

Supplementary file for: Hughes K.A. & Convey P. 2014. Alien invasions in Antarctica—is anyone liable. *Polar Research* 33. Correspondence: Kevin A. Hughes, British Antarctic Survey, Natural Environment Research Council, High Cross, Madingley Road, Cambridge CB30ET, UK. E-mail: kehu@bas.ac.uk

Supplementary Table S1. Summary of the articles contained within Annex VI—“Liability arising from environmental emergencies”—to the Protocol on Environmental Protection to the Antarctic Treaty.

Article no.	Content
1	Article 1 defines the scope of the Annex. It applies to scientific research programmes, tourism (including tourist vessels entering the Antarctic Treaty Area, but not engaging in landings), and all other governmental and non-governmental activities in the Antarctic Treaty area for which advance notice is required under the Antarctic Treaty (Article 7[5]) including associated logistic support activities. Fishing vessels and ships engaging in “innocent passage” through the Treaty area are not included.
2	Article 2 defines the terms used in the Annex and Article 2(b) makes it clear that the Annex cannot be applied retrospectively and applies only to environmental emergencies that have occurred after its entry into force. Article 2(e) sets out the meaning of “reasonable” as applied to preventative measures and response action. Such measures and actions should be “appropriate, practicable, proportionate and based on the availability of objective criteria and information, including ... risks to the Antarctic environment, and the rate of natural recovery.” Reasonable measures and actions must also be technologically and economically feasible.
3	In Article 3, which discusses preventative measures, Parties are required to ensure their operators (i.e., those acting on its behalf and/or permitted to operate within Antarctica) “undertake reasonable measures that are designed to reduce the risk of environmental emergencies and their potential adverse impacts.”
4	Article 4, on contingency plans, requires Parties to ensure that their operators establish contingency plans for responses to incidents with potential adverse impacts on the Antarctic environment and co-operate in the formulation and implementation of these plans. A detailed list of contingency plan components is also laid out.
5	Article 5 discusses the expected level of response action by an operator that has caused an environmental emergency. Each Party shall

ensure that its operators take prompt and effective responsive action in the event of an environmental emergency and if this does not occur, the Party of the operator or other Parties are encouraged to take action. Other Parties intending to take response action should inform the Party of the operator who caused the emergency, to give them an opportunity to respond; however, if significant impact to the Antarctic environment is imminent, then the other Party (or Parties) can take immediate response action and then notify as soon as possible the Party of the operator and the Secretariat of the Antarctic Treaty. Of particular note is that other Parties are not permitted to take response action unless (i) the threat of significant harm or threat to the Antarctic environment is imminent and it “would be reasonable in all the circumstances to take immediate response action,” (ii) the Party of the operator has not informed the Secretariat that it intend to take action itself within a “reasonable time” or (iii) the Party has informed the Secretariat of its intention to take response action but has failed to do so in a “reasonable time” (Article 5[3b]).

- 6 Article 6 describes liability for costs. The operator that caused the environmental emergency and failed to take response action is liable for the costs of Parties that did take response action. Where no response action was taken by the operator or by any Party, the appropriate procedure depends upon whether the operator causing the environmental emergency is a state operator (i.e., in most cases the operator responsible for government/Party activities within Antarctica) or a non-state operator (e.g., a tour company, or some state operators, depending upon their legal status defined by their domestic legislation). If a state operator caused the emergency, and no response action was undertaken by the state operator or any other Party, the state operator is required to pay a sum of money into a fund held by the Secretariat (detailed in Annex 12—see later) equivalent to the cost of the response action that should have been undertaken. If a non-state operator caused the emergency, the cost of response action is to be paid by the operator to the Party under whose jurisdiction the operator resides (for example, many cruise ship companies are permitted by the US), and the Party is to pay the money into the fund. Article 6(5) lays out the “sovereign immunity rule” whereby warships, naval auxiliaries or other ships or aircraft owned or operated by a Party, and used for governmental non-commercial activities are beyond the jurisdiction of the Annex.
- 7 Article 7 describes the process for a Party bringing an action against an operator to reclaim costs incurred following their response action to deal with an environmental emergency caused by the operator. If a non-state operator fails to take response action following an environmental emergency for which they were responsible, a Party can bring an action in the courts of the Party where the operator is incorporated or predominantly based. Legal actions must be brought within three years of (i) the response action or (ii) the date when the identity of the operators was known, whichever is later. No legal action can be taken more than 15 years after the response action began. Parties are to ensure that they have domestic legislation in place to allow non-state operators to be pursued in the courts. In contrast, the liability of a state operator of a Party is to be decided following an enquiry by the Antarctic Treaty Parties and the sum of money to be paid by the state operator to the fund is to be approved by a decision at the Antarctic Treaty Consultative Meeting. According to Article 7(4), any dispute between the Parties would be resolved under the dispute settlement process, set out in

the Environmental Protocol (Articles 18-20).

- 8 Article 8 lays out exemptions to liability which include if the environmental damage was caused by a natural disaster, terrorism, an act deemed necessary for safety reasons or to protect human life, or an act of belligerence against the activities of the operator.
- 9 Article 9 sets out the limits of liability. According to Article 9(1b), when an environmental emergency arises from an event which does not involve a ship, liability is limited to three million Special Drawing Rights (SDR; as defined by the International Monetary Fund), which at the time of writing equates to 4 560 000 USD. If a ship is involved, the maximum liability is determined by the tonnage of the ship, for example, a 50 000 tonne ship would have liability limited to 18.2 million SDR (ca. 27 664 000 USD). Article 9(3) states that liability shall not be limited if it is proved that the environmental emergency resulted from an act or omission of the operator, committed with the intent to cause such emergency or recklessly and with knowledge that such emergency would probably result.
- 10 Article 10 makes it clear that a Party is not liable for costs should one of its non-state operators cause an environmental emergency and fail to take response action.
- 11 Article 11 lays down the obligation to obtain insurance to cover litigation costs resulting from an operator causing an environmental emergency. Some Parties may choose to self-insure as permitted under Article 11(3).
- 12 Article 12 lays out details of a fund, held by the Secretariat of the Antarctic Treaty, for the reimbursement of reasonable costs incurred by a Party when taking response action following an environmental emergency. The reimbursement of money from the fund must be agreed by consensus by the Antarctic Treaty Consultative Meeting Parties and voluntary contributions to the fund may be made by any state or individual.
- 13 Article 13 sets out criteria for the amendment or modification of the Annex, and is similar to equivalent text in other Annexes to the Environmental Protocol.
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