

Full Proposals for International Polar Year 2007-2008 Activities

Proposed IPY Activity Details

1.0 PROPOSER INFORMATION

(Activity ID No: 172)

1.1 Title of Activity

Health of Arctic and Antarctic bird populations

1.2 Short Form Title of Proposed Activity

BIRDHEALTH

1.3 Activity Leader Details

Maarten Loonen
Arctic Centre, University of Groningen
The Netherlands

1.4 Lead International Organisation(s) (if applicable)

Endorsed by CAFF

1.5 Other Countries involved in the activity

Australia
Canada
Denmark
France
Germany
Norway
Poland
Russia
Spain
Sweden
The Netherlands
USA
France

1.6 Expression of Intent ID #'s brought together in this proposed activity

61

1.7 Location of Field Activities

Bipolar

1.8 Which IPY themes are addressed

1. Current state of the environment
2. Change in the polar regions
3. Polar-global linkages/tele-connections

1.9 What is the main IPY target addressed by this activity

1. Natural or social science

2.0 SUMMARY OF THE ACTIVITY

In short, the aim of the project is:

1. Study geographic variation in infections, parasites, immune system functioning and pollution levels in birds.
2. An effect study on individual marked birds
3. Modelling future scenario's of geographic variation and relating the findings to climate change, nature management and human health.

Healthy individuals are able to optimize resource use, survival and reproduction. Health of an individual will be under constant attack. Animals have developed immunological, physiological and behavioural strategies to battle these attacks from pathogens, parasites and/or pollution on their health. This battle for health is the main theme of the study.

Individually marked birds are the subject of this study. They can be studied over their life time in the wild. Health of marked individuals can be correlated with present and future fitness. Experimental manipulations will quantify the consequences of specific attacks on health and will determine cause and effect in the correlations.

Ecological immunology is a fast developing field, with beautiful examples of individual and species differences in immune response. Population size and distribution is structured by pathogens, parasites and pollution, which effect on fitness often is a complex interaction in an evolution of the struggle for survival. Spatial and temporal variation between populations and individuals is the main focus of the study.

The polar regions are of special interest for this study. These areas are considered to have relatively low levels of pathogens, parasites and pollution. Migratory birds linking temperate regions with the Arctic are potential vectors of diseases as shown by the recent spread of the West Nile Virus and Avian Influenza: diseases which are threatening domestic animals and humans. With a changing arctic due to climate change and pollution, more knowledge is needed on how animals cope with attacks on their health.

In the IPY, we will classify the occurrence of pathogens, antibodies, parasites and pollution levels in individually marked wild birds in the Arctic and Antarctic. We will study the immune system by running tests on blood samples or by challenging the individuals and monitor the production of antibodies. Fitness of the birds is measured during sampling as reproductive output or body condition, but also later as e.g. survival. Health can be monitored over time when the individual is repeatedly seen or caught. Finally we will model temporal and spatial variation and relate our findings to climate change, nature management and human health.

2.1 What is the evidence of inter-disciplinarity in this activity?

This project aims to bring together various disciplines of research (ecology, physiology, population genetics and veterinary and human medicine) and organize a circumpolar field sampling in the International Polar Year. Modelling should help understanding dynamics and consequences of changing environments.

2.2 What will be the significant advances/developments from this activity? What will be the major deliverables? What are the outputs for your peers?

Scientific advances: 1. Circumpolar distribution maps about the occurrence of specific pathogens, parasites, antibodies and pollution levels in birds. 2. Insight in geographical and temporal dynamics of pathogens, parasites, antibodies and pollution levels in free-ranging birds. 3. Quantification of the fitness effects (survival and reproduction) of specific pathogens, parasites and pollution levels. 4. Quantification of the activity of various components of the immune system to an experimental challenge. 5. Epidemiological and ecological models on the spatial and

temporal variation in health.

Outreach: 1. The development of a circumpolar network on this topic. 2. Training of new students. 3. Public awareness of the role of health issues in structuring animal populations.

Management support: Facts to support decisions to minimize the risk of infection for domestic animals and humans.

Deliverables: A large number of peer-reviewed papers for scientific journals. A summary report highlighting the relevant findings for conservation and management. A book.

2.3 Outline the geographical location(s) for the proposed field work (approximate coordinates will be helpful if possible)

Locations	Coordinates
Circumpolar Arctic and Antarctic, the project aims to study geographical variation. Field sites will be selected in a discussion with partners. This process is ongoing.	

2.4 Define the approximate timeframe(s) for proposed field activities?

Arctic Fieldwork time frame(s)	Antarctic Fieldwork time frame(s)
05/07 - 09/07	01/07 - 03/07
05/08 - 09/07	01/08 - 03/08
	MM/YY - MM/YY

2.5 What major logistic support/facilities will be required for this project?

Helicopters

Existing field stations

New field station

Fixed wing transport aircraft

Further details – The project hopes to mark and sample birds in many locations. Access to sites is essential. We are aiming on developing sampling kits to give with people, sending students with field parties of other projects and intensifying detailed studies on existing bird study sites.

2.6 How will the required logistics be supplied? Have operators been approached?

Source of logistic support	Likely potential sources	Support agreed
Consortium of national polar operators		
Own national polar operator		
Another national polar operator	Y	Y
National agency	Y	Y
Military support	Y	
Commercial operator	Y	
Own support	Y	Y
Other	Y	

2.7 If working in the Arctic regions, has there been contact with local indigenous groups or relevant authorities regarding access?

Yes, several partners have ongoing long-term research on specific bird colonies. But the aim of the project is to expand the sampling and the study to more sites to make a geographical comparison possible. Local indigenous people could do part of the sampling. Permissions for ringing and animal experimentation need to be obtained from national and local authorities.

3.0 STRUCTURE OF THE ACTIVITY

3.1 Origin of the activity

This activity is the start of a new programme that will outlive IPY

3.2 How will the activity be organised and managed? Describe the proposed management structure and means for coordinating across the cluster

A website has already played a central role in developing this project (<http://loonen.fmns.rug.nl/ipy>). Most partners have enlisted via the website. News is updated regularly, documents are available for download and a discussion forum is developing ideas. The website will aim to 1. facilitate fund raising and project proposals of the various partners. 2. provide an overview of relevant literature and sampling techniques. 3. be a link to a meta-database of results. 4. evolve in a public display of the ongoing research and the findings. The content management and further technical development of the website is secured. The website will continue to play a central role towards the IPY, regardless of funding.

The network will continue with a workshop in 2006 to finalize planned activities, to develop a sampling protocol and to coordinate field sampling and analysis. At present, all partners have already been actively monitoring ringed birds or studying health issues. There is a lot of knowledge among the partners, which need to be integrated to a detailed sampling scheme with shared facilities for analysis. The role of each individual within the network will be further structured as soon as funding becomes available.

In the IPY, a scientific director will coordinate the entire structure of the project from marking, sampling, analysis of samples and observations of marked birds. Data will be shared between partners and data analysis is coordinated by an annual workshop.

3.3 Will the activity leave a legacy of infrastructure and if so in what form?

As the proposed network is highly relevant for conservation and management, we anticipate a continuation of the network as an international expert group beyond the IPY. The network could be incorporated in the CBMP of CAFF.

We hope to involve local indigenous people and students in field sampling.

3.4 Will the activity involve nations other than traditional polar nations? How will this be addressed?

Several partners are based in countries without polar territories. Many birds in the arctic are migratory and spend part of their life in temperate areas. The items under study can also be addressed outside polar areas. Some partners are also involved in assessing diseases in birds outside the arctic. However we hypothesise that in the arctic birds can find refuge for pathogens, parasites and pollution.

3.5 Will this activity be linked with other IPY core activities? If yes please specify

Yes, we have discussed already cooperation with many other projects. There are close links and potential cooperation with all projects measuring bird fitness, such as #552 Shorebirds #216 Arctic waders #340 Sea birds #388 Predator-prey #456 Birds Canada #553 HATCH #670 HABS #680 AMAS #714 Antarctic birds #785 ptarmigan.

Other projects are relevant because they focus on access to study sites and are measuring biodiversity, such as #75 Islands of Arctic Life, #122 ITEX, #313 ARCDIV, #503 COMAAR #672 Arctic Wolves And finally there are projects which focus on human health like #495 Inuit, #516 Health #742 Food #914 AHHI. We will stay in contact with all these projects, exchange information and join efforts during the IPY. At this stage, all these projects decided to also continue their own focus, but activities will be linked.

3.6 How will the activity manage its data? Is there a viable plan and which data management organisations/structures will be involved?

The website is already functioning as a central point for data exchange between partners. This will be further developed. Metadata will be presented on our website but also be available for other databases on biodiversity. We hope to link to the Circumpolar Biodiversity Monitoring activity (CBMP) of CAFF, which is developing a database structure.

3.7 Data Policy Agreement

Will this activity sign up to the IPY draft Data Policy (see website)

Yes

3.8 How will the activity contribute to developing the next generation of polar scientists, logisticians, etc.?

We hope to work together with students and indigenous people, who will be trained to mark, sample and observe birds. The project is a cooperation where people will interact and learn from each others knowledge and the results. We hope to sample on a circumpolar scale, an activity which requires careful planning and logistics.

3.9 How will this activity address education, outreach and communication issues outlined in the Framework document?

Already, our topic of research is a news item with viruses spreading along the flyways of migrating birds. Our project intends to provide relevant information on this subject. The website will not only hold scientific data and discussions but also photo impressions about the field work (see e.g. <http://loonen.fmns.rug.nl/fragile>). We intend to communicate intensively with the press and prepare a final report and a book at the end of the project to disseminate our results to the general public and to stake holders. Especially when we have produced models future scenario's of geographic variation and have related the findings to climate change, nature management and human health and economics, we expect our results will find their way.

3.10 What are the proposed sources of funding for this activity?

This project can obtain funding from national science foundations, national IPY program committees and governmental programs on monitoring. The network hopes to support the partners in finding funding by providing scientific background documents and detailed working plans. Private sponsoring is also an option for this project.

3.11 Additional Comments

Strong support by the International IPY committee is essential for further developing this program and increasing the chances for funding. We will develop further links with other IPY projects and polar activities, but have decided to keep the research focus of this project.

4.0 CONSORTIUM INFORMATION

4.1 Contact Details

Lead Contact

Dr Maarten Loonen
Arctic Centre, University of Groningen
P.O.Box 716, Groningen
9700 AS
The Netherlands

Tel: +31503636834
Mobile: +31620550716
Fax: +31503634900 (address Arctic C
Email: m.j.j.e.loonen@biol.rug.nl

Second Contact

Dr Svein Are Hanssen
Institute for biology, University of Tromsø
Institute for biology, University of Tromsø
N-9037
Norway

Tel: +4777646415
Mobile: +4792635455
Fax: +4777644394
Email: Sveinn.hanssen@ib.uit.no

4.2 Other significant consortium members and their affiliation

Name	Organisation	Country
Bart Ebbinge	Alterra, Wageningen University	The Netherlands
Jesper Madsen	DMU	Denmark
Ron Fouchier	Dept. Virology, Erasmus MC, Rotterdam	The Netherlands
Marcel Klaassen	Netherlands Institute of Ecology	The Netherlands
Björn Olsen	Dep. Infectious diseases, Umea University	Sweden
Claus Bech	Norwegian University of ST, Trondheim	Norway
Phil Hansbro	University of Newcastle	Australia
Hans Heesterbeek	University of Utrecht	The Netherlands
Gerry Dorrestein	Dept. Veterinary Pathology, University of Utrecht	The Netherlands
Ian Rose	Oregon State University	USA
Rald-Udo Muehle	Potsdam University	Germany
Andrés Barbosa	Spanish Council for Scientific Research	Spain
Karen McCoy	GEMI, UMR 2724 IRD – CNRS, Montpellier	France
Thierry Boulinier	CNRS – CEFE UMR 5175, Montpellier	France
Tatiana Savinova	Akvaplan-niva Polar Env. Centre Tromsø	Norway
Olga Dolnik	Zoological Institute Sp Petersburg	Russia
Tony Gaston	Canadian Wildlife Service, Ottawa	Canada
Jose Sericano	GERG – Texas A&M University	USA
Erica Nol	Biology Dept., Trent University, Peterborough	Canada
Birgit Braune	CWS, Environment Canada, Ottawa	Canada
Patricia Nash	Quebec Labrador Foundation, Lourde BS	Canada
Ann Harding	Alaska Science Center, Anchorage	USA
Causey Douglas	MCZ Harvard University	USA
Richard Lancelot	US Fish and Wildlife Service, Anchorage	USA
Robert Rockwell	American Museum of Natural History, New York	USA
Thomas Müller	Federal Research Institute for Animal Health	Germany
Helmut Kruckenberg	WFG Research	Germany
Kjetil Sagerup	University of Tromsø	Norway
Geir Wing Gabrielsen	Norwegian Polar Institute	Norway
Lech Stempniewicz	University of Gdańsk	Poland
Emily Jenkins	Canadian Wildlife Service, Saskatoon	Canada