

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES  
OF WILD FAUNA AND FLORA

Sixteenth meeting of the Conference of the Parties  
Bangkok (Thailand), 3-14 March 2013

## CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

To transfer all species of geckos in the genus *Naultinus* from Appendix III to Appendix II. This genus of nine brightly-coloured gecko species is endemic to New Zealand. Since 1981, they have been absolutely protected in New Zealand, and were listed on Appendix III in 2003 because of growing concerns about the illegal collection of geckos in New Zealand to supply the international pet market. Appendix III listing has not provided the level of protection desired, because poaching has increased in recent years, apparently driven by demand from overseas reptile collectors.

An advantage of an Appendix-II listing over an Appendix-III listing is that in accordance with Articles IV and VII of the Convention it will require, *inter alia*, that before export the relevant Scientific Authority issue a non-detriment finding and that the relevant Management Authority must be satisfied that the specimen was not obtained illegally, or it was bred in captivity. In the case of re-exports, it requires, *inter alia*, that the Management Authority of the State of re-export is satisfied that the specimen was imported into that State in accordance with the provisions of the Convention.

This proposal is in accordance with the following criteria for inclusion of species in Appendix II:

- Article II 2 (a): Although *Naultinus* spp. are not necessarily now threatened with extinction, they may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilisation incompatible with their survival.
- Resolution 9.24 (Rev. CoP15) Annex 2a criterion B. On the basis of available trade data and information on the status and trends of the wild populations of *Naultinus gemmeus*, it is known or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting and other influences.
- Resolution 9.24 (Rev. CoP15) Annex 2b criterion A. Identification of *Naultinus* species can be difficult for non-experts. Domestic experience has indicated that enforcement officers who encounter specimens of CITES-listed geckos at the border are unlikely to be able to reliably distinguish between the various species of *Naultinus* geckos, especially between the uniformly green morphs of *N. gemmeus* and other species.

B. Proponent

New Zealand\*

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\* The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.

## C. Supporting statement

### 1. Taxonomy

1.1 Class: Reptilia

1.2 Order: Sauria

1.3 Family: Diplodactylidae (formerly Gekkonidae)

1.4 Genus: *Naultinus* Gray 1842

Species: *Naultinus elegans* Gray, 1842

*Naultinus gemmeus* (McCann, 1955)

*Naultinus grayii* Bell, 1843

*Naultinus manukanus* (McCann, 1955)

*Naultinus punctatus* Gray, 1843

*Naultinus rudis* (Fischer, 1882)

*Naultinus stellatus* Hutton, 1872

*Naultinus tuberculatus* (McCann, 1955)

*Naultinus* "North Cape", which is an undescribed species (Nielsen *et al.* 2011).

NB. The taxonomy of New Zealand geckos (Diplodactylidae) has been revised recently on the basis of data from nuclear (RAG-1, PDC) and mitochondrial (ND2, 16S) genes (Nielsen *et al.* 2011). This analysis shows that all *Naultinus* species are correctly placed within the endemic genus *Naultinus*; however, the species shown in the CITES Species Database will require some amendments. *Naultinus punctatus*, the former synonym of *N. elegans* is now recognised as a full species, and *N. poecilochlorus* is now treated as a synonym of *N. tuberculatus* (Hitchmough 1997, Nielsen *et al.* 2011). An extra species, *Naultinus* "North Cape", was recognised as a close, but distinct species in the *N. elegans* and *N. grayii* clade.

1.5 Scientific synonyms: South Island species (*N. gemmeus*, *N. manukanus*, *N. rudis*, *N. stellatus* and *N. tuberculatus*) were placed in a separate genus *Heteropholis* between 1955 (McCann 1955) and 1990 (Bauer 1990). Full species-level synonymies were presented by Bauer (1990). *N. punctatus* was a former synonym of *N. elegans*, and *N. poecilochlorus* is a synonym of *N. tuberculatus* (Hitchmough 1997, Nielsen *et al.* 2011).

1.6 Common names: English: *Naultinus* green geckos  
*Naultinus elegans* Auckland green gecko  
*Naultinus gemmeus* jewelled gecko  
*Naultinus grayii* Northland green gecko  
*Naultinus manukanus* Marlborough green gecko  
*Naultinus punctatus* Wellington green gecko  
*Naultinus rudis* rough gecko  
*Naultinus stellatus* Nelson green gecko  
*Naultinus tuberculatus* West Coast green gecko  
*Naultinus* "North Cape" North Cape green gecko

French:

Spanish:

1.7 Code numbers: unknown

### 2. Overview

This proposal is to list all species in the genus *Naultinus* in Appendix II. When listed on CITES Appendix III on 28 May 2003, New Zealand's gecko fauna was represented by two genera (*Hoplodactylus* and *Naultinus*). New Zealand's gecko fauna is now recognised as an endemic radiation of seven genera and at least 40 species (Nielsen *et al.* 2011), with the future discovery and description of additional species highly likely. Geckos can be found in most New Zealand natural habitats (Hitchmough 1997; Nielsen *et al.* 2011).

Many gecko species would have been extremely abundant in New Zealand before the arrival of humans and their accompanying mammalian and avian pests from about 1000 years ago (see Wilmshurst *et al.* 2008). Resultant habitat loss through the burning and clearance of forest, scrub and tussock grasslands for agriculture and exotic forestry, and predation by introduced pests had a huge impact on gecko populations. Although habitat loss is a minor issue nowadays, predation continues to threaten gecko populations throughout the mainland and on some offshore islands. All eight described *Naultinus* species, and the undescribed *Naultinus* “North Cape”, are considered “At Risk” under the New Zealand Threat Classification System (Hitchmough *et al.* 2010).

All *Naultinus* species have characteristics that make them attractive to collectors. They are extremely colourful and attractive, have unusual features such as bearing live young, are diurnal, and they are extremely long lived. All species are slow to mature to reproductive age (2-4 years, with quickest maturation in the warmest habitats) and have a low reproductive output (1-2 offspring per adult female per annum). It is assumed that as a consequence of strict domestic legislation that absolutely protects geckos in New Zealand, as well as features of individual animals that make them so sought after, collectors have resorted to poaching and smuggling of specimens.

It is predicted that the full extent of illegal trade in New Zealand geckos is yet to be realised as demand for these species rises. At least one wild population of *N. gemmeus* has declined by more than 95% over a 14-year period, at least in part, from poaching (Lettink 2011). The ability of New Zealand gecko populations to recover is limited due to their low reproductive potential. Even low levels of trade can have significant effects on wild populations.

New Zealand’s domestic legislation protecting geckos and the Appendix-III listing has had limited success in reducing the unlawful take of geckos from the wild and the illegal international trade in these animals. Wildlife criminals with illegally-collected geckos in their possession have been apprehended by New Zealand law enforcement authorities annually since 2009. In addition, we are aware of multiple cases of specimens being poached in New Zealand and then being later advertised on externally-hosted reptile websites (see Annex 1). Not all countries have domestic legislation that penalises international trade in specimens on Appendix III that have been exported or re-exported in violation of the laws of the country of origin. Given the high value of these specimens, the deterrents against smuggling, or passing smuggled animals off as captive-bred, are often minimal or nonexistent in some cases. Having these geckos listed on CITES Appendix II would require, *inter alia*, the issuance of a non-detriment finding by the appropriate Scientific Authority in accordance with Article IV of the Convention and the appropriate Management Authority would have to be satisfied that the specimens were not obtained illegally in accordance with Article IV of the Convention, or the appropriate Management Authority would have to issue a certificate that the specimens to be exported were bred in captivity in accordance with Article VII of the Convention. In the case of re-exports, the Management Authority of the State of re-export would have to be satisfied that the specimen had been imported into that State in accordance with the provisions of the Convention. In some countries, Appendix-II listing also provides a higher level legal basis to address illegal trade. These increased international controls will allow greater enforcement action, thus providing stronger deterrents to wildlife criminals and thus give a greater assurance of the long-term viability of these species in the wild.

New Zealand is of the opinion that the criteria outlined in *Annex 2a criterion B* of Resolution 9.24 (Rev. CoP15) apply to several *Naultinus* species, but especially to *N. gemmeus*. Illegal harvesting of endangered gecko species, and especially *N. gemmeus*, for international markets constitutes a serious threat to their long-term survival in the wild, particularly for those species with small populations and ranges. In the past four years, there have been several incidents of gecko poaching and smuggling – some of which have targeted gravid females. These poaching operations have had adverse impacts on their populations, and have led to population declines of up to 95%. An impact report submitted by a herpetofauna expert (Lettink 2011) for a successful prosecution of an apprehended smuggler noted that “It is estimated that 100-200 jewelled geckos [*N. gemmeus*] may have been taken from the Otago Peninsula alone. To put this in a regional perspective, the removal of 100-200 geckos would correspond to a decline of 7-14% in the known jewelled gecko population”. Recent evidence and anecdotal information have shown that New Zealand gecko species are appearing on the international pet market at numbers far exceeding the breeding capacity of the small international captive population established before they were legally protected.

New Zealand is of the opinion that the criteria outlined in the “look-alike” provisions of *Annex 2b criterion A* of Resolution 9.24 (Rev. CoP15) applies to the whole *Naultinus* genus. Identification of *Naultinus* species can be difficult for non-experts, especially since field identification is often based on location rather than morphological features because species have largely parapatric distributions (Hitchmough 1997) and considerable colour variation between individuals. Domestic experience has indicated that enforcement officers who encounter specimens of CITES-listed species at the border are unlikely to be able to reliably

distinguish between the various species of *Naultinus* geckos, especially between the uniformly green morphs of *N. gemmeus* and other species.

### 3. Species characteristics

#### 3.1 Distribution

The nine *Naultinus* species have ranges which abut but do not overlap, and were historically found all over the country. Their ranges are highly fragmented by habitat loss and modification (e.g., historical fires) and they are also greatly reduced in abundance by predation pressure from introduced mammals. They are found on only a few of the largest offshore islands which are mostly inhabited by people, so they lack the protection that remote and pest-mammal free islands provide for many other New Zealand lizards.

#### 3.2 Habitat

*Naultinus* species are found in forests and shrublands. They are often regarded as shrubland and forest edge specialists, but there is considerable uncertainty about the degree to which they may occur in the canopy of tall forest. They are diurnal and occupy the foliage of trees and shrubs. At night in good weather they sleep at the tips of twigs, but they retreat to cover on the ground in bad weather.

#### 3.3 Biological characteristics

All New Zealand geckos including *Naultinus* are characterised by ovoviviparity (live birth of young), low reproductive output, delayed maturity, and extreme longevity. All species give birth to one or two live young at a time, and none breeds more than once per year. Larger species of other genera and those occupying cooler habitats tend to breed only every second year. Although all *Naultinus* populations studied to date have been annual breeders, neither high-altitude nor the most southern populations have yet been studied. *Naultinus grayii*, from the warm northern part of Northland, can reproduce at two years old, but all other species which have been studied take at least three years to first breeding. They are dietary generalists, taking a wide range of invertebrate prey and nectar and soft fruit.

#### 3.4 Morphological characteristics

*Naultinus* species are much more spectacularly coloured than most other gecko species, usually predominantly very bright green, uniformly coloured or with contrasting coloured stripes or spots. They are comparable in colour only with the more brightly coloured *Phelsuma* species native to Madagascar and other islands in the southwestern Indian Ocean. Some *Naultinus* species have colour morphs where the green is replaced by brilliant yellow, and there is a rare, pale cream-coloured morph in *N. elegans*. Some species or populations have many individuals with unique markings that are stable over their lifespan, which means that it is possible to reliably identify these particular animals from photographs (Knox *et al.* in press).

The Otago Peninsula and Banks Peninsula populations of *N. gemmeus* which have been particularly targeted by poachers in recent years have very few uniformly green individuals and so are readily identifiable individually, but more southern and inland populations of the same species include uniformly green specimens which can not be individually identified. North Island species of *Naultinus*, Stewart Island region *N. gemmeus*, and *N. manukanus*, have many plain green individuals, and at least occasional uniformly green specimens are found in all species. Specific identification is often straightforward but there are exceptions, particularly when the geographical origin is uncertain. Captive stocks in New Zealand also include hybrids. For this reason, all species in the genus have been included for listing.

#### 3.5 Role of the species in its ecosystem

Geckos have a number of roles in the ecosystem: they are major predators of small invertebrates; they are major pollinators of divaricating scrubs – whose flowers and dense twiggy structure makes it impossible for larger birds and insects to pollinate – and other plant species; and they disperse seeds from small berries. When at natural densities (i.e. when introduced mammalian predators have been controlled), geckos are a major food source for large native carnivores such as tuatara, morepork/ruru and kingfishers/kōtare (Brockie 1985). The large population densities attained by geckos in the

absence of direct and indirect human impacts means that their biomass and the amount of energy flowing through them in local foodwebs are extremely high.

#### 4. Status and trends

##### 4.1 Habitat trends

Habitat loss has been extremely important in the past, but is rather less so now with more comprehensive protection of forests. However, coastal development and agricultural intensification are still major issues. *Naultinus* species are particularly at risk from agricultural intensification because they often occupy secondary shrublands on farmland near forest remnants. These shrublands are largely unprotected on private land.

##### 4.2 Population size

Population size is extremely difficult to estimate for most New Zealand gecko species. *Naultinus* species have highly fragmented regional distributions and are at unknown but presumably low densities in the canopy of at least some types of tall forest. The relatively large ranges of most species mean that they are likely to number in the thousands to tens of thousands, given that local populations have been found at densities up to about 40 (Hitchmough 1979) and even 500 per hectare (Knox, 2010). However, in both these instances the population was in a fragment of remnant habitat which probably had greatly inflated population density because of immigration from surrounding areas as habitat was destroyed. Most populations will be at much lower densities.

##### 4.3 Population structure

New Zealand geckos are highly sedentary, with very limited dispersal abilities. There is a great deal of local variation in features such as colour and body size even within species, and genetic studies confirm fine-scale population structuring (Hitchmough 1997; Nielsen *et al.* 2011). New Zealand geckos can occupy stable home ranges for many years; for example, Lettink *et al.* (2010) found a *Woodworthia brunnea* at least 48 years old still resident at the same site where it was marked more than 40 years earlier. No such long-term studies have been carried out on *Naultinus* species, but a 2-year study by Hitchmough (1979) found *Naultinus grayii* to have very stable home ranges. This means that natural recolonisation is extremely unlikely at isolated sites where populations have been extirpated. New Zealand skink species have been shown to have artificially elevated genetic population structuring with increased levels of inbreeding where populations have been fragmented by surrounding agricultural development (Berry *et al.* 2005), and it is extremely likely that geckos would show the same trend.

##### 4.4 Population trends

Population trends for all species were estimated by a panel of herpetological experts as part of the New Zealand Threat Classification of reptiles (Hitchmough *et al.* 2010). All *Naultinus* species were assessed to be declining at a rate of >10% over three generations.

##### 4.5 Geographic trends

Natural habitats in lowland New Zealand were extensively cleared for conversion to agriculture in the 19th and 20th centuries up until about 1990. Clearance of primary forest has now largely stopped, but secondary shrublands – favoured *Naultinus* habitats – are still subject to felling, burning or crushing by machinery as agricultural use and exotic plantation forestry on private land is intensified. Habitat is also being lost to urban expansion, particularly near the coast around cities and resort areas.

#### 5. Threats

Introduced mammalian predators and habitat loss/degradation are believed to be the key causal agents of decline in *Naultinus* populations. In addition to predation, geckos also suffer competition for favoured food sources from rodents, possums (*Trichosurus vulpecula*) and introduced vespid wasps. However, illegal collection for international trade poses a significant additional risk for many species which has accelerated dramatically in the last few years.

Since human settlement about 1000 years ago, forest cover has gone from 82% to 23% of the land surface area of New Zealand, and clearance has been particularly intensive in the lowlands. Clearance of primary forest largely stopped in the early 1990s, but semi-natural grasslands and secondary shrublands – favoured lizard habitats – are still being lost for agriculture and urban expansion in coastal areas.

Predation by invasive mammals is currently the primary agent of decline for all reptiles on the mainland of New Zealand. Population abundance and the range of habitats occupied are both very greatly reduced in the presence of invasive mammals, but they predictably and reliably recover when pest mammals are eradicated on islands.

The best-studied population of *N. gemmeus* (on Otago Peninsula) has been demonstrated to be in severe decline, with a 95% reduction in 14 years from 1994 to 2008 (M. Lettink, pers. comm.). Part of this decline results from mammalian predation; populations nearest to Dunedin city have disappeared progressively, and levels of grazing in gecko habitats has been linked to predation pressure from rodents, with grazing reducing habitat availability and thereby concentrating rodents and geckos into the same remnants of high quality habitat (Knox 2010). Poaching is known to have occurred at this site and this will have exacerbated the pressure from predators on this population. Gravid females (see Table 1 for figures) have been disproportionately represented in consignments seized from poachers (presumably because these animals are more valuable, and because they are larger and need to bask frequently to maintain high body temperature for foetal development). The loss of breeding females further exacerbates the deleterious effects of poaching and predation on these populations.

While poaching is known to have had a serious local impact in this well-studied Otago Peninsula population, it is hard to determine the impact at the species level because other populations are not being monitored closely. However, the rate of detected poaching incidents has accelerated so dramatically that it is realistic to infer that the impacts are likely to spread rapidly to other populations and other species in the genus and become a major agent of decline.

## 6. Utilization and trade

### 6.1 National utilization

Because all New Zealand reptiles are absolutely protected under the Wildlife Act 1953, there is no legal utilisation permitted, and therefore no harvesting, except that some individuals/organisations have been granted specific permits by the Department of Conservation to hold certain species for scientific or educational purposes.

### 6.2 Legal trade

There has been minimal legal trade in specimens of New Zealand geckos, involving a maximum of 21 individuals of two species (*N. elegans* and *N. grayii*) since listing on Appendix III in May 2003 (UNEP-WCMC 2012). Since 2003, only 11 *Naultinus* geckos have been exported from New Zealand for scientific and law enforcement purposes, and up to 10 individuals have been legally traded elsewhere (between Canada, China, Germany and the United States). The UNEP-WCMC record of 14 *N. rudis* “carvings” with a Philippines origin that were exported from Canada to the United States in 2010 appears to be a coding error.

### 6.3 Parts and derivatives in trade

New Zealand geckos have only been traded as live specimens. There is no evidence that any part or derivative of these species have been traded.

### 6.4 Illegal trade

Concrete evidence exists that *Naultinus* are available in European markets (see Annex 1). In the past few years, New Zealand border control agencies have intercepted several individuals attempting to leave the country carrying illegally-harvested gecko specimens (Table 1). Since 2009, seven individuals have been successfully prosecuted for attempting to smuggle New Zealand geckos and skinks:

**Table 1: Recent prosecutions of attempted smuggling of New Zealand lizards**

Year	Species	Specimens	Destination
2009	<i>Oligosoma maccanni</i>	15 skinks	EU
	<i>Oligosoma polychroma</i>	5 skinks	
	Hoplodactylus 'Canterbury'	1 gecko	
	Hoplodactylus 'Central Otago'	4 geckos	
	Hoplodactylus 'Cromwell'	13 geckos	
	Hoplodactylus 'Otago large'	3 geckos	
	Hoplodactylus 'Southern Alps'	3 geckos	
2010	<i>Naultinus gemmeus</i> (Otago Peninsula)	16 geckos (9 gravid)	EU
2011	<i>Naultinus gemmeus</i> (Otago & Banks Peninsulas)	4 geckos (2 gravid)	EU
2012	<i>Naultinus gemmeus</i> (Banks Peninsula)	4 geckos (at least 1 gravid)	EU

It is, however, known that more poaching and smuggling has taken place. The population from which the *N. gemmeus* specimens were taken in 2010 and 2011 has been extensively studied by a local ecologist/herpetologist. This ecologist/herpetologist has maintained an extensive photo library of individual animals, and so can recognise particular individuals from photographs (Knox *et al.* in press). Once the specimens were intercepted at the New Zealand border, they were returned to their natural home ranges in the area from where they were poached. Nonetheless, despite increased surveillance of the general area, some of these same individuals were later identified from photographs posted in advertisements on an internationally hosted reptile website. This indicates that they had been poached for a second time, and this time the poachers successfully avoided detection at the New Zealand border and offshore border(s).

#### 6.5 Actual or potential trade impacts

The long-term survival of New Zealand geckos is threatened by habitat loss, unnatural predation, and illegal collection. For small populations of rare reptiles – such as *N. gemmeus* – the impact of illegal collection could easily outweigh that of other threats (Lettink 2011). The slow life-history traits of these geckos also mean that populations are slow to recover from poaching, even of only a few individuals. In this regard, poaching of gravid females is a major concern (Lettink 2011). Populations are frequently small and highly fragmented, with connectivity between populations destroyed by historical habitat loss, so it is relatively easy for poaching to reduce local populations to below viable levels.

New Zealand herpetologists have observed that illegal collection of reptiles “appears to have been a major factor in the decline and imminent extinction of at least one gecko population on the Otago Peninsula”, and at least two other populations on the Otago Peninsula are known to have been targeted by poachers, in some cases repeatedly (Lettink 2011).

As well as directly impacting gecko populations, the illegal collection has made it extremely difficult to share or publish any information about the animals which includes locality data, as it is feared that the information will fall into the wrong hands. This makes it difficult to involve the community in such activities as distribution surveys.

While recently detected illegal collection has focussed on the Banks Peninsula and Otago Peninsula populations of *N. gemmeus*, other *Naultinus* species share all the features that attract the illegal attention, and attention could easily shift to other species if *N. gemmeus* alone was given additional legal protection.

## 7. Legal instruments

### 7.1 National

All gecko species are absolutely protected under New Zealand's Wildlife Act 1953. Taking or possessing geckos from the wild requires permits under the Wildlife Act. Three other Acts of Parliament protect habitat and animals on land administered by the Crown; Reserves Act 1977, National Parks Act 1980, and the Conservation Act 1987. Most species are represented, at least partially, on public conservation land. Prior to 1981, *Naultinus* spp. enjoyed general legislative protection under laws protecting all animals and plants in public conservation areas. Since 1981, they have been absolutely protected in New Zealand under the Wildlife Act 1953.

Before protection, both domestic and international trade were regulated, but not prohibited. At this time, herpetologists, collectors and hobbyists within New Zealand could legally take geckos from the wild, trade these with other hobbyists within New Zealand, and submit an application to the then Wildlife Service of the Department of Internal Affairs (now within the Department of Conservation) for authority to export these reptiles to other countries. Nationally, geckos could also be sold from pet shops, thereby legalising the domestic trade.

Since additional protections were instituted in 1981, it has been illegal for live geckos to be traded, or for them to be collected from the wild for other than conservation purposes. Export of captive-bred animals is a rare occurrence, such as for law enforcement and scientific purposes.

In September 2012, the New Zealand government announced tougher measures for individuals caught attempting to smuggle native wildlife out of the country. The Wildlife (Smuggling Deterrence) Amendment Bill will increase the maximum penalty for smuggling of native animals such as tuatara, parrots, and geckos from 6 months imprisonment or a \$100,000 fine to up to five years imprisonment and/or a \$300,000 fine. These increased penalties will trigger stronger controls on convicted offenders from entering or re-entering New Zealand or other countries.

### 7.2 International

New Zealand geckos (*Hoplodactylus* spp. and *Naultinus* spp.) have been listed on Appendix III of CITES since 28 May 2003. While Appendix III has been adequate in terms of controlling legal trade of New Zealand geckos (which has been minimal), this level of protection has proven to be inadequate for addressing their illegal trade. Some destination countries do not have prohibitions on trading of Appendix-III specimens, even if they have been illegally obtained and imported. Therefore, illegally harvested and smuggled specimens of Appendix III species can be legally sold in some countries, making enforcement of New Zealand legislation (and the Appendix-III listing) difficult.

## 8. Species management

### 8.1 Management measures

Active reintroduction of endemic New Zealand lizards onto pest-mammal-free offshore islands has been used increasingly in recent years as a management tool to mitigate the declines on the mainland. In addition, some species are naturally represented on offshore islands and, with the gradual eradication of introduced mammals on many of these islands, some populations have been able to naturally recover. It is likely that more reintroductions will occur as islands have predators eradicated and the island ecosystems are restored. However, these measures benefit *Naultinus* on only a few large islands, as they appear to be naturally absent from most small islands with seabird dominated ecologies. Also, predator-free offshore islands are not available for some species (e.g. *N. rudis*, *N. tuberculatus*).

Detailed long-term regional lizard conservation work plans have been formulated for most areas (e.g. West Coast Lizard Action Plan). The Department of Conservation has a Lizard Technical Advice Group made up of specialist herpetologists and experienced conservation managers which provides advice on the conservation management of endemic lizard species.



## 8.2 Population monitoring

Monitoring has only occurred on a very local and short-term scale during scientific study of gecko populations (e.g. Hitchmough 1979, Knox 2010). The Department of Conservation is moving towards well-targeted outcome monitoring for all species recovery programmes, but no such programmes are yet in place for any gecko species. Because of their arboreal and extremely cryptic behaviour, extremely good camouflage, and weather-dependent activity, monitoring is extremely difficult and typically provides population size and trend estimates with only very large confidence intervals. Consequently, trend monitoring must be conducted over long time periods.

## 8.3 Control measures

### 8.3.1 International

There are no other international controls for these species in addition to CITES.

### 8.3.2 Domestic

The New Zealand Wildlife Act 1953 prohibits the collection and possession of any wild geckos without prior lawful authorisation. The Act protecting geckos is generally effective because it contains provisions that make non-compliance an offence and have appropriate penalties. The New Zealand Wildlife Enforcement Group is a multi-agency wildlife crime unit that investigates illegal activity relating to wildlife. A large proportion of their time is targeted at combating illegal collection of New Zealand geckos.

All endemic gecko species have full legal protection against deliberate harm or collection from the wild. Collection may be carried out only under permits issued by the Department of Conservation, but such permits have been rarely issued since 1981, and almost all were issued for research purposes.

## 8.4 Captive breeding and artificial propagation

Before New Zealand gecko species became absolutely protected under national legislation, domestic export permits were available upon application, and large numbers of geckos are known to have been legally exported to Europe between 1994 and 1996. These permits were for *Hoplodactylus* species now in the genera *Woodworthia* and *Mokopirirakau* only – other genera have been protected under the Wildlife Act since 1981. Small captive populations of New Zealand geckos were established in Europe at this time and some may still exist today. However, if they do exist, the genetic diversity of these populations may be limited. A subsequent change in legislation has protected all gecko species, and breeding for commercial purposes has been totally prohibited within New Zealand since 1996.

Within New Zealand, several hundred private individuals and some zoological gardens and similar institutions hold individuals or populations of *Naultinus* under permit on a non-commercial basis. For most species, reproduction only slightly exceeds mortality and surplus animals are given free of charge to other permitted enthusiasts. They cannot be legally exported. Total captive population across all species is likely to be less than 1000 in New Zealand. The predominant species held are the North Island *Naultinus* species (*N. elegans*, *N. grayii* and *N. punctatus*). There are smaller populations of some of the South Island *Naultinus* species. These species all have satisfactory reproductive rates if well-managed in semi-natural conditions in outdoor enclosures. However, species and even populations vary widely in the ease with which they can be kept and bred in captivity.

In New Zealand, a captive population exists of *N. gemmeus* descended from Banks Peninsula animals collected before 1981. However, the morphologically distinct Otago Peninsula population on which most poaching has focussed now has very few if any animals in captivity in New Zealand despite a captive population existing in the 1970s-80s. This indicates that mortality has exceeded reproduction in this captive population, and it was not sustainable.

## 8.5 Habitat conservation

About one-third of New Zealand's land area is managed by the Department of Conservation for biodiversity conservation. This protects from habitat loss at least some populations of all species targeted by poachers. Unfortunately, available resources do not allow control of pest mammals in all protected areas, so gecko populations in some reserves and national parks will continue to decline because of the impacts of these exotic species. However, some sites have intensive predator management on the New Zealand mainland, and it has been demonstrated at one intensively-managed site that lizard (skink) populations have benefited (Reardon *et al.* in press). However, such benefits have not yet been demonstrated for *Naultinus* populations. Intensive management of invasive species in sites representing the full range of natural ecosystems in New Zealand is planned in the near future. Numerous offshore islands have had mammalian pests eradicated, and other gecko populations have rebounded on these islands, but so far *Naultinus* species have not been demonstrated to have benefitted in this way even on islands such as Kapiti and Little Barrier/Hauturu where they are resident and pests have been eradicated. It is likely that *Naultinus* has benefitted from this management, but the difficulties of monitoring its populations have meant that the benefits are as yet undetected.

## 8.6 Safeguards

Not applicable.

## 9. Information on similar species

*Naultinus* geckos are readily distinguished from all other gecko genera by their usually very bright colours, lamellae pads extending unbroken to the claw, and unscalloped edges to the pupil. Identification to species level can sometimes be very difficult. All species of *Naultinus* will be protected under this proposal to overcome this difficulty and because all are believed to be at least potential targets of illegal collection.

## 10. Consultations

The New Zealand Management and Scientific Authorities of CITES undertook consultations at two levels: (1) with domestic stakeholders, such as conservation groups, other Government agencies, and reptile enthusiasts; (2) with other CITES Management and Scientific Authorities, including those who have recent trade records for *Hoplodactylus* spp. and *Naultinus* spp. as indicated in the UNEP-WCMC trade records. The feedback from these consultations has been incorporated into this proposal.

## 11. Additional remarks

*Hoplodactylus* spp. and *Naultinus* spp. were originally proposed for inclusion in Appendix II at CoP12 (Prop. 12.33) in 2002. Several interventions suggested that because these geckos were endemic and New Zealand had stringent domestic legislation in place, then Appendix III listing was more appropriate. The proposal was rejected (30 votes in favour, 39 against, and 26 abstentions).

## 12. References

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Recent *Naultinus* geckos listed for sale, swap or purchase on [www.terrarium.com](http://www.terrarium.com) at 12 June 2012

Date	Wanted to sell/ swap/ buy	Species	No. of individuals	Cost (Euros)	Comments
12 Jun 2012	Sell	<i>N. gemmeus</i>	1.1		
12 Jun 2012	Sell	<i>N. gemmeus</i>	0.1		
5 Jun 2012	Sell	<i>N. gemmeus</i>	pair		
27 May 2012	Sell	<i>N. grayii</i>			"Young adult males; NZ 2010"
8 Mar 2012	Buy	<i>N. grayii</i>	0.1		
7 Mar 2012	Sell	<i>N. gemmeus</i> (northern Christchurch")	1.1		
1 Mar 2012	Sell	<i>N. grayii</i>	1.1		"NZ 2007"
29 Feb 2012	Swap	<i>N. grayii</i>	1.1		
11 Feb 2012	Buy	all <i>Naultinus</i> spp.	2.2	max 1000	
19 Jan 2012	Sell	<i>N. grayii</i>	1.1	3900	
18 Jan 2012	Sell	<i>N. stellatus</i> <i>N. manukanus</i> <i>N. rudis</i>	1.1 0.1 1.1	8000 4500 8500	
18 Jan 2012	Buy	<i>Naultinus</i> spp.			"wanted for Hamm"
17 Jan 2012	Buy	<i>N. grayii</i>	pair		
14 Jan 2012	Sell	<i>N. grayii</i>	1.0	-	"adult male 2009"
10 Jan 2012	Swap	<i>Naultinus</i> spp	1.1	-	
30 Dec 2011	Swap	<i>N. grayii</i>	1.1		
19 Dec 2011	Sell	<i>N. grayii</i>	1.0		"Perfect estetic [sic] and health"
13 Dec 2011	Buy	<i>N. grayii</i>	2-3 young		
3 Dec 2011	Sell	<i>N. grayii</i> <i>N. elegans</i>	1.0 1.0		"2010" "2010"
29 Nov 2011	Sell	<i>N. grayii</i>	2.1		"Offspring 8/2011"
31 Oct 2011	Buy	<i>N. grayii</i>	1.0		"Search for Hamm"
12 Sep 2011	Sell	<i>N. elegans</i>	1.0		
9 Sep 2011	Sell	<i>N. gemmeus</i>			"Last breeding female"
11 Jul 2011	Buy	<i>N. grayii</i>	1.0		
11 Jul 2011	Buy	<i>Naultinus</i> species			
9 Jun 2011	Buy	<i>N. grayii</i> , <i>gemmeus</i> , <i>rudis</i>			"Only serious offers"
30 May 2011	Buy	<i>N. gemmeus</i> (Banks Peninsula)			
13 May 2011	Sell	<i>N. grayii</i> <i>N. gemmeus</i> (Otago)	1.3 2.1	1100 1600	