



# Developing an Effective Enforcement System for a Marine Reserve in the Pitcairn Islands

A report produced by The Pew Charitable Trusts, the National Geographic Society, and the Pitcairn Island Council for submission to the UK Foreign and Commonwealth Office

## Overview

This paper details how monitoring and enforcement of the Pitcairn Island's exclusive economic zone could be effectively undertaken for a relatively low level of expenditure. It is important to note that there is no such thing as perfect enforcement, although, in general, the greater the funds available, the closer to perfection an enforcement system is likely to get. This paper does not attempt to detail how near-to-perfect enforcement might be achieved because establishing such a system would be far too costly to be a realistic policy option. Rather, it outlines the most important steps that could be taken to create a robust enforcement system and reviews some affordable technologies that could be deployed to support it.

Creating a marine reserve and deploying these relatively low-cost options would protect Pitcairn Islands' exclusive economic zone far better than it currently is, and far better than the vast majority of oceans worldwide. These actions would distinguish the United Kingdom as a world leader in responsible stewardship of the marine environment.

## **Review of this report**

Enforcement of protections in remote marine areas presents a challenge to enforcement officials both from a resource and effectiveness perspective. This document underscores the importance of utilising alternative approaches to protection enforcement of remote marine areas and reflects the developing line of thinking in the international enforcement community. The emphasis on the importance of the legal structure, followed by a scalable approach to detection and response to threats, and culminating in alternative adjudication measures is an inclusive recipe for success. The process described in this paper is exactly what is needed to effectively and economically achieve protection for a marine reserve around the Pitcairn Islands.

### **Cdr Daniel Schaeffer**

Chief of Fisheries, United States Coast Guard

### About the reviewer

Joining the US Coast Guard in 1988, Cdr Schaeffer has served on five Coast Guard ships, two small boat stations, and several command staffs. He also has served as liaison to the United States Department of State and as commanding officer of the fisheries training centre in Alaska. He has experience with the full range of fisheries enforcement actions both at sea and dockside boardings, operational planning and oversight, policy development, drafting of regulations, and intergovernmental cooperation. For nearly two decades, he has been involved with international fisheries enforcement in nearly every corner of the globe. That has included multilateral meetings, treaty negotiations, and serving as a member of US delegations to various regional fisheries management organisations, and as a US Coast Guard representative to enforcement meetings, bilateral enforcement agreements, operational discussions, and planning assessments of enforcement capacity.

---

## Introduction

The United Kingdom has demonstrated a strong commitment and concern for the marine environment and maritime global heritage not only at home but also in its overseas territories. This is evidenced by the creation of the Chagos Marine Reserve and, within the Pitcairn Islands, the designation of Henderson Island as a UNESCO World Heritage site. Despite these actions and the commitment expressed in the latest strategic guidelines for overseas territories,<sup>1</sup> the Pitcairn Islands are not explicitly identified as an area for action.

The establishment of the Pitcairn Islands exclusive economic zone as a fully protected marine reserve would be a minimal-cost action that demonstrates the commitment of the UK government to this isolated overseas territory. It is difficult and expensive to provide support to this region, yet through this demonstrable act, the importance of the Pitcairn Islands and its citizens to the UK government will be clearly stated without a large expenditure of resources.

To support high-impact, low-cost marine enforcement action, it is key to first establish a base governance structure, and then build an effective monitoring, control and surveillance system that will provide long-term sustained protection for this remote region. Traditional views of enforcement rely upon the concept of “boots on deck” that entail the detection of illicit activity and follow-on interdiction by surface assets deployed at sea. This option is expensive and is not a tenable approach to enforcement for the Pitcairn Islands or most other remote Pacific islands.

Because of the Pitcairn Islands’ location and isolation from traditional forms of policing actions, any enforcement structure must adopt a range of low- and high-tech solutions, bolstered by a supportive legal system that leverages existing and emerging international enforcement regimes. Whilst the key to successful protection is prevention, if illegal activity is detected, this enforcement structure must lead to successful adjudication. This legal precedent leads to the rules of the marine reserve being respected.

Though monitoring and enforcement of remote ocean areas remains a challenge, there is reason to be optimistic that costs will reduce in the near future and that ocean surveillance technology will become more effective. These two factors will combine to increase governments’ capacity to enforce marine areas. For example, The Pew Charitable Trusts is already in conversation with satellite-based surveillance companies that are working on new, cost-effective technologies (Collecte Localisation Satellite<sup>2</sup> and MarInt by Windward<sup>3</sup>). In addition, Pew is collaborating with INTERPOL, the Norwegian Ministry of Foreign Affairs, and the Norwegian Agency for Development Cooperation to develop Project Scale, a new international initiative to set up a fisheries crime desk within INTERPOL. The desk will coordinate police operations to target fisheries and related criminal activity, disrupt trafficking routes, and harmonise national and regional enforcement efforts.<sup>4</sup>

Presented below is an approach to the development of an effective enforcement system for a marine reserve in the Pitcairn Islands at an acceptable cost. The approach draws upon best practice in use in other parts of the world and follows five essential and mutually supportive steps needed to create an effective enforcement scheme:

1. Establishing clear **responsibility and leadership**
2. Drafting and adopting a robust and supportive **legal structure**
3. Creating **detection** capability
4. Developing a **response** capacity
5. Establishing effective **adjudication** procedures

## Responsibility and leadership

The single most important action to ensure better maritime enforcement in Pitcairn is to appoint an individual vested with the specific responsibility for that goal: an Overseas Territory Maritime Security Officer. This position would not need to be exclusively dedicated to Pitcairn, but could also have responsibility for at-sea law enforcement and security issues for other overseas territories. This office would draw on the resources and capabilities of the UK military, civil society and others to deliver, in collaboration with the territory governments, better maritime security and law enforcement in the marine areas surrounding the territories. This position, which could be a secondment from the Royal Navy, would also be responsible, under appropriate guidance of the territory governments, for the establishment and implementation of the detection and response elements described below.

## Legal framework

A properly crafted legal regime is an essential prerequisite for successful enforcement. Any effective legal regime needs to include elements that facilitate detection, response, follow-on adjudication, and development of bilateral agreements with regional and global partners.

The legal structure can build upon the existing legal framework for the applicable fisheries law, as well as drawing text from existing marine reserves in other regions of the world. For example, the proclamation establishing the exclusive economic zone, or EEZ, around the Pitcairn Islands—Henderson, Ducie, Oeno, and Pitcairn itself—includes the responsibility to exercise jurisdiction over the exploration and exploitation of resources as well as the protection and preservation of the marine environment.<sup>5</sup> Through this mechanism the current Fisheries Zone Ordinance was established to regulate fishing activity in the zone. This ordinance established robust protection measures within the area for all fishing vessel activity. These existing provisions can be expanded and used as the basis for protection measures in the marine reserve.

The essential elements of best practice in marine reserve legislation should include:

### Detection

- a. The power to establish a volunteer reporting system;
- b. The ability to utilise chartered and volunteer vessels, as well as remote sensing devices including cameras, hydrophones, satellites and any other means of detection.

### Response

- a. Ability to use chartered or third-party platforms for enforcement;
- b. Allow partner-nation enforcement on behalf of Pitcairn;
- c. Allow voluntary reports, photographic evidence or data from remote sensing devices as evidence.

## Adjudication

- a. Prosecution based on sighting and position data or breaches of permit requirements;
- b. Third-party or proxy adjudication;
- c. Prosecution *In absentia* or *ex parte*;
- d. Penalties that act as a deterrent—at a minimum 75 percent of the value of the boat, plus catch.

## International Cooperation

- a. Reporting illegal, unreported and unregulated, or IUU, fishing activity via international instruments
- b. Bilateral enforcement agreements
- c. Adjudication assistance

## Detection

While no one solution will provide full detection capability, the use of a combination of available tools will provide a significant amount of coverage at an acceptable expenditure of resources. Solutions can be made more cost-effective by applying them selectively in time or space, based upon historic patterns or anticipated activity in a specific area at a specific time. Technology is also rapidly lowering the cost and increasing the effectiveness of many detection mechanisms, so it can be anticipated that further improvements in detection will be possible as the cost and the capabilities of technology evolve.

## Controlling access

The initial step in successful detection will be controlling access to as large an area as possible of the marine reserve. Through acquiring knowledge of who is legitimately in the reserve, the detection of violators will be simplified and expensive response actions can be focused. Permits should be required for any vessel entering within 12 nautical miles of any of the four islands. Presence without permission would be sufficient to constitute a violation and allow for adjudication measures. This element would need to be incorporated into the legal framework.

Normally, access to the exclusive economic zone of a coastal state for innocent passage by vessels is required under the United Nations Convention on the Law of the Sea, or UNCLOS, making it difficult to control access outside of the 12 nautical miles territorial sea. However, there is an exception to this general rule that allows coastal states to adopt stricter rules—such as the requirement that vessels obtain a permit prior to entry—than would normally be permitted by designating part or all of their zone as a Particularly Sensitive Sea Area or PSSA<sup>6</sup> via the International Maritime Organisation. This has been done in both the Great Barrier Reef Marine Park and the Papahānaumokuākea Marine National Monument (see case study below). If Pitcairn's exclusive economic zone were recognised as a PSSA there is therefore scope in the future to extend control of access outside of the territorial limit of 12 nautical miles and into the full zone.

It is likely that the designation of Pitcairn as a PSSA would have greatest success if it were first designated as a marine reserve, as this would add credence to the arguments that it is an important area and worthy of special protections.

## Voluntary check-in requirements

For any vessel entering the proposed Pitcairn marine reserve, but remaining outside of the 12 nautical mile zones around the islands, a notification procedure should be promoted. This would greatly assist in maintaining cognisance of vessel activity, would raise awareness of the reserve, and would facilitate development of a system for voluntary reporting and verification of activity. It also would provide information to help judge whether any observations of ships are likely to be of concern. Whilst it would not of itself stop boats which intended to fish illegally from entering -- since presumably they would not check-in -- if such vessels were subsequently sighted, their failure to have registered their presence would prioritise them for further investigation.

## Tracking equipment

As a prerequisite for entry into any of the four zones requiring a permit, all boats should be required, as a condition of the permit, to carry an agreed upon tracking mechanism that would allow for remote monitoring of that vessel's location within the marine reserve. This can be accomplished through commercial providers with the user fees covered by the applicant.<sup>7</sup>

## Voluntary reporting

Seafarers on legitimate vessel traffic in the marine reserve can be encouraged to support the reserve by providing a sighting network of other vessel activity. A formalised system can be established with merchant vessels, similar in structure to other voluntary reporting systems such as synoptic weather reports used by the US National Oceanic and Atmospheric Administration Weather Service<sup>8</sup> and the international search and rescue response network, Amver<sup>9</sup>.

Additional information programmes can be integrated into a system for smaller commercial and private vessels operating in the region. Through the collection and analysis of volunteer sightings, information can be collected on the extent, location and seasonality of possible illegal activity. On occasion, sufficient evidence may be collected to allow subsequent proceedings against perpetrators. One additional consideration is the development of a reward system to provide monetary incentives to report actionable information that leads to prosecution.

## Remote sensing buoys and cameras

The areas surrounding Henderson, Ducie and Oeno Islands are particularly sensitive within the proposed Pitcairn marine reserve, as they are out of sight of Pitcairn Island and harbour valuable biodiversity in their nearshore area. These can be monitored for vessel activity by a series of sensor buoys equipped with passive acoustics. This type of buoy has been in development with successful deployments off the East Coast of the United States for monitoring whale and vessel activity.<sup>10</sup>

Buoys have a range up to 30 kilometres and can be deployed in a manner that maximises coverage of sensitive areas. Similar buoys are being deployed in Chagos by the Zoological Society of London with a combined scientific and detection function.<sup>11</sup> These are costing as little as £3,500 each. Data could be uploaded via a satellite connection, and the Zoological Society has already established a partnership with Iridium satellite communication company which provides global satellite coverage and offers a special fixed "conservation" rate for uploads.

The exact number of buoys would dictate the final costs of deployment of this system in Pitcairn, but six to nine buoys would provide good coverage of the area surrounding these islands. Additional costs beyond deployment would include periodic maintenance (which could be combined with scientific monitoring expeditions) and data retrieval and analysis.

In addition to buoys, static cameras could be deployed on the three islands. The cameras could be similar to those employed by the SMART system<sup>12</sup> (for which the Zoological Society of London is now developing a marine version) or those under development by the society and Oxford University for remote seabird monitoring in the Antarctic<sup>13</sup>. Such cameras might be able to provide supplementary data to the acoustic monitors if boats were operating close to shore. The cost of cameras is less than £1,000 each, but the cost of maintenance and data retrieval would be similar to the acoustic buoys.

The net effect of cameras and buoys should be to establish near real-time monitoring of the most vulnerable areas of the proposed marine reserve and evidence that could be used for later enforcement action.

## Chartered vessels

While government vessels are unlikely to be readily available as an option, it is possible to charter a vessel to make periodic detection patrols. For example, the current resupply vessel, the *Claymore II*, or other bareboat vessels in the region could be used. The patrols can be targeted spatially and temporally based on historical information on likely illegal fishing hot spots or hot periods. These patrols could carry authorised law enforcement officers to conduct boarding and checks on vessels.

## Space-based detection

Near real-time direct image acquisition from commercial satellites is not cost-effective and the analysis of cheaper historic images -- which would have been useful to determine historic patterns of illegal fishing -- is not thought to be possible because few, if any, images are likely to exist.

As technology and initial development costs continue to be amortised, the costs of satellite-based systems are expected to decrease, making this a potentially affordable option for the future. However, the UK military and their allied partners have the ability to acquire surveillance imagery of Pitcairn's marine environment. This should be explored, since even historic imagery would be informative in detecting likely areas and times of illegal activity. Such information could enable more effective use of enforcement vessels.

## Aircraft

Given the remote location and lack of supporting infrastructure, detection by aircraft of illegal fishing is limited and costly. There are few military vessels or aircraft that transit the region offering few, if any, opportunities to leverage their services. Whilst an aircraft operating out of Mangareva could be chartered to support short duration coverage, this would not be cost-effective.

## Unmanned vehicles

Unmanned vehicles can take the form of aerial, underwater and surface craft. While these options have become a popular method in the public mind, they do not offer a viable option for the Pitcairn marine reserve. The initial and long-term operating costs and lack of available port or landing facilities would prevent use of all but the most expensive systems.

## Response

Response is the reaction to the detection of an illicit action in the marine reserve. The basic element of a response is to obtain the identity of the vessel concerned. Depending upon the method used, detection may provide sufficient evidence to identify the vessel.

With a supportive legal regime, a response does not have to be a physical interdiction of a vessel at sea to facilitate prosecution. If the legal requirement is broad enough to allow documentation of the location within the Pitcairn Marine Reserve, identification of the vessel, and proof of fishing from electronic or other means, additional response options become available.

### Chartered vessels

While it is not reasonable to have continuous coverage of the Pitcairn Marine Reserve, it is possible to charter a vessel in the region to respond to detected violations to document the position and identification of the vessel. The vessel could have an enforcement official on board and take immediate legal action. In other cases, the documentation could be used to adjudicate through alternative means as described below.

### Voluntary response

As part of a volunteer reporting system, observers can be requested to document activity observed for further adjudication. This approach is used to good effect in many marine reserves in the United States, most notably in the Florida Keys National Marine Sanctuary. There, many of the violations that are prosecuted originate with volunteer reports of illegal activity<sup>14</sup>.

### International partners

Development of bilateral enforcement agreements with the French, Chilean, and/or New Zealand navies could enable those forces to periodically undertake patrols in Pitcairn's waters and to take enforcement action on behalf of Pitcairn.

## Adjudication

Satisfactory detection and response to illicit activity in the Pitcairn Marine Reserve concludes with adjudication. Successful adjudication ensures adequate sanctions are applied and acts as a deterrent to future illicit behaviour. This can be achieved in different ways based upon the initial legal construct and supporting efforts for the Foreign and Commonwealth Office to engage the flag state of the violators.

### Prosecution In absentia

Utilising language similar to the fisheries ordinance, vessels could be prosecuted in absentia by the Governor of Pitcairn. Within the ordinance there are specific provisions that can be adapted to reflect the specific situation of the proposed Pitcairn marine reserve. This would further align the fisheries and marine reserve legal provisions. Judgements could be enforced through the courts of the UK and allied countries.

## Bilateral enforcement agreement

Pitcairn is the most remote overseas territory that is not routinely the destination of British government or enforcement entities.<sup>15</sup> The proximity of French Polynesia and the current support to Pitcairn from New Zealand opens the possibility for potential cooperation. A bilateral enforcement agreement could be negotiated, permitting the authorised presence of inspection and arrest vessels in Pitcairn's waters and allowing them to take appropriate enforcement action on behalf of Pitcairn in their jurisdictions or ports.

## International instruments

The global community has long recognised the threat of illegal, unregulated and unreported fishing, taking significant steps to end this destructive practice. Much of the global effort has focused on international instruments that provide a mechanism to combat this illegal activity. Measures such as the UN Fish Stocks Agreement,<sup>16</sup> development of regional fisheries management organisations,<sup>17</sup> and Port State Control Measures<sup>18</sup> are some examples. In addition to international instruments, several nations including the United States and the EU have developed legislation that punishes vessels and the countries that register them under "flags of convenience" for engaging in illegal fishing.<sup>19</sup> These instruments may be an additional tool to deliver consequences for illicit behaviour and act as a deterrent.

The main threat to the proposed Pitcairn marine reserve will be illegal fishing. The use of any international instrument may necessitate the engagement of the Foreign and Commonwealth Office with the responsible flag state of the fishing vessel to report evidence of the vessel's activity and seek remedy for the illicit behaviour. Illicit actions beyond fishing vessels may likewise require interaction with the flag state but may lack the leverage of the illegal, unregulated and unreported fishing instruments.

### **Table 1:**

Resources that could be used for effective surveillance and enforcement in Pitcairn

Item	Cost (Annual British pounds sterling—£)
Overseas Territory Maritime Security Officer <sup>20</sup>	150,000
Voluntary reporting and permits, including website	25,000
Boat tracking (satellite AIS data)	50,000-75,000
Nine remote sensing buoys and nine cameras (cost includes acquisition over two years and ongoing maintenance and replacement)	60,000
Real time data acquisition from buoys and cameras	10,000
Patrol boat charter (for two months)	-400,000
UK military satellite surveillance	Unknown <sup>21</sup>

Law enforcement and ensuring security are fundamental duties of government. Funding the enforcement of Pitcairn's exclusive economic zone is technically the responsibility of the territory's government, but reality dictates that given the size of the area and the size of Pitcairn's population, any effective enforcement must actually be dependent on the UK government. However, there may be instances in which corporations, philanthropists and non-governmental organisations may be able to assist the government to increase effectiveness or reduce costs. In circumstances where the government finds itself constrained in what it can do, it should talk to partners about how they may be able to help.

## **Examples of marine reserves in similar circumstances**

### The Papahānaumokuākea Marine National Monument

A remote location in the Pacific Ocean without permanent habitation, this marine reserve was created to secure the preservation of a historically and ecologically important region. The monument was designated as a mixed natural and cultural World Heritage Site.

The decision was made to establish a legal structure to facilitate remote enforcement with the knowledge that traditional enforcement presence and actions were impractical. As part of its establishment the implementing regulation set the following provisions:<sup>22</sup>

- Designation as a no-entry area
- Creation of mandatory ship reporting system (both International Maritime Organisation and domestic).
- Requirement to seek permission to enter
- Requirement to carry a vessel monitoring system if in the area

These measures have been used to good effect as a deterrent to illicit behaviour. The agencies charged with protection of the reserve lack the ability to project an enforcement presence. They rely instead primarily upon reporting and tracking procedures established after monument designation, with voluntary reporting by transiting vessels and infrequent patrolling by the United States Coast Guard.

This example is analogous to what could be achieved by the UK in Pitcairn.

### United States Coast Guard remote surveillance in the western Pacific

The United States Coast Guard and National Marine Fisheries Service rely upon remote sensing technology to detect and prosecute cases in the remote stretches of the Western Pacific Ocean that lie under United States jurisdiction. Aircraft and surface patrols are infrequent and limited. To maximise these scarce resources, they are directed to areas of activity by intelligence gathered from remote sensing capabilities. Information gathered from aircraft sightings and electronic surveillance is used to prosecute violators even when surface assets are unable to respond.

In 2009, vessel monitoring system position reports indicated the Spanish-flagged *F/V Albacora Uno* was engaged in illegal fishing activity in the remote areas of the United States exclusive economic zone around Howland, Baker and Jarvis Islands in the central Pacific.<sup>23</sup> Further investigation confirmed 67 counts of fishing inside United States waters without a permit. The vessel was fined \$5 million and agreed to carry vessel monitoring equipment and not enter any United States exclusive economic zone in the Pacific region as part of the settlement. Again this example is analogous to what could be achieved by the UK in the proposed Pitcairn Islands marine reserve.

## References and further reading

- Brooke, S.D., T.Y. Lim, and J.A. Ardron. 2010. *Surveillance and enforcement of remote maritime areas. Paper 1: surveillance technical options.*, 1-37. Marine Conservation Biology Institute, USA. Version 1.2.
- Brown, A.J. and L. Wooninck. 2007. "Developing design guidance for offshore MPAs," MPA News, 9(2):4, swfsc. [noaa.gov/publications/FED/00872.pdf](http://noaa.gov/publications/FED/00872.pdf).
- FAO Expert Workshop on Marine Protected Areas and Fisheries Management: Review of Issues and Considerations. 2006. [ftp.fao.org/docrep/fao/010/a1061e/a1061e.pdf](http://ftp.fao.org/docrep/fao/010/a1061e/a1061e.pdf).
- Government Printing Office. *Endangered Fish and Wildlife; Advanced Notice of Proposed Rulemaking (ANPR) for Right Whale Ship Strike Reduction*. Federal Register, Vol 69, No 105. 2004. 30857 - 30864.
- Gullett, W. 2007. *Pushing the Limits of the Law of the Sea Convention: Australian and French Cooperative Surveillance and Enforcement in the Southern Ocean*. International Journal Of Marine & Coastal Law, 22(4). 545-583.
- Herriman, M., et al. (2000). *Implications of International Instruments for Australian Oceans Policy*. [Information Document relative to the Development of a Comprehensive and Integrated Oceans Policy: Review of International Instruments Influencing the Use and Management of Australia's Marine Environment.] [www.oceans.gov.au/](http://www.oceans.gov.au/).
- Kimball, L. (2000) *International Ocean Governance: Using international Law and Organizations to Manage Resources Sustainably*. IUCN.
- National Monument Ship reporting Area Appendix e to part 404—Content and Syntax for Papahānaumokuākea Ship Reporting System, 50 C.F.R. CH IV (2009).
- Roberts J., (2005) *Protecting Sensitive Marine Environments: The Role and Application of Ships' Routing Measures*. *International Journal of Marine & Coastal Law*. 20(1):135-159. Available from: Academic Search Complete, Ipswich, MA.
- Scovazzi, T. (2003) *Marine protected areas on the high seas: some legal and policy considerations*. Paper presented at the World Parks Congress, Governance Session "Protecting Marine Biodiversity beyond National jurisdiction", Durban, South Africa (11 September 2003)
- Spadi, F. (2000) *Navigation in Marine Protected Areas: National and International Law*. *Ocean Development & International Law*, 31(3), 285-302.
- Treaty between the Government of Australia and the Government of the French Republic on Cooperation in the Maritime Areas adjacent to the French Southern and Antarctic Territories (TAAF), Heard Island and the McDonald Islands, Canberra, 24 November 2003. In force 1 February 2005.

## Endnotes

- 1 Foreign and Commonwealth Office, *The Overseas Territories: Security, Success and Sustainability*, June 2012. [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/32952/ot-wp-0612.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32952/ot-wp-0612.pdf).
- 2 Collecte Localisation Satellite, [www.cls.fr/welcome\\_en.html](http://www.cls.fr/welcome_en.html).
- 3 Windward (MarInt system), [www.windward.eu](http://www.windward.eu); demo video available at [www.windward.eu/marint-demo-video/](http://www.windward.eu/marint-demo-video/).
- 4 INTERPOL News and Media, "INTERPOL Launches Project Scale to combat fisheries crime," [www.interpol.int/News-and-media/News-media-releases/2013/PRO24](http://www.interpol.int/News-and-media/News-media-releases/2013/PRO24).
- 5 "Laws of Pitcairn, Henderson, Ducie and Oeno Islands," Revised Edition 2001, Chapter XXIX, "Fisheries Zone Ordinance," 457-458, [www.pitcairn.pn/Laws/Fisheries%20Zone%20Ordinance.pdf](http://www.pitcairn.pn/Laws/Fisheries%20Zone%20Ordinance.pdf).
- 6 Particularly Sensitive Sea Areas are defined by the International Maritime Organization as "an area which needs special protection through IMO because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to environmental damage by maritime activities." IMO, "Particularly Sensitive Sea Areas," [www.imo.org/OurWork/Environment/pollutionprevention/pssas/Pages/Default.aspx](http://www.imo.org/OurWork/Environment/pollutionprevention/pssas/Pages/Default.aspx).
- 7 See, for example, AST Systems, Case Studies, "Environmentally Responsible Fishing," [www.ast-systems.co.uk/Case-Studies/VMS---Tracking.aspx](http://www.ast-systems.co.uk/Case-Studies/VMS---Tracking.aspx).
- 8 See National Oceanic and Atmospheric Administration, National Weather Service, "Jetstream—Online School for Weather: Synoptic Meteorology," [www.srh.noaa.gov/jetstream/synoptic/synoptic\\_intro.htm](http://www.srh.noaa.gov/jetstream/synoptic/synoptic_intro.htm).
- 9 United States Coast Guard, "Amver Reports," [www.amver.com/amverreports.asp](http://www.amver.com/amverreports.asp).
- 10 Technological Alternatives to the Problem of North Atlantic Right Whale Ship Strikes, NOAA Fisheries, [www.nmfs.noaa.gov/pr/pdfs/shipstrike/ss\\_techalt.pdf](http://www.nmfs.noaa.gov/pr/pdfs/shipstrike/ss_techalt.pdf).
- 11 Zoological Society of London, "Open Ocean Monitoring in the Chagos Archipelago," [www.zsl.org/conservation/regions/africa/chagos-coral/openocean,1916,AR.html](http://www.zsl.org/conservation/regions/africa/chagos-coral/openocean,1916,AR.html).
- 12 Smart Conservation Software, [www.smartconservationsoftware.org/Home.aspx](http://www.smartconservationsoftware.org/Home.aspx).
- 13 Zoological Society of London, "Keeping track of penguins," [www.zsl.org/conservation/regions/antarctica/monitoringpenguins,1770,AR.html](http://www.zsl.org/conservation/regions/antarctica/monitoringpenguins,1770,AR.html).
- 14 Florida Key National Marine Sanctuary, "Team Ocean: Team ocean volunteers," [floridakeys.noaa.gov/volunteer\\_opportunities/teamocean.html](http://floridakeys.noaa.gov/volunteer_opportunities/teamocean.html).
- 15 The last visit by the Royal Navy to Pitcairn was in September 2000. [www.parliament.uk](http://www.parliament.uk), [www.publications.parliament.uk/pa/cm201011/cmhansrd/cm111130/text/111130w0004.htm#11113050001237](http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm111130/text/111130w0004.htm#11113050001237).
- 16 United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks, Sixth session, New York, 24 July-4 August 1995, [www.un.org/Depts/los/convention\\_agreements/texts/fish\\_stocks\\_agreement/CONF164\\_37.htm](http://www.un.org/Depts/los/convention_agreements/texts/fish_stocks_agreement/CONF164_37.htm).
- 17 The Pew Charitable Trusts, Environment Initiatives, "FAQ: What is a Regional Fishery Management Organization?" [www.pewenvironment.org/news-room/fact-sheets/faq-what-is-a-regional-fishery-management-organization-85899371934](http://www.pewenvironment.org/news-room/fact-sheets/faq-what-is-a-regional-fishery-management-organization-85899371934).
- 18 UN FAO, Fisheries and Aquaculture Department, "Port State Measures," [www.fao.org/fishery/psm/en](http://www.fao.org/fishery/psm/en).

## Endnotes

- 19 European Commission, Fisheries, "Illegal Fishing (IUU)," [ec.europa.eu/fisheries/cfp/illegal\\_fishing/index\\_en.htm](http://ec.europa.eu/fisheries/cfp/illegal_fishing/index_en.htm).
- 20 Only part of this cost is applicable to Pitcairn, as it would be shared by all the overseas territories that needed it.
- 21 Cost will be dependent upon systems used and if any services are internal or need to be contracted.
- 22 Papahānaumokuākea Marine National Monument, "Resource Protection: Ship Reporting Requirements," [www.papahānaumokuākea.gov/resource/ship\\_reporting.html](http://www.papahānaumokuākea.gov/resource/ship_reporting.html).
- 23 National Oceanic and Atmospheric Administration, "NOAA Protects U.S. Waters From Illegal, Unreported and Unregulated Fishing: Spanish-flagged vessel charged with 67 counts of fishing without a U.S. permit," [www.noaa.gov/news/stories/2010/20100611\\_fishing.html](http://www.noaa.gov/news/stories/2010/20100611_fishing.html).

**Contact:** Elisabeth Whitebread, Senior Associate, Global Ocean Legacy  
e: [ewhitebread@pewtrusts.org](mailto:ewhitebread@pewtrusts.org) p: +44 (0) 207-388-5370 ext2802

**Facebook:** [/ProtectPitcairn](https://www.facebook.com/ProtectPitcairn)

**Additional Resources:** [protectpitcairn.org](http://protectpitcairn.org), [visitpitcairn.pn](http://visitpitcairn.pn), [ocean.nationalgeographic.com/ocean/explore/pristine-seas/pitcairn/](http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/pitcairn/)

---

**About The Pew Charitable Trusts:** The Pew Charitable Trusts is driven by the power of knowledge to solve today's most challenging problems. Pew applies a rigorous, analytical approach to improve public policy, inform the public and stimulate civic life.

**About the National Geographic Society:** The National Geographic Society has been inspiring people to care about the planet since 1888. It is one of the largest nonprofit scientific and educational institutions in the world. Its interests include geography, archeology and natural science, and the promotion of environmental and historical conservation.

**About the Pitcairn Island Council:** The Pitcairn Islands are an Overseas Territory of the United Kingdom in the South Pacific Ocean, inhabited by descendants of the mutineers from the HMAV Bounty. The Island Council is the legislature of the Pitcairn Islands, which, with a population of around just 55 people, is the smallest democracy in the world.