Risk of Avian Influenza in Antarctica

Antarctic Wildlife Health Network

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- COMNAP Delegates
- SCAR Exec, SCATS
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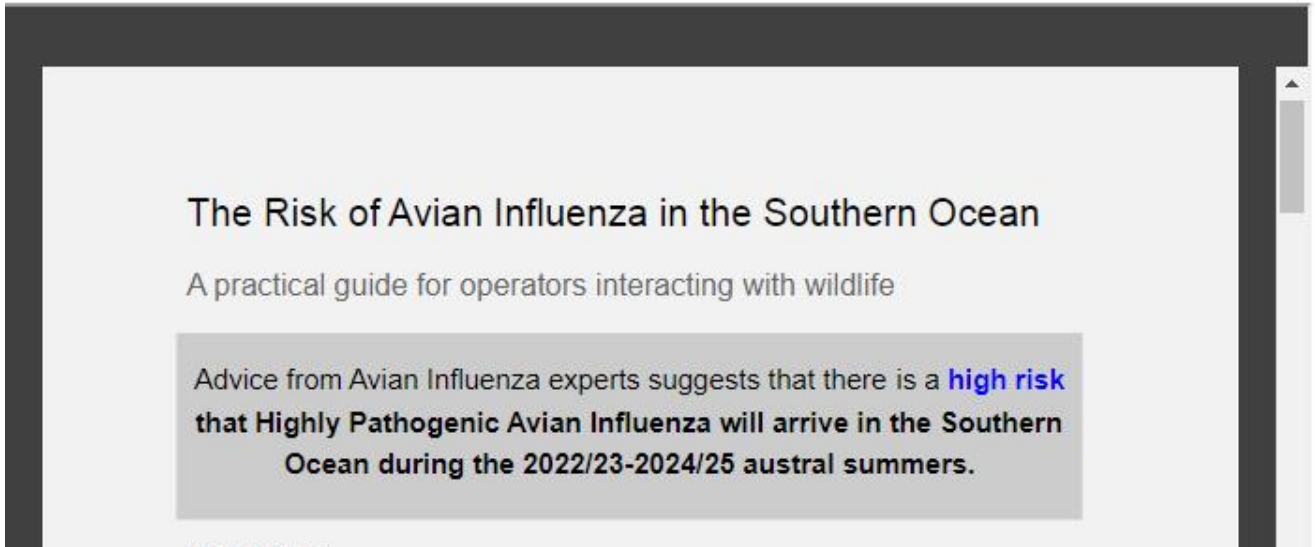
Outline

- Avian Influenza
  - What is it, Avian influenza in seabirds: history and context and Current Situation
- AWHN Risk Assessment
- IAATO Plan
- Example Risk assessment & Response Plan
- Afternoon Tea
- Round Table Discussions

Risk Assessment: A Practical Guide

This is a Preprint and has not been peer reviewed. This is version 7 of this Preprint.



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Abstract

Advice from Avian Influenza experts suggests that there is a high risk that Highly Pathogenic Avian Influenza will arrive in the Southern Ocean 2022/23-2024/25 austral summers.

Expanded Risk Assessment

- In response to rapidly increasing spread of HPAI throughout South America and requests for further information and guidance
- New Document includes;
  - Extensive background information on Avian Influenza, history of HPAI in seabirds and Antarctica
  - Comprehensive risk assessment by region and species
  - Expanded recommendations
  - Detailed Guidelines

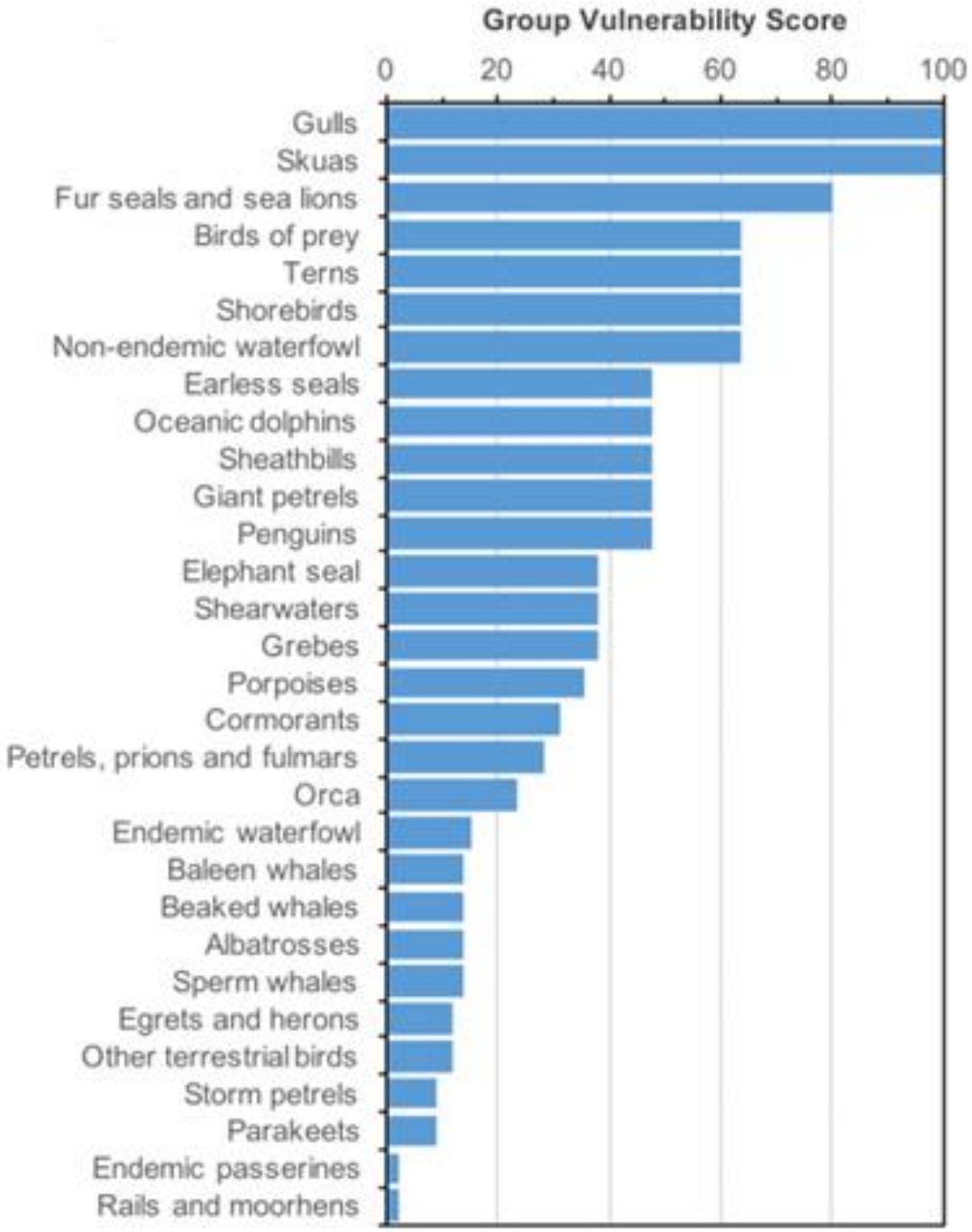
Species Risk Assessment

- Assessed the susceptibility of different wildlife groups to HPAI outbreak
- 3 variable chosen to identify risk for each group
- Each variable ranked out of 5
  - 1 = low
  - 5 = high
- Calculate Species Vulnerability Score

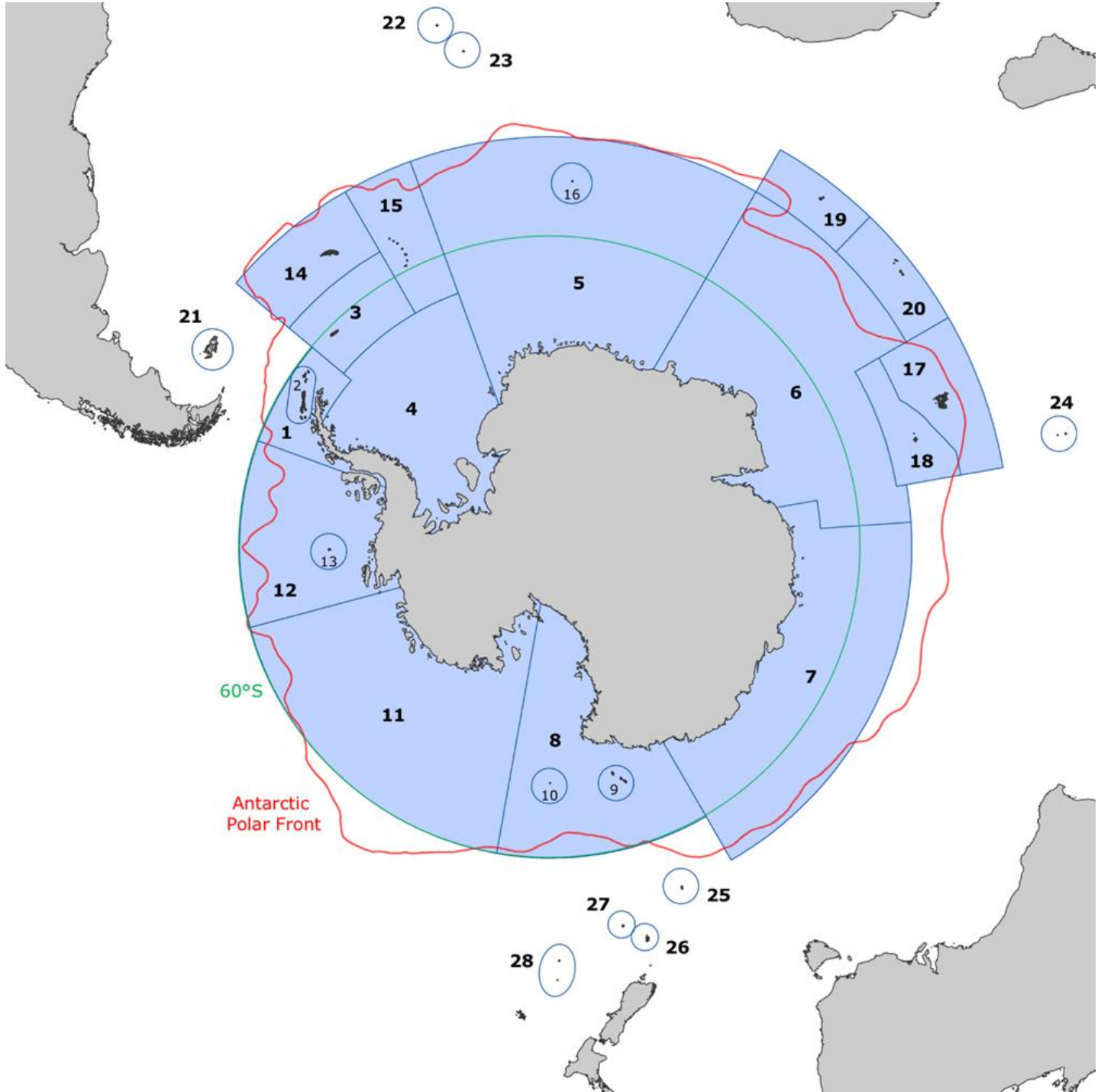
Variables

- Known Susceptibility
  - Is the group capable of being infected by HPAI?
- Risk Behaviours
  - Does the group present behaviours that might put it at an increased risk of exposure/transmission of HPAI?
- Population Connectivity
  - Do the individuals of this group frequently interact with those of other island groups, continents or oceans?

Risk Assessment



Regional Risk Assessment



Variables

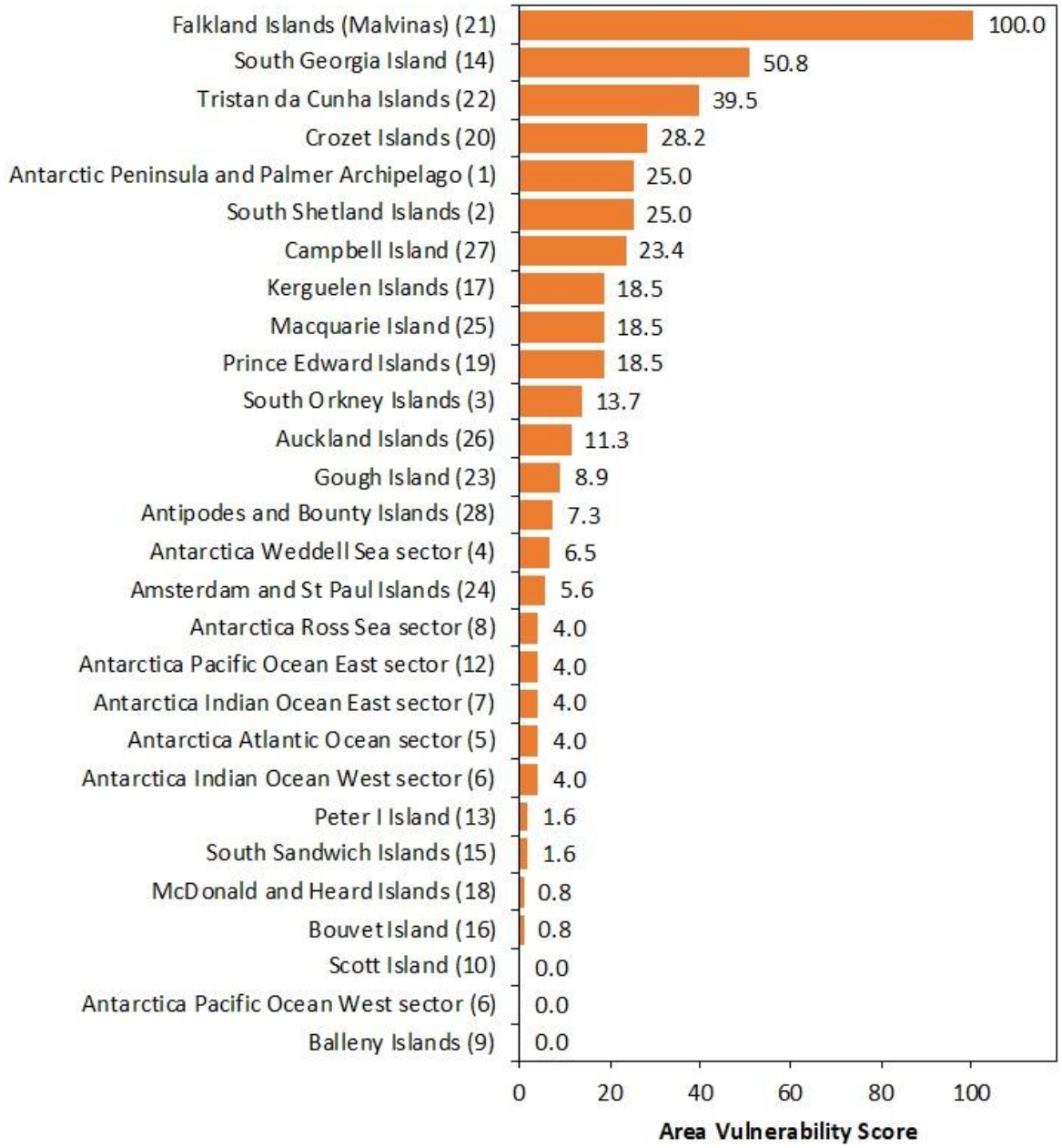
Vulnerability Score

- Proximity & wildlife Exchange
- Reservoir Hosts
- Human Presence

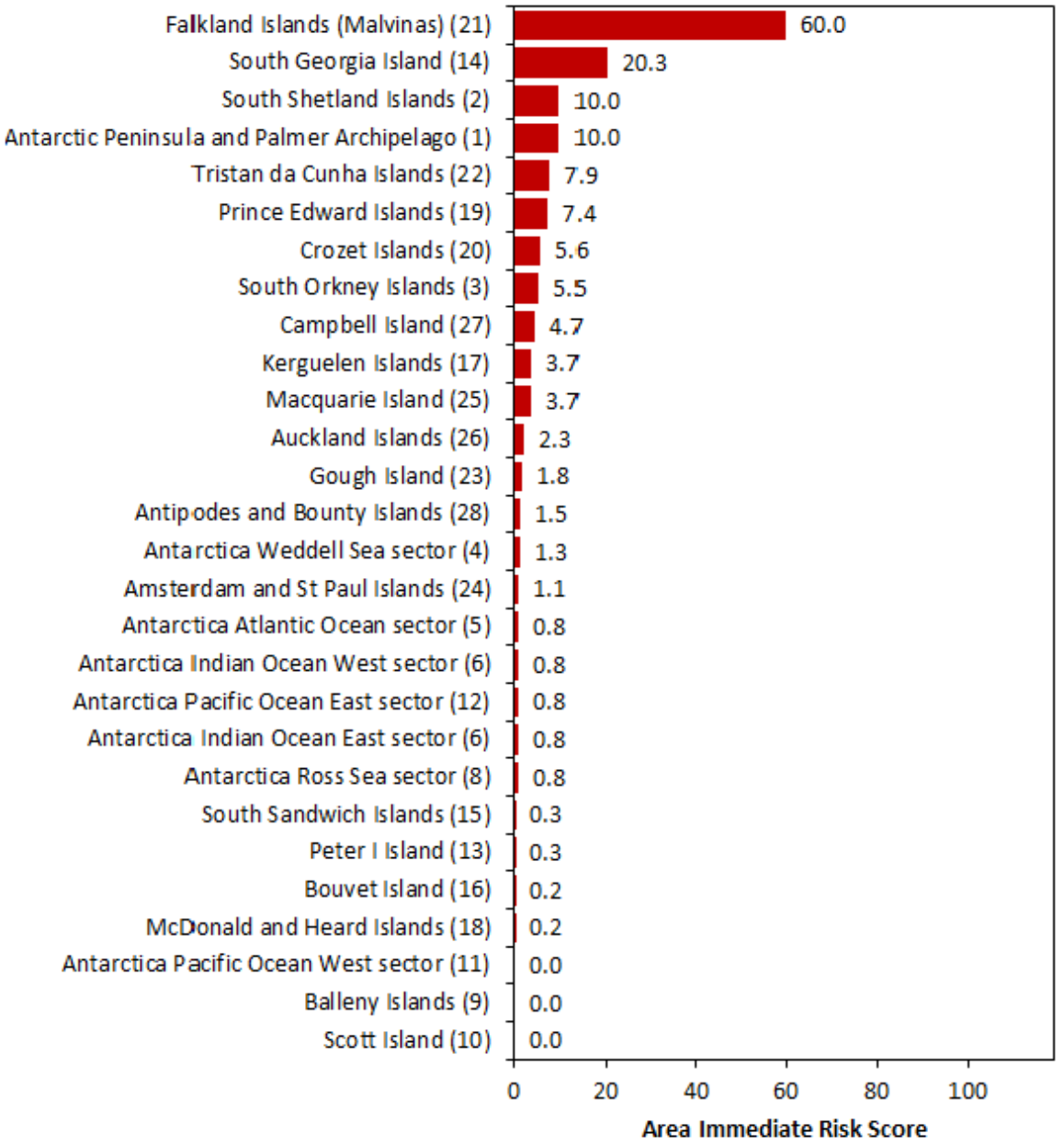
Immediate Risk Score

- Variables above plus distance to current outbreaks

Area Vulnerability Score



Immediate Risk



Expected Pathways

Potential Vector and Spreader Species

- Kelp Gulls
- Brown and South Polar Skua
- Giant Petrel
- Arctic Terns
- Waders/Ducks in sub-Antarctic
- Sheathbills
- Prospecting Juveniles

Recommendations – Biosecurity

- Before and After visiting colony
  - Clean footwear, clothing and equipment of any solid material
  - Spray with Viraclean, Virkon or F10.
- Follow ATCM Guidelines on visitation to wildlife colonies,
  - Only permitted scientists should enter colony
  - Keep distance from wildlife
- Avoid sitting down on the ground near wildlife colonies
- Do not enter colonies with unusual mortality or behaviour
- Do not touch sick, dying or dead animals unless permitted to

Recommendations – Surveillance

- Surveillance prior to outbreaks (dependant of capabilities)
  - Visual Surveys
    - E.g. Binoculars
      - Scan Colony for signs of unusual behaviour and mortality
  - Drone Surveys (only trained, licenced and permitted operators)
    - Fly over colony taking video recording of colony
    - Look for signs of unusual behaviour and mortality
  - Virus Screening
    - Non-invasive collection of faecal samples and environmental samples
    - Genetic screening via PCR/qPCR for virus
  - Antibody Testing (Ethics required, only trained personnel)
    - Collection of Plasma for detection of past virus infection (LPAI)

Suspected Events

- Suspicious, neurological behaviours
- Unusual Mortality
  - Dependant on species
  - Minimum cluster of 5+ dead birds, especially adults

- Trigger Action Plan

Recommendations – Responding to Event

- Record details of colony, including
  - Species affected
  - Percentage of infected birds
  - Percentage of deceased
  - Take video/photos of colony
  - GPS location
- Report sighting to relevant authority and enact Avian Influenza Response Plan
- Close site and surrounding area to all non-essential personnel for the duration of the outbreak

Recommendations – Responding to Event

- Remember this is class 3 pathogen
- PPE
  - Appropriate PPE **must be** worn before entering a colony with suspected or confirmed HPAI
  - All personnel should be trained in PPE donning and removal

Recommendations – Sample Collection

- If trained personnel are permitted to, collect samples
- Ethics and Permits required
  - Samples collected direct from animals
    - Dependant on species
  - Sample collection will be dependant on testing process
    - Sample preservation
      - Certified Lab – Live virus
      - Genomic Testing – DNA/RNA Shield, RNALater

Recommendations – Other Monitoring

- Recommended to monitor outbreak, preferably via visual surveys to prevent spread of virus
  - From a height using binoculars
    - Record spread/movement of virus in colony
    - Percentage of individuals affected
  - Via Drone Survey
    - Take video of colony
    - Record spread/movement of virus
    - Percentage of individuals affected

Recommendations –Active/Suspected Case Testing

- Certified Laboratory Testing (Off-site)
  - Require import/export permits & Licences
  - Agreements must be in place before season begins
  - Specific collection requirements for preservation
  - Note importing/exporting class 3 pathogens and/or genomic material lots of restrictions

Recommendations –Active/Suspected Case Testing

On-site Testing

- Trained personnel
- Check Regulations with Govt – Class 3 pathogen requirements
  - PCR/qPCR – presence/absence
  - MinION – in depth genomic information
  - Samples stored in RNA preservation media
- Recommend collection of samples for Genomic testing if applicable
- Identification of
  - Variants
  - Origin and movement of virus

Recommendations – Biogeographical Response Plans

- Establish joint and coordinated surveillance and response plan in different bioregions
- Prevent overlap, over sampling of sites
- Assist each other with surveillance, response and testing

Communications

All suspected and confirmed cases should be communicated to your

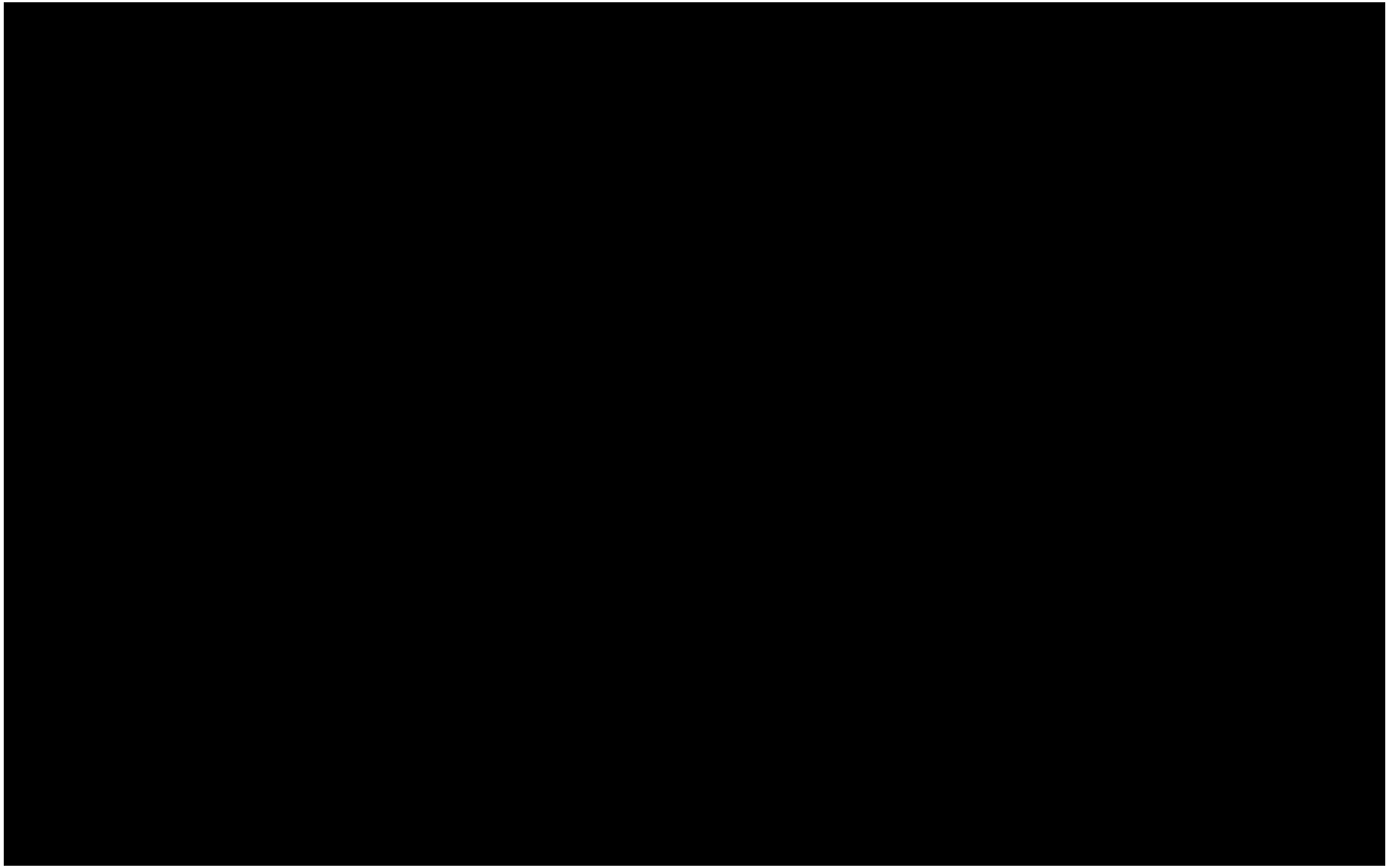
- National Program/Govt Authority
- IAATO (tour vessels)
- AWHN

DO NOT communicate about cases on social media, media or public unless permitted by you National Authority

Research Priorities

- Limited information on HPAI in sub-Antarctic and Antarctic wildlife
- Movement and genomics of Virus
- Patterns of Spread and Vector species
- Best biosecurity measures
- Susceptible species

IAATO Response/Plan




Example Risk Assessment
& Response Plan
Dr Megs Photography

Round Table Discussion

- Top 5-10 Research Priorities
- Biosecurity
  - Challenges for different bioregions/Operators
  - Solutions
- Data Sharing & Updating
- Key Information required from community