HAND REARING

by Martin Bell

Introduction

Many different species of birds throughout the world have been hand-reared and there are many different methods. This presentation is about the basic principles that I apply when hand rearing birds.
My experience has been gained in the last 20 years in the field of aviculture and I am fortunate to have hand reared a diverse range of species, from takahe (*Notornis Mantelli)* to fairy tern (*Sterna nereis)*. In most cases they have been endangered New Zealand species, often being hand reared for the first time. Basic hand rearing principles are the same for all species and I believe if you apply those principles then you are more likely to have a successful outcome.

Reasons for hand rearing

Hand rearing is done for a variety of reasons;

- when eggs or chicks have been abandoned
- when a valued individual is at risk in the nest
- when an individual needs to be tamed
- when the aviculturist needs or wants the experience
- when production is to be increased by removing and hand-rearing a first clutch and allowing the parents to rear a second clutch.

Research

There are a lot of detailed methods available in many good publications and papers. Much of my knowledge has been gained by reading such publications.
Experience with a similar (analogue) species or subspecies is often of direct relevance to another. For example, captive rearing of the North Island subspecies of New Zealand dotterel (*Charadrius aquilonius*) has direct relevance to the much rarer southern subspecies (*Charadrius obscurus obscurus).*
Aviculture has been practiced by hobbyists for generations and a lot of what conservationists like myself want to know can be learned from these people. Because of the interest generated by hobbyists in hand rearing, there has long been a supply of specialist equipment, foods and techniques that can be used by conservationists.
All too often, the wealth of experience of hobbyists is overlooked when a hand-rearing programme is to be started on an endangered species.

Considerations to take before hand rearing

Hand rearing is the artificial method of rearing an individual bird or group of birds. Generally, different species of birds have different requirements for hand rearing.

Some species of birds have been hand reared as far back as man can remember, such as ducks (Anseriformes), quails, pheasants (Galliformes) and parrots (Psittaciformes), generally for food or as pets. A great deal has been learnt on how to successfully hand rear many of these species.

However, there is an increasing number of other species that are reared for conservation reasons, perhaps as an analogue for a similar rarer species in the same family or because they themselves require hand rearing. For many of these species, a great deal still needs to be learned.

Some species of bird are much easier to rear than others, and the decision on what methods of hand rearing are to be used depends on whether the outcome is to have a bird that can adapt to a normal life in the wild or whether it is to stay in captivity. Some species need to learn important fundamental behaviours from their parents and by association with siblings while others appear to be more genetically engineered to know what they must do. As a general rule, the more developed a chick is when it hatches from the egg, the less it relies on its parents for care and the less it needs to learn behaviours. Perhaps the best example of this is the kiwi.

Young birds (neonates) are of two main types. The first is mainly naked and blind and wholly reliant on parental care. These are known as 'altricial' nestlings. The others are 'precocial'. These have their eyes wide open and are down or feather covered. Precocial nestlings leave the nest almost immediately. These categories are broad however, and there are subdivisions within them. An example of the extreme end of altricial young are passerines (perching birds) like the stitchbird *(Notiomystis cincta)* and the saddleback (*Creadon carunculatus)* and perhaps the most extreme example of precocial species is the kiwarents. When hand-rearing a species, it is important to know as much about how it is reared by its parents as possible and also know whether it is altricial or precocial. If the species is to be released into the wild and is expected to breed, there mayì ducklings. Perhaps for these precocial species which are on the move almost immediately after hatching, immediate recognition with mum and dad is paramount for their survival. This process is called "imprinting" and can prove to be a friend or foe during hand rearing.

Imprinting

When someone mentions imprinting, it is more often than not referred to as a negative effect. It is important to remember that the dictionary meaning is; "the development through exceptionally fast learning in young animals of recognition of and attraction to their own species or surrogates". Imprinting can be a positive or negative learning experience.

There are three *ex situ* conservation programmes in New Zealand where relatively extreme measures have been taken to prevent negative imprinting and promote positive imprinting, by using surrogate model parents that resemble their real parents. All three species; the takahe (*Notornis mantelli*), the black stilt (*Himantopus novaezealandiae)* and the Fairy tern *(Sterna nereis)* are precocial and, in the wild, the offspring depend on their parents for a considerable length of time.

Kiwi *(Apteryx spp.)* are also precocial, but by comparison to the takahe, black stilt, and fairy tern, spend considerably less time with their parents which suggests that they do not need to be taught a great deal of their behaviour. Many kiwi chicks are reared each year in captivity as part of "Operation Nest Egg", and they do not receive specialised care to minimise negative imprinting or stimulate positive imprinting. Once they have had time to recover from hatching, they are quite independent,

instinctively seeking out food and fending off unwanted hands as they would an intruder in the wild. They more often than not, need to be encouraged to eat supplementary food given to them by force-feeding. From my experience, given a choice, they will always eat a worm before they will eat a strip of beef heart.

Temperature Management

All hatchling birds require external warmth that is gradually reduced as they grow. Altricial species that hatch with little down or feathers require more warmth and for a greater period of time. As a general rule, the more down or feathers, the less heat is required. All birds are wet when they hatch and it is important that they have adequate warmth while they are drying.

I find as a rule of thumb, to judge whether the temperature is right for a baby bird, look at its behaviour.

Signs of too hot are;

- panting with beak open
- restlessness
- in extreme cases, the bird will be unusually limp
- feel warm to the touch (especially altricial species)

Signs of too cold are;

- shivering and huddling up
- noisy and restless
- cool or cold to the touch (especially altricial species)
- fluffed feathers (precocial species)
- tight clumping of chicks together

Baby birds need to be able to move away from the heat source in order to regulate their temperature. This is particularly important with precocial species that would normally be very mobile in the wild *(*slide of kiwi in brooder)*. A thermometer should always be used to accurately record the temperature of the environment that the bird/s are in.

Humidity

Humidity is much less important in hand rearing than it is in incubation. Generally ambient humidity is sufficient.

Signs of humidity to low

- dehydration may occur

Humidity too high

- premature feather growth (especially in parrots)
- fungal problems

Humidity can be measured using a hygrometer which reads the relative humidity as a percentage between 0% (dry) and 100% (saturation).

If humidity needs to be raised, it is achieved by increasing water surface area for greater evaporation.

Diet

Correct diet is very important for normal growth. The way it is presented to the chicks is also very important. If an artificial or supplementary diet is to be given, it needs to be nutritionally equivalent to what they would eat in the wild and it needs to be palatable.

Altricial species rely entirely on their parents for food. It is either fed to them whole (eg. as insects) or regurgitated as partially digested food (eg. fruit pulp). The way in which the parents would normally care for the species being hand reared should be replicated as much as possible by the hand rearer. In the case of regurgitated food, the consistency (water to solid ratio) changes throughout rearing. As a general rule, there is a higher liquid content to the food when younger and this gradually changes until the bird is on solid food by the time it is weened. This also correctly hydrates the bird. With altricial birds, food temperature is also important and as a general rule should be given at between 38°C and 40°C. Frequency of feeds is determined by the speed at which the food empties from the crop into the digestive system and this should be closely monitored. I like to ensure that the crop is empty or very close to empty before I administer the next feed.

Precocial birds partially rely on their parents for food. The parents usually pick food up and offer it to their offspring or the offspring learn quickly by following their parent's example. But once again, the way in which the parents would normally care for the species being hand reared should be replicated as much as possible by the hand rearer. Many precocial birds that are being hand-reared instinctively pick at things, especially moving things and this behaviour can be taken advantage of to encourage them to eat. However, once again, if the food is artificial, or supplementary, it has to be nutritionally similar to what they eat in the wild and palatable.

Water

All living things require water. In the case of altricial species, water is usually sufficiently provided for in their diet in the early stages of hand rearing but as they get older and the diet composition changes from more liquid to solid, they will require access to water for drinking and bathing. It is important to remember that birds can easily drown in water so they need to be able to get out of it if they accidentally fall in.

Precocial species often get enough water in their food also, as long as it has a high water content. Some species of birds such as waterfowl and waders for example require water for wading and swimming which is the medium in which they learn to search for food. They also need to have easy access in and out of water.

Cleanliness

When hand-rearing, good hygiene is one of the most important rules. All feeding utensils must be cleaned thoroughly between feeds and all equipment should be stored in a dust free place.

Bedding and substrates must be cleaned regularly and more often if temperatures are high and there is build up of faecal material or uneaten food.

Weening

Weening birds can be a very difficult and drawn out process. Often when hand-rearing, weening is attempted too soon. Weening should be consistent with what happens in the wild.

The weening process is usually more difficult with altricial birds that have entirely relied on food being administered to them. They are often quite happy to continue to be fed rather than have to feed themselves. Hand feeds should be significantly reduced but food should always be available. In the case of parrots, it is not uncommon for difficult birds to lose weight during the weening process and it can often be a battle of wills between the hand-rearer and the bird. Perseverance is the only solution.

Precocial species are usually much easier to ween because they are often foraging on their own from a very early age.

Handling

The way in which a young bird is handled, and how often it is handled needs to be considered when hand rearing.

It is important that the handler is confident and competent. A nervous and inexperienced handler can cause the bird to struggle, resulting in trauma to the bird.

When moving, weighing, measuring or examining; handling should be kept to a minimum.

Very small birds can quickly become too hot if they are held for prolonged periods in the human hand. Watch for the overheating signs mentioned earlier under temperature.

Record keeping

Every individual specimen should be identifiable, perhaps by a distinguishing physical feature, or by a band or marking. This is important so records can be kept on the individual. I have always made a practice of keeping records on individuals rather than a group for the reason that detail is lost in a group record.

Keeping records is very important during hand rearing because they can often pre-empt a serious problem. Good records are also useful when someone else wants to hand-rear the same species. Records should be kept on a special record sheet.

I keep records on the following;

- hatch weight
- regular weights. In some species (especially altricial species), pre and post-feed weights should be recorded.
- amount of food given
- feather development (making a note of which parts of the body are getting feathers and what colour they are).
- measurements (Culmen and tarsus)
- medical treatments and parasite control measures.
- problems encountered
- faecal texture and colour changes
- behaviours

SUMMARY

I have found the hand rearing of birds a challenging and rewarding occupation. With what we have learnt, hand rearing has become a viable alternative to other methods of conservation. There are a

number of examples in New Zealand where hand rearing has contributed to the conservation of that species in the wild with varying degrees of success;

- takahe
- black stilt
- kiwi
- shore plover
- NZ dotterel
- stitchbird
- kaka
- kakapo
- blue duck
- brown teal
- NZ fairy tern

As new technology appears and information specific to each species is learned, hand rearing becomes even more effective. Each one of you that embarks on a hand-rearing project will contribute in your own way to the pool of knowledge necessary to help conserve some of New Zealands most endangered species.