

# Full Proposals for International Polar Year 2007-2008 Activities

## Proposed IPY Activity Details

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### 1.0 PROPOSER INFORMATION

(Activity ID No: 170)

#### 1.1 Title of Activity

Aliens in Antarctica

#### 1.2 Short Form Title of Proposed Activity

Aliens

#### 1.3 Activity Leader Details

Dana Bergstrom

Department of Environment and Heritage, Australian Antarctic Division

Australia

#### 1.4 Lead International Organisation(s) (if applicable)

Department of Environment and Heritage, Australian Antarctic Division, Australia

Centre for Excellence in Invasion Biology, University of Stellenbosch, South Africa

British Antarctic Survey, UK

Netherlands Institute of Ecology, Netherlands

#### 1.5 Other Countries involved in the activity

France

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

852

#### 1.7 Location of Field Activities

Antarctic

#### 1.8 Which IPY themes are addressed

1. Current state of the environment
2. Change in the polar regions
6. The human dimension in polar regions

#### 1.9 What is the main IPY target addressed by this activity

1. Natural or social science
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## 2.0 SUMMARY OF THE ACTIVITY

The impact of non-native (alien) species on ecosystems is one of the big issues of the 21st Century. Human travel is occurring at an unprecedented level across the globe.

Currently alien microbes, fungi, plants and animals occur on some parts of the Antarctic continent and most of the sub-Antarctic islands. These have been transported to the region through human activity (Frenot et al 2005). Introduction routes are largely associated with movement of people and cargo in association with national scientific program and tourist operations (Whinam et al 2005). The impact of these alien species ranges from minor transient introduction to substantial loss of local biodiversity and changes to ecosystem processes and evolution. With rapid climate change occurring in some parts of Antarctica, greater numbers of alien introductions and more successful invasions by aliens are likely, with consequent increases in impacts on ecosystems (Bergstrom and Chown, 1999).

This project aims to assess the extent to which the annual migratory human population carry propagules (seeds, spores, eggs) of alien species unintentionally into the Antarctic region. It aims to take a snap shot of the propagule load during the first IPY summer. This project will be the first time that an assessment of the extent of transfer of alien species into an entire biome has ever been made.

This project will attempt to assess the propagule load carried by people on a large subsample of Antarctic voyages/flights into the Antarctic and subantarctic islands during the 2007/08 summer of IPY. Expeditioners' outer clothing and equipment will be inspected for propagules. Samples will be collected and identified to the lowest taxonomic level possible and using scaling-up procedures total propagule loads will be assessed. Furthermore recent travel histories of expeditioners will be taken, to assess potential sources of propagules. The significance of this element of the project is that propagules from cold areas such as the Arctic will have a greater chance of establishing in the Antarctic than those from warmer ecosystems.

## References

Whinam, J., Chilcott N. & Bergstrom, D.M. (2005). Subantarctic hitchhikers: expedition as vectors for the introduction of alien organisms. *Biological Conservation* 121: 207-219.

Frenot, Y., Chown, S.L., Whinam, J., Selkirk, P.M., Convey, P., Skotnicki, M., & Bergstrom, D.M. (2005). Biological invasions in the Antarctic: extent, impacts and implications. *Biological Reviews*. 80:45-72

Bergstrom, D.M. & Chown, S.L (1999) Life at the front: history, ecology and change on southern ocean islands. *Trends in Ecology and Evolution* 14(12). 472-477

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

This project addresses two inter-disciplinary areas of science. The first is ecosystem evolution through examination of potential sources of new (alien) species to the Antarctic. The second is science to support conservation and environmental management. Data and information gathered during this project will inform those specifically involved in the conservation and protection of the Antarctic region as well as elsewhere in the world. The impact of invasives is one of the major topics in conservation biology worldwide. This topic currently is of major interest to the CEP and endorsement from the CEP will be sought at its next meeting.

### **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?**

The significant advances of this project are that we will be able to assess the absolute size of the threat of alien propagule transfer to the Antarctic region through human activity. There will be four major deliverables in this project:

- 1) is the assessment of this threat across a wide range of national operators and tourist operators and transport modes
- 2) once the threat is established, appropriate mitigation methods can be established to combat the threat, thus a major conservation outcome will be delivered

3) The project will result in significant outreach across the elements of global community that has interests in the Antarctic, as many people will be involved in the project through the propagule collection component, and many undergraduate students will be involved in the propagule analysis component of the project

4) Scientific papers and presentations

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

Locations	Coordinates
All departure locations for the Antarctic	

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

Arctic Fieldwork time frame(s)	Antarctic Fieldwork time frame(s)
	11/05 - 02/05
	11/07 - 02/08
	MM/YY - MM/YY

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

**Further details** – This project will be based around all intra-continental transport logistic modes (eg ship, planes, helicopters, yachts).

### 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	Y	
Own national polar operator		Y
Another national polar operator		
National agency		
Military support		
Commercial operator	Y	
Own support		
Other	Y	

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

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## 3.0 STRUCTURE OF THE ACTIVITY

### 3.1 Origin of the activity

This is a new activity developed for the IPY period

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

This project is part of the SCAR EBA program. The SCAR EBA steering committee will oversee the project and a IPY sub-committee will run the day to day activities of the program, including establishing the protocols, managing the sampling and samples and running the analyses.

There are three steps of the project

- Step 1) Vacuuming of expeditioners' outclothing and equipment for proagules
- Step 2) Examination of the vacuumings for propagules
- Step 3) Analyses of propagule data

We are currently seeking assistance from COMNAP and IAATO with Step 1, with regard to transport schedules and access to vessels and planes.

Step2 examination of samples, will be conducted by undergraduate students across participating nations through the International Antarctic Institute.

Step 3 will be conducted by EBA researchers with outreach activities back to the students for their scientific development.

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

No

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

No

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

Yes, this project will be linked to the Evolution and Biodiversity in Antarctic activities.

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

Data management will be based at the Australian Antarctic Data Centre (AADC) in contact with JCDM. A web-based data portal will be established for students to upload their findings and to allow researchers to report back to students with regard to the total analysis. Participants will be able to assess the state of progress.

### **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.?**

With data gathering based in the International Antarctic Institute, many undergraduate students will be exposed to a major CEP based issue, as such this project contributes directly to the training of the next generation of scientists.

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

Outreach will be through two areas:

1. interaction with students in the data gathering component (Step 2)
2. Website hosted by the Centre for Invasion Biology which will educate people travelling to the Antarctic with regard to mitigating the threat of transporting alien organisms and propagules.

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

National programs. Once the Joint Committee on IPY endorses this project we will also approach industry partners for sponsorship of the supply of vacuum cleaners which are necessary equipment for this project.

### **3.11 Additional Comments**

Pilot programs will run during the summer of 05/06 through the British Antarctic Survey and through a tourist operator from IAATO. A workshop on this project will be scheduled for next year around the SCAR/ COMNAP joint meeting in Hobart.

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## 4.0 CONSORTIUM INFORMATION

### 4.1 Contact Details

#### Lead Contact

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#### Second Contact

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### 4.2 Other significant consortium members and their affiliation

Name	Organisation	Country
Dr. Ad H.L. Huiskes	Netherlands Institute of Ecology	Netherlands
Dr Peter Convey	British Antarctic Survey	United Kingdom
Marc Lebouvier	Ecobio, CNFRA, University of Rennes	France
Dr Kevin Hughes	British Antarctic Survey	United Kingdom
Nicki Chilcott	Australian Antarctic Division	Australia