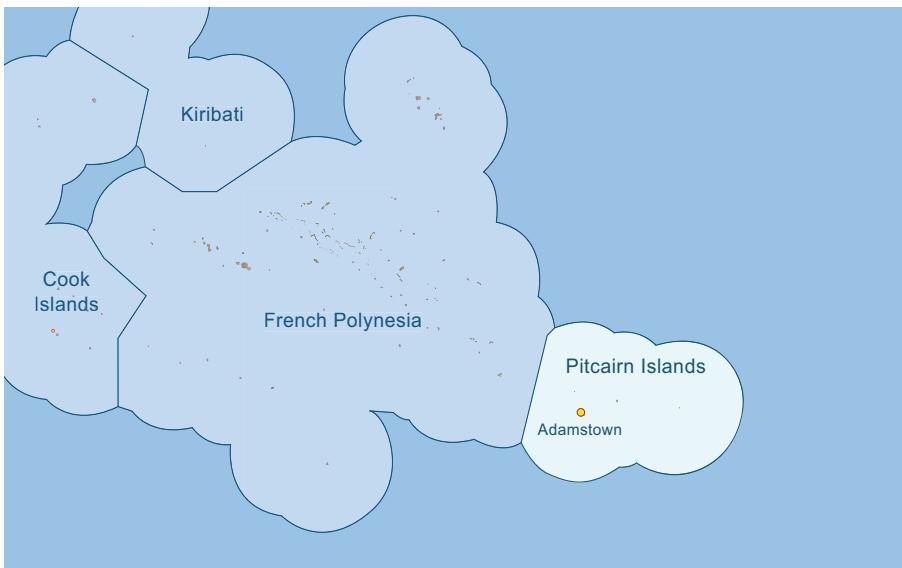


## 2.15 Pitcairn Islands



### Key features

#### Population

Year	2010	2035	2050	2100
Population <sup>a</sup>	66	66	66	66
Population growth rate <sup>a</sup>	n/a	n/a	n/a	n/a

a = Data from SPC Statistics for Development Programme ([www.spc.int/sdp](http://www.spc.int/sdp)); n/a = data not available.

**EEZ area (km<sup>2</sup>)** 800,000

**Land area (km<sup>2</sup>)** 5

**Land as % of EEZ** 0.001

**Fisheries and aquaculture activities:** Coastal fisheries.

**Membership of regional fisheries management arrangements:** Pitcairn Islands is not a member of any regional fisheries management organisation.



## Surface climate and the ocean

### Existing features

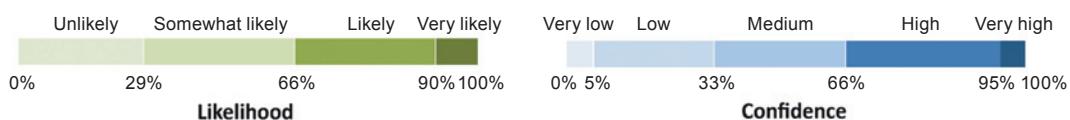
Pitcairn Islands has a tropical climate (Chapter 2). Recent air temperatures in Adamstown have averaged 20.9°C and average rainfall is ~ 1500 mm per year. Pitcairn Islands lies within the South Pacific Subtropical Gyre Province (SPSG) (Chapter 4, Figure 4.6). The SPSG Province is created by anticyclonic atmospheric circulation and rainfall in the centre of the province is low. The rotation of the gyre deepens the vertical structure of the water column, making the surface waters nutrient poor (Chapter 4).

### Projected changes to surface climate

Air temperatures in Pitcairn Islands are projected to increase and rainfall is expected to decrease in the southern subtropical Pacific due to climate change under the low (B1) and high (A2) emissions scenarios in 2035 and 2100 (see Chapter 1, Section 1.3 for definition of scenarios) relative to long-term averages (Chapter 2, Section 2.5, Table 2.6).

Climate feature <sup>a</sup>	1980–1999 average <sup>b</sup>	Projected change			
		B1 2035	A2 2035	B1 2100*	A2 2100
Air temperature (°C)	20.9 (Adamstown)	+0.5 to +1.0	+0.5 to +1.0	+1.0 to +1.5	+2.5 to +3.0
Rainfall (mm)	1512 (Adamstown)	+5 to +10%	-5 to -20%	-5 to -20%	-5 to -20%
More extreme wet and dry periods					■ ■

\* Approximates A2 in 2050; a = for more detailed projections of rainfall and air temperature in the subtropical Pacific, see [www.cawcr.gov.au/projects/PCCSP](http://www.cawcr.gov.au/projects/PCCSP); b = 1960–1999 data for Adamstown.



### Projected changes to the ocean

The projected changes to the key features of the tropical Pacific Ocean surrounding Pitcairn Islands relative to the long-term averages are expected to result in increases in sea surface temperature (SST), sea level and ocean acidification. Changes to ocean currents (increases in the South Pacific gyre) and reductions in nutrient supply are also expected to occur (Chapter 3, Sections 3.3 and 3.4, Tables 3.1 and 3.2).

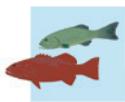
Ocean feature	1980–1999 average	Projected change			
		B1 2035	A2 2035	B1 2100*	A2 2100
Sea surface temperature (°C)	24.2 <sup>a</sup>	+0.6 to +0.8  	+0.7 to +0.8  	+1.2 to +1.6  	+2.2 to +2.7  
Sea level (cm)	+6 since 1960				
IPCC **		+8 	+8 	+18 to +38 	+23 to +51 
Empirical models ***		+20 to +30 	+20 to +30 	+70 to +110 	+90 to +140 
Ocean pH (units)	8.08	-0.1 	-0.1 	-0.2 	-0.3 
Currents	Increase in South Pacific gyre		Continued increase in strength of South Pacific gyre 		
Nutrient supply	Decreased slightly		Decrease due to increased stratification and shallower mixed layer  		< -20% 

\* Approximates A2 in 2050; \*\* projections from the IPCC-AR4; \*\*\* projections from recent empirical models {Chapter 3, Section 3.3.8}; a = average for EEZ derived from the HadISST dataset.



## Oceanic fisheries

There is no fishing activity in the exclusive economic zone of Pitcairn Islands by locally-based vessels, and little or no fishing by foreign fleets in recent years.



## Coastal fisheries

### Recent catch and value

The coastal fisheries of Pitcairn Islands are made up mainly of three components: demersal fish (bottom-dwelling fish associated with the coast and coral reef habitats), nearshore pelagic fish, and invertebrates gleaned from intertidal and subtidal areas {Chapter 9, Section 9.2.1}. The total annual catch was estimated to be 12 tonnes in 2007, worth > USD 70,000. The commercial catch was 5 tonnes. Demersal fish are estimated to make up > 80% of the total catch.

Feature	Coastal fisheries category				Total	Total value (USD m)*
	Demersal fish	Nearshore pelagic fish	Targeted invertebrates	Inter/subtidal invertebrates		
Catch (tonnes)*	10	1	0	1	12	0.07
Contribution (%) <sup>a</sup>	84	8	0	8	100	

\* Estimated total catch and value in 2007 (Gillett 2009)<sup>1</sup>; a = method for calculating disaggregated catch data for each category is outlined in Chapter 9 {Appendix 9.2, Supplementary Table 9.1}.

### *Existing coastal fish habitat*

Pitcairn Islands has 48 km<sup>2</sup> of coral reef habitat that supports coastal fisheries species. There are no mangrove or seagrass habitats. The area of intertidal sand flats on outlying reefs has not been documented.

### *Projected changes to coastal fish habitat*

Increasing sea surface temperatures and ocean acidification are expected to affect the health of coral reefs in Pitcairn Islands, in the medium and long term (Chapter 5). In particular, coral cover is projected to decrease over time.

Habitat feature <sup>a</sup>	Projected change (%)		
	B1/A2 2035	B1 2100*	A2 2100
Coral cover <sup>b</sup>	-25 to -65  	-50 to -75  	> -90  

\* Approximates A2 in 2050; a = no estimates in reduction of intertidal flats available; b = assumes there is strong management of coral reefs.

### *Projected changes in coastal fisheries production*

Fisheries for demersal fish and intertidal and subtidal invertebrates in Pitcairn Islands are projected to show progressive declines in productivity due to both the direct effects (e.g. increased SST) and indirect effects (changes to fish habitats) of climate change (Chapter 9, Section 9.5). There is the possibility that tuna may eventually increase as the distributions and abundances of the main species change (Chapter 8).

Coastal fisheries category	Projected change (%)			Main effects
	B1/A2 2035	B1 2100*	A2 2100	
Demersal fish	-2 to -5  	-20  	-20 to -50  	Habitat loss and reduced recruitment (due to increasing SST and reduced currents)
Nearshore pelagic fish	+15 to +20  	+20  	+10  	Changes in distribution of tuna
Intertidal and subtidal invertebrates	0  	-5  	-10  	Declines in aragonite saturation due to ocean acidification

\* Approximates A2 in 2050.

The overall projected change to coastal fisheries catch reflects the relative reliance on demersal fish and the projected decrease in productivity of this component of the fishery. As a result, potential catches from coastal fisheries in Pitcairn Islands are projected to decrease slightly under both scenarios in 2035 and continue to decline under both scenarios in 2100, particularly under A2 in 2100.

Coastal fisheries category	Contrib. (%)**	Projected change in productivity (P) and catch (%)					
		B1/A2 2035		B1 2100*		A2 2100	
		P***	Catch	P***	Catch	P***	Catch
Demersal fish	84	-3.5	-3	-20	-17	-35	-29
Nearshore pelagic fish	8	+17.5	+1	+20	+2	+10	+0.8
Inter/subtidal invertebrates	8	0	0	-5	-0.4	-10	-0.8
<b>Total catch<sup>a</sup></b>			<b>-1.5</b>		<b>-15</b>		<b>-29</b>

\* Approximates A2 in 2050; \*\* contribution of each component to total coastal fisheries catch in Pitcairn Islands; \*\*\* median projected change in productivity based on range in Chapter 9; a = assumes that proportion of each category remains constant.



## Freshwater and estuarine fisheries

Pitcairn Islands has no freshwater or estuarine fisheries.



## Aquaculture

Pitcairn Islands has no aquaculture production.



## Economic and social implications

### *Economic development and government revenue*

Licence fees from foreign vessels do not contribute to government revenue in Pitcairn Islands.

### *Food security*

Pitcairn Islands is among the group of PICTs (Group 1) where the estimated sustainable production of fish and invertebrates from coastal habitats will be more than enough to supply the national population with the 35 kg of fish per person per year recommended for good nutrition<sup>i</sup> (Chapter 12, Section 12.7.1).

<sup>i</sup> Based on fish contributing 50% of dietary protein as recommended by the SPC Public Health Programme (SPC 2008)<sup>25</sup>.

### *Current contributions of fish to food security*

Average national fish consumption in Pitcairn Islands is estimated to be 148 kg per person per year<sup>1</sup>, well above the recommended levels for good nutrition. Because the total population is only 66 people, coastal habitats in Pitcairn Islands are estimated to be able to supply > 2000 kg of fish per person per year.

### *Effects of population growth*

The population in Pitcairn Islands is projected to remain stable over this century and coastal fisheries are expected to continue to provide a very large surplus of fish.

### *Additional effects of climate change*

The effects of climate change on coastal fisheries are not expected to have a noticeable effect on the fish available per person for food security in Pitcairn Islands. The large area of coral reefs relative to population size will continue to supply the fish needed in 2100, even if there is up to a 50% reduction in the productivity of demersal fish.

## *Livelihoods*

### *Current contributions*

Apart from the estimates that the commercial fish catch in Pitcairn Islands was ~ 5 tonnes in 2007, there is little information on opportunities to earn income from coastal fisheries in Pitcairn Islands. Some of the fish caught is sold to passing ships and yachts.



### **Adaptations and suggested policies**

The key adaptations for maintaining the benefits from coastal fisheries for food in the face of climate change involve continued management of fish habitats and stocks.

## *Food security*

<b>Adaptation no. (Section 3.4)</b>	<b>Summary of adaptation</b>	<b>Supporting policy no. (Section 3.5)</b>
F2	Foster the care of coastal fish habitats	F1–F3, F18
F5	Sustain production of coastal demersal fish and invertebrates	F6, F7, F13, F18
F6	Diversify catches of coastal demersal fish	F6, F13, F18