

RELEASE INTO HELL.

By Raymond T. Hoser

INTRODUCTION:

Across Australia there are various animal and wildlife rescue networks in operation. Although mainly working with mammals and birds, these groups also tend to rescue reptiles from death at human hands, and after suitable "rehabilitation" (if necessary), these animals are then released back into the wild. Death at human hands may include snakes being found at new real estate developments who are in the process of losing their habitat/home, the snake facing the shovel over the head from a panic stricken ignoramus and so on.

Such stories of human efforts to look after the welfare of native wild animals are common in the media. Perhaps more insidiously, the media also commonly reports on reptiles seized/saved from would-be smugglers. Just recently I saw a story in the papers about a number of reptiles seized from an unlicensed keeper, with the clear implication that the animals were to be smuggled. The article even quoted retail prices for the reptiles seized, thereby adding fuel to the fire (idea) that they were destined for the overseas market. They were described as a "haul" (Anonymous, 1993).

The story said that the reptiles would be released by National Parks and Wildlife Service of New South Wales (NPWS) officials back into the wild. The clear implication of course is that these reptiles would soon be enjoying the "freedom" of being back where they belong and able to live out their lifetimes in the blissful surroundings of their natural habitat. If the story alone was true, perhaps the NPWS officials could be commended for acting in what they thought (albeit misguidedly) was best for the reptiles. The fact that the reptiles were being released in areas from where they may not have originated and perhaps to certain death, could I suppose be blamed on ignorance and nothing more. (In actual fact, the story above related to a raid on Glenhaven keeper,

teenager Kaj Bulliard, who had repeatedly applied for a NPWS licence and was then raided as a result. There had never been any evidence to suggest that he was doing anything other than keep the reptiles himself, in other words he was definitely not a smuggler! The reptiles in question were retained at Sydney's Taronga Zoo, before some were allegedly illegally passed on to another private keeper. According to Bulliard and others involved NONE were released. Bulliard was never charged over the "haul" and is now initiating action against NPWS for the theft of the reptiles, having taken legal advice over the matter). So, not only was the media wrong in portraying the release of the reptiles as favourable, but (because of NPWS) they appeared to have completely got their story wrong. As the saying goes ...never let the truth get in the way of a good story!

On 24th July 1995, at Wallsend Magistrate's Court, near Newcastle, New South Wales (NSW), NSW NPWS officials gave evidence (backed up with a video recording), that they had recently released about six reptiles including Lace Monitors (*Varanus varius*) from a lady's collection. The lady, Kim Helen Mace was alleged not to have had the reptiles licensed and thus NPWS officials had on 28th April 1995, taken them. The raid had involved about ten officials and a full-blown media circus (invited along by NPWS). Perhaps I should state that in this case the release should be treated as an "alleged" release, because NPWS officials are known to have lied about releasing reptiles previously (see Hoser, 1993 for examples), having in fact passed the animals on elsewhere.

Anyway it was clear from the way the evidence (using the term lightly here) was given by NPWS officials, that the release was videotaped and tendered in court to demonstrate the concern of NPWS officials for the welfare of

the reptiles and how they were giving these poor captive animals back their freedom. It was real emotive stuff. The media had again been invited to attend by the NPWS officials involved. Yes, a second media circus. The video had kids holding reptiles before their final liberation back into the bush along with other similarly emotive scenes. Kim Mace, the original holder of the reptiles had not been invited to witness the alleged release of these animals. Perhaps this is because they may not have actually been released, but rather filmed being released, before being re-captured and passed on elsewhere.

Taking NPWS "evidence" on face value however, they claimed in court to have taken the reptiles from Mace's house. At no time during the raid or after did NPWS get information as to where these animals had come from. This was their own evidence and not disputed by Mace or her lawyers. The reptiles were allegedly released at the Munmorah State Recreation Area, which is on the NSW Central Coast. However the reptiles themselves could quite easily have originated from almost anywhere in the Eastern half of Australia - that is anywhere from Victoria to Queensland.

This one case and others like it, raise a number of serious questions in relation to what happens to reptiles when they are released into the bush and whether the act of releasing reptiles, or other animals for that matter, into the wild is actually beneficial or harmful. This applies both to individual animals and species as a whole. The five potential risks (in approximate order of importance) that I have identified with the action of releasing reptile/s into the wild are broadly as follows:-

1. Mortality of the animals released.
2. Risk of disease transmission to population in area.
3. Unnatural distortion of gene pool in area.
4. Wasting of the captive reptile resource.
5. Creation of confusion at a later date in obtaining data relating to taxonomy and/or distribution.

1 - Mortality of the Animals Released:

Noting that in the above case, the animals could have come from anywhere in Eastern Australia

and almost certainly not from the Munmorah State Recreation area, the chances of these newly released reptiles surviving in this area would have been very, very remote. You see these animals would not be adapted to the climate or other conditions (including local predators) and thus unlikely to be able to survive for any reasonable term. Of course these newly released reptiles would have to compete with existing inhabitants for food and shelter resources and would almost certainly lose any such competition. Thus these newly released reptiles would almost certainly be sentenced to a slow and agonising death. I also note that in this case the reptiles were allegedly released at the end of Summer, giving them little, if any, time to adjust to their new surroundings (if in fact they could), before the onset of the winter inactivity period, which is when unadjusted reptiles would be possibly most vulnerable.

Perhaps it is worth asking, what is the mortality of newly released animals into the wild? Most studies have been on mammals and birds. The results however are terrible. Over 90 per cent of animals released back into the wild die shortly thereafter. This includes those released as a result of planned re-introductions into the wild of rare and endangered species into areas where pre-existing populations were known to have been higher. You see, in healthy populations, all available habitat and niches are occupied by the animals within the population. An example of this can be seen in Brush-tailed Possums (*Trichosurus vulpecula*). When animals are translocated from suburban areas to bushland areas, animals already resident in these areas prevent the new introductions from occupying scarce territorial sites and thus almost all introductions die shortly after. You see the limiting factor on populations of these animals is shelter sites with the birthrate usually producing more individuals than a population needs to be self-sustaining.

In 1989, there were only 32 Californian Condors (*Gymnogyps californianus*) left in the world (Anonymous, 1989). All these were captive. All wild birds had apparently died out. Attempts in 1992-3 to reintroduce a number of captive bred birds back into the wild generally failed. This was in spite of careful planning and

a survival course for each bird prior to being released. Causes of death of newly released birds included, three crashing into utility poles, one getting electrocuted by power lines and another drinking antifreeze in a parking lot (Anonymous, 1995).

Recent radio-telemetry studies by Jonathan Webb of Sydney University on Broad-headed Snakes (*Hoplocephalus bungaroides*) have indicated a strict winter habitat requirement of unshaded sandstone rocks of between 5-10 cm thick, with thicker and thinner rocks being rejected (Webb, 1995). This habitat "choice" is dictated by the thermo-regulatory requirements of the snakes. In other words releasing more Broad-headed Snakes into areas without suitable winter sheltering sites would probably guarantee death for many snakes. This would probably remain true in areas of depleted populations where shelter rocks have also been removed.

When introductions occur in areas of reduced population, the result is rarely useful as the cause of the original reduction of population such as habitat alteration (see above) or introduced pest has not been removed first. Getting back to Broad-headed Snakes, could anyone seriously consider releasing specimens back into the Randwick area. Some 200 years ago there was a healthy population of these snakes. Today there are none. The problem of course is that Randwick is now a heavily built-up inner Sydney suburb and without the removal of the innumerable houses and high-rises in the area, no Broad-headed Snakes would stand a chance at survival. A similar scenario is seen in many other (often remote) parts of Australia also. For example several planned re-introductions of endangered Greater Bilby (*Macrotis lagotis*) in parts of the Northern Territory into areas of apparently pristine suitable habitat failed. The reason - introduced foxes (*Vulpes vulpes*) and Cats (*Felis catus*) killed and ate them.

Quite often the method of re-introduction into the wild of captive animals will in itself sentence the new releases to certain death. This may even be for specimens from exactly the same area. For example, on the balmy tropical morning of January 30th, 1993, I was on the banks of the Ord River at Kununurra in

Western Australia. After photographing a number of reptiles caught in the same area, including Burton's Legless Lizards (*Lialis burtonis*), Moon Snake (*Furina ornata*), Bynoe's Gecko (*Heteronotia binoei*), Spiny-tailed Gecko (*Diplodactylus ciliaris*), and a number of other small lizards, I released them into the cover of a nearby bush. Nothing could be simpler - or so I thought. Shortly after this, it was pointed out to me that a number of birds had congregated around the bush and were actively preying on every reptile that I had placed under the bush's cover. It is doubtful if any survived! From the video tendered in court in the NPWS/Mace case (above), it is clear that there was no realistic consideration of the best methods to ensure immediate safety of the "allegedly" released reptiles.

While on the subject of mortality of released reptiles, perhaps it's worth mentioning a recent project involving Healesville Sanctuary, Melbourne Water and The Victorian Department of Conservation and Natural Resources (DCNR). Following the decision by Melbourne Water to build a pipeline through Tootgarook Swamp, near Frankston in Victoria, about 94 threatened Swamp Skinks (*Egernia coventryi*) were removed from the area. These were maintained at Healesville Sanctuary for some time, while the pipeline was built and the area revegetated with original vegetation by DCNR and Melbourne Water officials. The intention of the project had been to replace the lizards into the area after the above works had been done in order to maintain the integrity and viability of the original population. That I might add, was a laudable objective. At the beginning of the project as many of these skinks as possible had been caught and removed from the Pipeline area.

Prior to re-introduction of the lizards back into the area, it was found that other *E. coventryi* from adjoining areas had moved into the area and established territories. In relation to uncaptured *E. coventryi* moving back into the pipeline area, Taylor (1995) stated "This event would prevent us from releasing all the captive skinks back into the swamp as the species is extremely territorial", going on to document that within Healesville Sanctuary at least four and up to 16 of these skinks had killed one

another. In relation to *E. coventryi*, Taylor (1995) noted "Even though we housed a maximum of eight adult skinks in a single enclosure, this proved to still be too many to avoid territorial aggression".

Due to the territorial nature of this skink, it was decided not to release all skinks then at Healesville back into the swamp area, as it was decided that to do so, would simply be signing the death warrant for these skinks. In private conversations with one of the keepers at Healesville Sanctuary, I was told that he thought that most of the released animals would have died shortly after release due to competition from other lizards of the same species in the area. The keeper went on to say that he thought the project was a success as the population itself wasn't currently considered under threat and the whole effort had highlighted public awareness of rare and threatened reptiles. To the credit of all concerned, Healesville is maintaining a colony of these lizards in captivity and at the time of writing was constructing an important public display featuring *E. coventryi*.

The *E. coventryi* case also highlights another feature of life in the wild for both reptiles and other animals. It is rarely as blissful as the emotive media tells us. Animals born and bred in the wild have to face hazards usually avoided in captivity. *E. coventryi* have to run the gauntlet of others of it's own species just to be able to survive and find a resting place. Failure to contend with it's own species guarantees a painful death. Taylor (1995) noted injuries (not causing instant death, but debilitating all the same) caused by territorial behaviour. Cases of wild Lace Monitors injuring and even killing one another in combat are also known. In 1977 during a dry spell in Central Queensland, I caught a number of emaciated reptiles, including large Sand Goannas (*Varanus gouldii*) in an area south of Hughenden. These animals almost universally carried cestode tapeworms and pentastomids. Some were clearly sick beyond help and dying a slow and agonising death. Dr. Rick Shine of Sydney University has documented widespread and slow starvation among Red-bellied Black Snakes (*Pseudechis porphyriacus*) at the Macquarie Marshes in New South Wales,

during times of drought. In other words, life in the wild is often not the best alternative for a given reptile. The idea that life in the wild for reptiles or other native species equals freedom and bliss must be dismissed as pure fantasy by the emotive and ill-informed.

2. Risk of Disease Transmission to Population in Area.

Again I return to the case involving NPWS/NSW and Mace. Among the witnesses called by NPWS, was a Veterinary Surgeon from Sydney's Taronga Zoo. Taronga Zoo, was where a number of the reptiles were being held. Frances Anna Holt, told the court that 'some of the reptiles keepers...it came to their attention that they were passing worms'. This of course was sometime after the animals had been held there and also after some reptiles had been allegedly released at Munmorah State Recreation Area. In other words, no one knew whether or not those reptiles allegedly released had taken with them parasites or other disease which may infect the local population. Holt also told the court that a Shingleback (*Trachydosaurus rugosus*) had mouthrot, which in her words was a "fairly common condition". Be that as it may, it is also highly contagious. Again I ask, what about those that were allegedly released.

Damning to NPWS officials, Holt told the court of a deep wound in the dorsal mid-body of one of the Carpet Snakes (*Morelia spilota macropsila*), which she said had been recently inflicted - probably at the time of the raid. That this in fact occurred was borne out by the video, taken by NPWS official Katherine Thiveos. In that Video, the NPWS officials, Cook, Lowe, Potts and others were shown rough-handling snakes, posing for the media and brutally smashing open logs in order to obtain hiding reptiles. According to Mace, the back of the Carpet Snake was broken when the NPWS officials smashed open the log.

Returning to the infectious disease problem, it is here that the problems of releasing animals could be particularly dangerous. Both Taronga and Melbourne Zoos, hold their reptiles (in the main) in reasonable conditions. The keepers appear to have expertise as well as enthusiasm for their job and they are backed up by some of

the best veterinary surgeons in the land. Having said this, a perusal of death records for either institution reveal a huge assortment of causes of deaths for their reptiles. Included are a whole host of infectious diseases, parasites and so on. In spite of their alleged quarantining of all incoming reptiles, most death causing diseases only appear to be diagnosed after death - that is, at Post Mortem. In other words, most infectious diseases are not discovered until it is too late!

A perusal of the 1991-2 *Inventories of the Zoological Board of Victoria* (Various Authors, 1992), and associated "Transaction Reports" (usually printed by computer and not cited at rear of this paper), reveals causes of reptile deaths at Melbourne Zoo as including, Cryptosporidiosis in Olive Pythons (*Liasis olivaceous*), Respiratory disease in another Olive Python, Ovarian Tumour in a Brown-tree Snake (*Boiga irregularis*), Chronic Eye disease in a Brown-tree Snake, Septicemia in a Krefft's Tortoise (*Emydura kreffti*), Prolapsed cloaca in a Western Massasauga Rattlesnake (*Sistrurus catenatus tergeminus*) the cause of which wasn't diagnosed, Advanced jaw disease in a Central Bearded Dragon (*Pogona vitticeps*), Necrotic colitis in a Black-headed Python (*Aspidites melanocephalus*), Neurological disorder in a Black-headed Python; cause unknown, Severe Pneumonia in another Black-headed Python, Intestinal Trichomuriasis in an Urutu Pit-viper, (*Bothrops alternatus*), Liver degeneration in another snake of the same species; cause unknown, Oesophageal Tumour in a Scrub Python (*Morelia amethystina*), Leukemia in a Diamond Python (*Morelia spilota spilota*), Visceral and articular gout in a Frill-necked Dragon (*Chlamydosaurus kingii*), Bacterial stomatitis/ *aeromonas* in a Dwarf Bearded Dragon (*Pogona minor*), and so the list goes on. Dozens and dozens of reptiles in all, dying from a whole host of often highly infectious diseases.

Although the humble snake mite (*Ophionyssus natricus*), doesn't appear to rate much of a mention in the report in terms of it being a direct cause of death, the diseases it causes does. Septicemia is mentioned as a cause of death frequently among the Melbourne Zoo's reptiles. Mites are a well-known vector for

Proteas (= *Aeromonas*) *hydrophilous*, the causative organism of severe and often fatal haemorrhagic septicemia in snakes (Camin, 1948, Frye, 1991, Tarshis 1961). So not only can mites kill reptiles directly due to their direct blood-sucking habits, but they can also be an important vector for other highly infectious diseases. I make mention of this, only because in spite of their best efforts, the staff at Melbourne Zoo have had to contend with periodic outbreaks of these parasites and have probably paid a higher price for these outbreaks than they may have realised.

Although Richard Ross and Gerry Marzec (Ross and Marzec, 1984) criticise the rigidity of the original study by Camin published in 1948 of mites being a vector of disease, more recent studies have proved emphatically that mites can be a dangerous vector of disease for reptiles. I make mention of this so that readers of books and related literature that play down the potential dangers of mites should be warned as to their real dangers. For example, recently mites have been found to be an important vector for a newly discovered retrovirus infecting boid snakes in the United States. Known as 'Inclusion Body Disease' or 'CNS', this retrovirus is undetectable in its early stages of infection, highly contagious and is known to have wiped out entire collections (Feldmar, 1995).

Returning to Melbourne Zoo and their losses, staff appear to have done their best to diagnose causes of deaths for their reptiles. However, the report next to many animals was 'too autolysed for Post Mortem'. In other words cause of death not known.

In detailing the above, I am not intending to denigrate the Melbourne zoo or its staff. As home to one of the largest reptile collections, and also having a regular flow of specimens both in and out, it only stands to reason that they should also have one of the highest death rates, and perhaps from the widest variety of imported diseases. In fact it goes to the credit of staff there that they have published their results so that others may learn from them. What I am saying, however, is that if a so-called quarantine zone (the reptile section at Melbourne Zoo), with several full-time paid

staff and access to some of the best veterinary resources in Australia can have the above infectious diseases slip through their net, then what hope do the rest of us have? Diseases carried by mites, such as Infective septicemia or CNS, Cryptosporidium and other ailments are so highly infectious, that they could pose a threat to wild populations if let loose among them. Many of the above diseases/causes of death are preventable/treatable in a captive situation if diagnosed early enough (if possible), but put simply, they can easily be missed - even by the best of us. In other words, these potentially highly infectious ailments may not be noticed at their early stages. If infected animals are released into the wild, who knows what the consequences may be!

Returning again to the snake mite, again I must sound yet another warning. Cermak (1993) published a paper detailing how three mite infested Northern Death Adders (*Acanthophis praelongus*) lost them when placed in an outdoor pit in near natural conditions. He noted that ants appeared to overrun the snakes and consume all mites, going on to state that 'perhaps this sort of biological control is common in the natural environment'. While Mike Cermak may be correct, this is not always the case. Any Sydney-based herpetologist would be aware of the fact that nearly every wild Leaf-tailed Gecko (*Phyllurus platurus*) seems to be a carrier of a small red mite (of species unknown). Other wild Sydney reptiles also sometimes carry these parasites, occasionally in large numbers.

In 1992-3, Victorian Herpetological Society member Fred Rossignoli, decided to start a business doing educational reptile displays. He was given full backing by wildlife officials in Victoria and Fred commenced a major purchasing spree of suitable legally held reptiles. He purchased snakes and lizards from many of the most highly regarded private keepers and institutions in Victoria, New South Wales, South Australia, Queensland and the Northern Territory. When he received these reptiles, all appeared to be outwardly healthy and ailment free. In fact he bought these reptiles strictly on these terms.

In spite of this, some of Rossignoli's animals

got sick and a small number even died. Enlisting the help of Dorovich Pathology at Camberwell, Rossignoli identified over 20 infectious diseases, including parasites, sporidia and bacteria within a collection only numbering about 50 reptiles. Some were diagnosed after death, while others were diagnosed while the animals were alive and if possible, those reptiles were treated. Now, Rossignoli makes the valid point that none of these diseases could have originated at his facility. All had been inadvertently brought into his collection from outside and in spite of his best efforts to prevent such occurring. Again I ask, what would happen if some of these diseased reptiles had been liberated into the bush?

In the case of reptiles, there are as yet few documented cases of infectious diseases being introduced into wild populations as a result of releases from captivity. That is not to say that such won't become a problem in future. There are a number of examples of introduced diseases decimating populations of other wild animals. In Hawaii five native bird species are threatened with extinction by introduced disease. The Hawaii Akepa (*Loxops coccineus coccineus*), Kauai Akialoa (*Hemignathus procerus*), Small Kauai Thrush (*Myadestes palmeri*), Large Kauai Thrush (*Myadestes myadestinus*) and the Kauai O O, (*Moho braccatus*), all are declining as a result of mosquito borne avian malaria and pox brought to the Islands by introduced species (Anonymous, 1995). Even the deliberate introduction of myxomatosis to kill feral rabbits in Australia can be used as an example of how an unwanted disease may decimate wild populations - perhaps beyond the point of recovery.

More recently a newly introduced "megabacteria" (so named because of it's size) has been found in wild Australian Sulphur-crested Cockatoos (*Cacatua galerita*).

It is believed that this AIDS-like disease was introduced into Australian birds as a result of imported Budgerigars (*Melopsittacus undulatus*) or African Lovebirds (*Agapornis sp.*) being released with the bacteria and it then spreading to other birds. In South Africa up to 90 per cent of infected Ostrich (*Struthio camelus*)

chicks have died and the disease is also wiping out large numbers of birds in the UK, being regarded as the major health risk to some species. The bacteria multiplies in the birds' stomach forming a lawn-like covering, causing ulcers and an inability to digest food. Affected birds vomit, develop diarrhoea and eventually die from internal bleeding or malnutrition (Patrick, 1995).

Namoi River (New South Wales) *Elseya* tortoises currently appear to be threatened by a disease causing tumours on many of their population. The long-term survival of the population is now at risk. Whether this tumour is a natural phenomenon, results from environmental pollution, or as a result of introduced disease is not yet known. If the latter is the case, then again there is further evidence to support an argument for greater care before liberating animals into the wild. Aviculturists have taken great care to keep Newcastle Disease out of domestic bird populations mainly for fear of what it might do if released into wild populations. This policy of vigilance against the disease is supported by Wildlife and Customs Authorities Nation-wide. Many extinctions around the world that have in the past been attributed to introduced predators and competing species may have actually been caused or facilitated by diseases introduced rather than the competing species and predators. It is only in recent times that declines caused by diseases have begun to be correctly attributed.

The recent decline of frogs in many parts of the world, has been a mystery that is only now being solved. Although not all declines are probably caused by the same factors, disease most certainly is one of the more significant factors. At the Adelaide Herpetological Congress, Glen Ingram from the Queensland Museum told me of rare and endangered rainforest frogs succumbing to a virus shortly after metamorphosing. In discussing the decline of the endangered Sharp-snouted Day Frog (*Taudactylus acutirostris*), Mahony and Dennis (1995), noted that when translocating frogs 'we observed sick and dying stream frogs, indicating a pathogen was active'. Mahony and Dennis further stated, 'Thus we consider it possible that the death of many animals was because they were infected or because the water

supply harboured the infective agent. Survival of a small number of individuals in the ridge tank (elsewhere) supports the possibility that an infective agent remains in the stream.' These observations parallel what Ingram also observed. How the infective agent came to be in the stream is not known, but a number of people have speculated that the infection came from fish introduced by humans, and has since spread. On May 23rd 1995, a media article (Anonymous, 1995) stated that Dr. Rick Speare of James Cook University in North Queensland, would be commencing a study to identify a virus responsible for wiping out several North Queensland frog species. This work was to be done in conjunction with the Animal Health Laboratory in Geelong. At the time of writing this paper no results were available.

Reptiles from parts of Western Melbourne are well-known to carry large numbers of parasitic mites (Rob Valentic, personal communication, 1995). This again shows that not all wild reptiles are able to rid themselves of this parasite. Although at present these mites do not appear to be causing problems for local populations in terms of their survival, they could prove an effective vector for a potentially population threatening disease, should such a disease be liberated into the area via a newly released reptile. The evidence of some of these diseases in collections held by Melbourne Zoo, Rossignoli and others (possibly unaware of what pathogens their collections harbour), along with evidence of anuran declines in Eastern Australia as a result of disease transmission, should be enough to dissuade most reptile people from unnecessarily releasing their surplus stock.

Recently in parts of South Australia, *Cryptosporidium* has been found in wild populations of snakes. It is as yet uncertain if this is linked in any way to the decline in species such as Red-bellied Black Snake (*Pseudechis porphyriacus*) and Tiger Snake (*Notechis scutatus*). Unknowingly releasing a reptile with 'crypto' into a wild population, may cause havoc. Currently little research has been done in this area, so unnecessary risk-taking in terms of possible disease spread, should be minimised.

3. Unnatural distortion of the gene pool in area.

Reptiles are not very mobile. For example a Tiger Snake from Sydney will never make contact with one from Melbourne. In fact a snake from Sydney would be lucky to wander more than 20 kms from it's birth-site let alone the 800 odd kms between Sydney and Melbourne. Obviously conditions in Sydney and Melbourne are also very different. Sydney is warmer and sunnier, with different prey and predators, to Melbourne. Over thousands of years local snakes have adapted to local conditions. It would be safe to assume that Sydney Tiger Snakes would be better adapted to Sydney conditions than a Melbourne Tiger Snake. Thus releasing a Melbourne Tiger Snake in Sydney would be unlikely to be fair to the Melbourne snake. If conditions are favourable at the time, the Melbourne snake may in fact survive, and perhaps even reproduce with the local snakes. Then of course it's genes would spread into the wider population. This could later disadvantage the population when conditions take a turn for the worse through drought or similar - conditions that may not be experienced in the same manner in Melbourne. A number of respected scientists have argued in favour of maintaining intact gene pools for wild populations. Although the jury is still out in relation to such matters, it is probably prudent to adopt a conservative stand and not rush to mix things up. Although the example of releasing a Melbourne Snake in Sydney may seem extreme, the fact remains that it is only a very small percentage of reptiles that are released are in fact released within a few kilometres of where they were caught.

Most releases of reptiles will, if the reptiles survive, do nothing more than distort a natural gene pool in an otherwise healthy population, or in some cases a population that is in decline for reasons that won't be influenced by the release of extra reptiles in the area. In view of the inherent disease risks and those of potentially inferior genes being introduced into a population, any population decline may in fact be hastened by such an action.

4. Wasting of the captive reptile resource.

There is an old saying "*A bird in the hand is worth two in the bush*". The same often applies

to reptiles. For one person to release a reptile, just so that another may waste days in the bush trying to find one really does seem like a waste of time and effort. At the moment and for the foreseeable future, there is likely to be greater demand for captive reptiles than there are reptiles in captivity.

Releasing reptiles into almost certain death really does seem to be a stupid way to waste a precious resource. In cold hard, economic rationalist terms, releasing most captive reptiles into the bush would be tantamount to treason. This is after taking into account the likely mortality and possible reduction in quality of the wild populations (in terms of genetic integrity).

There are rare occasions, where for one reason or another a reptile cannot find a good home, or even dies in captivity. Quite often these specimens are sought after by State Museums. While consigning a reptile to a resting place in a jar may seem cruel in the short term. In the long term the act of placing reptiles in a museum can be very beneficial to the causes of science and conservation.

The dozens of ground-breaking papers by Professor Richard Shine at Sydney University on snake ecology could only have been achieved because of Shine's access to large numbers of preserved Museum specimens. It would never have been viable for Shine to accumulate the same volume of data by working in the field. Those same snakes are of course available to other workers in future, making them even more valuable to science. A snake consigned to almost certain death in an unfamiliar patch of bush could never be as useful.

5. Creation of confusion at a later date relating to taxonomy and/or distribution.

A few years ago, NPWS/NSW officials seized a number of Diamond and Carpet Snakes from Cessnock-based reptile-keeper, Nickolas J. Wilkins. When the case was heard at the Magistrate's Court, NPWS officers told the magistrate that they (NPWS) had taken it upon themselves to release the snakes in an area of suitable habitat. That sounded noble enough. Further questioning made the NPWS officials

come up with the statement that this area of suitable habitat was Kurrungai Chase National Park on Sydney's Northern outskirts. Now because none of the snakes had originated from Kurrungai Chase, or anywhere near there, they would probably have been sentenced to death (if in fact they were released there). The snakes had originated from near Newcastle New South Wales (about 100 km north of Kurrungai) and Queensland.

Now what would happen if a person unknowingly finds a NPWS-released Carpet Snake in their back yard at Turramurra (on the edge of Kurrungai Chase) and hauls it into the Australian Museum? Do we suddenly find the next crop of reptile books sporting a 400 km range extension for Carpet Snakes? OK, again I hear you saying that I'm being a bit extreme, no one would be so stupid as to think Carpet Snakes occur near Sydney. That's because Carpet Snakes are well-known and their southernmost limit of Port Macquarie is also well-known. But what about the other 90 per cent of Australian species who aren't as well-known. Releasing specimens of these species willy-nilly into various parts of the country could lead to havoc among scientists at a later date. Seriously wrong distribution information has made it into the books before. McPhee (1959), stated Broad-headed Snakes occurred in South-east Queensland, when they in fact occurred no where near the area. We don't need more of these problems in the future.

But reptile taxonomy doesn't just stop at the species level. It also deals in sub-species, races and so on. Characteristics used by taxonomists to identify different reptiles from different areas, can be as subtle as a few different body scales, or more recently differences in average venom yields (for Eastern Brown Snakes (*Pseudonaja textilis*) for example), DNA sequences, and so on. Moving such seemingly similar reptiles from area to area can potentially cause huge problems at a later date. Dr. Hal Cogger, in the most recent edition of his work *Reptiles and Amphibians of Australia* (Cogger, 1992, p. 30), warns against releasing reptiles and frogs into areas from where they don't naturally occur. He sums up saying 'to do so not only seriously jeopardises an animal's

chances of surviving, but can play havoc with future distribution records if it becomes established and/or is subsequently recaptured by another person.' If wildlife officials insist on releasing seized reptiles without locality information, into what they describe as areas of suitable habitat, taxonomic problems as foreseen by Cogger and others, may well arise in the not too distant future.

Another matter not raised so far, but worth mentioning is the problem of non-native reptiles, frogs or anything else for that matter being either deliberately or accidentally released into an area and displacing native species. While this practice is probably condemned by all reasonable people and therefore not likely to be subject of major argument, it is worth referring to Australian cases of non-native reptiles and frogs somehow being released into an area and then displacing native inhabitants. Not only may this problem cause long term decline of native species, but also problems as foreseen by Cogger (above) may be magnified.

The most well-known example involving Australian herpetofauna was the deliberate government sanctioned introduction of Cane Toads (*Bufo marinus*) into Queensland. The spread of these anurans has hastened decline of native birds, frogs, reptiles and mammals. The Toads, which have poison glands on their bodies are not only fatally poisonous to most native species that prey on them, but also themselves prey on species small enough to be eaten. As these Toads migrate across Australia's top end over the next half century, their damage to native ecosystems will spread and magnify. A lesser known example is that of the Australian Spotted Grass Frog (*Limnodynastes tasmaniensis*), which somehow became established in the Kimberley District near Kununurra, Western Australia. Tyler (1992) states that the frogs may have been introduced to Kununurra via transportable houses from Pooraka, South Australia. This was determined by analysing call data for the two populations of frogs. There is already limited evidence that this species, formerly only native to Australia's south-east and east is displacing other Kimberley frogs.

With reptiles, the problems of non-native

species displacing local inhabitants is also well-known. In Florida, USA, for example a number of foreign lizards (particularly Anoles (*Anolis* spp.)) have tended to replace native species in most built-up and adjacent areas. More recently frogs and tortoises have joined the list of unwanted immigrants in this area. A perusal of issues of the monthly publication *The League of Florida Herpetological Societies Newsletter* or *Herpetological Review* over the last ten years reveal case after case of introductions of species into Florida (individual publications not cited here). However the June 1994 issue of *Herpetological Review* is not all that unusual in carrying four separate articles relating to reptiles newly introduced to the wild in Florida.

In the US Pacific territory of Guam, accidentally introduced Brown-tree Snakes (*Boiga irregularis* (or *fusca*)) have overrun the island exterminating or threatening 13 native bird species upon which they prey. Interestingly, where these snakes occur in most parts of Australia and south-east Asia, they tend not to dominate the local fauna or ecology, usually being just one of a number of snake species and rarely if ever decimating bird populations, even though they feed on them. Besides the Brown-tree Snakes, Guam's native animals have to contend with introduced Cane Toads (*Bufo marinus*). This latter species may have played an important role in the recent decline of Mangrove Monitors (*Varanus indicus*) (McCoid, Hensley and Witteman, 1994).

In Darwin and other parts of South-east Asia and the Pacific, non-native geckos including the species *Hemidactylus frenatus* have begun to displace local species.

Closer to home, Red-eared Sliders (*Trachemys scripta elegans*) have been illegally imported into Australia and released into waterways around Sydney and Melbourne. In Victoria, wildlife officials have shown some interest in eliminating the species before they become firmly established (Tony Boardman, personal communication. 1993). NSW wildlife authorities have stated that they have no concern for the problem, going so far as to state their lack of concern in a personal letter to

the author in 1993 (Hoser, 1995). Some newly released Sliders, (originally native to the United States) have apparently been breeding in Australian waterways (Benson, 1995). It is feared that these hardy chelonians may displace local species.

THE WILDLIFE DEPARTMENTS.

The attitudes and policies of wildlife officials in Australia, range from good, to indifferent to terrible - and this can be within a single department. In New South Wales, the policy is so messy and inconsistent, it really is hard to fathom what to make of it. In the last two years, a senior wildlife law enforcement officer has appeared in the media arguing for the need to maintain the genetic integrity of populations, while at the same time other officials have claimed to be releasing reptiles in areas from where they never came.

Currently there are proposed bird-keeping laws that would force some bird keepers to release into the wild every second bird that they hatch. This could be a Pandora's box of problems for some populations of wild birds.

In Victoria the policy of DCNR makes a bit of sense sometimes. For reptiles, they generally discourage release into the wild of captive animals. This makes sense. In the case of the 74 Shinglebacks and 7 Bearded Dragons (*Pogona* sp.) seized from wildlife smuggler John Nichols in 1991, most were allowed into the private herpetological market and in a manner which didn't allow for suspicions to form about the integrity of the wildlife officers. In that case, there was no clear indication as to from exactly where the lizards had originated. Persons who hold reptile capture permits for so-called nuisance snakes (those found in back-yards and so on) are usually instructed to euthanase these snakes. While this prevents potentially harmful or counterproductive releases from taking place, it does again seem to be a terrible waste of a valuable resource. Surely DCNR can formulate some sort of policy whereby these animals are allowed to live and be passed into captivity. Obviously such a policy would need to be transparent, fair to all and one above any notion of corruption. Such a policy should be enacted in all states.

WHEN REPTILES SHOULD BE RELEASED INTO THE WILD.

Release of reptiles (and other animals) into the wild, while not usually advised, is of course useful in some circumstances. The action of releasing animals into the wild is a valuable conservation tool, particularly in the case of rehabilitating rare and endangered animals. The story of the Norfolk Island Woodhen (*Tricholimnas sylvestris*) is just one such case. Nearly eradicated from Norfolk Island, some of the last of these animals were taken from the wild and bred in huge numbers before being released back into the wild. The release into the wild only took place after introduced feral pigs were eradicated from the area, enabling the newly released birds to survive. The population of these birds went from under 30 individuals in the late 1970's to several hundred now (Hoser, 1991).

Captive breeding of reptiles must always be encouraged. It is unfortunate, but true that in the future the few reptiles we have in captivity may form a sort of Noah's ark to protect these species against extinctions in the wild. At a later date it may be possible to re-establish these animals in the wild, if we have sufficient specimens in captivity. However again I must stress that any planned releases must be just that - planned. Otherwise the whole effort may be of no use to the species concerned.

For those who claim that captive-breeding serves no useful purpose in terms of saving Australian wildlife, I remind them of just one thing. *Rheobatrachus silus*! This, the Gastric-brooding Frog of the Connondale Range area, was found in it's thousands in the wild state. Had more been taken from the wild state, when there were countless frogs available, and these frogs maintained in captivity in sufficient numbers and places around Australia, without being hastily released back into the wild, the species would still be with us. It is an indictment of all Australians, in particular the so-called wildlife protection authorities, that these frogs are now no longer a part of our heritage.

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