



Is Offshore Commercial Fishing a Prospect in the Pitcairn Islands?

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

Overview

Past studies in the Pitcairn Islands exclusive economic zone concur that fish stocks are low and that large-scale commercial fishing is not economically viable. Pitcairn lies in an area of the Pacific that is low in nutrients and therefore lacks the conditions necessary to support commercially significant fish biomass. Although it is possible that the available biomass for tuna may change in the future due to climate change, there is little evidence upon which to make a solid prediction and other climate change related factors may in any case preclude this from happening.

Furthermore, evidence from fisheries elsewhere shows that the sustainability of stocks can only be ensured through the use of on-board observers to monitor all activities and catches. This is economically viable only in non-marginal fishing areas, which therefore precludes Pitcairn waters.

Review of This Report

This short summary report reviews the past and current potential for commercial fisheries in the exclusive economic zone waters of the Pitcairn Islands. It presents good data summaries on past catches and makes a clear case for the low economic value and incentive for commercial fishing there. The waters around the Pitcairn Islands are clearly marginal in terms of the importance and viability for commercial fishing for large pelagic species. While there may be changes to tuna availability in the future due to climate change, it is clear that for all intents and purposes these waters will remain marginal for commercial operations for decades or even centuries to come.

Marginal fishing areas make management and enforcement of fishing regulations very difficult and expensive. To properly account for actual (in contrast to reported) catches as well as by-catch and discards, full on-board observer coverage is required. Especially for marginal fishing areas, this becomes cost-ineffective for commercial fisheries. Any other measure, such as relying on voluntary reporting by fishing vessels, results in biased and incomplete monitoring and reporting, as well as an inability to enforce rules and sustainable catch levels. This has been clearly demonstrated in Canadian west-coast fisheries, where 100 percent observer coverage is now mandated and enforced by the industry in the bottom-fish fisheries to ensure unquestionable resource accounting, along with equitable access and allocation.

In summary, the waters around Pitcairn are likely only of speculative interest to commercial enterprises, and management authorities should support removing these waters from fishing access.

Dr Dirk Zeller

Senior Research Fellow, University of British Columbia Fisheries Centre
Project Manager, *Sea Around Us* Project

About the reviewer

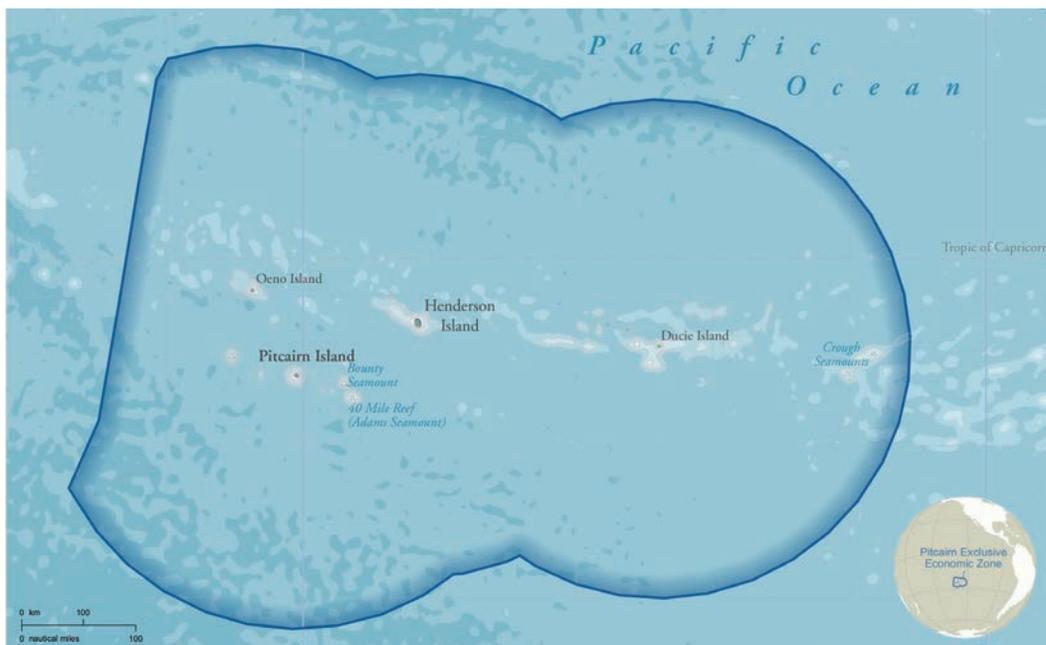
Dr Zeller has a background in tropical marine biology and fisheries ecology from James Cook University, Australia, and has professional interests in sustainability, strategic global policy developments, and resource economics, as well as marine reserves and coral reef ecology. He has produced more than 150 scientific contributions and has been published both in the primary literature (*Nature*, *Science*, *PLoS ONE*, *Marine Policy*, *Marine Ecology Progress Series*, *Environmental Health Perspectives*) and in dedicated book chapters and research reports. Dr Zeller was co-awarded the 2012 University of British Columbia Innovative Dissemination of Research Award and the 2011 Ecological Society of America Sustainability Science Award. He collaborates with scientists in Australia, Asia, Europe, the Americas, the Caribbean and the Pacific. He represents the *Sea Around Us* project at conferences and workshops throughout the world.

Introduction

The Pitcairn Islands exclusive economic zone, or EEZ, covers 836,108 square kilometres in the central South Pacific Ocean (*Sea Around Us* project website, 2013) (Figure 1). There is a history of distant water fishing nations, or DWFNs, using the EEZ as fishing grounds for long-line fishing for tuna and billfish, but few licences have been granted since the 1990s. Three regional fisheries management organisations have competence to manage certain fisheries in the area, although the United Kingdom (on behalf of the Pitcairn Islands) is not a member of any of these management organisations. The western edge of the Pitcairn Islands EEZ is inside the Western and Central Pacific Fisheries Commission management area, and the entire EEZ is within the convention area of the Inter-American Tropical Tuna Commission (Langley and Adams, 2005) and the newly formed South Pacific Regional Fisheries Management Organisation (South Pacific Regional Fisheries Management Organisation, 2012). All of these oversight groups aim to manage certain fish stocks to ensure their long-term, sustainable use.

Figure 1.

The Pitcairn Islands (Pew Charitable Trusts, 2012)

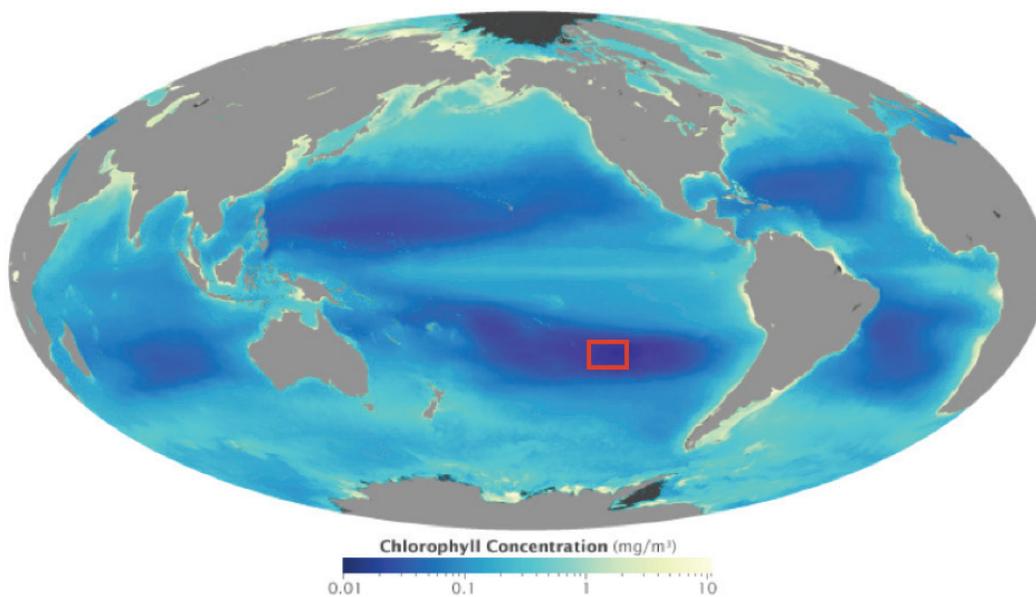


The most recent biological survey of the deep waters (in this survey, this was at depths of 78 to 1,585 m) surrounding the Pitcairn Islands (Sala et al., 2012) identified 57 fish species, including eight new to science, abundant top predators, and a “remarkable” level of fish diversity. Indeed, Palomares et al. (2011) suggest that the Pitcairn Islands may be one of the world’s last remaining places with a complete array of marine species. Of particular interest was the seamount at 40 Mile Reef, with a relatively high fish biomass and an intact ecosystem—rare for seamounts due to global fishing pressures. However, overall (including both deep- and shallow-water areas), total reef fish biomass of the Pitcairn Islands (1.5 tonnes/ha) was found to be lower than similar sites in more northerly areas of the central Pacific (5 tonnes/ha in the Line Islands). This is believed to be due to the Pitcairn Islands’ proximity to the South Pacific gyre, where oligotrophic conditions limit the primary productivity necessary to support higher biomass, essentially creating an “oceanic desert,” with fewer fish and other species compared to elsewhere.

Interestingly, whilst the Pitcairn Islands' low productivity makes it a poor choice for large-scale industrial fishing (which would likely wipe out fish stocks in a matter of years), the crystal-clear waters that arise from it, combined with the high numbers of sharks present thanks to its relatively unspoiled condition, make Pitcairn one of the world's best locations for divers interested in viewing marine life.

Figure 2.

Average chlorophyll concentration in the global oceans from July 2002 to May 2010. The Pitcairn Islands (red rectangle) lie in the least-productive region of the Pacific Ocean. Source: NASA Earth Observatory (earthobservatory.nasa.gov).



History of Fisheries and Catches Near the Pitcairn Islands EEZ

See Table 1 for a summary of fisheries in the Pitcairn Islands. Foreign long-line vessels from Japan, South Korea, and Chinese Taipei have used the Pitcairn Island EEZ and its vicinity as fishing grounds primarily for tuna and billfish since the 1950s, with a notable peak in catch in the 1970s and a smaller peak in the late 1980s/early 1990s. Since 1990, the fishing grounds have been used primarily by vessels from Chinese Taipei, but also by vessels from China, Japan, South Korea, and French Polynesia.

Table 1:

Summary of the fisheries that exist or have existed, or for which licences have been sought within Pitcairn’s EEZ. Data from Langley and Adams (2005), covering 1958 to 2004.

Type of fishery	Species	Potential catch per year (metric-tonnes)
Offshore—long-line	Primarily albacore tuna, with some yellowfin and bigeye tuna.	100-1,100 mt (up to 1,000 of which is albacore) seasonal and highly variable by year.
Offshore—long-line	Striped and blue marlin.	Unknown.
Handline	Bottom fish including deep-water snapper and red grouper.	Extremely limited.

From 1990 to 2004, annual landings of tuna ranged from less than 100 mt to 1,100 mt, with an average of 450 mt/year (Langley and Adams, 2005). The fishing area corresponding to this data is roughly twice the size of the Pitcairn Islands EEZ, so it is reasonable to assume that the potential catch from within the EEZ would be substantially lower than the 450 mt/year, perhaps half that amount or 225 mt/yr. For comparison, 450 mt/year is only about 0.5 per cent of the 81,217 mt annual catch of South Pacific albacore in 2010 (Harley et al., 2011). The catch around Pitcairn is dominated by albacore (95 percent) with small amounts of bigeye (3 percent) and yellowfin (2 percent) tuna, although there has been yearly variation when the latter two species comprised a larger percentage of the catch. Cyclical fluctuations have been observed in historical data with “3-4 years of higher catches followed by several years of low catches” (Langley and Adams, 2005). Fishing typically occurs in the austral spring or summer (October to March). A more recent summary of tuna fishing activities in the Pitcairn Islands EEZ (Bell et al., 2011a and 2011b) suggested there has been no oceanic fishing by foreign fleets in recent years.

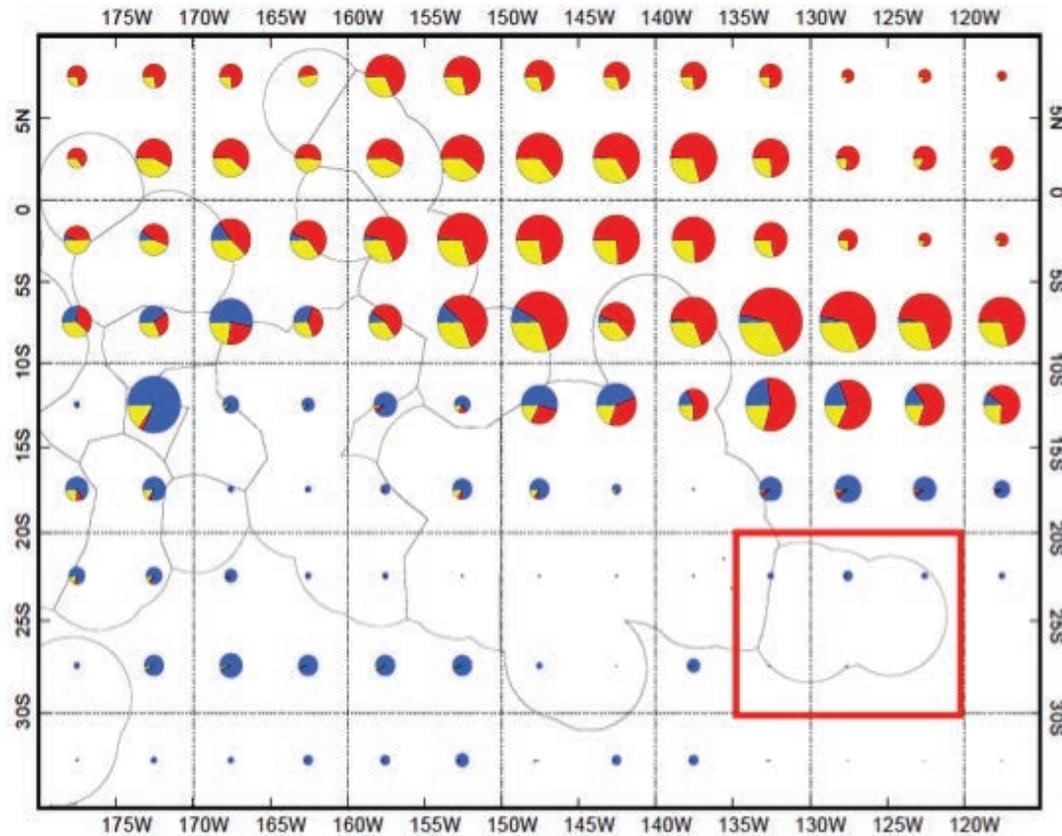
Given a historical catch of 225 to 1,000 mt/year (*Sea Around Us* project figure), and applying a licence value of 100 euros/mt (European Commission, 2010), there is likely income of €22,500 to €100 000 (US\$30,000 to \$132,000). However, there is considerable uncertainty about this figure. Actual income often does not follow a simple equation and depends entirely on the market at the time.

A 1994 expedition to evaluate the fishing potential of the Pitcairn Islands, performed by a New Zealand-based fishing company (under a licence granted by the office of the governor of the Pitcairn Islands), was not profitable and found no resources of interest. The seamount at 40 Mile Reef was deemed the richest fishing ground in the EEZ, but its small area of 2 km² would be rapidly “depleted by a commercial enterprise” (Sharples, 1994).

A 2005 report of the Secretariat of the Pacific Community said that “the maximum sustainable yield of deep-water snapper (all species) was estimated to be between 1.1 and 3.3 tonnes per year within the Pitcairn EEZ, which is far below the level needed to support a commercial fishery” (Langley and Adams, 2005). Even if they were abundant, deep-sea fish species are long-lived and have slow turnover rates; thus, their populations are very fragile and would likely be depleted even with light fishing pressure (Devine et al., 2006).

Figure 3.

Cumulative long-line catch of yellowfin (yellow), bigeye (red), and albacore (blue) tuna from 1990 to 2003 (Dawson and Irving, 2012), adapted from Langley and Adams, 2005). The area of the circles is proportional to the catch (maximum catch = 20,000 tonnes). Note that the catch in the Pitcairn Islands EEZ (red square) is minuscule compared with areas closer to the equator, where ocean productivity is higher.



Tuna stock sustainability

South Pacific albacore tuna is not overfished, with a biomass able to support the current level of catch (Hoyle et al., 2012). However, an increasing annual catch—including sequential record-breaking levels in 2009 and 2010—suggests vulnerability of the stock to future continued high catch levels and a possibility of decreasing catch in the near future (Harley et al., 2011). Given the history of albacore dominating the catch in waters around Pitcairn Islands, it is probably the only feasible fishery in the EEZ (Dickie et al., 2012).

Yellowfin tuna are not overfished but there are heavy areas of exploitation in the western equatorial Pacific, where the majority of yellowfin are caught (Langley et al., 2011). Bigeye tuna are undergoing overfishing, with current catch levels exceeding sustainable levels. That is why a 32 percent reduction in bigeye catch was recommended by the Western and Central Pacific Fisheries Commission in 2011 (Harley et al., 2011).

It is worth noting that in a recent volume on the potential impacts of climate change on Pacific fisheries, Bell et al. (2011) state that “there is a possibility that tuna may eventually increase [around Pitcairn] as the distributions and abundances of the main species change.” However, they also state that “reductions in nutrient supply are also expected to occur,” and so it seems that the impacts of possible future changes in the environment around Pitcairn will have uncertain consequences for its fish stocks. At this stage, any prediction with regard to fish abundance seems speculative.

Recent commercial fishing

There has been little offshore fishing activity within the Pitcairn EEZ since 1993. However, what has taken place underscores the low potential of Pitcairn’s waters to support a viable, sustainable commercial fishery in the long-term. As referred to above, an exploratory fishery in 1994 found no resources of interest and concluded that any commercial fishing by distant water vessels would be unsustainable. A Spanish long-liner was granted access in 2006 for a fee of US\$1,000. It only fished a few days due to poor catch (Irving and Dawson, 2012). Gillet (2009) references 5 mt of albacore taken from the “Pitcairn Islands zone” in 2005 by a long-line vessel as reported by the Secretariat of the Pacific Community’s Oceanic Fisheries Programme, but there is no reference to what, if any, agreement the Pitcairn Island government had with the long-liner.

However, a 5 mt catch is unlikely to have made the venture economical (at a likely value at market of US\$1,500 to \$2,000 per mt, the catch would have been worth US\$7,500 to \$10,000. The *Sea Around Us* project website reports limited yellowfin, bigeye, and skipjack tuna fishing (less than 500 mt/year, and many years less than 50 mt/year) within the EEZ from 1993 to 2007, but the website does not specify the origin of the fishing companies. In 2011, Pitcairn received requests from Chinese Taipei-, Spain-, and New Zealand-based fishing companies to fish in the EEZ (Dickie et al., 2012), indicating that interest does exist from foreign fishing companies, although none of the applicants received licences.

Factors favouring offshore commercial fishing

- Although the Pitcairn Islands EEZ offers a comparatively small and variable catch potential, given its location on the “margins of major tuna fishing grounds,” it might be a desirable location to distant water fishing nations already operating long-line vessels in neighbouring EEZs and/or international waters (Langley and Adams, 2005). Recent requests by foreign fishing companies indicate that demand exists at least at some level.
- It has been suggested (Bell et al., 2011a and 2011b) that future changes to the climate may lead to an increase in tuna stocks around Pitcairn. However, this prediction is highly speculative, and it is not clear how large any potential increase in stocks might be.
- Given the Pitcairn Islands’ experience in authorizing licencing agreements, granting fishing access in the EEZ is a means to generate revenue over a short time frame, Dickie et al. (2012) estimates a possible average income of US\$31,851 a year, based on a 2011 Chinese Taipei fishing application.
- Establishing a history of catching albacore tuna in Pitcairn waters may result in future eligibility for receiving shares if management of the fishery evolves into a regional/national quota system (Blanc, 2011). This opportunity to claim the resource existing in Pitcairn waters may be otherwise lost if there is no claim to a commercial fishery. However, this risk is highly speculative. As indicated by the experience around the British Indian Ocean Territory, also a British overseas territory, the UK government retains its place in the Indian Ocean Tuna Commission despite most of the British Indian Ocean Territory being a fully no-take marine reserve.

Factors against offshore commercial fishing

- Pitcairn Islanders support establishing the majority of the EEZ as a no-take marine reserve (see <http://www.visitpitcairn.pn/ourislands/marinereserve/index.html>). Under this proposal, Pitcairners would be able to utilise their marine area out to 12 nm from the shore of Pitcairn Island for commercial purposes. For biological and feasibility reasons, a sustainable commercial fishery is unlikely to be possible other than in close proximity to Pitcairn Island, where the islanders could observe and enforce the rules on themselves and on outsiders, as well as undertake the science needed. Thus, ruling out offshore commercial fishing through creation of the proposed marine reserve does not shut off the only likely avenue for the development of a sustainable commercial fishery.
- The potential increase in tourism generated by establishing the largest no-take marine reserve in the world could generate revenue in excess of the income projected from granting fishing licences (Dickie, et al., 2012).
- Any fishery would have to provide both scientific and enforcement capacity if it were to be sustainable and well-managed. There is clear evidence that management rules for fisheries will be followed only if independent on-board scientific observers monitor all activities and catches. The Canadian west coast is a leading example of this success (Trumble et al., 2010), and the EU fisheries are a prime example of failing in this regard. Thus, without independent science there could be no monitoring for sustainability. Furthermore, to licence a fishery without enforcement would likely lead to reduced (or no) revenue and invite poaching. Given the low income potential of the fishery and the high costs of the fishery science and enforcement required, any properly managed fishery in Pitcairn would be massively loss-making. Whilst enforcement and science would also be needed by a marine reserve, both are simpler for a reserve and there are conservation organisations interested in assisting with the science (the Zoological Society of London).
- Pitcairn's waters are of global importance as they are one of the few places that are in a nearly unspoiled state. They are a unique and an irreplaceable asset, which makes it imperative to secure them for science and future generations before damage occurs.
- The islands slope sharply to great depths, with very narrow, shallow, and therefore limited areas available for fishing. That is why deep-water species do not appear to be present in commercial quantities. Any commercial fisheries around Oeno, Ducie, or Henderson islands or on the seamounts would likely deplete the limited fish resources within a few years.
- Based on the scientific evidence to date, an offshore tuna fishery appears not to be profitable "[T]he Pitcairn Islands EEZ is likely to only support a seasonal tuna fishery and the performance of the fishery is likely to vary considerably between years. ... Fishing is likely to continue to be sporadic and variable between years" (Langley and Adams, 2005).
- A Skipjack Program survey in the waters of Pitcairn Islands showed that "the remote location of Pitcairn Islands and the lack of live-bait make it very unlikely that skipjack will ever be heavily exploited by pole and line vessels in these waters" (Argue and Kearney, 1982).
- The annual reported catches of tuna during the 1970s and late 1980s-early 1990s (when foreign fleets had permits for fishing in Pitcairn's EEZ) were much lower compared with other regions in the south-western and central Pacific (Langley and Adams, 2005; Irving and Dawson, 2012) (Figure 3). In 2005, the tuna catch on the Pitcairn EEZ was 500 times lower than the catch in French Polynesia.
- If access to Pitcairn's EEZ were opened up to commercial fishing, the UK's participation in the relevant RFMOs would be required. This would incur costs which could well exceed the likely licence income.

References

- Argue AW and Kearney RE. 1982. *An assessment of the skipjack and baitfish resources of Pitcairn Islands, Skipjack Survey and Assessment Programme*. Final Country Report No. 4, South Pacific Commission, Noumea, New Caledonia, November 1982.
- Bell JD, Johnson JE and Hobday AJ, editors. 2011a. *Vulnerability of tropical Pacific fisheries and aquaculture to climate change*. Secretariat of the Pacific Community, Noumea, New Caledonia. XII + 925 p.
- Bell JD, Johnson JE, Ganachaud AS, Gehrke PC, Hobday AJ, Hoegh-Guldberg O, Le Borgne R, Lehodey P, Lough JM, Pickering T, Pratchett MS, and Waycott M. 2011b. *Vulnerability of tropical Pacific fisheries and aquaculture to climate change: Summary for Pacific Island countries and territories*. Secretariat of the Pacific Community, Noumea, New Caledonia. VIII + 386 p.
- Blanc M. 2011. *A Recommended Framework for Domestic Fisheries Development in Pitcairn Islands*. Secretariat of the Pacific Community Nearshore Fisheries Development Section, Coastal Fisheries Programme, December 2011.
- Devine JA, Baker KD, and Haedrich RL. 2006. *Deep-sea fishes qualify as endangered*. *Nature* 439:29-29.
- Dickie I, Whiteley G, and Dutton A. 2012. *Revised Final Draft Report: Economic Analysis of Marine Reserve Designation in Pitcairn Islands' Waters, A Report for the Pew Environment Group's Global Ocean Legacy Project*. Economics for the Environment Consultancy. August 2012.
- European Commission. 2010. *Studies in the Field of the Common Fisheries Policy and Maritime Affairs*. Lot 4: Impact Assessment Studies related to the CFP, Annex A: External Policy Impact Assessment. http://ec.europa.eu/fisheries/documentation/studies/impact_assessment_phase_ii/annex_a_external_en.pdf
- Götesson LÅ. 2012. *Fishes of the Pitcairn Islands including local names and fishing methods*. Visby, Sweden: Books-on-demand, 354 pp.
- Harley SJ, Williams P, Nicol S, and Hampton J. 2011. *The western and central Pacific tuna fishery: 2010 overview and status of stocks*. Tuna Fisheries Assessment Report 11. Noumea, New Caledonia: Secretariat of the Pacific Community. http://www.spc.int/OceanFish/en/publications/doc_details/1007-the-western-and-central-pacific-tuna-fishery-2010-overview-and-status-of-stocks
- Hoyle S, Hampton J, and Davies N. 2012. *Stock assessment of albacore tuna in the South Pacific Ocean*. Western and Central Pacific Fisheries Commission, Scientific committee eighth regular session. Busan, Republic of Korea, 7-15 August 2012.
- Irving RA and Dawson TP. 2012. *The marine environment of the Pitcairn Islands*. A report to Global Ocean Legacy, a project of the Pew Environment Group. Dundee, Scotland: Dundee University Press, 115 pp.
- Langley A and Adams T. 2005. *The Potential for Development of Fisheries in the Pitcairn EEZ*. Secretariat of the Pacific Community Marine Resources Division, January 2005.

References

Langley A, Hoyle S., and Adams T. 2011. *Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean*. Western and Central Pacific Fisheries Commission, Scientific committee seventh regular session. Pohnpei, Federated States of Micronesia, 9-17 August 2011.

NASA Earth Observatory website: <http://earthobservatory.nasa.gov>. Accessed 30 January 2013.

Palomares MLD, Chaitanya D, Harper S, Zeller D, and Pauly D. 2011. *The Marine Biodiversity and Fisheries Catches of the Pitcairn Group*. A report prepared for the Global Ocean Legacy project of the Pew Environment Group by the Sea Around Us project. Fisheries Centre, University of British Columbia, Vancouver, BC, 42 pp.

Sala E, Friedlander A, Ballesteros E, Brown E, Bradner H, Caselle J, Fay JM, and Turchik A. 2012. *Pitcairn Islands Expedition Report*. National Geographic Society and Pew Environmental Group. 99 pp.

Sharp M. 2011. *Economic Viability Study of Commercialising the Pitcairn Islands Fishing Sector*. Secretariat of the Pacific Community Nearshore Fisheries Development Section, Coastal Fisheries Programme, December 2011.

Sharples P. 1994. *Pitcairn Island Fisheries Resource Survey—1994 Observer Trip Report*. (Included as Annex 2 in the Langley and Adams 2005 paper above).

South Pacific Regional Pacific Management Organisation website: <http://www.southpacificrmo.org>. Accessed 13 February 2013

The Sea Around Us project website: <http://www.searoundus.org/eez/612/1.aspx>. Accessed 24 January 2013.

Trumble RJ, Abbot J, Brannan D, Gislason G, Knapp G, and Swasey J. 2010. *Economic analysis of the impacts of catch shares on fisheries employment and income*. MRAG Americas report for Environmental Defense Fund. MRAG Americas, St. Petersburg, FL. 123 pp.

Visit Pitcairn website: <http://www.visitpitcairn.pn/ourislands/marinereserve/index.html> Accessed 6 February 2013.

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

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

Additional Resources: protectpitcairn.org, visitpitcairn.pn, 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.