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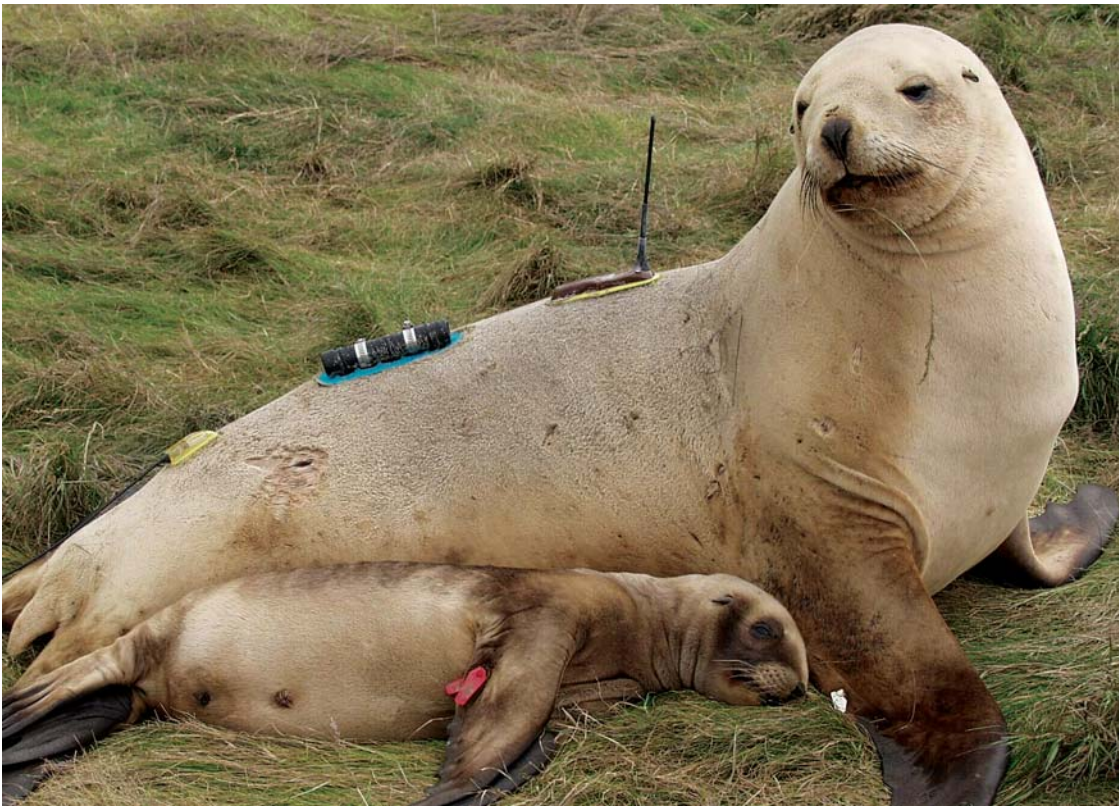

Department of Conservation
*Te Papa Atawhai*

# Marking amphibians, reptiles and marine mammals: animal welfare, practicalities and public perceptions in New Zealand

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Cover photo: Female sea lion with brand satellite transmitter (shoulder), time-depth recorder (mid-back) and VHF transmitter (hip) temporarily glued to the fur. She also has plastic flipper tags as does her pup.
PHOTO: © PADRAIG DUIGNAN, MASSEY UNIVERSITY.

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# Introduction

Identification of wildlife aids biological study and conservation management and, usually, the most reliable approach is to apply an artificial mark. Marking can affect the animals involved through the act of marking itself, the wearing of the mark and the procedures required for observing the mark. Adverse effects may be evident immediately or appear long after the procedure is performed, and may have implications for animal welfare, ecological balance, the value of the information obtained and public support for wildlife research.

In terms of animal welfare, virtually all marking methods require capture, which is stressful[1] to wild animals. Many methods also involve tissue damage and therefore cause pain. Persistent infection or protracted healing may extend the period of pain and change an animal's behaviour and energy use. Moreover, after healing, wearing the mark may alter an animal's appearance, social interactions, other behaviours and survival. Repeated capture and handling for re-identification can cause persistent low-level stress, which may make marked animals more vulnerable to the effects of other natural stressors.

The adverse effects of marking may extend beyond the individual animal to include disruptions to populations or interactions between species and, thereby, disturbances to ecological balance. For instance, marking may restrict an animal's movement or feeding, alter predator–prey relationships, disrupt breeding or social interactions or alter distribution or migration patterns.

Each marking method has its own advantages and disadvantages. Scientists need to weigh up the anticipated benefits of the research with the probable adverse consequences of marking for

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1 Stress represents physiological responses to significant challenges, which can be emotional and/or physical. They elicit well-documented 'fight-or-flight' responses and changes that help to deal with possible injuries. Externally observable signs of stress include aggression, struggling or freezing behaviours, abnormal postures, vocalisation or its absence, impaired grooming, altered activity patterns, shivering, altered breathing, change in skin colour and body temperature change. The associated physiological responses may be measured.

individual animals, populations and ecosystems, because such negative effects would compromise the quality of the data collected. If a mark is lost or illegible, or if the data collected are inappropriate or are corrupted by marking, reduced animal welfare and other negative effects will have occurred without redeeming benefit. Application of the General Safeguards, as outlined below, together with those safeguards specific to each method, should help to maximise the benefits of marking programmes.

Wildlife managers or researchers who consider using a new marking method, or the application of an existing method to a new population, must first conduct an evaluation of the effects of the method itself on individual animals, the population or ecosystem. Such preliminary studies will help to determine the appropriate welfare safeguards, and give an indication of the reliability of the data obtained from that particular marked population.

Hector's dolphin (*Cephalorhynchus hectori*). PHOTO: © STEVE DAWSON, OTAGO UNIVERSITY.

# Public perceptions and support

Public support for government-funded wildlife research is crucial. There will always be some people who object to interfering with wildlife in any way, and others who object to inflicting pain or stress on any wild animal. However, the majority of interested people appreciate the role of marking in wildlife biology and conservation, and it is to those people that scientists must demonstrate that the chosen methods are both suitable and humane.

Marking methods that appear to seriously harm animal welfare are likely to be unacceptable to the public. This applies in particular to methods that markedly change the appearance of the animal, obviously cause pain and/or stress, grossly alter behaviour or cause death. It is these types of negative effects that lead to public disquiet about wildlife marking. However, there is often a disparity between the *real* and *perceived* effects of marking on animal welfare. Methods that appear to the public to cause serious welfare problems, but in fact do not, may be more appropriate than other methods that are mistakenly considered to be benign. Therefore, it is critical that the public be informed about the benefits, risks and safeguards associated with each marking method used in New Zealand.

In the research context, all animal use in New Zealand must be approved by an Animal Ethics Committee (AEC). The law[2] requires that each AEC include, in addition to its scientific and technical members, a lay member (usually nominated by a local authority), an animal welfare advocate (usually nominated by the Royal New Zealand Society for the Prevention of Cruelty to Animals) and an independent veterinarian (nominated by the New Zealand Veterinary Association). These latter three members act as watchdogs on behalf of animals, and effectively represent the public interest. The members of the AEC must balance the anticipated value of the research against the pain and stress likely to be caused to the animals involved, and, in the case of marking, must decide whether the method is acceptable for the species and the research planned.

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2 Animal Welfare Act 1999.

There may be conservation and management activities involving marking that do not require formal approval from an AEC. We recommend that all marking methods used in such contexts, whether invasive or not, be assessed generically, preferably by each organisation's AEC. We also recommend that guidelines be drawn up for conservation managers, which include comprehensive species- and population-specific analyses of the practical and animal welfare advantages and disadvantages of each method, the safeguards, possible sources of public disquiet and the value of the information gained. They should be reviewed regularly and updated in the light of field experience and new research findings.

Public discontent with wildlife marking usually occurs when procedures are undertaken without the public being informed. Public perception of the degree of harm to welfare, whether accurate or not, must be considered if support for wildlife research is to continue. Most people respond positively to clear descriptions of project details and, especially, to the knowledge that measures have been put in place to safeguard animal welfare. Therefore, when animals are marked using a painful or stressful method, the following important steps should help to reduce public disquiet.

1. The public should be provided with the justification for the marking programme and the method chosen and a careful explanation of the benefits and general and specific safeguards employed.
2. Marking should be carried out only by knowledgeable and proficient personnel.
3. Anaesthesia and/or pain control should be used where appropriate.
4. Wounds should be treated appropriately.
5. The effects of marking should be monitored, untoward effects noted and, when necessary, remedial actions taken.
6. The outcomes of the research should be made public.

Another issue to consider is the extent of public access to the study site. If members of the public are unlikely to encounter marked animals, researchers may be more confident when

applying highly visible marks. In areas of high public access, the use of such methods may be unsuitable. However, it is important to remember that public perceptions of welfare problems may not accurately reflect actual problems, and methods which appear benign to the casual observer, may in fact cause serious harm. Nevertheless, an informed public will be less likely to respond negatively to encounters with marked wildlife.

Finally, it is imperative that information about wildlife marking be displayed in the most appropriate location. Where members of the public are likely to encounter marked animals, information about specific marking programmes should be prominently displayed or be readily available. Forewarning the public about the benefits and disadvantages, and the safeguards taken to minimise these disadvantages, will help to reduce public concern.

This booklet focuses on animal welfare impacts, practicalities and public perceptions associated with a range of methods used to mark wildlife found in and around New Zealand, in particular amphibians, reptiles and marine mammals. Further information about the methods discussed here is provided in the companion DOC publication *Methods for marking New Zealand wildlife: amphibians, reptiles and marine mammals* (2004).

Female sea lion with brand, white flipper tags and telemetry equipment (satellite transmitter, shoulder; time-depth recorder, mid-back; VHF transmitter, hip) temporarily glued to the fur. PHOTO: © PADRAIG DUIGNAN, MASSEY UNIVERSITY.

Forest gecko.
PHOTO: C ROBERTSON.

# Why and how we mark animals

Reasons for marking animals include:

- To identify individuals or groups of animals in order to study demographics, behaviour, ecology and other aspects of the lives of wild animals
- To estimate population size and to determine rates of survival, reproduction and recruitment within specific populations
- To determine the ranges and distributions of individuals, populations or species
- To identify particular stocks and rates of stock mixing (This kind of information is used extensively to monitor populations undergoing conservation management.)
- To identify individual animals for behavioural studies
- To develop and verify aging techniques and to ascertain growth rates in individual animals

The methods described below have been classified according to mark durability, rather than ranked by their potential to cause animal welfare problems, for several reasons. The ranking of methods on animal welfare grounds would be complicated and subjective, and we do not believe that enough information exists at the present time to classify marking methods on welfare grounds alone. In addition, the potential welfare problems would differ according to species, the environment and other factors. Finally, wildlife practitioners, for whom this report is primarily written, will want to focus on the method first and then consider the associated animal welfare implications. Therefore, the methods outlined in this report are broadly categorised as *temporary*, *semi-permanent* and *permanent* (Table 1).

For each method, this booklet lists the inherent *advantages* and *disadvantages,* the *safeguards* taken to help to minimise disadvantages relevant to animal welfare, and the method's *acceptability*, in terms of practicality, biological function and animal welfare, and to the public. In addition, a list of General Safeguards which apply to all marking methods has been included, and must be referred to and followed by all personnel working with wildlife.

TABLE 1. IDENTIFICATION METHODS.

| TEMPORARY | SEMI-PERMANENT | PERMANENT |
|---|---|---|
| Paints or dyes | Tags | Hot, freeze or chemical branding |
| Streamers, adhesive tapes, trailing devices | Neck collars, harnesses, bands | Tattooing |
| Hair/fur removal | Nocturnal lights | Passive integrated transponders (PIT) |
| Fluorescent powders | Telemetry (radio, satellite, bio) and archival data recorders | Visible implant fluorescent elastomer tags (VIE) |
| Radioisotope marking | | Tissue removal: ear notching; toe, disc and web clipping |
| | | Vital stains |
| | | Using natural markings |

Overloaded tuatara: (*Sphenodon punctatus*) male, showing identification markings and with a radio transmitter attached, Stephens Island, July 1977.
PHOTO: DON NEWMAN.

Chevron skink (*Oligosoma homalonotum*) with transmitter. This photo, taken in 2000, shows the much smaller size of transmitters now used.
PHOTO: KERI NEILSON.


# General safeguards for marking wildlife

1. It must be demonstrated that marking is necessary to achieve the proposed research objectives.
2. The purposes and benefits of the method chosen must be sufficient to justify its adverse effects.
3. Devices and methods must be selected carefully. Where there is a choice, choose a device that has a size, weight and configuration appropriate for the animal's species, size, behaviour and habitat (i.e. a device that minimises any adverse effects on the animal).
4. Methods must meet the precise objectives of the study in terms of data required, study duration, recognition proximity (close/distant) and specificity (individual/group).
5. Only experienced and/or well-trained personnel who are proficient in the method should carry out marking.
6. Personnel should assess marking procedures which are new, or new to the particular population, on captive individuals or allied species before attempting to mark wild populations.
7. Since any handling may cause short-term stress, use gentle and minimal handling, and for the shortest time possible.
8. If the adverse effects of a method are not known, the literature must be reviewed or laboratory assessments made to discover these and measures must be taken to minimise them.
9. Accidental injury during marking should be treated and, if sufficiently serious, the animal should be euthanised.
10. Personnel must minimise the transmission of infectious diseases and parasites between animals during the marking procedure.
11. Marker-induced distortions of survival, reproductive success, behaviour and interactions between conspecifics and with other species need to be assessed and measures devised to minimise them. Data analysis must take account of such effects.
12. Wherever possible, monitor the health and welfare of marked animals.
13. Marking should not compromise conservation strategies for endangered or threatened species (e.g. kill methods or those that adversely affect reproduction should not be used), nor should it adversely affect the ecological balance or the environment.