THREATENED SPECIES RECOVERY PLAN SERIES NO.9

TUATARA RECOVERY PLAN
(*Sphenodon* spp.)

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ABBREVIATIONS

DoC = Department of Conservation
MAF = Ministry of Agriculture and Fisheries
MoT = Ministry of Transport
PSPD = Protected Species Policy Division, DoC
RF&BPS = Royal Forest & Bird Protection Society of New Zealand
S&R = Science and Research Directorate, DoC
SRARNZ = Society for Research on Amphibians and Reptiles in New Zealand
TSU = Threatened Species Unit, DoC
V U W = Victoria University of Wellington

All island areas quoted in this report are from Taylor (1989) except where otherwise stated. Other sources of island areas may give different values.

ABSTRACT

This recovery plan describes actions necessary over the next five years to maintain and enhance existing genetic stocks of tuatara *(Sphenodon).* The major actions required are summarised in the critical path shown opposite, in which the height of the horizontal bars represents level of effort. Note that the high level of effort required by 1997 will taper off in subsequent years.

CRITICAL PATH

ACTION	1992	1993	1994	1995	1996	1997
ALL POPULATIONS:						
INCREASE SECURITY AND MONITOR ANNUALLY						
NORTHERN TUATARA:						
SURVEY & CAPTIVE BREEDING OR ISLAND TRANSFER OF LITTLE BARRIER TUATARA						
CAPTIVE BREEDING OF STANLEY, RED MERCURY AND CUVIER POPULATIONS						
RESTORATION OF STANLEY, RED MERCURY AND CUVIER ISLANDS						
RESTORATION OF HEN AND CHICKENS ISLANDS						
ERADICATION OF KIORE ON MIDDLE CHAIN ISLAND						
SURVEY POPULATIONS OF UNCERTAIN STATUS						
RE-ESTABLISHMENT OF ONE NEW WILD POPULATION						
BROTHERS TUATARA:						
INCREASE SECURITY OF NORTH BROTHER ISLAND						
ESTABLISH TWO NEW WILD POPULATIONS AND A CAPTIVE POPULATION						
COOK STRAIT TUATARA:						
RE-ESTABLISHMENT OF ONE NEW WILD POPULATION						
ADVOCACY & RESEARCH:						

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1.0 INTRODUCTION TO THE RECOVERY PLAN

1.1 Aims and Purpose

Tuatara are rare, medium-sized reptiles that are found only in New Zealand. They were once thought to be lizards, but are now known to be the only living members of the Order Sphenodontida, a group of reptiles that is otherwise represented only by ancient fossils (Fraser, 1988). As such, they are of exceptional international importance to the evolutionary history of reptiles (see Appendix 1).

Tuatara once lived on the mainland of New Zealand and now survive on about 30 offshore islands. They are the top terrestrial predator in the reptile-seabird communities on these islands and, in exceptionally productive environments, reach biomasses of at least 700 kg/hectare (Newman, 1982a). Tuatara thus have the potential to play an important role in community structure and energy flow. Tuatara are also unusual reptiles in being adapted to cool temperatures, and this has important consequences for conservation. In particular, tuatara live for at least 60 years (Castanet et al., 1988) and females reproduce less frequently than do most other reptiles (see Appendix 1 for details of tuatara biology).

Tuatara are recognised internationally and within New Zealand as species at risk. Adults have been legally protected from unauthorised collection since 1895, and their eggs have been similarly protected since 1898 (Newman, 1987a). They are described as "rare" in the IUCN (International Union for the Conservation of Nature) Red List (IUCN, 1988) and as "regionally threatened" by Bell (1986). They are also listed on Appendix I of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), which was ratified in New Zealand in 1989 as the Trade in Endangered Species Act.

Despite legal protection, tuatara numbers and habitats continue to decline. Since Polynesians arrived in New Zealand, the habitat occupied by tuatara has fallen to probably less than 0.5% of its original range. Within about the last 100 years, at least ten of 40 known offshore island populations (25%) have become extinct, and if present trends continue, at least four and perhaps seven of the 30 remaining populations (12-23%) are likely to become extinct within about the next 50 years.

Past management and current legislation relating to tuatara in New Zealand has referred only to the taxon *Sphenodon punctatus.* However, a recent genetic study has revealed that tuatara are represented by two species, one with a probable two subspecies (Appendix 1; Daugherty et al., 1990; Whitaker & Daugherty, 1991). This recovery plan therefore covers three different genetic types of tuatara: The Northern tuatara *(Sphenodon punctatus punctatus);* the Cook Strait tuatara (which probably represents an unnamed subspecies of *S. punctatus),* and the Brothers tuatara, (*S. guntheri).* One type is of particular concern: the Brothers tuatara exists on only one tiny island and the population consists of only a few hundred individuals (Appendix 3).

According to the species ranking system recently developed by PSPD (Molloy and Davis, 1992), Brothers tuatara is in category `A' (`requiring urgent recovery protection work'), and Northern and Cook Strait tuatara are in category `B' (`requiring work in the short term'.) In IUCN terms the appropriate classification for each would probably be Brothers tuatara - endangered; Northern tuatara - vulnerable; Cook Strait tuatara - rare.

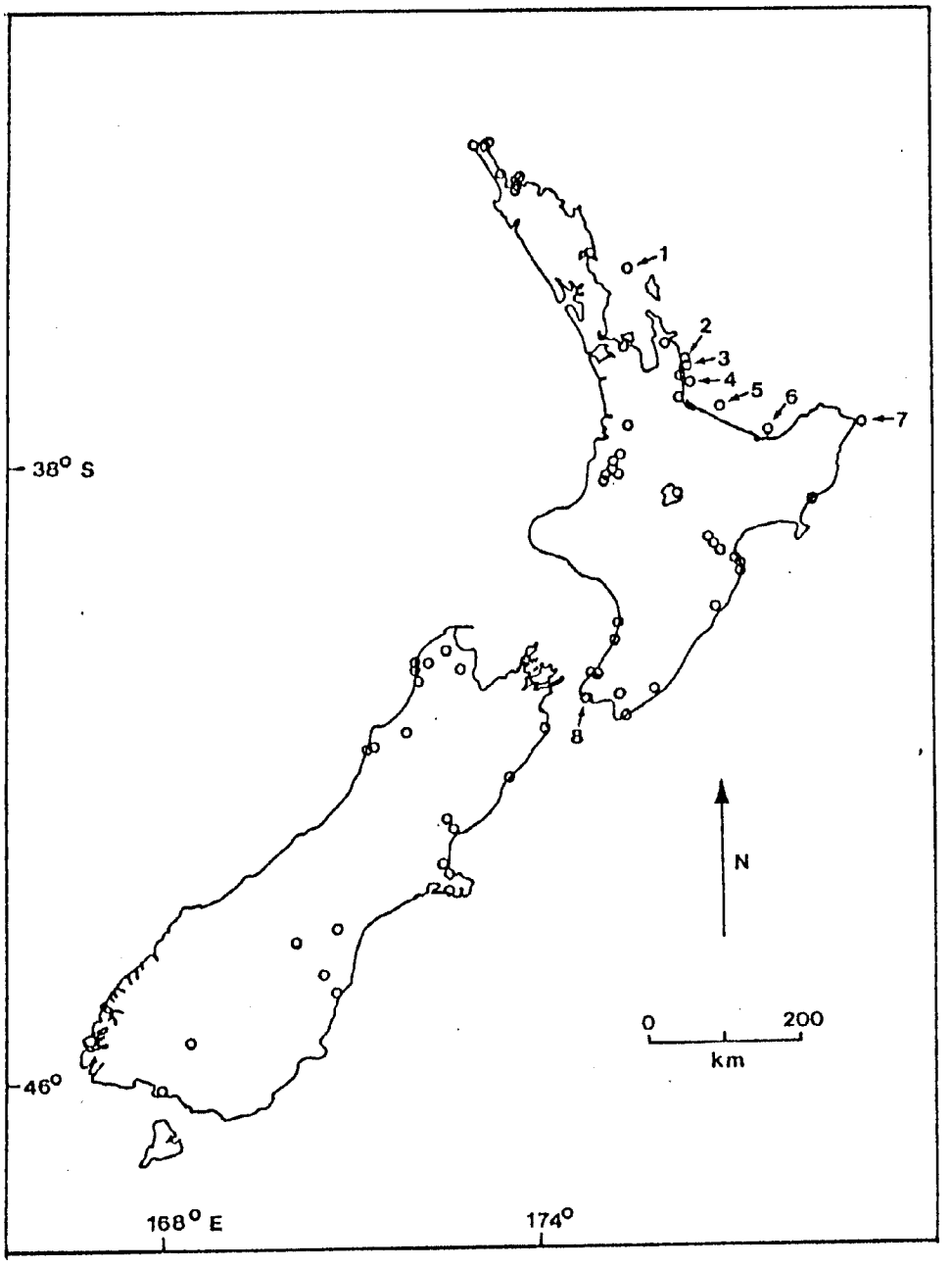

FIG. 1 Past distribution of tuatara (taxa unspecified) on the North and South Island based on cave and dune deposits of fossil material (P. Millener, pers. comm.). Offshore islands on which tuatara have apparently become extinct within about the last 100 years are numbered as follows: 1 = Mokohinau Group (three islands), 2 = Shoe Island, 3 = Slipper Island, 4 = Whenuakura Island, 5 = Motiti Island, 6 = Whale Island, 7 = East Cape Island, 8 = Somes Island. Additional islands on which tuatara may have become extinct but for which less evidence is available are listed in Appendix 2.

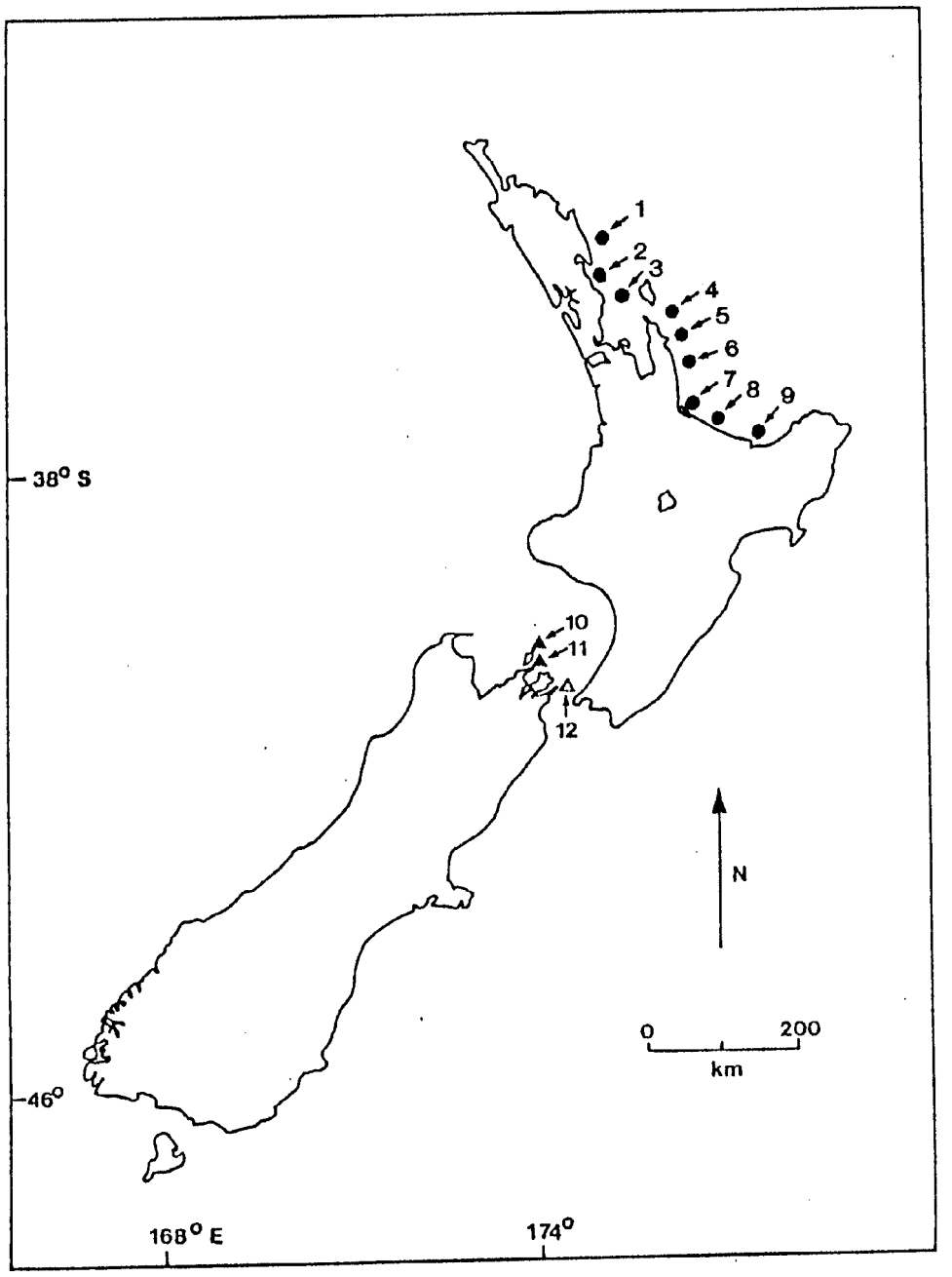

FIG. 2 Present distribution of tuatara. Islands on which each taxon is found are as follows:

Northern tuatara (solid circles): 1 = Poor Knights Group (five islands), 2 = Hen and Chickens Group (four islands), 3 = Little Barrier Island, 4 = Cuvier Island, 5 = Mercury Group (four islands), 6 = Aldermen Group (seven islands), 7 = Karewa Island, 8 = Plate Island, 9 = Moutoki Island.

Cook Strait tuatara (solid triangle): 10 = Stephens Island, 11 = Trios Group (three islands).

Brothers tuatara (open triangle): 12 = North Brother Island.

Almost all the known extinctions occurred in the probable presence of rats (Appendix 2). Although direct evidence is lacking, it seems likely that Norway rats *(Rattus norvegicus)* and ship rats *(Rattus rattus)* prey on tuatara eggs, juveniles and adults, and no tuatara population survives today where these rats are present. The most recent apparent extinction of tuatara occurred on Whenuakura Island between 1981 and 1984, during which time Norway rats appeared (Newman, 1986, 1987a).

Tuatara have also become extinct on at least three islands on which Polynesian rats (kiore, *Rattus exulans)* are or were recently present (Appendix 2). Although adult tuatara currently survive on several other islands in the presence of kiore (Appendix 3), kiore probably reduce or prevent recruitment of juvenile tuatara and thus may eventually lead to extinction of tuatara (Appendix 1).

Lighthouse and/or farming operations have been carried out on several islands on which tuatara have become extinct (Appendix 2). Apart from risking the introduction of rats, such activities have probably reduced the amount of suitable habitat for tuatara and encouraged the introduction of other predators such as cats. However, neither of these factors necessarily results in extinction in the short-term, because tuatara survive in high numbers on Stephens Island, which has been farmed extensively and has had numerous wild cats in the past (Appendix 3). Tuatara were collected in their hundreds by natural-history collectors last century (Buller, 1894), and this may have been a factor in the extinction of the population on East Island (Appendix 2).

3.0 PRESENT DISTRIBUTION

3.1 Location and Ownership of Tuatara Islands

Tuatara currently survive on about 30 islands ranging in size from 0.4 - 3083 ha (Fig. 2; Appendix 3). Five of these islands are in Cook Strait and the remaining 25 are off the northeastern coast of the North Island in the Bay of Plenty and Hauraki Gulf. Most are cliffbound and difficult of access. All but one have Nature Reserve, Scenic Reserve and/or Wildlife Sanctuary status (Appendix 3) and require DoC permission to visit. The exception is Moutoki (a Wildlife Refuge), which is Maori-owned and requires permission from the owners to visit.

Apart from Moutoki, four other tuatara islands are currently Maori-owned (Plate Island and the three Trios). Visits by either DoC or the Maori owners proceed only after both parties have given their consent (collection of muttonbirds by the owners is allowed under permit on Plate). One island, Stephens (Takapourewa), is the subject of a Maori land claim to the Waitangi Tribunal. Six islands (Tawhiti Rahi, Coppermine, Hen, Cuvier, North Brother and Stephens) have automated lighthouses or beacons belonging to the Ministry of Transport (MoT). Visits by MoT staff occur without consultation with DoC. Only two tuatara islands (Stephens and Little Barrier) are permanently staffed by DoC conservation officers.

3.2 Survival of Existing Populations

The survival of tuatara was confirmed on 27 islands in 1988-1991 (Appendix 3). Three small islands in the Aldermen Group (Half, North Stack and Middle Chain Stack) were last

surveyed in the early 1970s, and tuatara or their faeces were seen (Crook, 1973; A.H. Whitaker, pers. comm.).

3.3 Distribution of Different Taxonomic and Genetic Stocks

The distribution of the different types of tuatara is as follows (Fig. 2; Appendix 1):

Northern tuatara: Identified on 22 islands in the Hauraki Gulf and the Bay of Plenty. Three other populations in this area not yet blood-sampled (Half, North Stack and Middle Chain Stack in the Aldermen Group) are presumed to fall within this subspecies. [1]

Cook Strait tuatara: Found on four islands in western Cook Strait (Stephens, North Trio, Middle Trio and South Trio).

Brothers tuatara: Known only from North Brother Island in Cook Strait.

3.4 Captive Stocks (as at September 1992)

Northern tuatara:

ex Little Barrier Island: Four adults (two males, two females) are being held in a temporary outdoor enclosure on the island.
ex Stanley Island: 14 adults (7 males, 7 females) are held at a zoo.
ex Cuvier Island: 6 adults (4 males, 2 females) are held at a zoo.
ex Red Mercury Island: 11 adults (2 males, 9 females) and 14 juveniles are held at two zoos.

Cook Strait tuatara (cx Stephens Island):

A total of 149 specimens (120 juveniles, 29 adults) are held in captivity in New Zealand for display, research and/or breeding purposes, and seven adults and 18 juveniles from the same population are held by overseas zoos (Appendix 4).

Brothers Island tuatara: One aged female is held. Two zoos each hold 19 two-year olds, one zoo holds 72 one-year olds and 20 hatchlings and c20 eggs under incubation are held at an university.

[1] Note that the Little Barrier population is considered here as a population of Northern tuatara. Strictly speaking, this population is still recognised as a separate subspecies (*S. p. reischeki;* Wettstein, 1943), but a recent study shows it to be indistinguishable from surrounding populations of *S. p. punctatus* (Whitaker, and Daugherty, 1991). A taxonomic revision is expected in the near future.

4.0 WHY TUATARA ARE THREATENED

All tuatara islands face common, continuing threats: introduction of mammalian predators (especially rats), habitat destruction by fire, and poaching. Tuatara appear unable to survive where Norway rats or ship rats are present, and may show declines and eventual extinction where kiore exist. Fires do not necessarily lead to tuatara extinction, but could cause population declines. No evidence exists to assess the extent of poaching. Particular threats faced by the different types of tuatara are as follows:

4.1. Northern Tuatara

This subspecies probably consists of about 10,000 tuatara distributed over 25 islands (Appendix 3). About half of existing numbers and populations are threatened, for the following reasons:

Small size of islands: 11 populations occur on tiny (<7 ha) islands and are naturally small populations consisting of a few tens or at most a few hundreds of tuatara (Appendix 3). These populations are particularly vulnerable to the unpredictable events noted above. Rat introduction could result in extinction of the tuatara population before it was known that rats were ashore. Either illegal or legal landings could be the cause of rat introduction or fires. Rats could also get ashore by swimming from boats legally moored nearby. Small population size also makes these populations vulnerable to loss of genetic variation.

Presence of kiore and/or rabbits: Eight populations of this subspecies co-exist[2] with kiore, and one (Stanley) also co-exists with rabbits. (The past presence of cats, dogs and pigs may have been major factors in the decline of the Little Barrier population). Recent surveys (1988-91) have shown that these eight populations of Northern tuatara fall into three groups in terms of density of tuatara and presence of juveniles and small adults. A summary of these results is presented below, and further details can be found in Appendix 1.

The first group consists of four populations (Cuvier, Stanley, Red Mercury and Little Barrier) that appear to be relictual and endangered. These populations apparently contain extremely low numbers (< 21) of large adult tuatara only. Some appear too old, lean or widely separated from others of the opposite sex to reproduce (Cree et al., 1991c). Anecdotal evidence indicates that food supplies for tuatara (ground invertebrates, lizards and small burrow-nesting seabirds) are depleted on these kiore-inhabited islands, and rabbits on Stanley Island also contribute to a depauperate insect fauna by browsing the forest floor vegetation. These tuatara populations will almost certainly become extinct when the existing animals die (probably within the next 10-20 years). The fourth population, Little Barrier, appears to be in the same situation as the other three, though confirmation awaits more extensive surveying. Anecdotal reports indicate that tuatara were already rare on Little

[2] It appears at present (February 1992) that an attempted eradication of kiore and rabbits from Stanley Island has been successful (see Work Plan Objective 8).

Barrier late last century and early this century (Reischek, 1886; Department of Internal Affairs, unpublished). Despite the presence of numerous DoC officers on this island in recent years, no tuatara were seen there between the mid-1970s and February 1991. That month four (all large adults) were found during a survey covering a small part of the island's area (Whitaker & Daugherty, 1991). This island (3083ha) is particularly significant for tuatara because it is an order of magnitude larger than any other tuatara islands. Assuming that tuatara were once distributed over half the land area at an average density of 100 tuatara/ha (a conservative estimate of density; Appendix 1), the island may once have supported about 150,000 tuatara. It also supports tuatara in a habitat (kauri forest) not found on any other tuatara island.

A second group of Northern tuatara with kiore comprises three populations (Whatupuke, Coppermine and Hen) that apparently consist of low numbers of large adult tuatara, few or no small adult tuatara, and few or no juveniles. In surveys in 1989, no juveniles were found on any of these islands and no small adults were found on Hen Island. Surveys during the 1970s-1980s reported similar results (Appendix 1). These populations are thus considered threatened, and it is probable that they will become extinct when the existing animals die (perhaps in the next 30-50 years).

The third group of Northern tuatara with kiore consists of a single population (Lady Alice Island) with a low density of tuatara but in which juveniles and small adults are present. The frequency of juveniles and small adults seen in a 1989 survey was low and came close to differing significantly from that for Northern tuatara on kiore-free islands. Surveys in the 1970s also reported low numbers of juveniles and small adults (Appendix 1). These observations indicate that concern must be felt for this population. Its future is uncertain.

These findings, plus observations that at least three and perhaps as many as nine populations of tuatara have become extinct in the presence of kiore (Appendix 1) strongly indicate that recruitment of Northern tuatara is inhibited by kiore. The eight populations of tuatara still with kiore are on medium-large islands (78-3083 ha; Appendix 3) that could potentially support many thousands of tuatara. Should these tuatara populations become extinct, only two populations on islands >30 ha in area will remain to represent this subspecies (Tawhiti Rahi and Aorangi in the Poor Knights Group).

Kiore could still reach further populations of Northern tuatara. Seven kiore-free tuatara islands in the Aldermen group are particularly vulnerable. Middle Chain Island (23 ha), which lacks tuatara and lies in the centre of the group, has kiore (Crook, 1973). At least one tuatara island (Middle Chain Stack) lies close enough to Middle Chain (15 m away; Taylor, 1989) to be within the potential swimming distance of kiore (130 m; Whitaker, 1974) and it is possible that kiore could also become more widely distributed within the group by accidental means (Taylor, 1989).

4.2. Cook Strait Tuatara

This taxon consists of about 45,000 or more tuatara, of which at least 30,000 are on Stephens Island (Appendix 3). The major threats to this taxon are:

Small size of islands: Two islands (North Trio and South Trio) are tiny (<2 ha) and probably support only a few tens of tuatara at the most (Appendix

3). These populations are extremely vulnerable to the same threats noted above for small populations of Northern tuatara.

High visitor numbers: Primarily because of its exceptionally large tuatara population and other endemic wildlife, Stephens Island receives numerous visitors (in some recent years, probably several hundred per year). This brings increased risk of fires, rat introduction and damage to remnant forest. In particular, the present rat-free status of Stephens Island is a matter of extreme good fortune given the large number of visitors to the island and the absence, until recently, of stringent measures to prevent rat introduction.

Revegetation of nesting areas on Stephens Island: Tuatara numbers on Stephens Island are exceptional, being an order of magnitude higher than on islands of similar size elsewhere. It has been suggested that this reflects, at least in part, the provision of open areas of sheep pasture in which large numbers of tuatara now nest (Appendix 1). The future management of Stephens Island is under discussion and is likely to include revegetation of at least some sheep pasture to a more natural state. While this may be in the long-term best interests of the entire Stephens Island biota, revegetation of nesting areas could lead to a decline in tuatara numbers on the island. However, the tuatara population would not be endangered, and would probably still remain in the tens of thousands for the coming century.

4.3. Brothers Tuatara

This rare species of tuatara consists of about 300 adults and uncounted juveniles in a 1.7 ha patch of scrub on the top of North Brother Island (Thompson et al., 1992; total island area: 4 ha). Lighthouse construction in the 1870s reduced the area of suitable habitat, and over-collecting last century may have threatened the population (Newman, 1878). Reproduction is still occurring (Cree et al., 1991b), and no rats are present. The major current threat is reduced security resulting from lighthouse automation in April 1990. This increases the risk of rat introduction, fires, or poaching resulting from illegal visits.

5.0 ABILITY TO RECOVER

The major actions proposed in this plan are:

- captive-breeding of adult Northern tuatara, and captive incubation of eggs of the Brothers tuatara, to raise juveniles for re-introduction to the wild;
- eradication of kiore from seven islands between 23 and 225 ha in area;
- establishment of Northern tuatara on one or two new islands, the Brothers tuatara on at least two new islands, and Cook Strait tuatara on one new island;
- the establishment of long-term, self-sustaining stocks of the two species of tuatara in captivity.

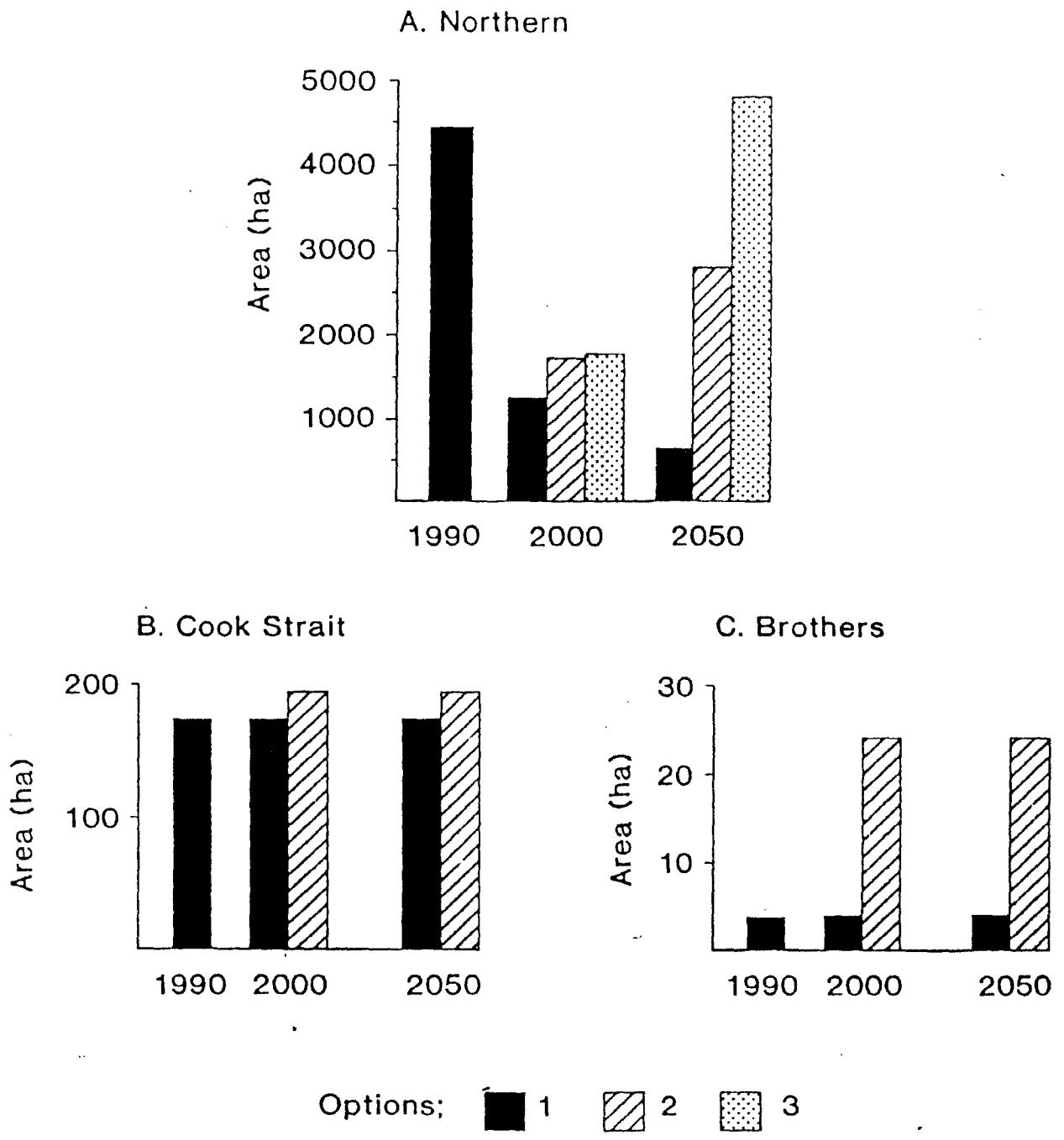

FIG. 3 Likely effect of various recovery options on area of habitat occupied by the three types of tuatara. See text for explanations of options.

Recent studies suggest that all these actions are biologically feasible. For instance, kiore have recently been eradicated from islands as large as 32.5 ha (I. McFadden, pers. comm.), Norway rats from islands up to 170 ha (Thomas and Taylor, 1988), and mice have been eradicated from an island (Mana) of 217 ha (Hutton, 1990). Early indications are that kiore have also been eradicated on Stanley Island (99.5 ha) (P.Thomson, pers. comm.) (see Objective 8, Work Plan). Most of the tuatara islands proposed for kiore eradication in this recovery plan are larger than previously attempted, but within the size range for successful eradication programmes for other rodents within New Zealand. Kiore are not native to New Zealand and their eradication from these islands is likely to benefit many elements of the fauna in addition to tuatara, while posing no threat to the survival of kiore in New Zealand; see Appendix 8). Adult Cook Strait tuatara are easily maintained in captivity, and eggs from Cook Strait and Brothers tuatara have been incubated in captivity with high hatching success (Appendices 1 and 4). Captive-reared tuatara have not yet survived to breed in captivity, but with further research based on an already extensive knowledge of reproduction in Cook Strait tuatara (Appendix 1), improvements in juvenile survival and in breeding of captive-reared tuatara of all types should be achievable. No attempts to establish new populations of tuatara have been made within the last 50 years. An attempt was made in 1920 to establish tuatara on Mokopuna Island (0.8 ha) in Wellington Harbour (Hislop, 1920; Department of Internal Affairs, unpublished) but details are scant and the attempt was apparently unsuccessful. Given the long life-span of tuatara, their high tolerance to habitat modification, and recent improvements in knowledge of habitat requirements (Appendices l and 3), introduction programmes now have a high chance of success.

6.0 OPTIONS FOR RECOVERY

Possible recovery options for each type of tuatara for the next five years are as follows:

6.1. Northern Tuatara (Fig. 3a)

Option l: Do nothing. This will almost certainly result in the extinction of populations on Little Barrier, Cuvier, Stanley and Red Mercury within the next 20 years. It could also result in the decline or extinction of populations on Whatupuke, Coppermine, Lady Alice and Hen within the next 50 years. Should all these populations become extinct, about 1640 (16%) of the total existing number of Northern tuatara would be lost, and the total area of habitat left unoccupied by Northern tuatara would be about 4414 ha (i.e., 92% of the current total). One or more smaller populations could also be lost as a result of unpredictable events such as the introduction of rats.

Option 2: Increase security and monitoring of all existing populations; bring surviving tuatara from Cuvier, Stanley and Red Mercury into captivity to breed; eradicate kiore from Cuvier, Stanley, Red Mercury and Middle Chain and rabbits from Stanley; re-establish tuatara populations on Cuvier, Stanley and Red Mercury using captive-reared juveniles from the

same island. Develop methods for kiore eradication on Whatupuke, Coppermine, Lady Alice and Hen and implement as soon as possible. Assuming that tuatara on these seven islands eventually re-established themselves at an average density of 100 tuatara/ha over half of each island, the total number of Northern tuatara could eventually increase from the present 10,000 to about 68,000.

Take some tuatara from Little Barrier Island into captivity (or if sufficient are found transfer enough to establish a population on another island (e.g. in Mokohinau Group)). Re-establish population on Little Barrier Island when feasible (this may require kiore eradication there). Tuatara established at average densities over half of Little Barrier would lead to a total population for the taxon of ca. 220,000.

Option 3: As for Option 2, but in addition, establish a population on an island capable of supporting at least 1000 tuatara, preferably on an island on which tuatara have become extinct in historic times. The primary purpose would be to allow controlled public access to view tuatara and an island restoration programme.

Option 4: As for Option 3. But instead of recolonising the islands of Stanley, Cuvier, Red Mercury and Little Barrier with animals of their original stock, use animals from other northern islands.

Preferred option: The option chosen for the duration of this recovery plan is Option 3. However if at the end of the 5-year term of the plan, significant progress has not been made on building up numbers of tuatara for re-introductions based on existing stocks, Option 4 should be considered.

6.2. Cook Strait Tuatara (Fig. 3b)

Option 1: Do nothing. The total population might remain at about 45,000 but it could also decline as a result of unpredictable events such as rat introduction.

Option 2: Increase security and monitoring of existing populations, and establish at least one additional population, preferably on an island on which tuatara have become extinct within historic times, capable of supporting at least 1000 tuatara. The primary aim of establishment would be to allow controlled public access to view wild tuatara and an island restoration programme, without endangering existing populations of exceptional importance such as that on Stephens Island. This option would also increase the number of populations of this

taxon from four to five, and the total number of tuatara would increase slightly (from 45,000 to at least 46,000).

Preferred option: The option chosen for this recovery plan is Option 2.

6.3. Brothers Tuatara (Fig. 3c)

Option 1: Do nothing. The population size may remain stable, but the species could become extinct owing to unpredictable events such as rat introduction.

Option 2: Increase security and monitoring of existing population; establish at least two new wild populations on rat-free islands capable of supporting at least 1000 tuatara each; and establish one long-term self-maintaining captive-breeding population. These actions should ensure the survival of this species of tuatara in both the wild and captivity. The total number of individuals could eventually rise to at least 2300, and the total area of habitat occupied in the wild from 1.7 ha to about 21.7 ha.

Preferred option: The option chosen for the duration of this recovery plan is Option 2.

6.4. Other Possible Options

A more ambitious option - the re-establishment of tuatara on all offshore islands where they have become extinct within historic times - is not feasible within the next five years with existing staff and financial resources, existing expertise in predator control, and current land-uses. However, this option should be left open as a possible long-term goal for future recovery plans, and should be met wherever possible for individual islands within the duration of this recovery plan. For instance, if rats are eradicated from small islands that had tuatara within historic times (e.g., East Island), attempts should be made to re-establish tuatara there. Larger islands on which tuatara have become extinct within historic times (e.g., Motiti and Slipper Islands) have the potential to support many thousands of tuatara, and should have priority as restoration islands for tuatara should they come into Crown ownership and/or become rodent-free in the future. The re-establishment of tuatara on these islands need not necessarily prevent the same islands being used as refuges for other rare species, particularly in view of the sedentary behaviour and late sexual maturity of tuatara.

However, because of the tuatara's position as a top predator in terrestrial food-chains, it is important that all potential desired uses of these islands are considered from the outset and the timing of any tuatara introductions planned accordingly. The transfer of tuatara to islands from which tuatara have never been recorded and from which rodents have been eradicated should be considered on a case-by-case basis in accordance with the Transfer Guidelines For Indigenous Terrestrial Fauna and Flora (DoC Policy 17 September 1990). All tuatara re-introductions should be subject to satisfactory impact assessment (see Appendix 8). Re-establishment of wild tuatara on the mainland would not be possible without constructing rodent-proof barriers, and is not considered a feasible option at present.

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