



# Captive Breeding for the Conservation of New Zealand's Endemic Birds

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Captive breeding is usually one of the last methods employed by conservation authorities but internationally it is increasingly used in the fight to save endangered species from extinction. Captivity is regarded by many as undesirable and some even advocating that a species should rather become extinct than be brought into captivity. Nothing brought this home to me more than a visit to the Californian Condor breeding centre managed by the San Diego Zoo. It was explained to me that the fortress-like appearance of the facility was to protect the birds from extremists who had threatened to kill the birds rather than allow them to be held captive.

Fortunately, however, there has in recent years been an ever-increasing number of success stories which have calmed the objections of the critics of captive breeding. Most recently I have just read that the American Peregrine Falcon, re-established from captive-bred birds, has been removed from the threatened and endangered species lists in the USA.

Conservation authorities will most often use the option of translocation of individuals from an established, secure wild population to be used as founder members for a new population. When, however, the wild population is already at a low point and can not safely be harvested to provide sufficient individuals for translocations, captive breeding, which can be initialized with a handful of founder members, becomes an option.

Captive breeding is no longer the hit and miss affair it used to be and the goals of most captive programs are decided on by a recovery group. Captive programs are run – often with expert advice from a taxon advisory group (TAG) – in accordance with a

captive management plan, which is part of a species recovery plan and defines the goal of the captive program. The Reintroduction Specialist Group (RSG) is part of the Species Survival Commission (SSC), which is in turn part of The World Conservation Union (IUCN). The RSG have produced guidelines for re-introductions and publish a regular update on some of the re-introduction programs globally.

Single species holdings, high standards of record keeping, husbandry and hygiene, strict disease screening and management protocols, researched release methods, and good post release monitoring are now the accepted code of conduct for captive breeding/release programs.

Captive breeding involves a long-term commitment and is an expensive process. Release sites have to be carefully assessed and seldom is a single

release successful in re-establishing a population. Techniques and protocols are usually refined over a number of years and successive releases. Even once a reintroduced population is looking likely to establish, supplementation with captive-bred birds is often required to ensure long-term success.

Once the captive husbandry techniques have been successfully established and documented in a husbandry manual, the next step, and probably the most challenging is to find sufficient safe habitat and to develop successful release methods for the species concerned. Factors responsible for the initial decline of the species have to be addressed prior to releases. These factors vary significantly throughout the world but the most common factors responsible for species declines are human pressure and the resulting loss or fragmentation of habitat and the introduction of alien plant and animal pests.

Another common denominator when looking at endangered species on a global scale is the high percentage of island species, often endemic, which are in dire straits. New Zealand, for example, has lost about 50% of its terrestrial species, Hawaii 15 out of approximately 50 species and Guam 10 out of 13 species.



*Kaka Parrots at the feeding station.*

Photo courtesy of Mt. Bruce Center National Wildlife.



Animal pests, which impact on the native species, vary greatly from feral cattle, goats and pigs to monkeys, mongoose, rodents, and mustelids (stoats, ferrets, and weasels), snakes and introduced birds. Some of these introduced species alter the habitat, others compete with native species for food and nests and some prey directly on eggs, nestlings and/or adult birds. The Pacific Rat is on record as being responsible for more species extinctions in the Southern Hemisphere than any other single species or factor.

### Bird Decline in New Zealand

In New Zealand the prime factors for the decline in bird numbers are loss of habitat and the introduction of rats, opossums, and mustelids. The Mt Bruce National Wildlife Centre (NWC), managed by the New Zealand Department of Conservation stands on the ground where the first Takahe were historically brought into captivity 10 years after being re-discovered in 1948. The primary objectives of the centre are:

- Achieve excellence in research, rearing, release, and advocacy (education) objectives for national priority species
- Increase public awareness of the lesser-known threatened species and techniques employed for their conservation. (Hosts 45,000 visitors per annum)

The NWC has pioneered research into the captive husbandry of a number of species and has achieved a number of first-time captive breeding for species such as: Blue Duck, Takahe, Little-spotted and Great-spotted Kiwi, Black Stilt, Antipodes Island Parakeet, Stitchbird, Kokako, Auckland Island and Campbell Island Teal, NZ Shore Plover, North Island Robin and Saddleback.

With some of these species (for example the robin and saddleback) it has been found that translocation (birds sourced from existing wild populations) provides the most cost-effective method of establishing new populations.

The past two summer seasons i.e. 1998/99 and the present 99/2000 season have produced a number of exciting firsts for captive bred birds from

the NWC which have been used for re-introductions primarily to predator free offshore islands:

### Campbell Island Teal *Anas nesiotis*

The wild population of an estimated 20 pairs lives on the remote 25ha Dent Island which is little more than a rock stack off the main Campbell Island. First brought into captivity in 1984, with a few additional birds caught in 1991, it took 10 years to produce the first captive offspring. Unique features of this aggressive species are that they are flightless, largely nocturnal and produce a small clutch of 3-5 eggs, which are extremely large in comparison to body size. In April 1999 a second captive population was started at the Isaac Wildlife Trust in Christchurch, and at the same time the first 12 birds consisting of six adults and six juveniles were soft released, with transmitters, onto Codfish Island.

Following on from 100% survival in the first six months and some of the birds instinctively using the inter-tidal zone in which to feed, a number of pairs have separated off and copulations have been observed. By mid-November the first clutch of five eggs had been laid on the island with four females eventually producing nine ducklings. All the ducklings perished as a result of owl predation and a very

dry season.

Further releases are planned for some years to come with the ultimate aim of moving all the birds back to the main Campbell Island. Rats are yet to be exterminated on the main Campbell Island. The 99/2000 season has been exceptional season for the captive population with an expected 16-18 youngsters produced (waiting on four fertile eggs as I write) compared to the usual 8-10 per season. An excellent husbandry manual for the species has recently been completed.

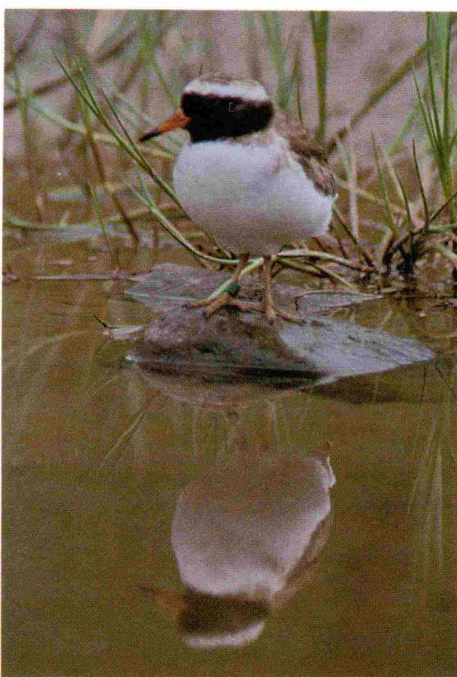
### Shore Plover *Charadrius novaeseelandiae*

The worlds rarest plover (I believe) with the wild population of approximately 140 bird is now confined to two islands in the Chatham Island group. The initial captive stock was derived from eggs sourced from the wild stock in 1991. The husbandry techniques and captive diet for this species are now well researched and proven. Since 1993 In excess of 80 birds have now been released onto two offshore islands and in the 1998/99-summer season the first chicks from parent birds originating from the captive-breeding program at the NWC, hatched on Christmas day. Birds in a new population of 16 birds established, from 26 released over a two-year period, on Portland Island, have also begun nesting.

The plover are released using the soft release method. Fledglings have been banded on both islands in the past season. A recent chemical analyses of the captive diet has shown the diet to be all but complete with a potential shortage of calcium and selenium – both of these are now being added to the diet as a premix. The husbandry manual for this species is well underway.

### Kaka *Nestor meridionalis*

In 1996 a mixed group consisting of wild caught, captive-bred/parent-raised and captive-bred hand-raised, juveniles were soft released, with transmitters, into the Mt Bruce forest reserve. Once a day the birds still receive a food supplement at the feed stations which allows staff to check on the birds while



New Zealand Shore Plover.

Photo courtesy of Mt. Bruce Center National Wildlife.



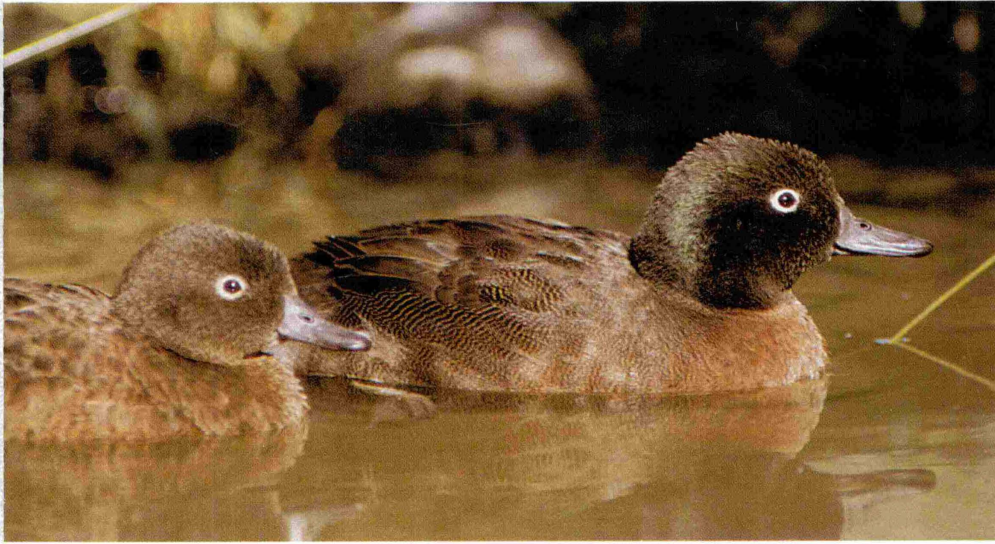


Photo courtesy of Mt. Bruce Center National Wildlife.

*A pair of endangered Campbell Island Teal.*

also providing an excellent advocacy opportunity with a talk given to visiting public. No significant differences were noted in the field with all the birds adapting equally as well as exhibiting all the natural behaviors expected e.g. removing insects from rotting logs and taking sap from grooves which they had made in bark.

In the 98/99-summer season, two females, one a hand-raised three-year-old bird another a two-year-old captive-bred/ parent-raised bird successfully fledged chicks in the forest. Already this season we have one pair incubating in and another pair investigating, artificial nest boxes we have placed in the forest. One clutch of eggs has been removed from a natural nest, which was close to ground level and would have resulted in the loss of the female due to mustelids. This female is currently incubating a second clutch in a natural nest. They do naturally have years in which the birds fail to breed and this is I believe the only known active Kaka nest on the North Island this season. This project and release method which is still in the research stages could provide a valuable re-introduction method for parrots of both a national and international significance.

#### **Kokako *Callaeas cinerea***

One of two New Zealand wattlebirds. The primary goals of the captive program are saving rare genes and public advocacy (education), the captive breeding program has been limited to two pairs of birds and the last few

years 14 offspring were produced which were hand released, with transmitters, onto two island sites. In the 1998/99 season birds bred at the NWC produced chicks on both of the island release sites. The original breeding pair have now been separated to allow for breeding with new partners/genes, the latter of which were the last known birds from the Taranaki regional population now thought to be close to extinction. One of these pairs is looking promising with courtship feeding a daily routine. At least six of the original 14 released birds are known to be nesting so far in the 99/2000 season.

Another new development this season, to develop egg transfer and hand-rearing protocols, will be the harvesting of 4-6 eggs from nests doomed to attacked by predators and hand-rearing these chicks at the NWC. These birds will also provide new young stock to be used to support the aging captive population.

#### **Stitchbird *Notiomystis cincta***

One of three endemic New Zealand honeyeaters, Stitchbirds are limited to a single secure island population on Little Barrier Island with three relatively new island populations initiated with translocated birds. Only the Little Barrier population is considered secure at present. The primary objective of the captive program is to research captive husbandry techniques and disease issues (particularly coccidia), which affect this species. An excellent husbandry manual is currently being com-

pleted and we believe that we are nearing the situation where we can safely say that if ever the requirement arises, we are able to produce the species in reasonable numbers.

The captive population is also to be used to research techniques, such as artificial nest boxes, which will be applied to the island populations. Although excess birds produced (4 males to date) in the program have been hand released, this is not a primary goal. It was extremely pleasing to hear however that one of the males released early in 1999 has recently fathered two clutches of chicks, thus proving that captive-bred Stitchbird can survive and breed *in situ*.

#### **Black Stilt**

##### ***Himantopus novaehollandiae***

*(Information contributed by Richard Maloney and Emily Sancha at the Twizel stilt breeding centre South Island.)*

The latest release of kaki to the wild took place on 16 September 1999. In total, three adults and 17 sub-adults raised in captivity were released. The survival rate from this release has been very high. One sub-adult was found dead one day after the release, but the remaining 19 birds (95 %) are all alive two months after the release.

Two changes to the release protocol have increased post-release survival from a mean survival rate to adult age of 29% obtained from 1993 to 1997, to the 80+% survival rates presently achieved.

These are (1) all birds receive supplementary food for one month after release, and (2) all birds have iodine added to their captive diet pre-release. Supplementary food used is their normal captive food placed in plates at the release site. Mealworms are initially added to the plates to encourage the birds to feed at the plates. Iodine has been added to the birds' diet because necropsies on dead bodies recovered from a previous release in 1998 showed that most released birds had goiter (thyroid dysplasia). Goiter may not be the proximate cause of death of released birds, it causes a reduction in the metabolic rate, which may make birds more susceptible to predation or cold weather conditions. At least one

further release will be undertaken at this site, then a new site elsewhere in the Mackenzie basin will be chosen.

### **Takahe *Porphyrio hochstetteri***

*(Information contributed by Andrew Smart at the Burwood Field Centre.)*

The wild population of approximately 145 birds (44 known pairs) lives in the Murchison Mountains (530sq km), west of Lake Te Anau in Fiordland National Park. The first attempts at captive rearing started in 1957 at Mt Bruce. Over a period of 18 years, four eggs, six chicks and 17 adults were removed from the wild population. It wasn't until 1972 that the first fertile egg was produced and only four chicks were raised to independence by 1983. The hand-rearing program began in 1983 at the Te Anau Wildlife Park. The basic methods used then are still the cornerstone of today's techniques. After this initial success it was decided that a purpose built Takahe hand-rearing facility should be built at Burwood Bush. This was completed in time for the 1985/86 breeding season. The facility is designed to accommodate incubation and hand rearing of up to 20 chicks per breeding season. This season we have 15 chicks at Burwood and approximately a dozen in the wild. The Burwood chicks are held for approximately one year, when they re-introduced into the wild population. The survivorship of our re-introduced birds to one year after release is high (71%, n=58).

Ninety-six Takahe have been released into the Murchison Mountains since November 1991. Of these 23 are known breeders. Prior to this the hand-reared Takahe were released on a number of offshore islands and in the Stuart Mountains. The off-shore Islands were set up as an insurance population (now approximately 60 birds on four islands) in case of something-catastrophic happening to the wild population. The Stuart Mountain population was started as an attempt to establish a new population in the next mountain chain north of the Murchison's. Fifty-eight Takahe were released in the Stuart's until 1992 when it was discontinued due to a low resighting rate. 