

In this review:

- A. Recent articles – no abstract
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A. Recent articles – no abstract

Rocke, T.E. and Barker, I. **Proposed link between paralytic syndrome and thiamine deficiency in Swedish gulls not substantiated.** *Proceedings of the National Academy of Sciences [USA]* 107(4): 14, 2010.

B. Recent publications available online

Lanctot, R.B., Aldabe, J., Almeida, J.B., Blanco, D., Isacch, J.P., Jorgensen, J., Norland, S., Rocca, P. and Strum K.M. 2009. **Conservation Plan for the Buff-breasted Sandpiper (*Tryngites subruficollis*).** Version 1.0. U.S. Fish and Wildlife Service, Anchorage, Alaska, and Manomet Center for Conservation Sciences, Manomet, Massachusetts, USA. 108pp.

Available at: [http://www.whsrn.org/sites/default/files/file/Conservation Plan for the Buff-breasted Sandpiper 10 01-13.pdf](http://www.whsrn.org/sites/default/files/file/Conservation%20Plan%20for%20the%20Buff-breasted%20Sandpiper%2010%2001-13.pdf)

Notes: The Buff-breasted Sandpiper (*Tryngites subruficollis*) is a medium-size shorebird that breeds sporadically (both temporally and spatially) along Arctic coasts in Russia, Alaska, and Canada (Lanctot and Laredo 1994). It spends the nonbreeding (wintering) season in South America on the pampas of Argentina, Uruguay, and Brazil where individuals frequent heavily grazed grasslands adjacent to wetlands. Once abundant, the population decreased substantially due to commercial harvests in the late 1800s and to loss of habitat along its migratory route in the central United States and its nonbreeding grounds in South America. Recent surveys on breeding, migration, and nonbreeding grounds suggest this species may still be declining, although more study is needed to accurately determine the actual population size and trend. In 1999, the Buff-breasted Sandpiper was added to Appendix I and II of the Convention on the Conservation of Migratory Species of Wild Animals. The species is also categorized as a Highly Imperiled global species in the U.S. Shorebird Conservation Plan (2004), and as a species of High Concern in the Canadian Shorebird Conservation Plan. The species is also a high-priority bird in Argentina, Brazil, Paraguay, and Uruguay. Factors that led to these designations were a small and declining population, and a relatively small nonbreeding area within which birds concentrate. Based on recent survey work on migration sites in North America, the authors suggest revising the estimated population size of Buff-breasted Sandpipers from 30,000 to 56,000 individuals (range of 35,000 to 78,000), and note that it is important to recognize that there is large uncertainty in this estimate. Conservation threats faced by the species vary throughout the annual cycle. On the breeding grounds, habitat is being lost or degraded due to energy production and climate change. Climate change may also be affecting demographic parameters but the overall effects are unclear. During migration, Buff-breasted Sandpipers may be negatively impacted from wind field installations and habitat changes. Climate change may also affect the species during migration by increasing the severity of storms over the western Atlantic that could directly impact survival rates of juveniles. On the nonbreeding range, Buff-breasted Sandpipers are

threatened by conversion of historic grasslands into agriculture, wood plantations, mines, and tourist locations. Finally, climate change may result in sea-level rise and greater precipitation, which will inundate the many low-lying areas used by the species during the nonbreeding season.

BirdLife International. 2010. **Rockhopper Penguins: A Plan for Research and Conservation Action to Investigate and Address Population Changes.** Proceedings of an International Workshop Edinburgh, 3–5 June 2008. BirdLife International, Cambridge, UK. 126pp.

Available at: http://www.birdlife.org/downloads/news/birdlife_rockhopper_penguin_report.pdf

Notes: The aim of this Report is to provide an assessment of research and conservation action required to investigate and address population declines in southern and northern rockhopper penguins, both at a global and a regional scale. Rockhopper penguins live in the Indian, South Atlantic and Pacific Oceans. There are two distinct species: northern rockhopper penguin *Eudyptes moseleyi* (Endangered) and southern rockhopper penguin *Eudyptes chrysocome* (Vulnerable), and both these species have been disappearing from the southern oceans. Over the past 37 years, the number of northern rockhopper penguins has declined by 57% from 390,000 to 168,000 pairs, while, based on breeding sites that have been accurately surveyed, the number of southern rockhopper penguins has declined by 34% from 1,792,000 to 1,177,000 pairs. The causes of declines have been largely unknown though potential factors include climate change, pollution, changes in the marine food web, disease and fishery interactions. The report sets out the steps which must be taken to help save the species and calls for international action so that the actual and potential impacts of these factors can be properly researched and addressed.

North American Bird Conservation Initiative, U.S. Committee. 2009. **The State of the Birds, United States of America, 2009.** U.S. Department of Interior: Washington, DC. 36pp.

Available at: http://www.stateofthebirds.org/2009/pdf_files/State_of_the_Birds_2009.pdf

Notes: The United States is home to a tremendous diversity of native birds, with more than 800 species inhabiting terrestrial, coastal, and ocean habitats, including Hawaii. Among these species, 67 are federally listed as endangered or threatened. An additional 184 are species of conservation concern because of their small distribution, high threats, or declining populations. Every U.S. habitat harbors birds in need of conservation. Hawaiian birds and ocean birds appear most at risk, with populations in danger of collapse if immediate conservation measures are not implemented. At least 39% of the U.S. birds restricted to ocean habitats are declining. These birds face threats from pollution, over-fishing, and warming sea temperatures caused by climate change, as well as threats at island and coastal nesting sites. Declining seabirds may be the most visible indication of an ocean ecosystem under stress. Bird populations in grassland and aridland habitats show the most rapid declines over the past 40 years. Birds that depend on forests are also declining. In contrast, wetland species, wintering coastal birds, and hunted waterfowl show increasing populations during the past 40 years, reflecting a strong focus during this period on wetlands conservation and management. Although some coastal birds are increasing, shorebirds that rely on coastal habitats for breeding and refueling on migration are besieged by human disturbance and dwindling food supplies. Sea level rise caused by accelerating climate change will inundate shoreline habitats. Half of all coastally migrating shorebirds have declined. Because of their relatively small and highly threatened global populations, shorebirds are of high conservation concern.

van Beusekom, R., Langley, N. and Tentij, M. (eds.). 2009. **The Wadden Sea: A vision for the conservation of a Natural Heritage.** Vogelbescherming Nederland, Dansk Ornitologisk Forening and NABU. 26pp.

Available at: <http://www.birdlife.org/eu/pdfs/Waddenvision.pdf>

Notes: The Wadden Sea is one of the last true wilderness areas in Northwest Europe. Characterised by vast mudflats, it stretches over three countries: Denmark, Germany and the Netherlands and is a complex of Important Bird Areas. The region is important for millions of birds including species such as Red Knot *Calidris canutus*, Bar-tailed Godwit *Limosa lapponica*,

Sandwich Tern *Sterna sandvicensis*, Eurasian Spoonbill *Platalea leucorodia* and Pied Avocet *Recurvirostra avosetta*. This report notes, however, that the numbers of some bird species for which the Wadden Sea is of international importance have dropped significantly since 1987. Regular monitoring shows that Common Eider *Somateria mollissima*, Eurasian Oystercatcher *Haematopus ostralegus* and Kentish Plover *Charadrius alexandrinus* have declined significantly. These birds are highly specialised species which depend on the healthy functioning of the Wadden Sea's uniquely varied ecosystem of intertidal mudflats, salt marshes and sand banks. Their plight is a reliable indicator of the region's declining condition due to industrial developments, large scale fisheries, growing mass tourism, military activities, intensive farming, and the effects of climate change. This report outlines a number of required conservation measures such as protecting biodiversity by restoring a strong food web based on healthy biogenic structures like shellfish banks and eel grass fields, restoring the unique natural landscape along the coast, letting natural processes have free reign again and guaranteeing undisturbed breeding places and high tide refuges for birds.

C. Recent articles with abstracts

Merkel, F.R., Mosbech, A., and Riget, F. **Common eider *Somateria mollissima* feeding activity and the influence of human disturbances.** *Ardea* 97(1): 99-107, 2009.

Notes: We studied the impact of human disturbances on the feeding activities of Common Eiders *Somateria mollissima* wintering in Southwest Greenland. Eider activity and human disturbances (fast moving, open boats) were recorded during 9 days of observations in mid and late winter 2002. When most heavily disturbed, the feeding activity in the study area was reduced up to 60% on a daily basis. At the same time locomotion activity tripled. Logistic regression analyses showed that eiders attempted to compensate for lost feeding opportunities by rescheduling more feeding to periods where feeding conditions were relatively less profitable with respect to other variables. When undisturbed, eiders avoided feeding during high tide and intensified feeding at the start and at the end of the day, but these tendencies were levelled out if eiders were disturbed. When disturbed, the time interval and the distance to the last disturbance were both significant explanatory variables for the feeding activity. There was a cumulative effect of repeated disturbances on the feeding activity if disturbances were close in time and space (<1 h, <1 km). The day with the highest number of disturbances coincided with observations of nocturnal feeding the following night and may indicate that a critical threshold of disturbances was reached where eiders could not rely on a diurnal feeding strategy.

Ward, D.H., Dau, C.P., Tibbitts, T.L., Sedinger, J.S., Anderson, B.A., and Hines, J.E. **Change in abundance of Pacific brant wintering in Alaska: Evidence of a climate warming effect?** *Arctic* 62(3): 301-311, 2009.

Notes: Winter distribution of Pacific Flyway brant (*Branta bernicla nigricans*) has shifted northward from low-temperate areas to sub-Arctic areas over the last 42 years. We assessed the winter abundance and distribution of brant in Alaska to evaluate whether climate warming may be contributing to positive trends in the most northern of the wintering populations. Mean surface air temperatures during winter at the end of the Alaska Peninsula increased about 1 °C between 1963 and 2004, resulting in a 23% reduction in freezing degree days and a 34% decline in the number of days when ice cover prevents birds from accessing food resources. Trends in the wintering population fluctuated with states of the Pacific Decadal Oscillation, increasing during positive (warm) phases and decreasing during negative (cold) phases, and this correlation provides support for the hypothesis that growth in the wintering population of brant in Alaska is linked to climate warming. The size of the wintering population was negatively correlated with the number of days of strong northwesterly winds in November, which suggests that the occurrence of tailwinds favorable for migration before the onset of winter was a key factor in whether brant migrated from Alaska or remained there during winter. Winter distribution of brant on the Alaska Peninsula was highly variable and influenced by ice cover, particularly at the heavily used Izembek Lagoon. Observations of previously marked brant indicated that the Alaska wintering population was composed primarily of birds originating from Arctic breeding colonies that appear to be growing. Numbers of brant in Alaska during winter will likely increase as temperatures rise and ice cover decreases at high latitudes in response to climate warming.

Jones, T. and Cresswell, W. **The phenology mismatch hypothesis: are declines of migrant birds linked to uneven global climate change?** *Journal of Animal Ecology* 79(1): 98-108, 2010. O/A

Notes: 1. Migrant bird populations are declining and have been linked to anthropogenic climate change. The phenology mismatch hypothesis predicts that migrant birds, which experience a greater rate of warming in their breeding grounds compared to their wintering grounds, are more likely to be in decline, because their migration will occur later and they may then miss the early stages of the breeding season. Population trends will also be negatively correlated with distance, because the chances of phenology mismatch increase with number of staging sites. 2. Population trends from the Palaearctic (1990-2000) and Nearctic (1980-2006) were collated for 193 spatially separate migrant bird populations, along with temperature trends for the wintering and breeding areas. An index of phenology mismatch was calculated as the difference between wintering and breeding temperature trends. 3. In the Nearctic, phenology mismatch was correlated with population declines as predicted, but in the Palaearctic, distance was more important. This suggests that differential global climate change may be responsible for contributing to some migrant species' declines, but its effects may be more important in the Nearctic. 4. Differences in geography and so average migration distance, migrant species composition and history of anthropogenic change in the two areas may account for the differences in the strength of the importance of phenology mismatch on migrant declines in the Nearctic and Palaearctic.

Liu, Y., Guo, D.S., Qiao, Y.L., Zhang, E., and Cai, B.F. **Regional extirpation of the Critically Endangered Chinese Crested Tern (*Thalasseus bernsteini*) from the Shandong Coast, China?** *Waterbirds* 32(4): 597-599, 2009.

Notes: Skin collections show that the Shandong coast of China used to harbor a breeding population of the Chinese Crested Tern, *Thalasseus bernsteini*, in the 1930s. However, the current status of this Critically Endangered population is poorly documented. From June to July 2006 a survey was conducted along the southern Shandong coast. The results suggest that the species has likely been extirpated. The extirpation of the regional breeding population may have resulted from anthropogenic colonization and development on the breeding islands starting during the 1950s.

Beaulieu, M., Dervaux, A., Thierry, A.-M., Lazin, D., Le Maho, Y., Ropert-Coudert, Y., Spée, M., Raclot, T., and Ancel, A. **When sea-ice clock is ahead of Adélie penguins' clock.** *Functional Ecology* 24(1): 93-102, 2010. O/A

Notes: In Polar Regions, the extent and dynamics of sea-ice are changing. This affects the ocean productivity which consecutively impacts plankton communities and polar top predators like penguins. Yet, the underlying behavioural and physiological mechanisms remain poorly understood. Here we monitored the ecophysiological responses of Adélie penguin (*Pygoscelis adeliae*) pairs during two seasons of contrasting timing of sea-ice retreat. Beside classical breeding parameters like foraging trip duration, body mass and reproductive success, we also investigated food-related stress (*via* plasma corticosterone concentration), nutritional state (*via* metabolite levels) and the use of penguins' habitat (*via* blood isotopic values). Body mass and reproductive success remained unchanged but foraging trips were shorter when sea-ice retreated earlier. Constant plasma corticosterone concentrations indicated that none of the feeding conditions resulted in a food-related stress. However metabolite levels were lower when sea-ice retreated early, suggesting that the foraging performance and the quality/quantity of food differed. Indeed isotopic ratios indicated that coastal prey like fish contributed more to the penguins' diet when sea-ice retreated prematurely. The early sea-ice retreat was related to higher chlorophyll concentrations, known to favour krill recruitment. Paradoxically, this was not associated to a higher krill contribution in the penguins' diet. We propose that a shift in the phytoplankton quality (rather than quantity), affecting krill recruitment, forced penguins to switch to more available prey like coastal fish. In some Antarctic regions, sea-ice is retreating earlier and earlier. In the present study, even though the timing of sea-ice retreat and the consecutive ocean productivity differed drastically between the 2 years, Adélie penguins were not severely affected because they were able to adjust their at-sea behaviour and thus maintained their body condition and reproductive success unchanged. This suggests that the timing of sea-ice retreat does not represent an important threat to populations of Adélie penguins at least as long as alternative resources are still available and other environmental parameters like winter sea-ice extent are not dramatically altered.

Jenssen, B.M., Aarnes, J.B., Murvoll, K.M., Herzke, D., and Nygård, T. **Fluctuating wing asymmetry and hepatic concentrations of persistent organic pollutants are associated in European shag (*Phalacrocorax aristotelis*) chicks.** *The Science of the Total Environment* 408(3): 578-585, 2010.

Notes: In aquatic birds, high body burdens of persistent organic pollutants (POPs) have been associated with developmental effects related to growth, increased fluctuating wing asymmetry, and disruption of the thyroid hormone, vitamin A (retinol) and vitamin E (tocopherol) homeostasis. The aim of the present study was to examine if morphological variables (body mass, liver mass, wing length, tarsus length and head length), fluctuating asymmetry of the wings and tarsus, growth rates and endocrine variables (thyroid hormones, retinol and tocopherol) were associated with hepatic levels of POPs (PCBs, OCPs and PBDEs) in 21 day old chicks of European shag (*Phalacrocorax aristotelis*). Partial Least Squares (PLS) analysis showed that fluctuating asymmetry of wing bone length (FA_{WBL}) was affected by PCB-105, -118, -138, -153, and -180 ($r^2_x = 0.88$, $r^2_y = 0.35$, $q^2 = 0.29$). Bivariate correlation confirmed significant positive relationships between FA_{WBL} and each of these PCB congeners. In the PLS model no other biological variables were significantly affected by any of the POPs. Levels of POPs were much lower in the shag chicks than in eggs and in hatchlings from the same breeding colony, most likely due to growth dilution of the compounds. We suggest that the effects of the PCBs on FA_{WBL} may be due to effects of these compounds on bone growth and bone structure. FA_{WBL} may have functional effects on the fitness if it persists after fledging.

Ottinger, M.A., Lavoie, E.T., Abdelnabi, M., Quinn, M.J., Marcell, A., and Dean, K. **An overview of dioxin-like compounds, PCB, and pesticide exposures associated with sexual differentiation of neuroendocrine systems, fluctuating asymmetry, and behavioral effects in birds.** *Journal of Environmental Science and Health Part C - Environmental Carcinogenesis and Ecotoxicology Reviews* 27(4): 286-300, 2009.

Notes: Dioxin, polychlorinated biphenyls (PCBs), and pesticides impact neural systems in birds due to interference with sexual differentiation. Early endocrine disrupting chemical (EDC) effects may delay maturation and have long-term effects on lifetime reproduction, especially in precocial birds that complete sexual differentiation prior to hatch. Semi-altricial and altricial species appear more resilient to EDC effects and show a gradient in sensitivity, especially in the neuroplastic song system. Embryonic steroid exposure occurs via maternally deposited steroids followed by embryo produced hormones; EDCs potentially affect these developing systems. As such, EDCs can impact lifelong fitness by acting on neural systems that regulate reproduction, metabolism, and behavior.

Egevang, C., Stenhouse, I.J., Phillips, R.A., Petersen, A., Fox, J.W., and Silk, J.R.D. **Tracking of Arctic terns *Sterna paradisaea* reveals longest animal migration.** *Proceedings of the National Academy of Sciences [USA]* 107(5): 2078-2081, 2010.
O/A

Notes: The study of long-distance migration provides insights into the habits and performance of organisms at the limit of their physical abilities. The Arctic tern *Sterna paradisaea* is the epitome of such behavior; despite its small size (<125 g), banding recoveries and at-sea surveys suggest that its annual migration from boreal and high Arctic breeding grounds to the Southern Ocean may be the longest seasonal movement of any animal. Our tracking of 11 Arctic terns fitted with miniature (1.4-g) geolocators revealed that these birds do indeed travel huge distances (more than 80,000 km annually for some individuals). As well as confirming the location of the main wintering region, we also identified a previously unknown oceanic stopover area in the North Atlantic used by birds from at least two breeding populations (from Greenland and Iceland). Although birds from the same colony took one of two alternative southbound migration routes following the African or South American coast, all returned on a broadly similar, sigmoidal trajectory, crossing from east to west in the Atlantic in the region of the equatorial Intertropical Convergence Zone. Arctic terns clearly target regions of high marine productivity both as stopover and wintering areas, and exploit prevailing global wind systems to reduce flight costs on long-distance commutes.

Steeves, T.E., Holdaway, R.N., Hale, M.L., McLay, E., McAllan, I.A.W., Christian, M., Hauber, M. E., and Bunce, M. **Merging ancient and modern DNA: extinct seabird taxon rediscovered in the North Tasman Sea.** *Biology Letters* 6(1): 94-97, 2010.

Notes: Ancient DNA has revolutionized the way in which evolutionary biologists research both extinct and extant taxa, from the inference of evolutionary history to the resolution of taxonomy. Here, we present, to our knowledge, the first study to report the rediscovery of an 'extinct' avian taxon, the Tasman booby (*Sula tasmani*), using classical palaeontological data combined with ancient and modern DNA data. Contrary to earlier work, we show an overlap in size between fossil and modern birds in the North Tasman Sea (classified currently as *S. tasmani* and *Sula dactylatra fullagari*, respectively). In addition, we show that Holocene fossil birds have mitochondrial control region sequences that are identical to those found in modern birds. These results indicate that the Tasman booby is not an extinct taxon: *S. dactylatra fullagari* O'Brien & Davies, 1990 is therefore a junior synonym of *Sula tasmani* van Tets, Meredith, Fullagar & Davidson, 1988 and all North Tasman Sea boobies should be known as *S. d. tasmani*. In addition to reporting the rediscovery of an extinct avian taxon, our study highlights the need for researchers to be cognizant of multidisciplinary approaches to understanding taxonomy and past biodiversity.

Atkinson, P.W., Maclean, I.M., and Clark, N.A. **Impacts of shellfisheries and nutrient inputs on waterbird communities in the Wash, England.** *Journal of Applied Ecology* 47(1): 191-199, 2010. **O/A**

Notes: 1. Overexploited fisheries threaten many species that depend on the exploited resource. Shorebird populations are in decline globally and here we describe how changing shellfishery management and nutrient inputs have had dramatic influence on waterbird communities on an internationally important wetland. 2. Cockle *Cerastoderma edule* and mussel *Mytilus edulis* fisheries conflict with shorebirds by removing prey and increasing mortality amongst non-target benthic invertebrates. Under intense dredging pressure, evidence suggests that benthic invertebrates such as worms, with rapid growth and short-generation times, should predominate over species such as bivalves, with slower growth and longer generation times. 3. We investigated the change in the waterbird assemblage in the Wash, eastern England, between 1981-1982 and 2002-2003. This period was characterized by heavy fishing pressure on mussels and cockles, ultimately leading to a crash in the mussel stocks. 4. During the study period, the waterbird assemblage underwent a gradual change from one dominated by those species with a high proportion of bivalves or 'other' prey (e.g. crustaceans, fish) in their diet to those with a higher proportion of worms. This gradual change was punctuated by major shifts, corresponding to three winters when oystercatcher *Haematopus ostralegus* mortality was 5-13 times normal winter levels. 5. Oystercatcher, knot *Calidris canutus* and shelduck *Tadorna tadorna* showed the highest levels of decline. Since the last major oystercatcher mortality event in 1996-1997, the assemblage has not shifted back to that observed prior to the major crash in the mussel stock in 1992. 6. Changes in the waterbird assemblage were significantly related to mussel and cockle stock levels and, to a lesser extent, nutrient levels. Although correlative, evidence from this study indicates that fisheries caused shifts towards a waterbird community dominated by species with a high proportion of worms in their diet. 7. Synthesis and applications. Mechanical shellfisheries directly conflict with the nature conservation interest of sites holding internationally important waterbird populations. Removal of the mussel beds in the Wash led to major shifts in the waterbird assemblage, with a shift towards worm-feeders. Setting annual quotas that provide sufficient food for shellfish-eating birds is essential to maintain the favourable status of this and other internationally important wetlands where shellfish are exploited.

Pichegru, L., Ryan, P.G., Crawford, R.J.M., Van der Lingen, C.D., and Gremillet, D. **Behavioural inertia places a top marine predator at risk from environmental change in the Benguela upwelling system.** *Marine Biology* 157(3): 537-544, 2010.

Notes: In variable environments, organisms are bound to track environmental changes if they are to survive. Most marine mammals and seabirds are colonial, central-place foragers with long-term breeding-site fidelity. When confronted with environmental change, such species are potentially constrained in their ability to respond to these changes. For example, if environmental conditions deteriorate within their limited foraging range, long-lived species favour adult survival and abandon their current breeding effort, which ultimately influences population dynamics. Should poor conditions persist over several seasons, breeding-site fidelity may force animals to continue breeding in low-quality habitats instead of emigrating towards more profitable grounds. We assessed the behavioural response of a site-faithful central-place forager, the Cape gannet *Morus capensis*, endemic to the Benguela upwelling system, to a rapid shift in the distribution and abundance of its preferred prey,

small pelagic shoaling fish. We studied the distribution and the abundance of prey species, and the diet, foraging distribution, foraging effort, energy requirements, and breeding success of gannets at Malgas Island (South Africa) over four consecutive breeding seasons. Facing a rapid depletion of preferred food within their foraging range, Cape gannets initially increased their foraging effort in search of their natural prey. However, as pelagic fish became progressively scarcer, breeding birds resorted to scavenging readily available discards from a nearby demersal fishery. Their chicks cannot survive on such a diet, and during our 4-year study, numbers of breeding birds at the colony decreased by 40% and breeding success of the remaining birds was very low. Such behavioural inflexibility caused numbers of Cape gannets breeding in Namibia to crash by 95% following over-fishing of pelagic fish in the 1970s. In the context of rapid environmental changes, breeding-site fidelity of long-lived species may increase the risk of local or even global extinction, rendering these species particularly vulnerable to global change.

Gaston, A.J., Bertram, D.F., Boyne, A.W., Chardine, J.W., Davoren, G., Diamond, A.W., Hedd, A., Montevecchi, W.A., Hipfner, J.M., Lemon, M.J.F., Mallory, M.L., Rail, J.-F., and Robertson, G.J. **Changes in Canadian seabird populations and ecology since 1970 in relation to changes in oceanography and food webs.** *Environmental Reviews* 17: 267-286, 2009.

Notes: Systematic monitoring of seabird populations in Canada has been ongoing since the 1920s and the monitoring of diets and other biological indicators of ecosystem change started in the 1970s. Long-term monitoring of population parameters began in the 1980s. These studies originally were conducted mainly by the Canadian Wildlife Service, but subsequently have involved several universities and nongovernment organization groups. We review the results of this monitoring from the 1970s onwards for six oceanographic regions to assess population trends among Canadian seabirds and correlated trends in diets, phenology, and other breeding biology variables. Within regions, trends in most variables studied have been broadly congruent, but there was often variation among regions. In particular, seabird populations in the Pacific coast zone affected by the California Current upwelling system have shown generally negative trends since the 1980s, whereas trends for populations of the same species to the north of this zone have been mainly positive. Likewise, on the east coast, trends at Arctic colonies have been decoupled from those at colonies around Newfoundland and in the Gulf of St. Lawrence, especially since the major cold water event of the early 1990s. Several long-term studies have shown an association between population events and diet and phenology changes. Diet and indicators of condition (chick growth, reproductive success) sometimes responded very rapidly to oceanic changes, making them excellent signals of ecosystem perturbations. The review highlights the effects of decadal-scale regime shifts on Canadian seabirds, confirms the value of long-term studies and supports the applicability of single-site observations to regional populations.

Kuro-o, M., Yonekawa, H., Saito, S., Eda, M., Higuchi, H., Koike, H., and Hasegawa, H. **Unexpectedly high genetic diversity of mtDNA control region through severe bottleneck in vulnerable albatross *Phoebastria albatrus*.** *Conservation Genetics* 11(1): 127-137, 2010.

Notes: In the late part of the nineteenth century and the early part of the last century, the short-tailed albatross *Phoebastria albatrus* was in danger of extinction owing to feather hunting. In the middle of the last century, the total number of this species was inferred to be approximately 50-60 with breeding occurring only on Torishima Island of the Izu Islands. Recently, the number of individuals has increased to more than 2,000 and that of their breeding islands to three, namely, Torishima Island, and Minami- and Kita-kojima Islands of the Senkaku Islands. Here, we show that the 44 short-tailed albatrosses we examined represent 29 haplotypes in the control region of mitochondrial DNA, and have a considerably higher genetic diversity than most avian species, but not very high in albatross species; the h and p were 0.96 and 0.013, respectively. However, the parsimony network clearly showed that many intermediate haplotypes were lost. It was concluded that the majority of the haplotypes in the founder population have been maintained. Judging from these findings and the exponential increase in the number of individuals, the present population of the short-tailed albatross seems not to be affected by inbreeding depression through a severe bottleneck. The conservation and expansion of their breeding grounds, and effective protection from bycatch mortality in foraging areas are important for the future survival of this species.

Ryan, P.G., Jones, M.G.W., Dyer, B.M., Upfold, L., and Crawford, R.J.M. **Recent population estimates and trends in numbers of albatrosses and giant petrels breeding at the sub-Antarctic Prince Edward Islands.** *African Journal of Marine Science* 31(3): 409-417, 2009.

Notes: The second mid-summer survey of surface-nesting seabirds at the Prince Edward Island group (Marion and Prince Edward islands) was conducted during December 2008, seven years after the initial mid-summer survey. Wandering albatrosses *Diomedea exulans* may have decreased slightly at Prince Edward Island, mirroring a decrease of roughly 2% per year at Marion Island from 1998 to 2005, a decline that has since reversed. Numbers of grey-headed albatrosses *Thalassarche chrysostoma* on Marion Island have remained stable, whereas the population on Prince Edward Island decreased by 20% from 2001 to 2008 (3% per year). The estimate of Indian yellow-nosed albatrosses *T. carteri* at Prince Edward Island was similar in 2001 and 2008. Counts of both sooty albatrosses *Phoebastria* spp. were substantially higher at Prince Edward Island in 2008, possibly as a result of better coverage compared to 2001. Dark-mantled sooty albatrosses *P. fusca* on Marion Island have decreased by almost 2% per year since 1996, continuing a negative trend from the early 1980s, whereas light-mantled sooty albatrosses *P. palpebrata* have increased by almost 6% per year at Marion Island since 1996. Counts of both giant petrels increased at Prince Edward Island (northern *Macronectes halli* by 44%; southern *M. giganteus* by 28%), whereas their numbers have remained stable at Marion Island. Current best estimates for annual breeding populations (pairs) at the two islands are 3 650 wandering albatrosses, 9 500 grey-headed albatrosses, 7 000 Indian yellow-nosed albatrosses, 2 900 dark-mantled sooty albatrosses, 800 light-mantled sooty albatrosses, 750 northern giant petrels and 2 800 southern giant petrels, confirming the global importance of the Prince Edward Islands for these seven species. Apart from the dark-mantled sooty albatross, their populations are reasonably healthy despite fishing mortality.

Crawford, R.J.M., Whittington, P.A., Upfold, L., Ryan, P.G., Petersen, S.L., Dyer, B.M., and Cooper, J. **Recent trends in numbers of four species of penguins at the Prince Edward Islands.** *African Journal of Marine Science* 31(3): 419-426, 2009.

Notes: Four species of penguin breed regularly at South Africa's Prince Edward Islands: king penguin *Aptenodytes patagonicus*, gentoo penguin *Pygoscelis papua*, macaroni penguin *Eudyptes chrysolophus* and southern rockhopper penguin *E. chrysocome*. In December 2008, it was estimated that some 65 000 pairs of king penguins were incubating eggs at Marion Island, the larger of the two islands in the group, and 2 000 pairs at Prince Edward Island. At Marion Island from 1987 to 2008, there was no long-term trend in numbers of king penguin chicks that survived to the end of the winter period, but there was considerable fluctuation in chick production in the 1990s. It was roughly estimated that on average 88% of king penguin chicks survived the winter period (from April to September/October). Numbers of gentoo penguins at Marion Island decreased from more than 1 300 pairs in the mid-1990s to fewer than 800 pairs in 2003, and then increased to almost 1 100 pairs in 2008 as breeding success improved. Between 1994/1995 and 2008/2009, numbers of macaroni and southern rockhopper penguins at Marion Island decreased by about 30% and 70% respectively. In 2008/2009, some 290 000 pairs of macaroni penguins bred at this island, mostly in two large colonies where there was a progressive decrease in the density of nests. At both these colonies, decreases in numbers breeding followed outbreaks of disease. Inadequate breeding success has influenced the decreases of macaroni and rockhopper penguins. In 2008/2009, some 42 000 pairs of southern rockhopper penguins bred at Marion Island and 12 000 pairs of macaroni penguins and 38 000 pairs of southern rockhopper penguins at Prince Edward Island.

Rivalan, P., Barbraud, C., Inchausti, P., and Weimerskirch, H. **Combined impacts of longline fisheries and climate on the persistence of the Amsterdam Albatross *Diomedea amsterdamensis*.** *Ibis* 152(1): 6-18, 2010. **O/A**

Notes: Incidental capture of seabirds in longline fishing gear is a central issue in the conservation of many long-lived marine species. Despite growing evidence of climate-induced effects on population trends of long-lived species, climate change remains generally overlooked in most risk assessments of seabirds. Because variation in climate may interact with the detrimental effects of bycatch, considering climate is of great importance, especially in the context of ongoing global warming. This paper examines the combined effects of bycatch and climate change on the persistence of one of the world's rarest birds, the Amsterdam Albatross *Diomedea amsterdamensis*, which has a single population in the upland plateau of Amsterdam Island (Southeast Indian Ocean). Using continuous monitoring from 1983 onwards, we first estimated the relationship between climate and the species' demographic parameters. We then built a stochastic matrix population model to estimate the population growth rate and the probability that the population declines below the level recorded in 1983 of nine breeding pairs under different scenarios involving the joint effects of additional mortality caused by longline fisheries and climate change.

The results suggest that the demography of the Amsterdam Albatross is influenced by climate in both breeding and wintering grounds and that these relationships may to some extent compensate for the impact of additive bycatch mortality. However, these compensatory effects would be negligible if the annual additional mortality exceeds around six individuals per year, suggesting that the resumption of longline fishery in the foraging range of the Amsterdam Albatross would rapidly put this species at risk of extinction.

D'Alba, L., Monaghan, P., and Nager, R.G. **Advances in laying date and increasing population size suggest positive responses to climate change in Common Eiders *Somateria mollissima* in Iceland.** *Ibis* 152(1): 19-28, 2010. **O/A**

Notes: Models of climate change predict that its effects on animal populations will not always be negative, but most studies indicate negative associations between changes in climate and the phenology of animal migration and reproduction. For some populations, however, climate change may render particular environments more favourable, with positive effects on population growth. We used a 30-year population dataset on over 2000 Common Eiders *Somateria mollissima* at a colony in southwest Iceland to examine the response of this species to climate fluctuations. Eiders are strongly dependent on suitable climatic conditions for successful reproduction and survival. Temperatures in southwest Iceland, in both winter and summer, have generally increased over the past 30 years but have shown considerable fluctuation. We show that females laid earlier following mild winters and that year-to-year variation in the number of nests was related to the temperature during the breeding season 2 years previously. Milder summers could have positive effects on breeding success and offspring survival, producing an increase in nest numbers 2 years later when most Eiders recruit into the breeding population. In this part of their range, Eiders could benefit from a general warming of the climate.

Clavero, M., Brotons, L., Pons, P., and Sol, D. **Prominent role of invasive species in avian biodiversity loss.** *Biological Conservation* 142(10): 2043-2049, 2009.

Notes: The rise of extinction rates associated with human activities has led to a growing interest in identifying extinction-prone taxa and extinction-promoting drivers. Previous work has identified habitat alterations and invasive species as the major drivers of recent bird extinctions. Here, we extend this work to ask how these human-driven impacts differentially affect extinction-prone taxa, and if any specific driver promotes taxonomic homogenization of avifauna. Like most previous studies, our analysis is based on global information of extinction drivers affecting threatened and extinct bird species from the IUCN Red List. Unlike previous studies, we employ a multivariate statistical framework that allows us to identify the main gradients of variation in extinction drivers. By using these gradients, we show that bird families with the highest extinction risk are primarily associated with threats posed by invasive species, once species richness and phylogeny are taken into account. As expected, the negative impact of invasive species was higher on island species, but our results also showed that it was particularly high in those species with small distribution ranges. On the other hand, mainland species and island species with large ranges tended to be affected by habitat destruction. Thus the impacts of invasive species promote the process of taxonomic homogenization among islands and between islands and continents. Consequently, introduced species may increase biotic homogenization not only directly, as generally believed, but also indirectly through their disproportional impact on endemic species imperilment.

Okes, N.C., Hockey, P.A.R., Pichegru, L., Van der Lingen, C.D., Crawford, R.J.M., and Gremillet, D. **Competition for shifting resources in the southern Benguela upwelling: Seabirds versus purse-seine fisheries.** *Biological Conservation* 142(10): 2361-2368, 2009.

Notes: In the southern Benguela upwelling ecosystem off the west coast of South Africa, seabird populations are decreasing dramatically because of reduced availability of pelagic fish. We tested the hypothesis that the west coast fishing industry is competing for the remaining stocks of anchovy and sardine with the largest colony of Vulnerable Cape Gannets (*Morus capensis*) along the Atlantic coast. Using GPS-tracking of the birds, echo-sounding of pelagic fish, and vessel log books, we located overlap areas between bird foraging ranges, pelagic fish distribution, and fishing activities. We then compared fish catches by gannets and vessels within their joint foraging zones. In October 2007, purse-seine fishing grounds and gannet foraging areas overlapped by only 13%. However, for a 1-month period, the amount of fish removed from this area by purse-

seine boats amounted to 41% of the food requirements of the 72,000 gannets breeding on Malgas Island (25% of the world population). The fishery's catch in this area is significant in terms of its potential impact on gannets, but comprises only 3.6% of total fishery catch. Based on this finding, the rapidly decreasing size of the gannet colony and the stated objectives of South Africa's Marine Living Resources Act of 1998, the case for considering and experimenting with at-sea 'no-take' areas for the purse-seine fishery is strong. Efforts to establish whether 'no-take' fishing zones increase food availability for top predators is an important next step in conservation of the southern Benguela Ecosystem.

Pinet, P., Salamolard, M., Probst, J.M., Russell, J.C., Jaquemet, S., and Le Corre, M. **Barau's Petrel *Pterodroma barau*: history, biology and conservation of an endangered petrel.** *Marine Ornithology* 37(2): 107-113, 2009. O/A

Notes: The Barau's petrel *Pterodroma barau* is an endangered gadfly petrel endemic to Reunion Island. It nests in pristine cloud forests between 2200 m and 2800 m above sea level. Although locally abundant, this species is one of the least-studied seabirds in the world. The lack of basic biological information constrains effective conservation action. In this paper, we compile information on past and present status and distribution, ecology, threats and conservation actions. The objectives were to: (i) summarize current knowledge and identify major gaps, (ii) outline major threats to Barau's Petrel and (iii) propose management actions to mitigate those threats. Critical gaps in our knowledge include (i) a lack of precise demographic parameters, (ii) the exact distribution of this species at sea and the factors that influence it, and (iii) habitat requirements associated with nesting. Barau's Petrel is classified endangered (International Union for Conservation of Nature Red List 2008). The major threats include, in order of importance, predation by alien mammals, light-induced mortality and modification of nesting habitat. These threats affect the various age classes of the population (eggs, chicks, juveniles and adults) differently. A recent modelling exercise suggested the extinction of Barau's Petrel in fewer than 100 years, attributable to feral cat predation at breeding colonies in the absence of cat control. The recent establishment of a National Park on Reunion Island should unify conservation and research actions, and prioritise controlling feral cats in breeding colonies. This control should commence as soon as possible in association with a dedicated education program on the effects of feral cats on the Barau's Petrel population.

Surman, C.A. and Nicholson, L.W. **The good, the bad and the ugly: ENSO driven oceanographic variability and its influence on seabird diet and reproductive performance at the Houtman Abrolhos, Eastern Indian Ocean.** *Marine Ornithology* 37(2): 129-138, 2009. O/A

Notes: Each spring/summer more than a million pairs of seabirds breed at the Houtman Abrolhos, Western Australia, the most significant seabird breeding site in the Eastern Indian Ocean. The southward-flowing Leeuwin Current is the dominant oceanographic feature influencing the region, in conjunction with the northward-flowing Leeuwin Undercurrent and the Capes Current. Seabirds at the Houtman Abrolhos are reliant wholly upon marine sources of food, and several species feed predominately upon larval ichthyoplankton species, the availability of which has been found to play a pivotal role in their reproduction. We conducted a comparative study of the timing of breeding, breeding participation and reproductive success over a 17-year period of four tropical pelagic seabird species in relation to the regional oceanographic conditions affecting the Leeuwin Current. Three tern species, the Lesser Noddy *Anous tenuirostris*, Brown Noddy *A. stolidus* and Sooty Tern *Sterna fuscata*, and the Wedge-tailed Shearwater *Puffinus pacificus* comprised our study species at the Houtman Abrolhos between 1991 and 2007. The diet of these species was also investigated between 1991 and 2000. Life-history traits determined the response of these seabirds to fluctuations in marine resources caused by variation in the flow of the Leeuwin Current. During El Niño Southern Oscillation (ENSO) events, reproductive effort and output were severely reduced in all species, which coincided with reduced volumes of key prey species in regurgitates. Between 1991 and 2000, ENSO driven changes in the Leeuwin Current resulted in lower participation rates and reduced breeding success or catastrophic breeding failure for all four seabird species and delayed timing of breeding for the tern species. Between 2000 and 2007, the relationship between each ENSO event and a subsequent poor reproductive season was not as strong. Increasing years of poor breeding performance were recorded outside El Niño periods, accompanied by a significant seasonal delay in the onset of breeding in the three tern species. Based on our seabird observations, we postulate that in recent years the high number of ENSO events have resulted in a regime shift in offshore and oceanic planktonic food chains off central Western Australia. The use of seabirds as an upper-trophic-level indicator of change in marine productivity as a result of variability in the Leeuwin Current system is discussed. The possibility that tropical seabirds in the region are adapting to a new suite of prey, dictated by a Leeuwin Current system which is influenced by more frequent ENSO events, is also discussed.

Crawford, R.J.M., Whittington, P.A., Martin, A.P., Tree, A.J., and Makhado, A.B. **Population trends of seabirds breeding in South Africa's Eastern Cape and the possible influence of anthropogenic and environmental change.** *Marine Ornithology* 37(2): 159-174, 2009. **O/A**

Notes: Eleven species of seabird breed in South Africa's Eastern Cape Province. Numbers of African Penguin *Spheniscus demersus* and Cape Gannet *Morus capensis* in the province increased in the 20th century, but penguins decreased in the early 21st century. A recent eastward displacement of Sardine *Sardinops sagax* off South Africa increased the availability of this food source to gannets but did not benefit penguins, which have a shorter foraging range. Fishing and harbour developments may have influenced the recent decrease of penguins. Cape Cormorant *Phalacrocorax capensis* and Swift Tern *Thalasseus bergii* also feed on sardine and increased in the Eastern Cape in the early part of the 21st century. There has been a recent increase in the Kelp Gull *Larus dominicanus* population in South Africa's Indian Ocean sector, which includes the eastern portion of the Western Cape Province. Hartlaub's Gull *L. hartlaubii* and Damara Tern *Sterna balaenarum*, which have their main populations in the Benguela system off western southern Africa, were first recorded in the Eastern Cape in the late 1970s and later shown to be breeding there. Numbers of White-breasted Cormorant *P. lucidus* and Caspian Tern *Hydroprogne caspia* breeding in this province have been stable, but those of Grey-headed Gull *L. cirrocephalus* and Roseate Tern *St. dougallii* have increased since the early 1990s. The former three species also breed at inland localities; the Roseate Tern is at the western extent of its distribution in the Indian Ocean. Although not yet breeding in the Eastern Cape, the Crowned Cormorant *P. coronatus*, another western species, has extended its range to this province. Congruent changes in the distributions and abundance of several marine species off South Africa, and similar changes elsewhere in the Indian Ocean, suggest that large-scale environmental change may be influencing the distribution and abundance of species. Conservation will need to account for these as well as for anthropogenic impacts.
