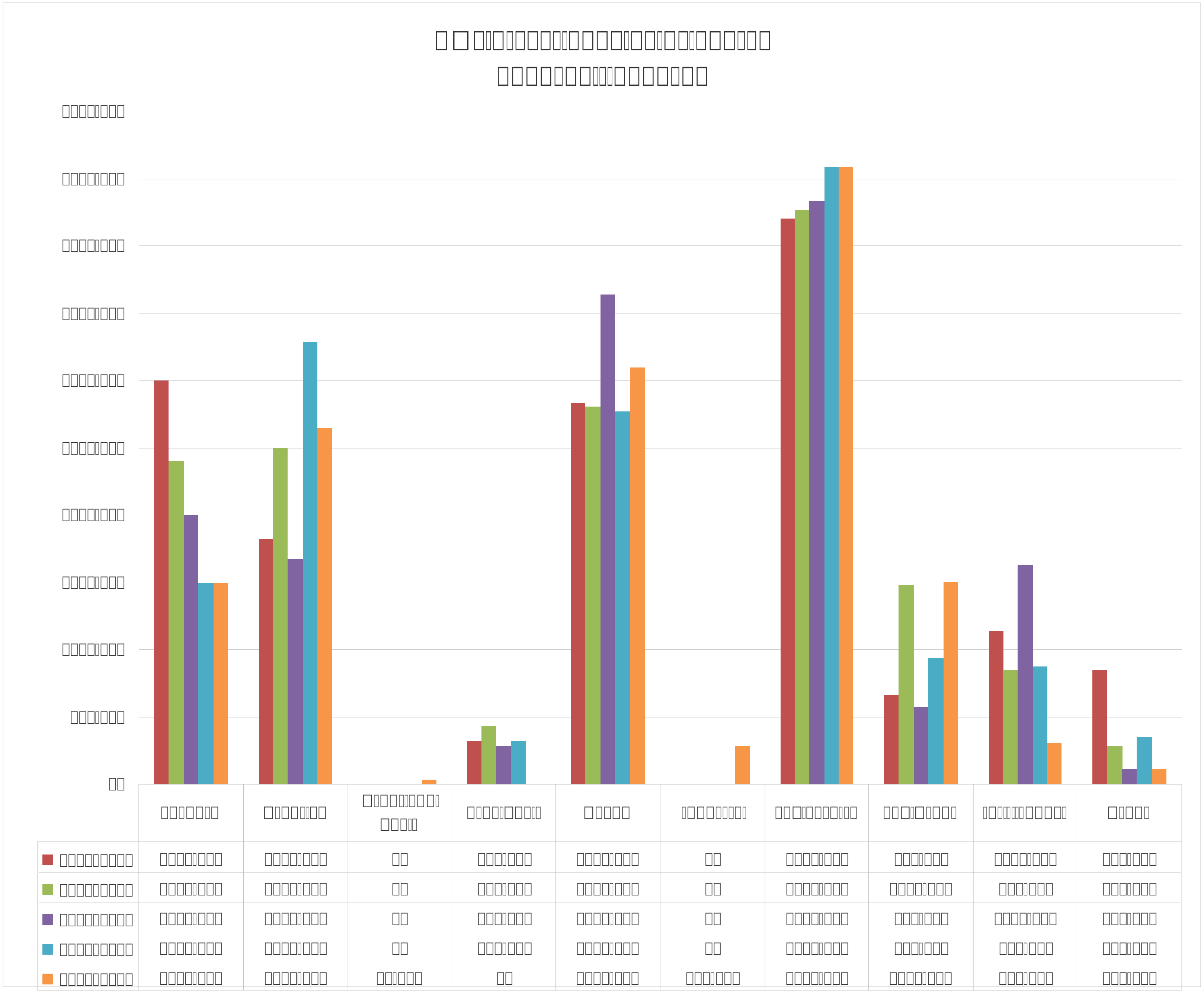
EC-sponsored PDF Cailin Xu modeled population fluctuations of Pacific and Atlantic dunlin, based on a 35-year time series of Christmas Bird Counts, with respect to environmental variation. The analysis implies that substantial annual mortality is associated with storm systems during southward migration. A second paper by Ydenberg, Xu and Lank is examining changes in regional distribution in the CBC data in the context of changes in danger regimes over the past 30 years.

important prey, the copepod *Neocalanus cristatus*. Conditions were less than idea for other

Division) that supplies $150,000 per year for CWE research in priority coastal, riparian and grassland ecosystems in British Columbia.

The 5 year chart compares revenue projections (formulated for this agreement) to actual revenue from Environment Canada, SFU and other industrial, provincial, federal and international sectors.





General Funding for CWE

Generated Research Funding

Species at Risk

Human Impact on Birds

Declining Avian Pn n

VII. PUBLICATIONS

This list reflects those publications produced since our last report (publications that were "in press" or "submitted" for the last report are included and have been updated). We continue to publish actively with 9 publications out in 2015 through April, 4 publications in press and 5 submitted. Two PhD and two MSc students supervised by CWE faculty successfully defended their theses. Most of our publications relate to the research carried out in the main CWE programs and most refer to work carried out in the Pacific Northwest. We are however interacting with scientists throughout Canada and beyond and some of our publications reflect this.

A. Books or Book chapters

Williams, T.D. and T.G.G. Groothuis. In press. Egg quality, embryonic development and post-hatching phenotype: an integrated perspective. In: *Nests and Eggs*, Deeming, C. and S.J. Reynolds, eds. Oxford: Oxford University Press.

B. Papers in Refereed Journals or Books

In press:

Green, D.J., I.B.J. Whitehorne, H.A. Middleton and C.A. Morrissey. In press. Do American dippers obtain a survival benefit from altitudinal migration? PLoS One.

van Oort, H., D.J. Green, M. Hepp and J.M. Cooper. In press. Do fluctuating water levels alter nest survivorship in reservoir shrubs? Condor.

Webster, K.H., K.E. Harr, D.C. Bennett, T.D. Williams, K.M. Cheng, F. Maisonneuve and J.E. Elliott. In press. Assessment of toxicity and coagulopathy of brodifacoum in Japanese quail and testing in wild owls. Ecotoxicol.

Williams, T.D. and M.A. Fowler. In press. Individual variation in workload during parental care: can we detect a physiological signature of quality or cost of reproduction? J. Ornithol.

2015

Currier, H.A., R.J. Letcher, T.D. Williams and J.E. Elliott. 2015. Assessment of effects of the polybrominated diphenyl ether BDE-47 on growth, development, and reproductive success in Zebra Finches. Bull. Environ. Contamin. Toxic. 94**:** 140-145.

Ellison, A.M., J. Watson and E. Demers. 2015. Testing problem-solving in turkey vultures (*Cathartes aura*