

Christopher R Field, PhD

christopher.field@uconn.edu (he/him)

[Personal webpage](#), [Google Scholar](#), [ResearchGate](#), [GitHub](#)

Most recent position

Postdoctoral researcher (2020 – 2021)
Department of Natural Resources Science
University of Rhode Island
Mentor: Dr. Brian Gerber

Visiting scholar (2020 – *present*)
Department of Ecology, Evolution, and Natural Resources
Rutgers University
Mentor: Dr. Julie Lockwood

Previous position

Postdoctoral Fellow (2017 – 2019)
National Socio-Environmental Synthesis Center (SESYNC)
University of Maryland

Education

PhD, Ecology and Evolutionary Biology, University of Connecticut, Advisor: Dr. Chris Elphick
(received May 2016)

Dissertation: A threatened ecosystem in a human-dominated landscape: tidal marsh conservation in the face of sea-level rise

MS, Biodiversity and Conservation Biology, University of Connecticut (received May 2007)

BS, Ecology and Evolutionary Biology with a special focus in Ornithology, University of Connecticut
(received May 2007)

Publications

Peer-reviewed

Ruskin KJ, Herring G, Eagles-Smith C, Eiklor A, Elphick CE, Etterson M, **Field CR**, Longenecker RA, Kovach AR, Shriver WG, Walsh J, Olsen BJ. 2022. Mercury exposure of tidal marsh songbirds in the northeastern United States and its effects on nest survival. *Ecotoxicology* 31:208-220, [10.1007/s10646-021-02488-1](https://doi.org/10.1007/s10646-021-02488-1).

Lopez BE, Kennedy C, **Field CR**, McPhearson T. 2021. Who benefits from urban green spaces during times of crisis? Perception and use of urban green spaces in New York City during the COVID-19 pandemic. *Urban Forestry & Urban Greening* 65:127354, <http://doi.org/10.1016/j.ufug.2021.127354>.

Vijay V, **Field CR**, Gollnow F, Jones KK. 2021. COVID-19 pandemic search behaviour shows increased links between human health and conservation. *Biological Conservation* 257:109078, <https://doi.org/10.1016/j.biocon.2021.109078>.

Klingbeil BT, Cohen JB, Correll MD, **Field CR**, Hodgman TP, Kovach AI, Lentz EE, Olsen BJ, Shriver GW, Wiest WA, Elphick CS. 2021. High uncertainty over the future of tidal marsh birds under current sea-level rise projections. *Biodiversity and Conservation* 30:431–443, <https://doi.org/10.1007/s10531-020-02098-z>.

Olsen BJ, Froehly JL, Borowske AC, Elphick CS, **Field CR**, Kocek AR, Kovach AI, Longenecker RA, Shriver GW, Walsh J, Ruskin KJ. 2019. A test of a corollary of Allen's rule suggests a role for population density. *Journal of Avian Biology* 50, <https://doi.org/10.1111/jav.02116>.

Field CR, Elphick CS. 2019. Quantifying the return on investment of social and ecological data for conservation planning. *Environmental Research Letters* 14:12408, <https://doi.org/10.1088/1748-9326/ab5cae>.

Field CR, Ruskin KJ, Cohen JB, Hodgman TP, Kovach AI, Olsen BJ, Shriver GW, Elphick CS. 2019. Framework for quantifying population responses to disturbance reveals that coastal birds are highly resilient to hurricanes. *Ecology Letters*, <http://doi.org/10.1111/ele.13384>.

Olsen BJ, Froehly JL, Borowske AC, Elphick CS, **Field CR**, Kocek AR, Kovach AI, Longenecker RA, Shriver WG, Walsh J, Ruskin KJ. 2019. A test of a corollary of Allen's rule suggests a role for population density. *Journal of Avian Biology*, <http://doi.org/10.1111/jav.02116>.

Klingbeil BT, Cohen JB, Correll MD, **Field CR**, Hodgman TP, Kovach AI, Olsen BJ, Shriver WG, Wiest WA, Elphick CS. 2018. Evaluating a focal-species approach for tidal marsh bird conservation in the northeastern United States. *The Condor* 120:4, <http://doi.org/10.1650/CONDOR-18-88.1>.

Field CR, Ruskin KJ, Benvenuti B, Borowske A, Cohen JB, Garey L, Hodgman TP, Kern RA, King E, Kocek AR, Kovach AI, O'Brien KM, Olsen BJ, Pau N, Roberts SG, Shelly E, Shriver WG, Walsh J, Elphick CS. 2018. Quantifying the importance of geographic replication and representativeness when estimating demographic rates, using a coastal species case study. *Ecography* 41:971-981, <http://doi.org/10.1111/ecog.02424>.

Borowske A, **Field CR**, Ruskin KA, Elphick CS. 2018. Consequences of breeding system for body condition and survival throughout the annual cycle of tidal marsh sparrows. *Journal of Avian Biology* 49:4, <https://doi.org/10.1111/jav.01529>.

Field CR, Dayer AA, Elphick CS. 2017. Landowner behavior can determine the success of conservation strategies for ecosystem migration under sea-level rise. *Proceedings of the National Academy of Sciences* 114:9134-9139, <http://doi.org/10.1073/pnas.1620319114>.

Ruskin KA, Etterson MA, Hodgman TP, Borowske A, Cohen JB, Elphick CS, **Field CR**, Kern RA, King E, Kocek AR, Kovach AI, Pau N, Shriver WG, Walsh J, Olsen BJ. 2017. Demographic analysis demonstrates systematic but independent spatial variation in abiotic and biotic stressors across 59% of global species range. *The Auk* 134:903-916, <https://doi.org/10.1642/AUK-16-230.1>.

Correll MD, Wiest WA, Hodgman TP, Kelley J, McGill BJ, Elphick CS, Shriver WG, Conway M, **Field CR**, Olsen BJ. 2017. A Pleistocene disturbance event explains modern diversity patterns in tidal marsh birds. *Ecography* 41:684-694, <http://dx.doi.org/10.1111/ecog.02937>.

Field CR, Bayard T, Gjerdrum C, Hill J, Meiman S, Elphick CS. 2017. High-resolution tide projections reveal extinction threshold in response to sea-level rise. *Global Change Biology* 23:2058–2070, <http://dx.doi.org/10.1111/gcb.13519>.

Ruskin KA, Etterson MA, Hodgman TP, Borowske A, Cohen JB, Elphick CS, **Field CR**, Kern RA, King E, Kocek AR, Kovach AI, Pau N, Shriver WG, Walsh J, Olsen BJ. 2016. Seasonal fecundity is not related to geographic position across a species' global range despite a central peak in abundance. *Oecologia*, <http://dx.doi.org/10.1007/s00442-016-3745-8>.

Field CR, Gjerdrum C, Elphick CS. 2016. Forest resistance to sea-level rise prevents landward migration of tidal marsh. *Biological Conservation* 201:363-369, <http://dx.doi.org/10.1016/j.biocon.2016.07.035>.

Field CR, Gjerdrum C, Elphick CS. 2016. Choice of statistical method to adjust counts for imperfect detection has little effect on inferences about animal abundance. *Methods in Ecology and Evolution*, <http://dx.doi.org/10.1111/2041-210X.12601>.

Reed MJ, **Field CR**, Silbernagle MD, Nadig A, Goebel K, Dibben-Young A, Donaldson P, Elphick CS. 2015. Application of the complete-data likelihood to estimate juvenile and adult survival for the endangered Hawaiian stilt. *Journal of Animal Conservation* 18:176-185, <http://dx.doi.org/10.1111/acv.12156>.

Mengesha G, Elphick CS, **Field CR**, Bekele A, Mamo Y. Abundance and temporal patterns in wetland birds in and around Lake Zeway, Ethiopia. 2015. *Journal of Biodiversity Management & Forestry*, 2015.

Elphick CS, **Field CR**. 2014. Monitoring indicators of climate change along Long Island Sound: A simple protocol for collecting baseline data on marsh migration. *Wetland Science and Practice* 31:7-9.

In review

Field CR. The creation of ghost forests is driven by physical, ecological, and disturbance factors but remains a rare phenomenon (in review) [preprint available at BioRxiv].

Field CR. Identifying and overcoming model skepticism to better understand the impacts of offshore wind (in review) [manuscript available upon request].

Field CR. Quantifying the effect of giant turbines on bird collision risk (in review) [manuscript available upon request].

Cho SJ, Encinas Z, Jenkins LD, Chandler L, Adams A, Ardoin NM, Lopez BE, **Field CR**. Environmental public art: a conceptual model outlining social, cultural, and environmental factors for catalyzing environmental awareness and community engagement (in review)

Popular articles

[Riding Out the Storm ... But Not Climate Change](#). *Maryland Today*.

[Coverage of Field et al. 2019, *Ecology Letters*; C. Field is sole author of the *Maryland Today* article but could not be listed due to institutional constraints on bylines]

Askins RA, **Field CR**. 2016. The future of early successional forest birds in Connecticut. *Connecticut State of the Birds*, Connecticut Audubon Society, https://www.ctaudubon.org/wp-content/uploads/2016/11/SOTB16_Final.pdf.

White papers and reports

Field CR, Elphick CS. 2020. Modeling the potential for alternative management strategies to improve the conservation status of saltmarsh sparrow and other tidal marsh specialist birds. Final report to Atlantic Coast Joint Venture, U.S. Fish and Wildlife Service.

Field CR, Elphick CS. 2017. Navigating trade-offs in game vs. non-game management: incorporating American Black Ducks into coastal conservation planning. Final report to Connecticut Department of Energy and Environmental Protection.

Field CR, Elphick CS. 2016. Human dimensions of LIS ecosystems: an evidence-based socio-ecological model for education and management. Final report to Connecticut SeaGrant.

Field CR, Elphick CS, with key contributions from co-investigators Correll MD, Huang M, Olsen BJ. 2014. Sentinels of climate change: coastal indicators of wildlife and ecosystem change in Long Island Sound. Final report to Connecticut Department of Energy and Environmental Protection/Long Island Sound Study, <https://www.tidalmarshbirds.org/?download=2910>.

Fellowship and awards

2017. Greg and Mona Anderson Award for Best Dissertation of 2016. (University of Connecticut, Ecology and Evolutionary Biology Dept.)

2014. Switzer Environmental Fellowship (\$15,000). <http://www.switzernetwork.org/user/928>

2014. University of Connecticut CLAS Graduate Fellowship (support for one semester).

2008. National Audubon Society ACE award.

2007. Audubon Excellence award for a stewardship team for work coordinating stakeholders during the development and implementation of the Lighthouse Point Park conservation plan.

Grants awarded

2021. Incorporating new tracking technologies in the transparent modeling of collision risk for bird species. Co-PIs: **CR Field**, BD Gerber, PR Loring. Bureau of Ocean Energy Management (\$250,566 [grant awarded but amount subject to final adjustments]).

2019. Modeling the potential for alternative management strategies to improve the conservation status of saltmarsh sparrow and other tidal marsh specialist birds. Co-PIs: **CR Field**, CS Elphick. U.S. Fish and Wildlife Service (\$49,000).

2019. Evaluating the impact of environmental public art in the US. Funding for workshop at the National Socio-Environmental Synthesis Center (SESYNC). Co-PIs: SE Cho, **CR Field**, BE Lopez.

2017. Research Immersion Fellowship. National Socio-Environmental Synthesis Center (SESYNC). NSF (\$215, 000).

2014. Navigating trade-offs in game vs. non-game management: incorporating American Black Ducks into coastal conservation planning. PI: CS Elphick; Co-PI: **CR Field**. CT Department of Energy and Environmental Protection (\$50,500). [CF role: took lead on conceptual development and grant writing; listed as co-PI due to institutional restrictions on graduate students being PIs]

2014. Human dimensions of LIS ecosystems: an evidence-based socio-ecological model for education and management. PI: CS Elphick; Co-PIs: **CR Field**, A Dayer. CT Sea Grant (\$129,372). [CF role: took lead on conceptual development and grant writing; listed as co-PI due to institutional restrictions on graduate students being PIs]

2014. Is sea-level rise affecting the growth rates of trees in Long Island Sound's coastal forest? Ecology and Evolutionary Biology/Museum of Natural History Award (\$952).

2013. Ecological resistance of multiply stressed populations: the response of tidal marsh birds and plants to Hurricane Sandy. PIs: BJ Olsen, CS Elphick, WG Shriver. NSF-RAPID (\$199,976). [CF role: unnamed collaborator due to institutional restrictions on students being named on grants; contributed analytical design to proposal and was lead data analyst for project]

2013. Are Long Island Sound's coastal forests reaching a tipping point? Ecology and Evolutionary Biology/Museum of Natural History Award (\$1,000).

2012. Sentinels of climate change: coastal indicators of wildlife and ecosystem change in Long Island Sound. PI: CS Elphick; Co-PIs: **CR Field**, M Huang. Long Island Sound Study (\$193,049).

2006. Important Bird Area Conservation Plan for Lighthouse Point Park. People's Bank community award (\$5,000).

2006. The vocal behavior of Saltmarsh Sharp-tailed Sparrows. Summer Undergraduate Research Fund (\$3,000).

2006. Important Bird Area Conservation Plan for Lighthouse Point Park. Quebec-Labrador Foundation Sound Conservancy Grants Program (\$500).

Presentations

Invited talks

Field CR. 2022. Assessing the state of forecasting and population viability analyses for saltmarsh sparrows. Presentation to the Species Status Assessment team at U.S. Fish and Wildlife Service, Hadley, MA, U.S.

Field CR. 2021. What evidence can scientists be generating to support smart decision-making for coastal and offshore conservation? UMass Environmental Conservation seminar series, University of Massachusetts.

Field CR. 2021. Decision support for offshore wind and bird collisions. Presentation to U.S. Offshore Wind Avian Working Group.

Field CR. 2020. Socio-ecological modeling of endangered tidal marsh birds. Department seminar, Department of Natural Resources Science, University of Rhode Island.

Field CR. 2020. Weathering the storm but not the sea: socio-ecological modeling reveals a bleak future for tidal marsh birds. Department seminar, School of Biology & Ecology, University of Maine.

Field CR. 2019. Planning for coastal squeeze: Is our current understanding of the socio-environmental factors that drive ecosystem migration enough? Resilience Building in the Coastal Zone Conference, Earth Institute, Columbia University, New York, NY, U.S.

Field CR. 2018. Integrating ecology and social science to predict ecosystem change for tidal marshes. Department seminar, Department of Ecology, Evolution, and Natural Resources, Rutgers, New Brunswick, MA, U.S.

Field CR. 2017. Marshes on the move? Ecological and human roadblocks to tidal marsh migration in the Northeast. UMass Boston Dimensions of Sustainability series, Boston, MA, U.S.

Field CR, Dayer AA, Elphick CS. 2017. Will landowner behavior and resilient forests hold back marsh migration in Long Island Sound? NOAA Science Seminar, Silver Spring, MD, U.S.

Field CR and Elphick CS. 2016. Conservation status of saltmarsh sparrow and other tidal marsh birds in the northeastern U.S. USFWS Science Seminar, Hadley, MA, U.S.

Field CR and Elphick CS. 2013. Coastal Connecticut Decision Support Tool. Atlantic Flyway Council Annual Meeting, Mystic, CT, U.S.

Field CR and Elphick CS. 2012. Trade-offs in coastal conservation: making the costs and benefits of alternative actions explicit. Plenary talk, Bird Conservation Conference in the Northeast, Plymouth, MA, U.S.

Field CR 2009. Breeding bird atlases as tools for conservation. Plenary talk. Connecticut Ornithological Association, Middlesex, CT, U.S.

Conference presentations

Field CR, Elphick CS. 2020. Modeling and visualizing management scenarios for saltmarsh sparrows (*Ammospiza caudactus*). National Coastal & Estuarine Summit.

Field CR, Loring P, Gerber B. 2020. Updating collision risk models (CRMs) to quantify cumulative impacts for endangered birds. State of the Science Workshop on Wildlife and Offshore Wind Energy, New York State Energy Research and Development Authority.

Elphick CS, **Field CR,** et al. 2019. Using demographic simulations to understand the resilience of conservation priority species to extreme weather and other disturbance events. International Congress for Conservation Biology, Kuala Lumpur, Malaysia.

Field CR, Organizer. 2019. Art-science collaboration for ecology, conservation, and sustainability symposium, International Association of Landscape Ecology Annual Meeting, Fort Collins, CO, U.S.

Lopez BE, **Field CR.** 2019. Art-science collaboration: An introduction. International Association of

Landscape Ecology Annual Meeting, Fort Collins, CO, U.S.

Field CR, Lopez BE. 2019. Frameworks for using art as a tool for conservation behavior change. International Association of Landscape Ecology Annual Meeting, Fort Collins, CO, U.S.

Lopez BE, **Field CR**. 2018. Exploring the power of nature's intrinsic value for conservation. Integrative Conservation Conference, Athens, GA, U.S.

Field CR, Dayer AA, Elphick CS. 2017. Large-scale surveys highlight potential for ecological and social impediments to marsh migration. Coastal & Estuarine Research Federation, Providence, RI, U.S.

Field CR, Dayer AA, Elphick CS. 2016. Ecological and social impediments to marsh migration in Long Island Sound. National Summit on Coastal and Estuarine Restoration and meeting of the Coastal Society, New Orleans, LA, U.S.

Dayer AA, **Field CR**, Elphick CS. 2016. Effects of ecosystem services messages on coastal landowner attitudes and behaviors in the face of sea level rise. North American Congress for Conservation Biology, Madison, WI, U.S.

Field CR, Dayer AA, Elphick CS. 2016. Will coastal landowners allow tidal marsh migration? Long Island Sound Research Conference, Storrs, CT, U.S.

Field CR, Gjerdrum C, Elphick CS. 2015. Is marsh transgression necessary to secure the future of tidal marsh birds in the face of sea-level rise? Society for Wetland Scientists, Providence, RI, U.S.

Field CR, Dayer AA, Elphick CS. 2015. Integrating social data into conservation planning for tidal marshes. Connecticut Conference on Natural Resources, Storrs, CT, U.S.

Field CR, Gjerdrum C, Elphick CS. 2015. Recent trends in Connecticut's tidal marsh vegetation. Northeast Association of Fish and Wildlife Agencies, Portland, ME, U.S.

Elphick CS, Reed JM, **Field CR**. 2013. Complex statistics and stakeholder engagement: Is a better analysis always a good idea? International Congress for Conservation Biology, Baltimore, MD, U.S.

Elphick CS, **Field CR**, Olsen BJ, Hodgman TP, Shriver GW. 2013. The ability of tidal marshes to maintain vertebrate biodiversity is slipping: Is human mitigation possible? Northeastern Geological Society of American Section Meeting, Bretton Woods, NH, U.S.

Reed JM, **Field CR**, Silbernagle MD, Nadig A, Goebel K, Dibben-Young A, Donaldson P, Elphick CS. 2013. Survival rate of Hawaiian Stilts. Hawaiian wetland management: Reflections on 30 years of efforts and ecological thinking associated with management in a highly modified system. Kaneohe, HI, U.S.

Field CR, Elphick CS. 2012. A decision support tool for salt marsh conservation in Connecticut. Connecticut Conference on Natural Resources, Storrs, CT, U.S.

Elphick CS, **Field CR**, Bayard T, Meiman S, Hill J, Gjerdrum C, Rubega M. 2012. Projected extinction of tidal marsh sparrows following sea-level rise: Can people do anything? North America Congress for Conservation Biology, Oakland, CA, U.S.

Field CR, Elphick CS. 2011. Bursting the bubble for bird populations: an interaction Motion Chart of statewide trends. Connecticut Conference on Natural Resources, Storrs, CT, U.S.

Teaching and mentoring

Published case studies

2018. Lawrence BA, **Field CR**. The Polar Bear of the Salt Marsh? National Center for Case Study Teaching in Science, <https://www.nsta.org/ncss-case-study/polar-bear-salt-marsh>.

Courses taught

2020. *Introduction to Bayes*, Guest Lecturer, University of Rhode Island.

2018. *Methods for quantitative risk assessment in ecology and conservation* (short course), Instructor, University of Connecticut.

2016. *Conservation Biology*, Guest Lecturer, Eastern Connecticut State University.

2016. *Wetlands Biology and Conservation*, Guest Lecturer, University of Connecticut.

2015. *Summer Flora*. Guest Lecturer, University of Connecticut.

2012. *Ornithology*. Teaching Assistant and Guest Lecturer, University of Connecticut.

2007. *Fundamentals of Biology*. Teaching Assistant, University of Connecticut.

Mentoring

2011-2015. Mentored two undergraduate students conducting honors theses related to my dissertation research. University of Connecticut.

2010. Mentored high school student conducting an independent research project for Glastonbury High School's Science Mentor Program. University of Connecticut.

2010. Advised two undergraduates for Yale School of Forestry and Environmental Studies' practitioner mentor program. National Audubon Society.

Media and press coverage

Press

Living Bird Magazine. Sea Change: As Sea Levels Rise, Can Saltmarshes Be Saved?
<https://www.allaboutbirds.org/news/living-bird-spring-2020-table-of-contents/>

New York Times. Hurricanes may kill some birds, but humans are the real threat.
<https://www.nytimes.com/2019/09/17/science/hurricanes-birds-threat.html> [Coverage of Field et al. 2019, *Ecology Letters*]

WreckLines (Fall-Winter 2019-20 issue). Keeping up with sea-level rise: natural and human influence on salt marsh migration. <https://seagrant.uconn.edu/wp-content/uploads/sites/1985/2019/12/Marsh.migration.NBalcom.pdf> [Coverage of Field et al. 2017, *PNAS*]

The Wildlife Society. For shorebirds, hurricanes aren't the biggest threat.

<https://wildlife.org/for-shorebirds-hurricanes-arent-the-biggest-threat/> [Coverage of Field et al. 2019, *Ecology Letters*]

Maryland Today. Riding Out the Storm ... But Not Climate Change.

https://today.umd.edu/articles/riding-out-storm-not-climate-change-77803a74-1961-47a8-933b-7f8cddf7f20b?utm_source=MD+Today&utm_campaign=3e2ea5cb43-EMAIL_CAMPAIGN_2019_09_20_06_35&utm_medium=email&utm_term=0_a897daf4c7-3e2ea5cb43-48122127 [Coverage of Field et al. 2019, *Ecology Letters*]

UConn Today. Coastal birds can weather the storm, but not the sea.

<https://today.uconn.edu/2019/09/coastal-birds-can-weather-storm-not-sea/> [Coverage of Field et al. 2019, *Ecology Letters*]

New York Times. Saltmarsh sparrows fight to keep their heads above water.

<https://www.nytimes.com/2018/09/17/science/saltmarsh-sparrow-extinction.html> [Coverage of Field et al. 2017, *Global Change Biology*]

ClimateWire. Landowners mostly unwilling to make room for wetlands.

<https://www.eenews.net/climatewire/stories/1060058499/search> [Coverage of Field et al. 2017, *PNAS*]

Connecticut Public Radio (WNPR). Coastal resiliency projects lack landowner support in Connecticut.

<http://wnpr.org/post/coastal-resiliency-projects-lack-landowner-support-connecticut> [Coverage of Field et al. 2017, *PNAS*]

New London Day. UConn study finds resistance to conservation easements.

<http://www.theday.com/local/20170809/uconn-study-finds-resistance-to-conservation-easements> [Coverage of Field et al. 2017, *PNAS*]

New Haven Register. UConn study examines sea level rise, response from coastal property owners.

<http://www.nhregister.com/connecticut/article/UConn-study-examines-sea-level-rise-response-11759731.php> [Coverage of Field et al. 2017, *PNAS*]

Television and radio appearances

2015. Aqua Kids television show, PBS. Episode: Coastal marshes.

<http://www.switzernetwork.org/fellows-news/field-featured-aqua-kids-episode-salt-marsh-birds-and-habitat>

2011. The Colin McEnroe Show, Connecticut Public Radio (WNPR). Episode: One for the birds of Connecticut.

Peer reviewer

Proceedings of the Royal Society B, Ecology, Conservation Biology, Ecography, Avian Conservation and Ecology, Biological Conservation, PLOS ONE, Ecology and Evolution, The Auk, Ibis.

Other professional positions

2019 – 2020. Independent contractor, U.S. Fish and Wildlife Service, Atlantic Coast Joint Venture (ACJV), 40 hrs/wk.

2016 – 2017. Postdoctoral Researcher, Ecology and Evolutionary Biology, University of Connecticut, 40 hrs/wk.

2008 – 2011. Important Bird Areas Program Coordinator for Connecticut, National Audubon Society, 40 hrs/wk.

2007 – 2008. Lab and research manager, Yale University. Coordinated research for Dr. Maria Diuk-Wasser's lab, 40 hrs/wk.

2007 – 2008. Independent contractor, Co-author of the Falkner Island Important Bird Area Conservation Plan.

2006 – 2008. Independent contractor, Author of the Lighthouse Point Park Important Bird Area Conservation Plan.