

WHAT ARE THE CHALLENGES IN NORWEGIAN FIELD RESEARCH?

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Outline



- Field research in Norway
- Who is allowed to do field research?
- The use of 3R's in planning field research
- Capture and handling of wild animals
- Risk associated with catching of wild animals
- Sampling of wild animals
- Electronic tagging of wild animals
- Reporting field research
- How to improve field research?
- Conclusions

Field Research



Field research studies, which are performed in the wild, are dominated by the use of telemetry/satellite systems on wild animals.

Field Research



Field research is mainly related to questions asked by wildlife management rather than basic research. In Norway most applications received are related to management or movements of animals. There are few applications related to purely experimental studies.

Number of applications



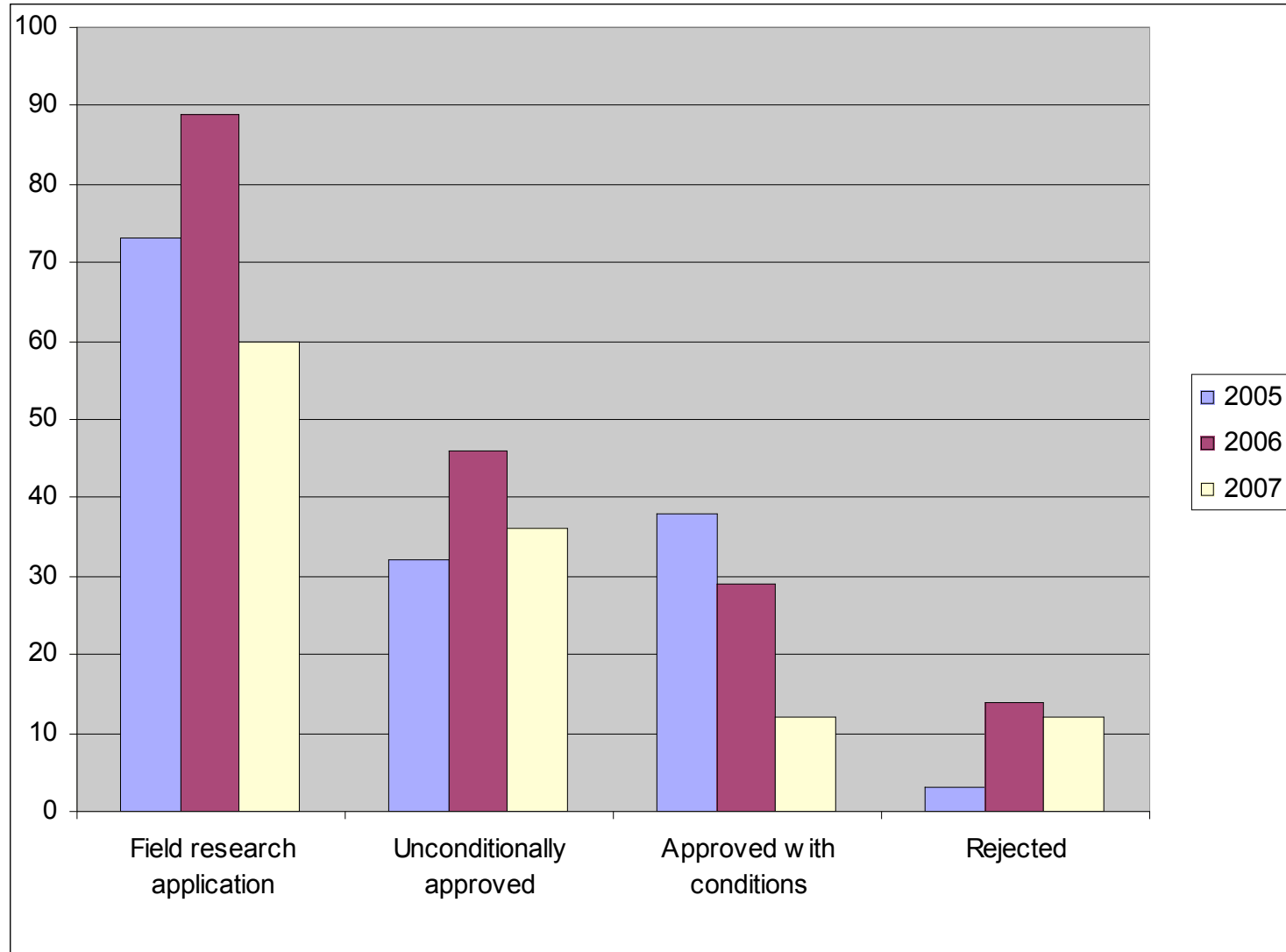
Year	Total number of applications	Field research applications
2005	452	73
2006	594	89
2007	575	60

Animals used in "field" research



Year	Total number of animal used	Fish	Birds	Mammals
2005	350 000	345 000	5 500	700
2006	116 400	114 000	1 190	1 230
2007	3 133 000	3 130 100	4 530	1 290

Field research applications



Experiments



No person or institution is allowed to do experiments on animals without permission from the Norwegian Animal Research Authority.

This includes experiments which are performed at an approved animal research facility and experiments which are classified as field research.

Permission to perform experiments



Permission to do experiments on animals should only be given when no other scientifically satisfactory method exist.

”It is the responsibility of the applicant for animal research to investigate which alternative methods are available, and to present these in the application”.

Alternative methods?

There are few replacements/alternatives that can be used in a lot of field research. However, reduction and refinement are very often possible.

Each of us should answer the questions raised in the application from the Norwegian Animal Research Authority.

We are not aware of dedicated databases for field research, allowing for exploration of alternatives, but try: www.go3r.org/ or <http://altweb.jhsph.edu/searchalt.htm>

3 R's

- Replacement - preferably use methods that do not involve capture and handling.
- Reduction - get more information from less animals. Avoid "wasting" animals by using too few/many or badly planned studies.
- Refinement - distress animals as little as possible for as short a time as possible.

2008 is the year of the Great Owl

In our last meeting (April 2008) the Norwegian Animal Research Authority received five applications to do studies on Great Owls.

These applications were not co-ordinated and we asked the applicants to make a plan for owl research in order to reduce the number of birds used.

The Directorate for Nature Management approved the decision made by Norwegian Animal Research Authority and a science plan is now being developed for the Great Owl.

Capture and handling of wild animals

Capture and handling of wild animals is distressing; it can cause stress, pain, exhaustion and injury.

Capture and handling should therefore be seen as an important part of field research/planning.

Capture methods

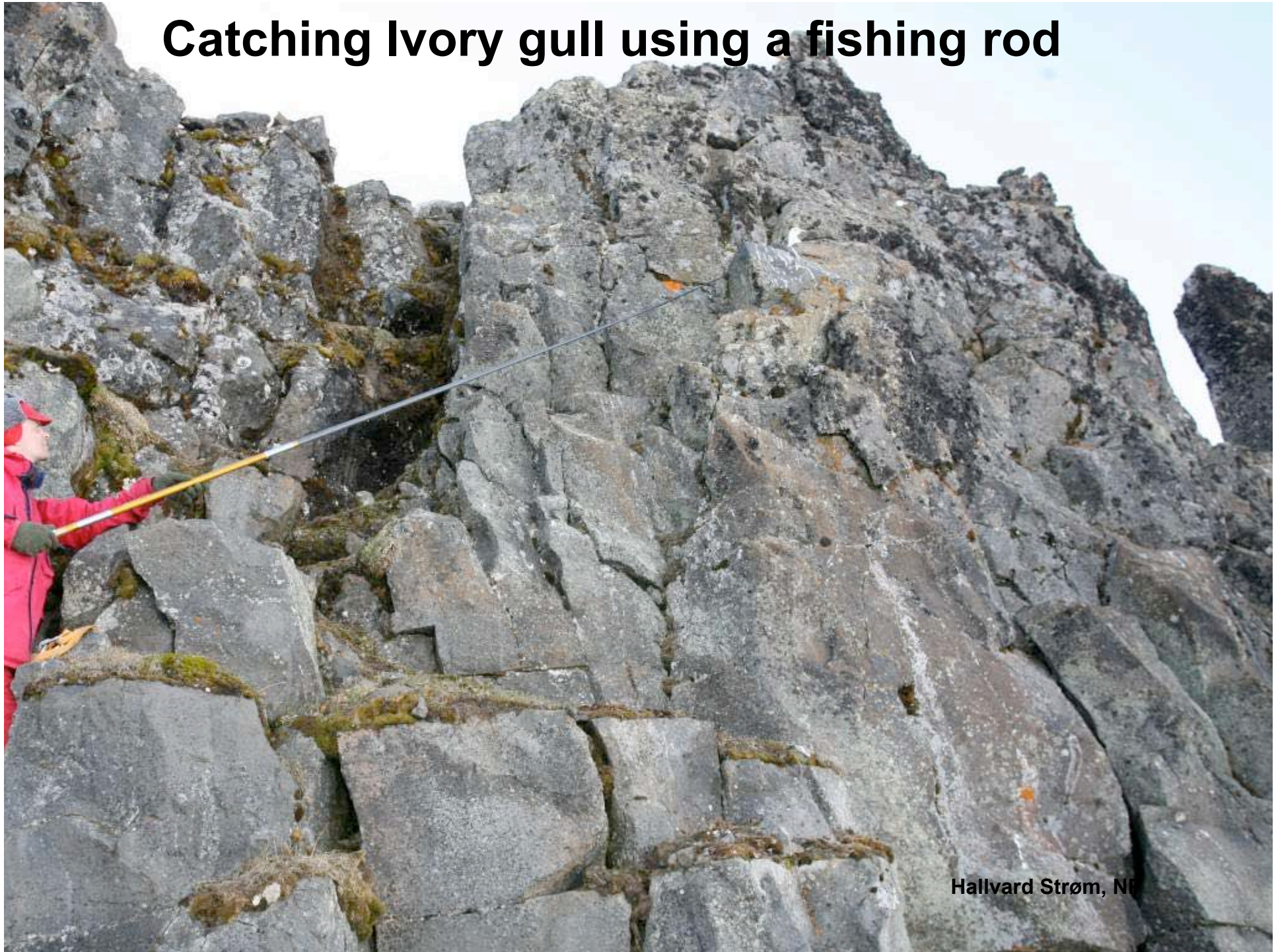
- Birds (use of traps, bait, cannon nets or mist nets)
- Marine mammals (immobilization, traps and nets)
- Terrestrial mammals (immobilization, cages, traps, snares, net guns and nets)

Catching Golden eagle with a baited cage-trap in Finnmark



Torgeir Nygård, Nina

Catching Ivory gull using a fishing rod



Hallvard Strøm, NI

Mist-netting



Foto: Ulla Falkdalen



Catching a ring seal using a net

Kit Kovacs/
Christtian

Live trapping of polar fox



Heli Routti/Eva Fuglei,
NP

Risk associated with catching and marking (brown bear)



Catch mortality:

1984-1991 3,8% (7/183)

1992-2004 0,3% (3/893)



Capture-related mortality in free-ranging mammals

- Moose: 0.7 %
- Brown bear: 0.9 %
- Gray wolves: 3.4 %
- Wolverines: 2.8 %
- Lynx: 2.9 %

In the 1950s and 1960s the mortality rates were high (between 25-35 %)

In north America the mortality rate is still above 10 %

In Norway the mortality related to capture of wild animals has improved.

Wildlife professionals should strive for minimal mortality.

Risk associated with catching and marking wildlife

Anaesthetics:

Hospitalised: Humans: 0.05 %

Dog/cats: 0.10 %

Horses: 1.00 %

Birds/rodent: 3.90 %

Wild species: Moose: 0.50 % (extreme N.Am.6-19 %)

Red deer: 0.13 % (Roe deer 1-4 %)

Svalbard reindeer: 0.30 %

Brown bear: 0.40 %

Polar bear (Canada): 0.09 %

Wild boar (Sweden): 5.90 %

In white whales, bearded seals and ringed seals no chemical immobilization is used.

No loss of animals since capture started in the 80's



Kit Kovacs/Christian
Lydersen, NP

Since 2000 one of 27 walrus has died during immobilization

Since 1995 one of 260 harbour seals has died during immobilization (sex difference)



Catching of Svalbard reindeer using nets



A total of 2137 reindeer have been caught since 1995.

Nine reindeer died due to catching (7 animals broke their neck and 2 broke legs)

Sampling of wild animals



Sampling of wild animals

- Biopsies of skin and blubber (for DNA, diet and pollution studies)
- Blood (for hormone, immune and pollution studies)
- Tooth (age studies)
- Feather/fur (for genetic and pollution studies)
- Salvia (for bacteriological studies)
- Feces (for bacteriological and diet studies)

No permission needed to do the following tasks;

- Blood sampling and collection of "natural secretions" do not need permission if they do not affect the life development of the animal in any way or cause anything other than momentary and mild pain or discomfort.
- Normal ringing of birds (coloured rings or other special types may require permission).

Should these tasks be put on the list where no permission is needed?

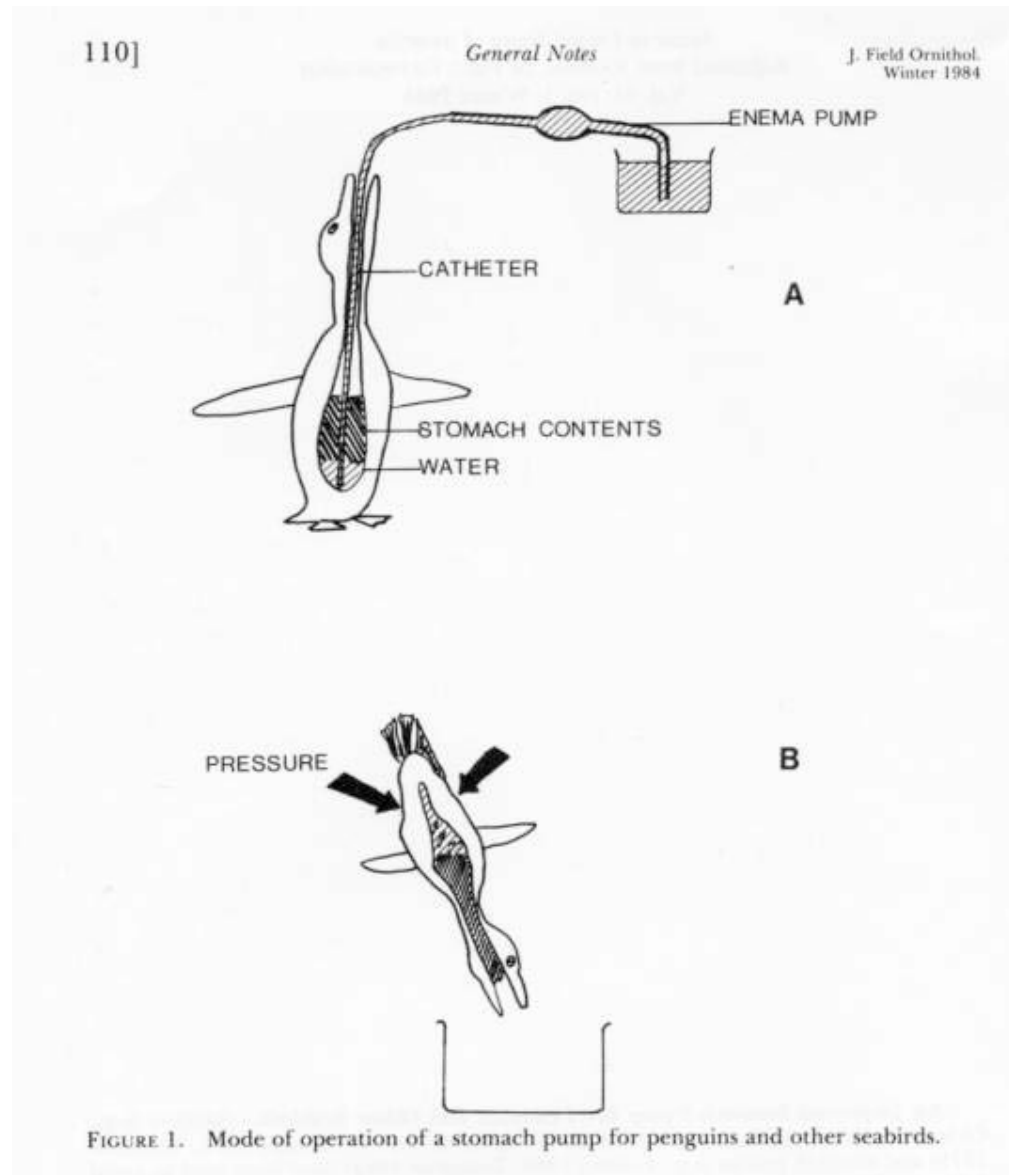
- Collection of biopsies from whales by the use of a cross-bow or a dart gun
- Collection of food samples (lavage) from seabirds
- Clipping of feathers/fur in birds and mammals to collect samples for DNA studies or for analysis of contaminants

Permission not needed?



Hans Wolkers, NP

Permission not needed?



Immobilization of wild animals



Photo: Åsa
Fahlman

Immobilization

Results from studies of captive animals/zoo animals have been used for the development of anesthetic drugs for wild animals.

There is still a need to develop better anesthetic drugs for several wild species.

There is also a great need to develop anesthetic monitoring equipment for during field conditions.

Protocols

- Protocols, which include information of immobilization and sampling, should be developed for all wild species.
- The protocols should ensure the best welfare practices that are available to field researchers.

Statistical treatment

Applicants should do statistical analysis (power analysis) when appropriate in order to explain the number of animal used in the study.

If you are not competent to do the calculation yourself you should seek advice/assistance from a statistician.

Electronic tagging of wild animals

- Implanted dataloggers for physiological studies
- Satellite transmitters/dataloggers for ecological studies
- Tracking/VHF transmitters for ecological studies
- Mobile phone systems for ecological studies

The use of electronic systems

- Transmitters/loggers are smaller and the weight is dramatically reduced (should be less than 2-3 % of body mass)
- The use of harnesses has been greatly improved and the use of drop-off systems is recommended
- Implantation of dataloggers should be performed with advice from a veterinarian

Televilt Posrec 100 g drop-off transmitter



Foto: T. Nygård

Field Research

Few Norwegian studies report consequences of their studies on the animals involved.

Field research should investigate effects on animals and report these in order to continually improve the methods used.

International studies show;^{1,2}

- **Increased spontaneous death**
- **Increased predation**
- **Changed social status**
- **Changes of behaviour**

1) Hawkins P., Bio-logging and animal welfare: practical refinements, Mem. Natl. Inst. Res., 58, 2004.

2) Research techniques in animal ecology: Controversies and consequences, Columbia University Press 2000.

Barnacle geese study



GeirW. Gabrielsen, NP

The effects of implanting data loggers (1)

- Ten data loggers were implanted in 10 barnacle geese at the start of egg-laying period
- Eight of ten barnacle geese did not return to their original nest sites after implantation
- Six of ten barnacle geese completed incubation after renesting

The effects of implanting data loggers (2)

	Implanted geese	Control birds
Clutch size	3.1 eggs	3.9 eggs
Duration of breeding	24.4 days	25.8 days
Number of goslings	2.7	3.6
Number of times away from the nest (per day)	3.8-4.7	1.4-2.4
Time away (per day)	85-144 min.	23-67 min.

The effects of implanting data loggers (3)

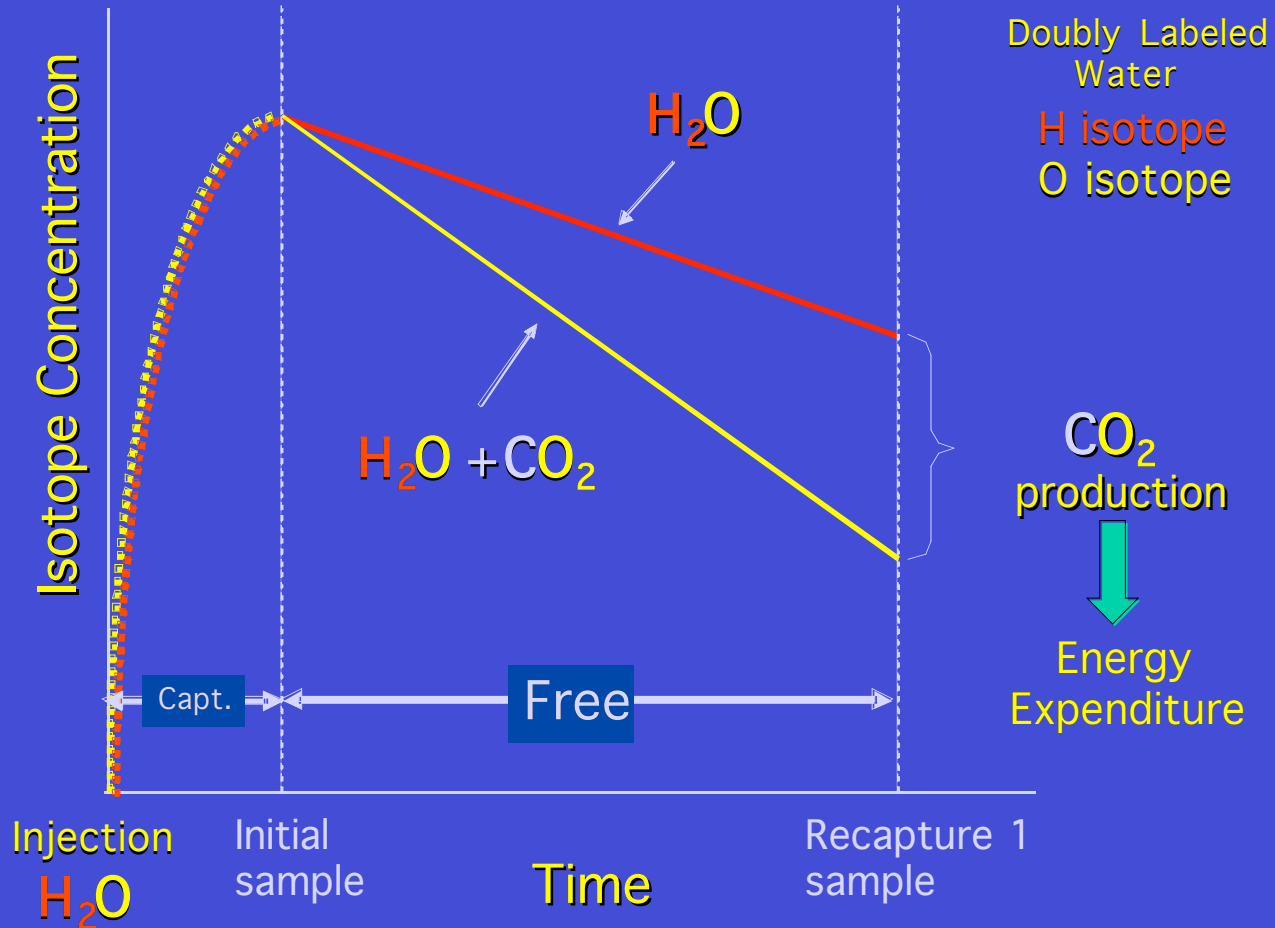
One year after;

Nine of ten geese returned to breed on the same Island (no difference in clutch size and goose production between implanted birds and control birds)

Implantation should not be performed before and during the breeding period in Arctic breeding geese

Energetic studies

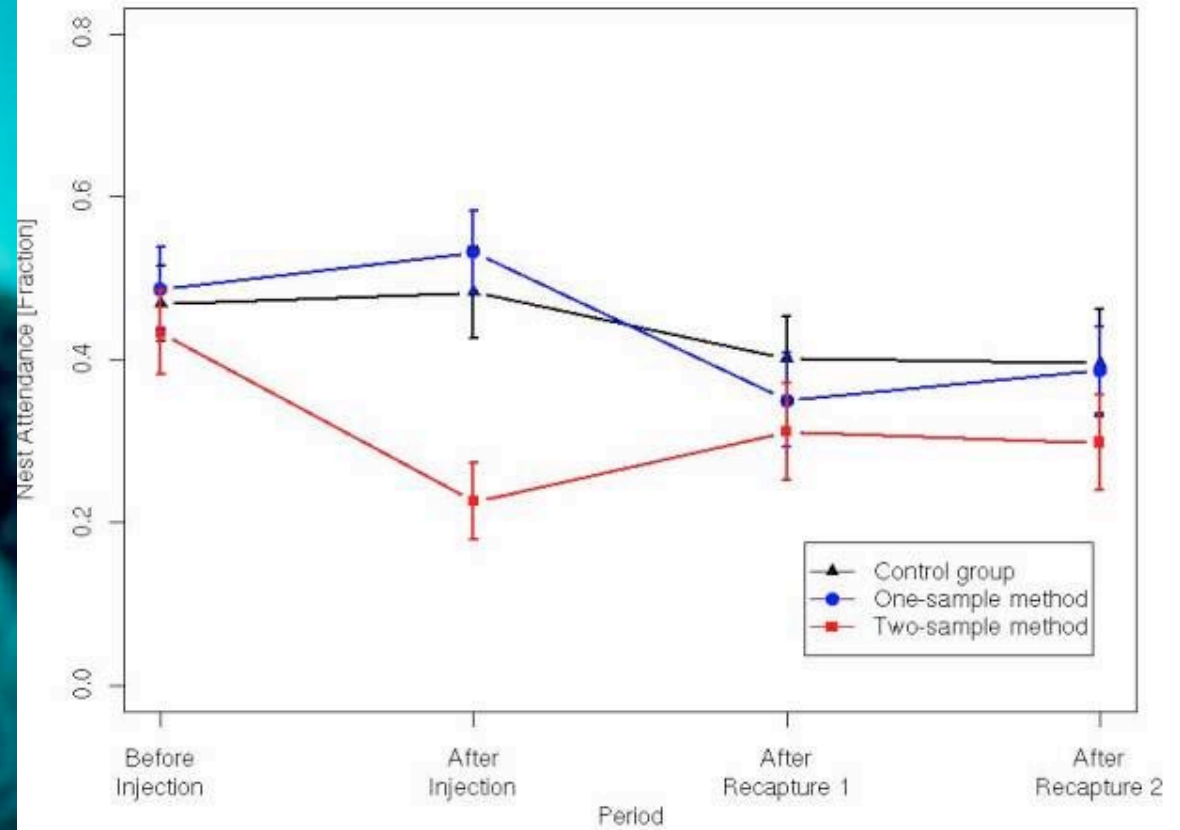
Effect study: doubly labeled water method in kittiwakes



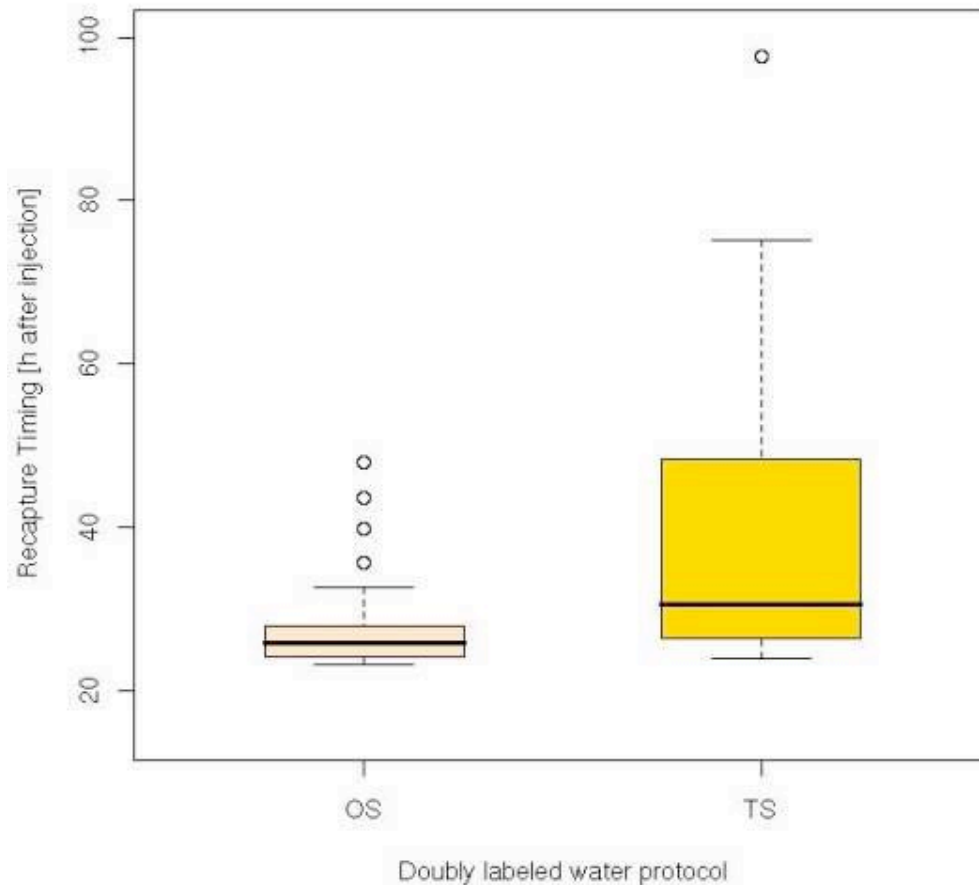
Nest attendance of breeding kittiwakes



Foto; Geir W. Gabrielsen



Choice of method determines also recapture probabilities of kittiwakes



Based on the results from our DLW study it is now recommended to use the one sample method

How to improve field research?

- More consideration of animal welfare effects during application process is needed
- Better registration of effects during field studies
- Proper evaluation of animal welfare effects after completion of studies
- Wider reporting/sharing of information about effects to others (publications)

FOTS

- An English version of FOTS is needed
- FOTS should also include a database in order to improve field research
- FOTS should be linked to guidelines, procedures and protocols
- FOTS should be linked to Norecopa

Conclusions

- Methods for capturing, handling and sampling of wild animals must be improved
- Better anesthetic drugs and equipment for anesthetic monitoring of or wild species is needed
- Protocols for wild species should be developed
- Better registration of the effects and reporting on field research is needed