



## SYMPOSIUM and WORKSHOPS

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### **S1 & S5 - Causes and consequences of individual variability in foraging and migration strategies [Individual variation in movement strategies]**

*(Daunt, Gonzalez-Solis, Lewis, Phillips)*

Tuesday October 27, 2015

11:00 – 12:30

14:00 – 15:30

Auditorium II

In seabirds, individuals show remarkable variation in foraging and migration strategies due to a combination of intrinsic state and environmental conditions experienced. Technological advances in recent years have seen an explosion of studies tracking individuals for extended periods, enabling among- and within-individual variation to be quantified in unprecedented detail. These studies are providing fundamental insights into key factors such as individual specialisation, plasticity in response to environmental change, seasonal carry-over effects, navigation, habitat connectivity and the genetic basis of behaviour. Quantifying the intrinsic and environmental factors underpinning individual variation in foraging and migration is critical for understanding population dynamics and implementing effective conservation programmes. This symposium will showcase the latest research in this fast moving field, using a range of approaches including bio-logging, experimental manipulations and advanced modelling.

### **S2 & S6 - Seabirds as indicators of ocean health**

*(Chastel, Braune, van der Pol, Mallory, Cherel, Bustnes)*

Tuesday October 27, 2015

11:00 – 12:30

14:00 – 15:30

Room 1.60

Contamination of the world's oceans by halogenated compounds and heavy metals generated from human activities has been a topic of global concern for over half a century. International conventions and protocols to reduce emissions of some chemical contaminants, in conjunction with the release of newer, emerging compounds, are constantly changing the exposure scenarios for ecosystems worldwide. Given the long-range dispersal of many of these contaminants, seabirds have been increasingly used as monitors of the marine environment to evaluate the changes in chemical pollution on a local, regional and global basis. Although toxic effects of heavy metals and halogenated compounds have been described under controlled laboratory conditions, their consequences on long-term fitness have been virtually neglected in free-living vertebrates because of the dearth of long-term data sets that would be required to address this topic. Further, to date very few data are available on the physiological mechanisms (e.g. endocrine disruption) involved in the



adverse consequences of contaminants exposure in free-living birds. This symposium will look at seabirds as indicators of contamination of the world's oceans and other aquatic environments in relation to such factors as migratory patterns, trophic positions and individual features (age, sex, reproductive status).

### **S3 - Evolutionary physiology**

*(Grémillet, Elliott)*

Tuesday October 28, 2015

11:00 – 12:30

Room 2.61

There is a renewed interest for seabird physiology, as a mechanistic tool for testing and forecasting seabird responses to environmental change. In this context, seabird studies in ecophysiology are greatly facilitated by rapid developments in biotelemetry technologies, of new laboratory procedures, and of mechanistic models. Seabird evolutionary physiology therefore emerges as a highly exciting research field, which investigates the adaptation of physiological traits, and the potential of these traits as indicators of Darwinian fitness. Our session is meant to promote recent, innovative work exploring the links between seabird physiology and evolutionary ecology. For instance, we will ask whether metabolism, hormone levels, or other physiological indices can be used as fitness proxies either directly or via their impact on behaviour. Further, it is essential to assess the heritability of physiological traits, and the plasticity of such traits under the influence of environmental change. Ultimately, understanding evolutionary physiology will determine our capacity to design mechanistic models forecasting the ecophysiological responses, the distribution and population dynamics of seabirds facing global change.

### **S4 - Seabirds as prey: top-down control of seabird colony, population and foraging dynamics [Seabirds as prey: top-down control of seabirds]**

*(Suryan, Hipfner, Lyons)*

Tuesday October 27, 2015

11:00 – 12:30

Room 2.64

In most marine and coastal food webs, seabirds are not apex predators. The potential impact of top-down regulation in seabird ecology and population dynamics, however, remains understudied. Furthermore, the recovery of native predator populations following decades of suppression is exerting previously unobserved pressures on seabird populations. Important questions remain regarding to what extent some seabird populations may be shifting from bottom-up to top-down control, and whether ecological principles of trophic cascades or meso-predator release apply to food webs involving seabirds. This symposium will focus on the interactions of seabirds and seabird predators (primarily, but not exclusively,



native predators) and the degree to which top-down control is impacting seabird colony, population, and foraging dynamics.

## **S7 - Population ecology of penguins**

*(Dann, Crawford)*

Tuesday October 27, 2015

14:00 – 15:30

Room 2.61

The poor and worsening conservation status of the penguins makes it important to understand factors that are limiting populations and how they may be mitigated. It is anticipated that comparative analyses of the population ecology of penguins that occur in similar habitats (e.g. Crawford et al. 2006) or have a similar biology (e.g. Croxall and Davis 1999) will improve such understanding. The opportunity to undertake such comparative studies has been greatly facilitated by the recent publication of a detailed review of the natural history and conservation of all the world's penguins (Garcia Borboroglu and Boersma 2013). The comparisons would include consideration of demographic parameters (e.g. adult and immature survival, age at breeding, sex ratio, breeding frequency, breeding success) and factors influencing them (e.g. but not limited to flexibility of breeding season and moult period, plasticity of diet regarding species composition and the size and quality of prey, fasting, foraging ecology, fidelity to mate and site, ability to form new colonies, migration, emigration/immigration, colony size, breeding habitat, anthropogenic impacts). A lack of some of this information would not preclude the usefulness of comparisons of data that are available. Templates will be provided to each speaker to encourage some standardisation of presentations and it is hoped that the proposed symposium may stimulate several publications and a wider and more thorough review of the subject at the 9<sup>th</sup> International Penguin Congress, which will be held in Cape Town in 2016.

## **L7 – Seabirds.net Workshop**

*(Humphries)*

14:00 – 15:30

Room 2.64

This workshop will deliver an update on seabirds.net and its performance since its inception. We will also discuss the first world seabird Twitter conference and metrics associated with that event. We will finish off by discussing ideas for future changes and development of the website over the next five years.

## **L1 – Tracking Database Legacy Workshop**

*(Croxall, Lascelles)*

Wednesday October 28, 2015



11:00 – 12:30

Auditorium II

The 1st WSC established a number of legacy products focused on data, which are intended to promote collaborations and provide long-term products for the seabirds and researchers. One of the products focused on the compilation of seabird tracking data. Since the 1st WSC the Tracking Ocean Wanderer's Database, managed by BirdLife International, has been revamped and expanded to act as a global repository for seabird tracking data. This session will provide an update on this database, summarise species included in the last 5 years and outputs that have resulted. This will be complemented by a series of talks showing the range of ways tracking data is now used, and discussion round future directions for the legacy product.

### **S8 & S10 - One-third for the birds: competition between low trophic level fisheries and coastal seabird assemblages [Forage Fishery Impacts]**

*(Bertrand, Wanless, Piatt, Sydeman)*

Wednesday October 28, 2015

11:00 – 12:30

14:00 – 15:30

Room 1.60

Seabird-fishery interactions can be categorised broadly into direct and indirect (e.g. competition with fisheries for food fish) impacts. Regarding the latter, the "one third for the birds" concept, taken from a seminal paper (Cury et al. 2011 *Science*) that assessed fishery impacts on seabirds in seven well-studied ecosystems globally, demonstrated that when forage fish biomass fell below a threshold of around 1/3 of estimated maximum biomass, seabird breeding success consistently declined. Thresholds and indicators for varying forage fish biomass on other seabird demographic parameters, foraging success, and populations have yet to be synthesized and compared between ecosystems. This session will include papers from across the globe that address functional and numerical responses of seabirds in relation to variation in forage fish abundance (broadly defined), direct studies of the impacts of lower trophic level fisheries on seabird communities, and descriptions of seabird-forage fish fisheries management programs. In particular, it will include comparative analyses from coastal ecosystems, including upwelling systems and marginal seas globally. The symposium will bring together current researchers working on these topics to explore species-specific, multi-species and ecosystem-wide approaches, the socio-economic factors influencing fisheries management, and seabird conservation relative to forage fish fisheries.

### **W1 - The challenges of tackling seabird bycatch in small-scale fisheries [Tackling seabird bycatch in small-scale fisheries]**

*(Crawford, Yates)*

Wednesday October 28, 2015

11:00 – 12:30

Room 2.61



Small-scale (often called artisanal) fisheries are widespread globally and in many cases are vitally important to sustainable livelihoods. The impacts on biodiversity of these fisheries are poorly understood, and data gaps are a major limiting factor on progress, but there is increasing concern that the impact of bycatch in such fisheries is substantial. Additionally, for some gears – including gillnets and purse-seines – there are no best practice measures to reduce seabird bycatch. This workshop will address the challenges of working with small-scale fisheries, to better understand the scale of seabird bycatch in these fisheries, to identify priority areas for collaborative conservation action and to develop concepts for solutions to bycatch.

### **S9 - The effects of marine renewables on seabirds and where the information gaps still occur [Green energy impacts]**

*(McGregor, Wilson)*

Wednesday October 28, 2015

11:00 – 12:30

Room 2.64

To meet targets for a reduction in CO<sub>2</sub> emissions, many Governments are encouraging the development of marine renewable energy generation. Legal protection of species and habitats has the potential to constrain marine renewable development so there is a strong incentive to improve understanding of the effects of renewables on the marine environment, particularly seabirds and their populations. Monitoring of operational marine renewables in Europe has been ongoing for several years and results are beginning to inform assessment of new sites. To develop better directed impact assessment focussed research by seabird scientists is increasingly being commissioned to understand a range of factors influencing species risk. Through understanding where knowledge gaps still exist, future scientific research can be better targeted.

### **W2 - Setting spatial conservation priorities for seabirds using tracking data**

*(Dias, Lascelles, Small, McGowan, Possingham)*

Wednesday October 28, 2015

14:00 – 15:30

Auditorium II

Seabird tracking data are increasingly being used to assess areas of greatest bycatch risk, design Marine Protected Areas, and assess impacts of new developments such as oil and gas exploration and shipping routes. There are a variety of approaches to setting spatial priorities for seabird conservation. These include, for example, systematic conservation planning tools and BirdLife International's Important Bird and Biodiversity Areas. Systematic conservation planning is the standard approach to zoning the ocean and it normally uses data on benthic habitats, species distributions, human uses and ecoregions. Information about seabirds, in particular the most



pelagic species, is often neglected in systematic conservation planning and where it is used there are a variety of approaches.

Applied conservation is much about choosing conservation actions in time and space. These actions range from land-based activities such as removing invasive species from islands and sea-based actions such as marine protected areas or by-catch reduction zones. Prioritization of sea-based actions is often more challenging, given the lack of baseline information about species' at-sea distribution and habitat use. This gap has begun to be filled in the last past decades through the collection of tracking data.

In this symposium we aim to explore and discuss the use of telemetry data in setting marine conservation priorities, how it has been used in "real world" decision-making and which empirical data are most likely to lead to different or new actions – and hence, the kind of research that is most useful for conservation. This is timely as many countries rush to meet their 2020 Aichi target of protecting 10% of their exclusive economic zones.

## **S11 - Host-parasite interactions: evolutionary ecology and eco-epidemiological issues [Host-parasite interactions]**

*(Boulinier, Burthe)*

Wednesday October 28, 2015

14:00 – 15:30

Room 2.64

Seabirds are well known to be hosts of a diverse set of parasites and pathogens. Most seabird species are also widely distributed, migratory, long-lived, colonial and site faithful. Such characteristics mean seabirds are useful and important model systems for investigating host-parasite interactions, particularly the ecology and evolution of these interactions. For instance, especially high level of infestation by nest dwelling ectoparasites can be recorded on colony sites that are recurrently used by high densities of seabird hosts, which may have strong implications for the circulation of arthropod-borne infectious agents. Several species are known to be hosts of infectious agents of medical and veterinary importance, such as Lyme disease *Borrelia*, *Salmonella* spp, *Campylobacter* spp, Avian Influenza viruses, Newcastle Disease Virus and West Nile Virus, but little is known about their eco-epidemiology and the effects they may have on host populations. In some cases, disease agents can threaten endangered seabird populations, which may have consequences in terms of conservation and management. Endoparasite infections affect the energy budgets of hosts, with potential interactions with food availability, with direct and indirect implications for host fitness. Moreover, given their particular life-histories, seabirds are expected to invest in long term specific immunity as they may be re-exposed to the same infectious agents during their lives, but surprisingly little is actually known about such immune investment strategies. Finally, interactions between pollutants, stress levels and parasitism are of growing concern. In this symposium, recent advances in this broad field will be outlined by a series of short invited talks on these topics.



## **S12 - Tropical seabird foraging ecology**

*(Weimerskirch, Shaffer)*

Wednesday October 28, 2015

16:00 – 17:45

Auditorium II

The last two decades have seen a burgeoning of information on the general ecology, distribution, physiology, and population demography of temperate and high latitude seabird species. In contrast, comparable programs focusing on tropical seabird species are far fewer, particularly with regard to foraging ecology. Yet tropical waters occupy a large part of the oceanic waters, and ancient seminal studies by Fisher, Ashmole, Schreiber, and others, had stressed a long time ago the potential adaptations of seabirds to foraging on low productivity tropical oceans and their susceptibility to year-to-year variability in food availability and El Nino events. More recently other specificities of tropical seabirds have been spotted such as interactions with sub surface predators, impact of tuna fisheries, and the looming effects of increasing water temperature and rising sea level from the anticipated climate change. Thus we felt it was appropriate to host a specific symposium devoted to tropical seabirds that would show the progresses made recently on tropical seabird ecology.

## **S13 - Advances in design and analysis for seabird demographic studies [Establishing seabird demographic parameters]**

*(Converse, Barbraud, Altwegg)*

Thursday October 29, 2015

11:00 – 12:30

Auditorium II

Demographic studies of seabirds are critical for understanding ecology and evolution of life histories, assessing conservation status, identifying extinction threats, and proposing effective conservation actions. For example, many seabird species have a worrying conservation status and demographic studies are essential to quantify the impact of environmental factors on seabird populations. However, developing field studies and datasets capable of providing precise and unbiased information can be a challenge, given the complex life history of seabirds and the sampling challenges in remote environments. Numerous advances in the design and analysis of demographic studies have, in recent years, improved the prospects for such studies of seabirds, and the number of long-term studies on seabirds is increasing steadily. This symposium will focus on major advances in both study design and data analysis for seabird biologists who are interested in applying improved methods in their study populations. Specific topics will include: the interaction between field design and analytical tools for demographic studies, multi-event models, integrated population models, population viability analysis, models for estimation of at-sea population characteristics, and research priorities for population studies.



## **S14- Restoration of seabird nesting islands**

*(Albores, Towns, Kress)*

Thursday October 29, 2015

11:00 – 12:30

Room 1.60

Islands are critical habitats for breeding seabirds due to the proximity to feeding areas and the distance from diverse disturbances related to the continents. In some cases, islands host concentrations of several millions individuals. However, insular ecosystems have also suffered because of introduced species such as mammal (e.g. cats, rats, mongoose, goats, etc.) that either predate on breeding seabird colonies, endemic land biota or modify the nesting habitat. Great progress has been made in developing methods for eradicating introduced mammals from seabird nesting islands. This success has permitted some seabirds to return to historic nesting islands once the invasive mammals have been removed, but highly philopatric species such as petrels and albatross are examples of seabird species that are slow to recolonize on their own and may not rediscover the restored habitat. Likewise, seabird populations that are reduced from oil spills, hunting, climate change and other anthropogenic factors are vulnerable to extinction from cataclysmic and climate changes. We propose a symposium that focuses on eradication projects and the natural subsequent steps: active restoration methods such as social attraction, chick translocation and habitat creation that reduce extinction risk by creating new colonies within historic ranges. In this symposium, we will discuss when such projects are appropriate, the cost-benefits of active restoration and selection process for determining locations for active restoration projects.

## **L3 & L4 - Community-based seabird conservation**

*(Hodum, Mangel, Collier, Nevins, Moller, Jones)*

Thursday October 29, 2015

11:00 – 12:30

14:00 -15:30

Room 2.61

Community-based education and outreach programs are an essential component of long-term conservation strategies in places where humans co-exist with wildlife. With increasing threats of climate, invasive species and other anthropogenic impacts, there is a great need for local communities to engage in efforts to conserve many seabird populations. The goals of this symposium are to (1) share outreach and education activities, (2) provide a forum for discussion about best practices in community outreach and education, (3) develop outreach and education strategies that recognize and maintain local traditions and cultural values while improving the capacity within communities and other stakeholders relevant to local seabird conservation and (4) discuss methods to measure the effectiveness of outreach and education efforts. We envisage a symposium and workshop to exchange experiences



of developing outreach and education initiatives that use and maintain local traditions and cultural values and enhance the knowledge and capacity of local communities to address issues relevant to the plight of seabirds.

### **S15 - International agreements and seabird conservation**

*(Lascelles, Semelin, Tasker, Wolfaardt, Phillips, Favero, Kuletz, Gilchrist)*

Thursday October 29, 2015

11:00 – 12:30

Room 2.64

Multilateral Environmental Agreements (MEA) such as the Convention on Biological Diversity, the Convention on Migratory Species, and the Agreement for the Conservation of Albatrosses and Petrels play key roles in defining national policy, legislation and targets for seabird and marine conservation. Ensuring that appropriate legislation is in place to tackle the threats and pressures acting on seabird populations is therefore of vital importance if conservation gains are to be made. The session will serve to demonstrate the main issues involved in trying to conserve seabirds on an international scale and aim to engage the wider seabird research community (especially those who have not been directly involved in the work of MEAs). The session will showcase examples of success within conventions, illustrating the challenges faced, progress achieved to date, and encourage greater engagement of seabird researchers in the future.

### **S16 – From Movement Ecology to Population Dynamics**

*(Grémillet, Boulinier, Dugger)*

Thursday October 29, 2015

14:00 – 15:30

Auditorium II

Seabird movement ecology is booming, thanks to the rapid development of electronic tags and refined analytical tools. This now enables studies of seabird spatial ecology across their lives. Concomitantly, long-term seabird population studies are flourishing, providing access to individuals of known breeding history. The time has now come to blend biotelemetry and population dynamics, to fully understand the consequences of individual bird movements on seabird life-history traits, population and meta-population processes. This line of thought is currently the starting point of many exciting seabird research programs, and this session will catalyse this rapidly emerging theme, by convening tenors of the field, as well as rising young researchers.

### **S17 - Attraction and translocation: management and science in establishing new seabird colonies [Establishing new seabird colonies]**

*(Carlile, Tataya, Wanless, Taylor, Rayner)*

Thursday October 29, 2015



14:00 – 15:30

Room 1.60

Recovery of breeding populations and the restoration of ecosystem function is a key component of conservation. Seabird colonies can be restored following disasters (natural or anthropogenic) and new colonies created via a diversity of techniques. These actions can have significant input into the restoration of ecosystem function, particularly on islands. Passive restoration relies on seabirds naturally dispersing and either recruiting to a former colony or being attracted to a new, secure colony site. Additionally, there are many reasons for actively translocating seabirds to new sites or previously extinct colonies, but this topic was not covered in any depth at WSC1. This symposium will cover principal issues relating to seabird restoration across a spectrum of taxa. A key outcome will be the development of guidelines for seabird attraction and translocations – justifications, techniques, and case studies (based on presentations).

### **S18 - Seabirds and oil spills – integrating what we know and need to know about hazards and consequences from marine spills [Impacts of oil spills]**

*(Dann, Mills, Ziccardi, Strauss, Ruoppolo, Morgan, Haney)*

Thursday October 29, 2015

14:00 – 15:30

Room 2.64

Oil pollution, both catastrophic and chronic, poses a significant and ubiquitous threat to seabirds at ecological levels of organization ranging from the individuals to population, community, and ecosystem. Pursuit-diving seabirds are particularly vulnerable and the conservation of several penguin species is directly linked to how we manage the risks to and the rehabilitation/restoration of oil-affected populations. Assessing impacts from oil spills on marine birds is fraught with numerous logistical challenges due to limitations of scale, but also from a need to integrate information from highly disparate sources. There have been a number of recent advances in our knowledge of the effects of oil pollution on the demography of seabirds, in the conservation significance and efficacy of rehabilitation of oiled seabirds, and the emergence of new technologies for cleaning oiled wildlife and habitats. Several large open ocean oil spills in recent decades have stimulated interest in assessing impacts as well. This inter-disciplinary symposium will feature recent progress and provide needed direction for continuing and future studies. We will emphasize new insights that have or might be gleaned from more inter-disciplinary approaches, including advances that integrate rehabilitation technology, demographic research, marine spatial planning, synoptic oceanography, forensic reconstruction, offshore risk assessment, ecosystem dynamics, and computer modeling.



## **S19 - Approaches to quantify and mitigate researcher disturbance on nesting seabirds [Researcher disturbance on nesting seabirds]**

*(Sherley, Barham)*

Thursday October 29, 2015

16:00 – 17:45

Room 2.64

Assessing the impacts of research-related activities on wildlife can be difficult, but doing so is crucial to account for potential biases and derive appropriate conclusions from data. Additionally, as the conservation status of the world's seabirds continues to decline, field-based researchers should strive to balance the potential adverse effects of their activities against the benefits of research outcomes. Advances in technology now allow researchers to gather behavioural and population-level data in the absence of human observers. Population surveying and monitoring studies increasingly make use of technologies such as camera traps, passive audio-recording devices or unmanned aircraft (drones), while computer vision systems have the potential to reduce drastically the time spent analysing the reams of data collected. These new tools have the capacity to limit the impact of research on nesting seabirds, while simultaneously complementing and augmenting traditional data collection methods. However, gaining the most from these new approaches will require interdisciplinary collaboration and that ecologists evaluate developed systems in an unprejudiced manner to judge whether they indeed provide an advantage in efficiency, accuracy, or comparability over existing human observer methods. This symposium will provide a platform for presentations on state-of-the-art approaches to assess and mitigate researcher disturbance in breeding colonies through the use of non- or minimally-invasive monitoring methods. In addition, the symposium is expected to foster new international collaborations in this rapidly growing research field.

## **L5 & L6 - Outcome-based seabird conservation (How to enhance acquisition and effective use of funds for seabird conservation).**

*(Hall, Croxall)*

Friday October 30, 2015

8:30 – 10:12

11:00 – 12:30

Room 2.64

Seabirds face multiple major threats, most of which require substantial resources to address and require a long-term commitment to implementation at scale to be effective. Many funding organizations/foundations increasingly expect to be able to support seabird conservation projects which are of High priority, relatively High feasibility and result in high or measurable return for target seabird populations (the low hanging fruit "syndrome"). This poses particular challenges in respect to addressing High-Medium priority actions which are assessed currently as Low-Medium feasibility.



Additional and related challenges include: maintaining the interest/commitment of funders over the timescales (decades) often necessary to implement effective seabird conservation programs, maximizing complementary support by a diverse funder pool and educating funders about the full array of threats/needs/opportunities and risks required for effective conservation actions. On the basis of prior assessments of priorities/feasibilities for different seabird topics/groups, the aim of these sessions is to focus on approaches to addressing the issues of how to tackle high/medium priority actions listed as low/medium feasibility and to educate funders about the nuance of seabird conservation investing.

## **S20 - Impacts of marine debris**

*(Provencher, Bond, Lavers, Nevins)*

Friday October 30, 2015

11:00 – 12:30

Auditorium II

This session will review and explore how seabirds interact with marine pollution, including ingestion, nest incorporation, chemical interactions and entanglement. In part this will be a follow-up from the *Marine Debris* session at the First World Seabird Conference in 2010. This session will also include more recent work examining the implications of seabirds ingesting plastics, i.e. transfer of chemicals, and how seabirds are being used worldwide as sentinels of marine pollution. This area of study is an emerging field with legislation already in place in the North Sea to monitor marine pollution through the use of seabirds, with other regions looking to establish similar models.

## **S21 - Ecosystem services provided by Arctic seabirds**

*(Rönkä, Kadin)*

Friday October 30, 2015

11:00 – 12:30

Room 1.60

The symposium focuses on the ecosystem services provided by Arctic seabirds, i.e. the ecological, socio-economic and cultural benefits humans obtain from ecosystems involving seabirds. To facilitate management and conservation efforts of ecosystem services and decision-making concerning marine resource use there is an urgent need to further the understanding of ecosystem services in relation to seabirds. This includes identifying the ecosystem services provided by seabirds, establishing methodologies for quantifying the values of these services, and assessing the ecological and socio-economic drivers affecting their management and conservation as well as possible trade-offs between different ecosystem services. In the Arctic, the ecosystem services provided by seabirds may be of high value while potentially strongly affected by climate change and other human impacts. As culture changes, also new ecosystem services arise, including for instance services supporting nature tourism. The symposium consists of six presentations, starting with an introduction



to ecosystem services provided by seabirds, then deepening insights into provisioning, regulating, supporting and cultural services. The symposium also highlights the interaction between ecological and ecosystem service research and the importance of interdisciplinary approaches in ecosystem service management, conservation and restoration. In addition to regular oral presentations, the symposium includes a short poster presentation. Presentations are followed by a comprehensive discussion, where the audience is invited to take part. In the discussion, we summarize current knowledge on ecosystem services provided by seabirds and its applicability to the Arctic, and discuss the generality of the conclusions of the symposium presentations for systems other than the Arctic. We also identify research needs: poorly known ecosystem services, methods for the quantification of ecosystem services, areas or species of particular importance, and current and upcoming issues relevant to the management and conservation of ecosystem services and seabirds.

## **S22 - Seabird population health**

*(Uhart, Gilardi)*

Friday October 30, 2015

11:00 – 12:30

Room 2.61

Seabirds are sentinels of ocean health, yet the impacts of ocean degradation on seabird health are poorly understood. This lack of information is of particular concern for threatened and endangered species, as the potential impact of disease on small populations can be devastating. Advancing knowledge of seabird health will help inform preventative actions and proactive strategies for limiting the impact of disease on seabird populations. In this symposium we will present case studies that analyze a variety of health threats including infectious pathogens, fisheries interactions, changing climate, and biotoxins, highlighting the imperative to increase seabird health monitoring and reporting efforts worldwide. We will also discuss risks and benefits associated with interventions such as rehabilitation, and will examine ways to maximize use of new technologies and opportunities to increase knowledge on seabird health.

## **S23 - Seabird demography and dynamics facing climatic and anthropogenic threats: potential for ecological and/or evolutionary rescue [Ecological/evolutionary rescue for threatened seabirds]**

*(Pardo, Frederiksen, Oro)*

Friday October 30, 2015

14:00 – 15:45

Auditorium II

The field of demography and population dynamics is becoming more and more important given the crucial need to better understand causes and consequences of population trends in a rapidly changing environment. At the same time, recent



improvements in analytical tools and the increasing length of demographic time series allow increasingly sophisticated analyses. In this session we want to gather studies describing variations in demographic rates over time and space in seabirds and trying to identify environmental drivers (e.g. global warming, extreme events, prey availability, fisheries bycatch, discards, introduced predators, pollution) of changes in the mean or variance of these rates. Such demography/environment relationships can then be used in matrix population models to try and predict the future structure and size of seabird populations and their potential chances of resilience through ecological (density-dependence, plasticity) or evolutionary rescue (selection, micro-evolution).

### **W3 - Advancing gadfly petrel conservation**

*(Lascelles, Rayner, Johnston)*

Friday October 30, 2015

14:00 – 15:45

Room 1.60

Croxall et al. (2012) shows that, after the species covered by the Agreement for the Conservation of Albatross and Petrels, the next most threatened group of seabirds are the gadfly petrels (*Pterodroma* and *Pseudobulweria*). Collectively the conservation needs of these species cover virtually all topics of relevance to pelagic seabird species, except fishery bycatch. To date, conservation actions for these species have tended to be assessed and undertaken on a species-by-species basis. Given their pressing conservation status, the isolated nature of many breeding sites (and hence researchers), and upcoming policy opportunities it is timely to gather relevant researchers to discuss shared conservation needs and potential actions for this group, including how a case can be made for greater conservation focus through international/regional policy mechanisms such as the Convention on Migratory Species. Building from an initial workshop held at WSC1, this workshop will 1) showcase conservation case studies, 2) summarise *Pterodroma* distribution, threats and actions from the IUCN Red List data, and 3) discuss future conservation actions for the group.

### **S24 - Skuas/jaegers: travellers between the poles**

*(Peter, van Bemmelen)*

Friday October 30, 2015

14:00 – 15:45

Room 2.64

In recent years much has been revealed about the ecology and evolution of skuas and jaegers. This session aims to bring together researchers studying this group and to provide a broad overview of recent developments, with an emphasis on foraging ecology and long-distance migration patterns of both northern and southern hemisphere skuas.