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PACIFIC ISLANDS TROCHUS INTRODUCTIONS

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The natural distribution of Trochus niloticus in the Pacific Islands is limited to the region west of a line between Yap Island and Wallis Island. During the past 60 years there have been numerous attempts to introduce trochus into new areas. Starting with Japanese work in the Western Caroline Islands in the 1920s, at least 63 transplantations to nine Pacific Island countries have been carried out. The accompanying table summarizes the known operations.

Trochus have been transported on fishing boats, cargo ships, passenger ships, and in aircraft. Carrying arrangements have included flooded containers, specialized baitwells, wet sacks, aerated plastic bags, and dry racks. Transport time has ranged from a few hours up to several weeks. In general, those operations attempting to carry trochus for more than 4 days without utilizing circulating seawater or for more than two weeks with such a system have met with limited success.

About one-third of the trochus transplantations are known to have failed. The lack of success has been caused either by the animals dying in transit (overcrowding, excessive time, improper salinity), or, having survived the journey, failure to reproduce and proliferate in the new environment.

Successful transplants have been carried out with as few as 40 trochus, although up to 6745 animals have been moved in a single operation. The first indication that a transplant has been successful has usually been the detection of smaller trochus than those transported. This has occurred as soon as 22 months after the transplantation. Commercial harvesting begins after the trochus become plentiful which, for example, occurred 12 years and 14 years after transplantation for Truk and Tahiti respectively.

The benefits of transplanting trochus to new areas can be substantial. The progeny of the 40 trochus introduced to Aitutaki in the Cook Islands produce an economic return of over US\$ 30,000 annually.

Few, if any, of the trochus transplantations listed in the table were preceded by careful ecological studies to gauge the impact of introducing an exotic species. The more recent operations have been justified on the basis of an apparent absence of negative environmental implications of the earlier transplantations.

Date	Areas	Details	Source
Before 1927	Palau to Truk Palau to Pohnpei	Unsuccessful attempt	McGowan 1957
1927-1931	Palau to Truk	Total of 6724 shells transferred in bait wells of skipjack boats; 5 years elapsed before judged successful. First harvest 1939, greatest annual harvest (1952) 230 tons.	McGowan 1957 McGowan 1958
1930	Palau and Yap to various sites in Caroline Islands	Japanese Govt. and private companies transferred shells to many islands including Ngulu, Ngatik, Mokil, Pulawat. Transfers to Sorol, Woleai, Ifaluk, Kapingamarangi, and Nukuoro not successful.	McGowan 1957
1937	Palau to Phoenix Island	No details of transfer available; 1986 status unknown to Kiribati officials. Probably mistaken, Enderbury (Phoenix) could have been confused with Enderby (Pulawat, Truk)	Bour et al 1982 Onorio, per.comm.
1938	Palau to Saipan	2974 individuals released	South Seas Government 1938
1939	Truk to Pohnpei	Skipjack vessel transported shells in 2 trips.	Asano and Inenami 1939
1939	Truk to Jaluit	6143 tonne cargo ship carried shells in 4 water tanks.	Asano and Inenami 1939
1939	Palau to Pohnpei Palau to Satawan	6745 shells transferred; greatest harvest (1951) 180 tons; 5000 shells transferred; success not known.	McGowan 1957 McGowan 1958
1939 or 1940	Yap to Ulithi	Very successful	McGowan 1957, 1958 McCoy, per.comm.
1939	Palau to Jaluit	Shells transferred to other atolls of the Marshalls including Majuro and Ailinglaplap; transfer to Ebon not successful.	McGowan 1957 Bour et al 1982
1940s or Early 1950s	Pohnpei to Kosrae	Unsuccessful operation	McGowan 1958
Early 1950s	Saipan to Guam	Shells transplanted by two fishermen; very successful.	Stojkovich and Smith 1978. Smith, per.comm. Smith 1986
1952	? to Hawaii	39 shells released in Kaneohe Bay	Katekaru, per.comm

1957	Fiji (Viti Levu) to Aitutaki	2 transfers; one in sea water, other damp in crates (40 shells); seaplane used; trochus population plentiful in 1965. First harvest 1981 (200 tonnes).	Van Pel 1957 Devambez 1960, Sims 1984 Powell, per.comm.
1957	Vanuatu to Tahiti	1200 shells shipped in circulating water tanks. 40 survived the 15 day trip.	Yen 1985 Yen, per.comm.
1958	Fiji to American Samoa	No details available.	Bour et al 1982
1958	New Caledonia to Tahiti	40 shells transferred by aircraft in damp sacks. First harvest 1971; greatest annual harvest (1973) 261 tonnes.	Van Pel 1957 Anon. 1972, Powell 1960
1959	Pohnpei to Kosrae	500 live trochus released at 13 locations	Gawel 1982
1963	Guam to Hawaii	750 trochus released in Kaneohe Bay; 1967 survey showed trochus surviving, but no indication of reproduction observed; some trochus observed in 1970.	Katekaru, per.comm. Kanayama, 1967
1963	Tahiti to Moorea	No details available	Anon. 1972
1964	Tahiti to Raiatea	No details available	Anon. 1972
?	Tahiti to Tuamotu	No details available	Anon. 1972
1973+ ?	Aitutaki to Palmerston	Several transplants but was not successful like earlier transplants to Aitutaki	Powell, per.comm.
1981-1983	Aitutaki to Southern Cook Is.	Palmerston Is, 3000 shells transferred, abundant at date of report; Manuae, 500 shells, uncommon in 1985; Mitiaro, 300 shells, rare/extinct; Atiu, 300 shells, rare/extinct; Mangaia, 300 shells, rare; Rarotonga, 200 shells, rare/extinct.	Sims 1984
1982	Aitutaki to Rakahanga and Manihiki	Shells carried on deck in wet sacks Unsuccessful; all dead before arrival.	Sims 1985
1983	Yap to Woleai	2000 trochus transplanted. All died in transit	Fagolimul and Price 1987

1984	Yap to Woleai and Fachaulap	4,708 shells transferred, 12 died enroute	Fagolimul and Price 1987
1985	Yap to Ifalik and Eaurpik	1979 shells transferred; 90 died enroute	
1985	Aitutaki to Northern Cook Is.	Penryhn, 439 shells, carried 6 days in bait tank; Manihiki, 398 shells, carried 9 days in bait tank; Rakahanga, 693 shells, carried 10 days in bait tank; Pukapuka, all dead, carried 13 days in bait tank.	Sims 1985
1985	Aitutaki to Suvarrow	460 shells carried for 3 days in flooded skiff; very low mortality.	Sims, per.comm.
1985	Fiji (Viti Levu) to Funafuti	181 shells transferred in 3 air shipments; successful; larger transfer planned.	Parkinson 1984 Pita 1985 Adams, per.comm. Batty, per.comm.
1986 per.comm.	Aitutaki to Northern Cook Is.	1200 trochus shipped using flooded skiff on domestic vessel. Very good survival rate.	Dashwood,
1986	Fiji (Viti Levu) to Tokelau	1029 shells transferred; 584 sent by ship via Western Samoa; 161 flown to Western Samoa to join original shipment; 284 flown direct to Fakaofo and parachuted. One juvenile found Dec. 1987	Gillett 1986 Gillett 1987
1986	Yap to Eaurpik, Elato, Lamotrek and West Fayu	3,125 shells transferred, 22 died enroute	Fagolimul and Price 1987
1987	Aitutaki to Suvarrow	1,000 shells transferred via flooded skiff, no mortality.	Sims, per.comm.
1987	Fiji to Funafuti	200 trochus transported on commercial aircraft, 20 died in transit.	Petaia, per.comm.

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