

PITCAIRN ISLANDS

INTRODUCTION

Area: 43 sq.km.

Population: 66 in January 1992.

The Pitcairn Islands are a group of four small islands situated between latitudes 23° and 26° South and longitudes 124° and 131° West in the South Pacific, about 2,000 km southeast of Tahiti and 1,900 km west of Easter Island. The group comprises Pitcairn Island (25°04'S, 130°06'W) and three uninhabited islands: Oeno (120 km northwest of Pitcairn), Henderson (200 km east-northeast of Pitcairn) and Ducie (472 km east of Pitcairn). Pitcairn itself is a high volcanic island of 450 ha with lava cliffs and rugged hills rising to a peak at 335 m. Henderson, the largest island in the group with an area of 3,700 ha, is a raised limestone atoll which rises to 33 m. Oeno (65 ha) and Ducie (70 ha) are both low coral atolls with maximum elevations of about 4 metres.

The climate is subtropical, with an average annual rainfall of about 2,000 mm spread evenly throughout the year. Henderson is somewhat drier than Pitcairn, with 1,620 mm of rainfall in 1991/92 compared with 2,170 mm on Pitcairn in the same period. Mean monthly temperatures range from 24°C in January to 19°C in July. The Southeast Trades predominate.

The Pitcairn Islands are a British Crown Colony, with the British High Commissioner to New Zealand holding the position of Governor. Most of the 66 inhabitants are direct descendants of the mutineers from H.M.S. Bounty and their Polynesian consorts, who reached the islands in 1790. In 1856, the 194 inhabitants were moved to Norfolk Island, off the east coast of Australia, but by 1864, 43 of the islanders had returned, and Pitcairn has been permanently settled since then. The local economy is based on subsistence agriculture, the fertile volcanic soils of Pitcairn producing a wide variety of tropical and subtropical crops. Some fruit, vegetables and handicrafts are sold to passing ships running between New Zealand and Panama. A re-forestation scheme was introduced in 1963 with emphasis on the planting of miro trees (*Thespesia populnea*) which provide the wood used in making handicrafts.

The islands are of particular conservation importance for their endemic plants and invertebrates, endemic land-birds (four on Henderson Island), globally significant breeding populations of seabirds (especially gadfly petrels *Pterodroma* spp.), and non-breeding populations of the threatened Bristle-thighed Curlew (*Numenius tahitiensis*). The main interest in the coral reefs is their isolated and undisturbed location at the geographical limit of reef growth. The breeding population of Green Turtles (*Chelonia mydas*) at East Beach on Henderson Island may also be of international importance.

Summary of Wetland Situation

The Pitcairn Islands have very few freshwater habitats. Pitcairn itself has some permanent streams as well as a number of intermittent streams, but there do not appear to be any permanent freshwater ponds or marshy habitats. No fresh water is known to occur on the other three islands except for cave drips on Henderson and freshwater lenses on Oeno. The only other wetland habitats in the islands are coral reefs, reef flats and beaches. Coral reefs are well developed on Oeno and Ducie and surround most of Henderson, but are poorly developed around Pitcairn (Hepburn *et al.*, 1992). There are three large discrete coral sand beaches on Henderson.

Only seven species of waterbirds are known from the islands. The Pacific Reef-Heron (*Egretta sacra*) has been recorded on Henderson and Oeno. The flightless Henderson Island Crake (*Porzana (Nesophylax) atra*) is confined to Henderson where it remains common, and the Spotless Crake (*Porzana tabuensis*) has

been reported from Oeno. Wandering Tattlers (*Heteroscelus incanus*) and Bristle-thighed Curlews (*Numenius tahitiensis*) are fairly common non-breeding visitors to the beaches and reef flats during the austral summer, and the Pacific Golden Plover (*Pluvialis fulva*) and Sanderling (*Calidris alba*) have been recorded (Williams, 1960; Pratt *et al.*, 1987; M. de L. Brooke, pers. comm.). The relatively large numbers of Bristle-thighed Curlews (a threatened species) on Henderson and Oeno are of international significance. Green Turtles (*Chelonia mydas*) nest on the largest beach on Henderson.

No protected areas have been established in the islands, but the extreme isolation of Henderson, Oeno and Ducie affords these uninhabited islands a considerable degree of protection. Henderson Island was inscribed as a World Heritage Site under the Unesco World Heritage Convention in 1988. Hepburn *et al.* (1992) have recently discussed the application of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) to the Pitcairn Islands, and have concluded that the two low-lying coral atolls of Oeno and Duce and the beaches and inshore reefs of Henderson would be suitable for designation as Wetlands of International Importance under the terms of the Convention.

Wetland Research

Despite a substantial number of visits by scientists and naturalists to one or more of the Pitcairn Islands in the last century, the islands remain relatively poorly known. A major independent multi-disciplinary expedition, based on Henderson Island from January 1991 to March 1992, has gathered a considerable amount of information on the current and historical ecology of Henderson and on the other islands in the group. Thirty-four individuals from seven countries participated in this expedition. Much of the information has yet to be analyzed and presented, but early results from the expedition (Brooke *et al.*, 1991; Weisler *et al.*, 1991) provide a substantially improved basis for assessing the conservation value of the islands' biota (Hepburn *et al.*, 1992). One of the objectives of the Pitcairn Islands Scientific Expedition was to assess the potential for designation of Oeno and Ducie atolls as Wetlands of International Importance under the terms of the Ramsar Convention.

Wetland Area Legislation

Conservation legislation in the Pitcairn Islands has recently been reviewed by Hepburn *et al.* (1992). There is no specific conservation policy for the islands, and there appears to be no specific legislation covering the protection of sites for conservation purposes. The Ordinances (Local Government Regulations, 1971) cover wildlife protection and fisheries management. The legislation generally prohibits the killing of wild birds or taking of their eggs, or, subject to the authority of the Wild Bird Protection Committee, controls the extent to which certain prescribed species may be exploited. An amendment in 1982 adds species which are protected (three whales, three seabirds and two turtles), and sets conditions under which they may be captured, killed or harassed. This amendment also extends protection to migratory species as a means of implementing the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention) within the Pitcairn Islands.

The Pitcairn Islands are included in the UK ratification of the Ramsar Convention.

Wetland Area Administration

The Pitcairn Islands Council has ultimate responsibility for the implementation of any management decisions which might affect natural ecosystems including wetlands.

Organizations involved with Wetlands

Pitcairn Islands Council

- Wild Bird Protection Committee

WETLANDS

Site descriptions compiled from information provided by J.R. Setterfield (Office of the Governor of Pitcairn Island), M. de L. Brooke and I. Hepburn.

Wetland Name: Oeno Atoll

Country: Pitcairn Islands

Coordinates: 23°56'S, 130°44'W

Location: in the central South Pacific, 120 km northwest of Pitcairn.

Area: Land area, 65 ha; land, reef and lagoon, 1,600 ha.

Altitude: Sea level to 3.6 m.

Overview: A seldom visited, ecologically undisturbed atoll with a significant wintering population of Bristle-thighed Curlews (*Numenius tahitiensis*) and large breeding populations of seabirds.

Physical features: A low coral atoll comprising a central islet surrounded by a lagoon, mostly 3-6 m in depth, which in turn is surrounded by a fringing reef within which there are many smaller reefs. An interesting northward shift of the islet, the result of erosion and deposition under the influence of the prevailing Southeast Trades, has taken place in the last 150 years.

Ecological features: *Montipora* is the dominant coral genus, with *Acropora* also common. Other genera recorded are *Pocillopora*, *Psammocora*, *Pavona*, *Porites*, *Cyphastrea*, *Plesiastrea* and *Montastrea*. The terrestrial vegetation is atoll forest and scrub with a few coconuts.

Land tenure: State owned (Crown Land).

Conservation measures taken: None. Considerable protection is afforded by the extreme remoteness of the island.

Conservation measures proposed: Oeno was proposed for listing as an "Island for Science" in 1969 (Elliot, 1973). Hepburn *et al.* (1992) have recommended that the entire atoll be designated as a Ramsar Site. Hepburn (in prep) recommends that the island be made rat-free to provide a secure nesting site for seabirds, especially gadfly petrels (*Pterodroma* spp.) which are heavily preyed upon by Polynesian Rats on Henderson.

Land use: Uninhabited, but usually visited once a year (and sometimes more) by about 30 Pitcairn islanders for a fishing holiday. Occasionally visited by the crews of passing yachts (about five a year).

Possible changes in land use: Various persons in Mangareva (Gambier Islands, French Polynesia) have expressed interest in the establishment of black pearl oyster farms in the lagoon.

Disturbances and threats: Introduced Polynesian Rats (*Rattus exulans*) are present. The disturbance associated with the proposed establishment of oyster farms might be detrimental to the seabird populations, especially if the latter were harvested. Fishing in the lagoon and the harvesting of shells could also be damaging to the lagoon ecosystem. The Pitcairn islanders have recently expressed a desire to plant coconuts and other exotic species on the island.

Hydrological and biophysical values: None known.

Social and cultural values: A "holiday resort" for Pitcairn islanders.

Noteworthy fauna: The island supports a significant wintering population of Bristlethighed Curlews (*Numenius tahitiensis*) (about 100 individuals), and a large breeding population of seabirds, including about 8,000-10,000 pairs of Murphy's Petrels (*Pterodroma ultima*), 250 pairs of Red-footed Boobies (*Sula sula*), 250 pairs of Masked Boobies (*S. dactylatra*) and 100 pairs of Great Frigatebirds (*Fregata minor*). Coconut Crabs (*Birgus latro*) occur on the island, and the undisturbed lagoon supports prolific fish populations.

Noteworthy flora: There are no endemic species of plants on the island, but this constitutes the extreme southeastern limit for several species (e.g. *Hedyotis romanzoffiensis*). *Tournefortia argentea* grows to the exceptional height of 8 m.

Scientific research and facilities: The island was briefly visited by a Smithsonian Expedition in 1987. Scientists from the Pitcairn Islands Scientific Expedition (based on Henderson) visited the island at approximately three-monthly intervals during 1991 and early 1992.

Recreation and tourism: Roughly once a year, the island is visited by about 30 Pitcairn islanders for a holiday of one week.

Management authority and jurisdiction: Pitcairn Islands Council in conjunction with the British Consulate-General in Auckland (New Zealand).

References: Dahl (1980, 1986); Elliot (1973); Hepburn (in prep); Hepburn *et al.* (1992); Philipson & St. John (1960); UNEP/IUCN (1988); Williams (1960).

Reasons for inclusion: 1a, 2a, 2c. One of the least disturbed atolls in southeastern Polynesia, with an internationally important wintering population of Bristle-thighed Curlews.

Source: M. de L. Brooke.

Wetland Name: Henderson Island

Country: Pitcairn Islands

Coordinates: 24°22'S, 128°20'W

Location: in the central South Pacific, 200 km ENE of Pitcairn Island.

Area: Land area, 3,700 ha; area of beaches and reef flats unknown.

Altitude: Sea level to 33 m.

Overview: One of the least disturbed raised coral atolls in the world, with its terrestrial ecosystems virtually intact. The island supports a large breeding population of seabirds, and has four endemic land-birds, one of which is a flightless rail. The beaches and reef flats are important for wintering Bristle-thighed Curlews (*Numenius tahitiensis*).

Physical features: A raised coral atoll composed of coralline limestone, with a slight depression in the centre considered to be an uplifted lagoon. The island is arid, with no surface fresh water except for some drippings in caves, a few very small fresh to brackish pools at the South End (which appear to be rain-fed and become increasingly saline through evaporation and salt-spray), and small amounts of rainwater trapped in vegetation, such as at the base of *Asplenium* leaves. Fresh or brackish springs have been located below high tide level at North Beach and Northwest Beach. No readily available source of groundwater has yet been located. The surface of the island is largely reef rubble, with some areas of dissected limestone, especially around the periphery. The island is surrounded by steep cliffs of bare limestone. There is a fringing reef averaging 50-100 m in width around most of the island except in the extreme south and west. In three places, North Beach, Northwest Beach and East Beach, the reef extends up to 200 m offshore, and is backed by a wide, gently shelving coral sand beach over bedrock which is partly exposed. The reef off the East Beach has a poorly developed lagoon; those off the North and Northwest beaches are seawardly sloping reef platforms without a well-defined reef crest. There are two narrow channels through the reef on the north and northwest coasts. Tides are semi-diurnal, with a tidal range at spring tides of about one metre.

The island lies in the Southeast Trades, and probably has a mean annual rainfall of about 1,500 mm. The recorded rainfall during the period February 1991 to January 1992 was 1,620 mm.

Ecological features: Coral cover on the fringing reef is about 5%, dominated by *Pocillopora* with *Millepora* becoming dominant at depths greater than 7 m. The top of the island is densely vegetated with tangled scrub and scrub forest, 5-10 m tall, except in the central part of the depression, which is more sparsely vegetated. The tallest trees are screwpine *Pandanus tectorius*; other trees include the endemic sandalwood *Santalum hendersonense*, *Myrsine hoskae*, *Celtis paniculata* var. *viridis*, and two shrubby endemic varieties of *Bidens hendersonensis*. Some coconuts have been planted near the main landing sites, close to which the Pitcairners harvest hardwoods. Otherwise the vegetation is largely undisturbed.

Land tenure: State owned (Crown Land).

Conservation measures taken: Henderson Island has not been declared a protected area as such, although it receives *de facto* protection from its isolation and various restrictions on possession, occupation and transference of land applied under the Lands and Administration of Estates Ordinance (IUCN, 1991). Access to the island requires a licence issued by the Governor following approval by the Pitcairn Islands Council. Henderson Island was inscribed as a World Heritage Site under the Unesco World Heritage Convention in 1988, but no formal management of the site has yet been undertaken. The UK Joint Nature Conservation Committee has recently commissioned the production of a draft management plan for the World Heritage Site.

Conservation measures proposed: Henderson was proposed for listing as an "Island for Science" in 1969 (Elliot, 1973), and recommended as a reserve by the IUCN Threatened Plants Committee (Dahl, 1980). It has also been suggested that the island be declared a Biosphere Reserve under Unesco's Man and the Biosphere Programme. The draft management plan (Hepburn, in prep) recommends that Local Government Regulations be amended to provide appropriate protection to the World Heritage Site. Hepburn *et al* (1992) have recommended that the coastal and inshore marine zones of the island be designated as a Ramsar Site.

Land use: Henderson was apparently colonized by Polynesians between about 800 and 1600 AD, but has remained uninhabited in modern times. Pitcairn islanders visit the island roughly once a year, normally for one day, to cut and remove timber (*Cordia subcordata* and *Thespesia populnea*) from the woodlands behind the beach. The wood is used for carving handicrafts for sale to visitors. The island is occasionally visited by passing yachts and natural history cruise ships.

Disturbances and threats: Goats and pigs were introduced to the island in the early part of this century but did not survive. Introduced Polynesian Rats (*Rattus exulans*) are, however, still present, and cause devastating predation on the chicks of three species of gadfly petrel, *Pterodroma neglecta*, *P. heraldica* and *P. ultima*. The terrestrial vegetation is still largely pristine, with very few exotics, although there are two substantial coconut groves at the principal landing sites. A proposal in 1982/83 by an American millionaire to settle on Henderson was given serious consideration by the British authorities. The development would have included clearance of forest in order to graze cattle, the building of an airfield, and the introduction of other farm stock. The proposal was finally rejected on environmental and technical grounds. There has been some anchor damage to the coral reefs. Reef blasting to improve the landing passage would be detrimental, as would the introduction of any alien plants or animals.

Hydrological and biophysical values: None known.

Social and cultural values: Miro trees (*Thespesia populnea*) and Toa (*Cordia subcordata*) are of value to the Pitcairn islanders as a source of wood for carving.

Noteworthy fauna: The beaches and reef flats are used by a wintering population of some 40-50 Bristle-thighed Curlews (*Numenius tahitiensis*), most of which arrive in early September and depart in April. Small numbers of Wandering Tattlers (*Heteroscelus incanus*) and Sanderlings (*Calidris alba*) also occur on the beaches. The island is very important for its large breeding population of seabirds, estimated at 50,000-80,000 pairs. These include 10,000-20,000 pairs of Kermadec Petrels (*Pterodroma neglecta*), 30,000 pairs of Herald Petrels (*P. heraldica*), several thousand pairs of Murphy's Petrels (*P. ultima*), 200-300 pairs of Red-tailed Tropicbirds (*Phaethon rubricauda*), 50-60 pairs of Masked Boobies (*Sula daco*)*latra*, a few hundred pairs of Red-footed Boobies (*S. sula*), 100 pairs of Great Frigatebirds (*Fregata minor*), 100 pairs of Brown Noddies (*Anous stolidus*), small numbers of Black Noddies (*A. minutus*), possibly ten pairs of Blue-grey Noddies (*Procelsterna cerulea*) and very large numbers of Fairy Terns (*Gygis alba*) (Hepburn, in prep). The island has three endemic species of land-birds, the Henderson Island Rail (*Porzana (Nesophylax) atra*), Henderson Island Fruit-Dove (*Ptilinopus insularis*) and Stephen's Lorikeet (*Vini stepheni*), as well as an endemic subspecies of the Pitcairn Reed Warbler (*Acrocephalus vaughani taiti*). The rail is primarily a forest bird, foraging in the leaf litter for insects and molluscs. Although still common, this flightless and tame species would be at considerable risk from introduced predators and is therefore listed as threatened in the IUCN Red Data Book (Collar & Andrew, 1988). The total population was estimated at about 4,700 pairs in 1991/92 (Hepburn, in prep). The lorikeet appears to be rather uncommon, and is also listed as threatened.

The only mammal present is the introduced Polynesian Rat (*Rattus exulans*). Green Turtles (*Chelonia mydas*) nest on East Beach, where up to 30 scrapes were reported in 1991/92. There is one species of skink (*Emoia cyanura*), which appears to be abundant throughout the island, and two species of gecko, one of which (as yet unidentified) may be endemic. Coconut Crabs (*Birgus latro*) are present. Possibly all of the island's 14 or so species of land snail and about 30% of the island's 170 species of insect are endemic. The proportion of endemic species in some other invertebrate groups is given by Hepburn (in prep). The coral reefs support a diverse marine fauna, although fish species are relatively few (UNEP/IUCN, 1988).

Noteworthy flora: Henderson supports a rich and almost undisturbed terrestrial flora, with 72 species of vascular plants, ten of which are endemic to the island. The two endemic varieties of the shrub *Bidens hendersonense* are of particular botanical interest. Scientific research and facilities: A number of scientific expeditions have visited the island, including the Whitney South Sea Expedition in 1922 and the Mangarevan Expedition in

1934. A multi-disciplinary scientific expedition (the Pitcairn Islands Scientific Expedition) was based on the island from January 1991 to March 1992. The major results of this expedition are likely to be available in 1994.

Recreation and tourism: The island is occasionally visited by passengers from cruise ships, with groups of up to 100 people landing at a time.

Management authority and jurisdiction: Pitcairn Islands Council in conjunction with the British Consulate-General in Auckland (New Zealand).

References: Collar & Andrew (1988); Dahl (1980, 1986); Elliot (1973); Hay (1985); Hepburn (in prep); Hepburn *et al.* (1992); IUCN (1991); St. John & Philipson (1962); UNEP/IUCN (1988).

Reasons for inclusion: la, 2a, 2b, 2c, 2d. Henderson is of outstanding value as the world's best remaining example of a raised coral atoll ecosystem. The reef flats and beaches support an internationally significant wintering population of Bristle-thighed Curlews.

Source: J.R. Setterfield, I. Hepburn and references.

Wetland Name: Dude Atoll

Country: Pitcairn Islands

Coordinates: 24°40'S, 124°47'W

Location: in the central South Pacific, 472 km east of Pitcairn Island and 1,336 km WNW of Easter Island.

Area: Land area, 70 ha; land, reef and lagoon, 320 ha.

Altitude: Sea level to 4 m.

Overview: A seldom visited, exceptionally undisturbed atoll; the easternmost atoll in the Indo-Pacific biogeographic region, possessing a pure, though impoverished, Polynesian biota.

Physical features: A small coral atoll comprising a main island (Acadia) and three smaller islets or "motu" (Edwards, Pandora and Westward) encircling a lagoon approximately 1.5 km in diameter. The islands are composed of coral rubble, echinoid remains and dead shells. Acadia is largely surrounded by reef flats, the reef to the northwest consisting for the most part of a somewhat uneven reef pavement flat. Small channels between the lagoon and the ocean are found at the northernmost extension of Westward and western end of Acadia, but these have little influence on water exchange within the lagoon. The greatest seaward extension of the reef is at the southwest, where the shelf extends 270 m offshore to a depth of 30 m. There is a regular semi-diurnal tide. Salinity in the lagoon is about 38 p.p.t., and water temperature averages 26.5°C.

Ecological features: The reef flats are generally covered by a thin layer of sand and fine algal growth. There is a fair amount of coral cover in the lagoon, the dominant genera being *Montipora* and *Astreopora*. The lagoon floor between the patch reefs consists of fine white sand. The outer reef has fairly good coral cover, with very high cover (as much as 50%) recorded in deeper water. Corals of the genera *Acropora* and *Montipora* dominate. Terrestrial vegetation is confined to Acadia, and comprises an impoverished atoll scrub dominated by *Tournefortia*. There is also one *Pemphis* bush.

Land tenure: State owned (Crown Land).

Conservation measures taken: None. Considerable protection is afforded by the extreme remoteness of the island.

Conservation measures proposed: Ducie was proposed for listing as an "Island for Science" in 1969 (Elliot, 1973). Hepburn *et al.* (1992) have recommended that the entire atoll be designated as a Ramsar Site.

Land use: The atoll is visited very infrequently (less than five times a year) by passing yachts and cruise ships, but because of the difficulty in landing, few people set foot on the islands.

Disturbances and threats: Polynesian Rats (*Rattus exulans*) are present, but apparently cause relatively little predation on nesting sea-birds. There is a possibility that the crews of passing fishing boats occasionally land on the islands to harvest seabirds. In 1970, there was evidence of a relatively recent mass mortality of corals, the cause of which was not identified, although a sudden drop in water temperature was postulated. Some recovery seemed to have occurred by 1987 (UNEP/IUCN, 1988).

Hydrological and biophysical values: None known.

Social and cultural values: Limited value for tourism.

Noteworthy fauna: Ducie Atoll is particularly important for its large breeding populations of sea-birds. The island supports probably the world's largest breeding colony of Murphy's Petrels (*Pterodroma ultima*), with around 250,000 pairs, as well as about 20,000 pairs of Kermadec Petrels (*P. neglecta*) and 20,000 pairs of Herald Petrels (*P. heraldica*). Other breeding seabirds include Christmas Shearwater (*Puffinus nativitatis*), Red-tailed Tropicbird (*Phaethon rubricauda*), boobies (*Sula* spp.), Great Frigatebird (*Fregata minor*), Sooty Tern (*Sterna fuscata*), Brown Noddy (*Anous stolidus*), Blue-grey Noddy (*Procelsterna cerulea*) and Fairy Tern (*Gygis alba*). Three species of migrant shorebirds have been reported, Wandering Tattler (*Heteroscelus incanus*), Bristle-thighed Curlew (*Numenius tahitiensis*) and Sanderling (*Calidris alba*), but numbers are generally low (less than 20). There are no land-birds, and the only mammal present is the Polynesian Rat (*Rattus exulans*). Two species of land hermit crab (*Coenobite* spp.) have been recorded. The fish fauna is considered to be impoverished; only 138 species were recorded by Rehder and Randall (1975), with 15 of these being confined to southeastern Oceania. However, the island has a reputation for its large shark population. Insects, crustaceans, echinoderms and corals are listed by Rehder and Randall (1975).

Noteworthy flora: The island is exceptional for the paucity of its flora; only two species of vascular plants are known.

Scientific research and facilities: The island was visited by the Whitney South Sea Expedition in 1922, by the 1970-71 National Geographic Society-Oceanic Institute Expedition to Southeast Oceania, and by Operation Raleigh in 1987. Scientists from the Pitcairn Islands Scientific Expedition (based on Henderson) visited the island at approximately three-monthly intervals during 1991.

Recreation and tourism: The island has some value for "high-quality" tourism, e.g. for passengers from Society Expeditions cruise ships.

Management authority and jurisdiction: Pitcairn Islands Council in conjunction with the British Consulate-General in Auckland (New Zealand).

References: Dahl (1980, 1986); Elliot (1973); Hepburn *et al.* (1992); Rehder & Randall (1975); UNEP/IUCN (1988).

Reasons for inclusion: 1a, 2a, 2c. An exceptionally undisturbed atoll ecosystem and one that, by virtue of its geographical location, is likely to remain so.

Source: M. de L. Brooke and references.

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