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Conservation Science Newsletter is issued six times per year in Feb., Apr., Jun., Aug., Oct., and Dec. Contributions should reach the Editor by the 1st of the month in which they are to appear.

EDITORIAL

This issue has a number of interesting reports on research in progress, including that of Margaret O'Brien on the women in DoC. In addition to all the interesting information about the women in DoC, Margaret gives us a picture of how a social scientist works.

We have had many compliments on the new format, as well as some critical comment on the mast head which emphasizes the CON SCIENCE part of our name. Our critic thought that perhaps we were being clever with a play on the word "conscience"; that this was distasteful, and injurious to our credibility. Nothing could be further from our intention! The name was chosen to signify that the science done in DoC was in the interests of managing our land, sea, and cultural treasures. The tension between the urge to discover for its own sake and the need to provide knowledge for DoC managers and workers is where CONSCIENCE (the newsletter) lives. I would be happy to hear from readers who have other points of view on this topic. We will print the best comments in the next few issues as part of a symposium on the relationship between science and conscience.

Kaye Green
Editor

Remote Sensing – the view from a higher plane

This seminar, by Craig Trotter, Landcare Research, Palmerston North, was presented in two parts. In the first section Craig presented an overview of the various remote sensing technologies, following by a review of work carried out for DoC on Rangitoto Island designed to assess forest health using remote sensing.

Remote sensing embraces a range of technologies, from "conventional" aerial photography through to satellite imagery using a variety of sensors. A fundamental feature of all the major technologies is the formation of an image which, if in digital form can potentially be used in a geographic information system. Common "platforms" for remote sensing are aircraft or satellites at various altitudes, and common sensors are video, conventional analog (film) cameras and multispectral sensors used in satellites. Resolution obtained is determined by the pixel size (pixels are small squares or rectangles used to build up the image), usually expressed as metres which is the area represented by each pixel on the ground. Pixel size varies from 1 metre or less with high quality–low altitude aerial photography to 30 metres or more in satellites. Typical weather satellite images have a pixel size in excess of a kilometre, but the next generation of landsat satellites (which operate in a relatively low earth orbit) are expected to have resolutions of less than 10 metres.

Craig discussed the advantages and disadvantages of each major technology. Airborne video is low cost, rapid, but has relatively low coverage per image and poor resolution. Nevertheless it has the great advantage of immediate availability, without further processing or analysis using standard VCRs.

Aerial photography gives high resolution and generally greater swathe width than aerial video, resulting in fewer images and less problems rectifying images unless carried out at very low altitudes. With the advent of desk top scanners that can convert analog images to digital images there has been a resurgence of interest in this technology. Data acquisition is relatively low cost. Major disadvantages relate to the processing and management of the photos (image stretching etc.) and to variation in colour intensity across an image.

Satellite images are relatively expensive to purchase, but cover large areas although with lower resolution than aerial photographs. Multispectral scanners allow acquisition of a range of spectral information in the thermal, visible and infrared (IR) regions of the spectrum which can yield more data than conventional panchromatic or colour scenes. For example, IR can differentiate between vegetation and other materials that might not be distinguished using only visible wavelengths.

The Rangitoto study was to determine whether the normalised vegetation index (derived by comparing infrared and red light absorbance) could be

related to leaf cover and canopy condition, and hence possum damage, in *Metrosideros* forests. A number of ground control points were established, % canopy assessed from the ground at five sites, and this compared with the vegetation index (essentially a measure of greenness) derived from multispectral (colour-infrared) aerial photography.

Calibration curves were obtained for each site, allowing a photomap to be produced showing vegetation index which was correlated with canopy leaf area. The study showed a good correlation between canopy health predicted by remote sensing and the ground data. Several other species were present in the study area. Most showed a similar relationship between NVI and "health" to *Metrosideros*, but manuka/kanuka forest gave different result, due to the lower proportion of green leaves on healthy plants.

The study was carried out after the major possum and wallaby eradication programme on the island commenced, and some forest recovery was already evident. Nevertheless it provides a basis against which to measure future recovery. Given the success of this investigation, it is hoped to extend the technique to a range of more complex vegetation communities to assess its usefulness as a monitoring tool in a variety of environments, using either aerial photography or multispectral satellite imagery.

EuanNicol
Science &Research Division

Reintroduction Biology of Australasian Fauna

Greg Sherley thought he should write something on the *Conference on Reintroduction Biology of Australasian Fauna, Melbourne, 19 to 21 April 1993.*

About 145 delegates attended, including three from DoC (although I was the only one funded by the Department). All the others were Australians from state and federal conservation organisations or zoos and universities. The conference venue was the Healesville Wildlife Sanctuary near the Dandenong Ranges about 40 km out of Melbourne. Papers were given in the Badger Creek Primary School gymnasium about 2 minutes walk from the Sanctuary. The papers were all of a high standard and most will be published in proceedings which should come out this year. In the interim I thought a summary of the recurrent messages might be of interest.

Population modelling

At least three papers addressed this subject. Speakers encouraged the use of even the simplest modelling techniques to help the researcher or manager to quantify crucial parameters such as the minimum numbers of transferees required for the successful establishment of founder populations. It was argued that even in the absence of basic information some attempt at modelling was better than none because the process of building models develops an understanding of the synergies involved in the establishment of a founder population. Population viability analysis software is apparently

available as an add-on to Excel 3.0 which is used in DoC.

Experimentation

One of the important take-home messages for researchers was that every translocation programme should be designed in such a way as to allow some hypothesis to be tested. Benefits of hypothesis testing include: refining field models and the postulated reasons for needing the translocation in the first place and deriving reliable field knowledge of the translocated species and its predators or competitors. It was pointed out that translocations test limiting factors on the species today not necessarily the original causes for their demise.

Behaviour of release animals

Animals moved into a new environment may behave differently – they may change their diet, respond more poorly to predators, disperse so far that they escape the protection of their new habitat. Captive bred animals may lose their wariness and hence increase their vulnerability to predators (natural or otherwise). They may also have lost innate skills such as migratory behaviour.

Behaviour of the threatened species in the wild

The natural history of the translocated species needs to be known at the outset e.g., helmeted honeyeaters are a social gregarious species and groups attract others. Therefore "critical mass" considerations are necessary for the successful establishment of founder populations. Another example is the echidna which has a home-range that is considerably smaller than its life-range – a consideration easily missed when assessing the areas required for protecting founder populations.

An interesting paper by Doug Armstrong (Massey University) suggested that familiarity of transferees was not likely to be important for birds successfully establishing pair-bonds and breeding successfully. Another by Landcare's Bruce Thomas showed how successful the Fiordland skink could disperse unaided between islets.

Captive breeding

This topic arose in most papers because it is an obvious tool which most workers use to augment numbers. A commonly made point was the need to coordinate captive breeding research with the study of the animal in the wild – obvious, but not always successfully done – including in New Zealand.

Genetics

The genetic patterns of wild populations needs to be thoroughly understood. Driscoll's paper on frogs described genetic variation within and between populations of the same species. Hence translocation without regard to local genetic patterns could swamp local genetic characters and obliterate evolutionary patterns.

Release techniques

"Soft" and "hard" release techniques were discussed by several speakers. Isobel Castro (Massey University outnumbered DoC delegates) gave preliminary results on the fate, dispersal and breeding success of hihi released by either technique. "Soft" release of wild caught animals may induce higher mortality since stress is increased due to the longer time spent in captivity. Capture myopathy can be an under-estimated factor in translocating animals.

A superb paper by Short showed experimentally how peninsulas could

be managed as islands and the complex interaction of foxes and cats as predators and competitors between each other and the threatened species (plural). There are lessons for New Zealand in this research with respect to management techniques and research findings on cats.

General observations

Given the complexity of the variables which may or may not be important in successful translocations, speakers encouraged pilot studies to tease out the important variables to manage before large-scale investment proceeded.

Assuming the above comments about the dynamics that could be involved, it was obvious that predator control was one of the main variables confounding successful establishment of founder populations.

Without understanding the causes of decline in the first place, there is little point translocating animals. It may be that all that is necessary is the control of one variable and the species may well survive *in situ* despite an otherwise highly modified environment.

It was the sort of conference where you felt every paper was really worth listening to and not to be missed. I encourage every colleague interested in translocation to read the proceedings.

Greg Sherley
Science & Research Division

NOTES AND NEWS

Women – Environment and Development

The New Zealand Federation of Business and Professional Womens Clubs (Inc.) (NZFBPW) will be presenting one National Award of $2000 to a woman whose employment, studies, or research involves environmental concerns. The NZFBPW is actively promoting their current International theme: "Women – Environment and Development".

Applicants for this award must have been involved for one year or more in one or more of the following:

> Protection of the biosphere, sustainable management, development and protection of resources, reduction and disposal of waste, wise use of energy, safety, risk reduction and damage compensation, education and training of environmental issues and organic production and management.

The award must be used for continuing study and/or research. Each of the 45 BPW clubs in New Zealand will select **one** candidate from their applicants, to enter the nationwide NZFBPW Environment Award. Interested women may contact the Secretary, NZFBPW, PO Box 28-326, Remuera, Auckland 1136, for the name and address of clubs closest to them. Application forms and a full criteria are available from the club secretary.

The NZFBPW closing date for applications will be 31 August 1993, with club closing dates approximately one month before this.

A recent press release from Landcare Research:

Safety of 1080 Possum Poison in the Environment

Recent research has shown the poison 1080 is safe to use in possum control operations in New Zealand. Studies into the fate of 1080 in the environment by Landcare Research scientist Charles Eason have confirmed that the poison is biodegradable and does not persist in the environment. Dr Eason found 1080 breaks down in water and soil, and does not accumulate in the food chain.

Answering public concerns about the safety of the toxin and updating previous research, Dr Eason used new analytical techniques to trace the pesticide in the environment. Field and laboratory studies have looked at 1080 in water, some non-target animals such as livestock, and invertebrates.

Water quality was tested following two of New Zealand's largest 1080 operations at Waipoua Forest and Rangitoto Island. Both areas were extensively monitored for six months after the aerial sowing of 1080 bait. Tests of the water samples showed no traces of 1080 in the surface or groundwater after the successful control operations.

Sodium monofluoroacetate or 1080 is highly soluble in water and is broken down rapidly by soil micro-organisms. The compound occurs naturally in plants, with some Australian species having high levels.

Dr Eason also found that livestock exposed to sub-lethal doses of 1080 rapidly excreted the compound. "We can conclude that 1080 is unlikely to occur in meat unless exposure to the toxin is immediately prior to slaughter."

Secondary poisoning of invertebrates such as insects, wetas and spiders was studied. "Our results provide further evidence that 1080 is readily biodegradable in all living systems."

Dr Eason is currently investigating possible alternatives to 1080 with funding from the Animal Health Board and Foundation for Science, Research and Technology. Any alternative will have to meet the strict safety requirements which 1080 is subject to. Dr Eason says new formulations of cyanide and better toxin delivery systems improve the effectiveness and safety of present possum control methods.

Dr Eason believes the results should reduce public fears about the use of 1080. "We found no evidence of harmful effects from the controlled use of 1080. Until better methods of possum control are developed, 1080 will remain an essential tool in our efforts to contain the spread of Tb by possums and reduce possum damage to forests and crops."

Collecting coralline algae

This little note is all about nongeniculate Corallinaceae, or more specifically an Australian research team that have begun the overdue task of researching the classification of our crustose coralline algae. This team has requested specimens of New Zealand coralline algae from Dr Wendy Nelson of the Museum of New Zealand, but unfortunately the Museum's collection is not particularly representative of the N.Z. flora. As Wendy wants to encourage

research into this neglected group she is keen to receive specimens and forward these on to Australia. Wendy will pick up the cost of postage. For those interested, the suggested collection protocol goes something like this:

> "It is important to try to collect entire plants and preferably populations of plants. For epiphytic and epizoic populations, entire host organisms should be collected. The same applies to coralline nodules (rhodoliths), plants occurring on smaller stones and rocks, and to plants on refuse. Always attempt to collect populations of plants rather than single individuals so that it is possible to study the variability that occurs within single populations. Knowledge of within-population variation is critical to an understanding of the value of characters for use in species delineation.
>
> "When plants cannot be removed intact, pieces of individual plants should be prized off the substrate (usually a large rock surface), and all pieces from the same individual placed into a single bag secured by a tie. It is important to avoid mixing pieces from different individuals in the same bag.
>
> "Specimens collected should be preserved by submerging them in approximately 10% formalin for a minimum period of 1 hour. The formalin solution should be added to each bag containing pieces of single individuals; for intact plants, general preservation in a barrel works well. Excess liquid can be drained off, and the material stored indefinitely in a drip wet state in darkness. Material can also be shipped in this condition in leak proof containers.
>
> "Wherever possible, collections should be obtained from intertidal and subtidal habitats. Material from each locality should be accompanied by a label indicating locality, date of collection, collector, habitat information (e.g., intertidal vs subtidal; nature of substrate; whether from reef top, boulders, or tide pools, depth information for subtidal material)."

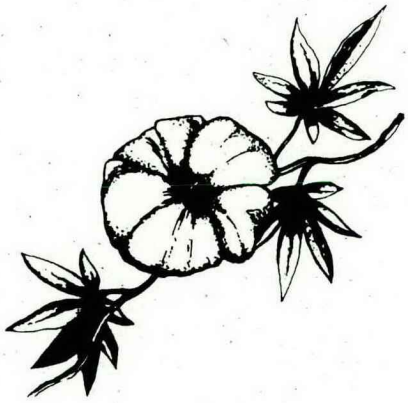
Another way of storing this stuff once it is fixed is to wrap the specimens in cheese cloth soaked in 10% formalin, double bag them and put them in a dark container.

Wendy can be contacted at:

Museum of New Zealand
P.O. Box 467 (135 Taranaki St.)
Wellington
phone: (04) 385-9609

Keep those corallines in mind.

Clint Duffy
Hawkes Bay Conservancy



Of Chickens and Kiore

Northland Conservancy is carrying out a sequential kiore eradication programme on some of the Chickens (Marotere Islands), with Coppermine Island having been treated in 1992, and Whatapuke and Lady Alice due to be treated in 1993 and 1994 respectively. Kiore on Mauitaha and Araara will be left in situ. The programme offers an excellent opportunity to examine the impacts of kiore on the biota by measuring any responses of plants and animals following kiore removal.

One of the more ambitious research projects on the Chickens is the tuatara/kiore programme of Auckland University's Graeme Ussher. Over the next few years Graeme aims to identify the nature of competitive interactions between the two species, while retaining his full compliment of fingers – he has found that "hands in" experience of tuatara can be rather unpleasant! Basically the project is comparing tuatara and kiore diet on islands where the two species co-exist, then measuring any dietary response from tuatara on the now kiore-free (we hope) Coppermine Island. Supporting work on invertebrate biomass, tuatara condition, and tuatara productivity will help determine if kiore are limiting tuatara and by what means – competitive exclusion, predation or other means.

A lizard project has been established by Richard Parrish (with advice from Dave Towns) aimed at measuring responses of different species following kiore removal. Richard has sunk a series of pitfall trap sites to snare unsuspecting lizards on Coppermine (experimental) and Lady Alice (temporary control). The study has produced interesting results from its first summer with many young cyclodinid lizards being found on Coppermine, but not on Lady Alice. The study will continue for 3 years and should provide guidelines for reintroduction of threatened lizards.

Two small seabird species, Pycroft's petrel and little shearwater, are the subject of one of my research projects. Little shearwaters have been shown by Mike Imber to suffer heavily at the teeth of kiore in some years at least, but we have no information on vulnerability of the rare Pycroft's petrel. The first summer's data on Pycroft's petrel revealed breeding success to be three times higher on Coppermine (60%) than on Lady Alice Island, with kiore sign being associated with most of the Lady Alice failures. The only other potential player in egg or chick predation is the tuatara which has fairly similar densities between the study islands. The acid test in identifying "who dunnits" comes, of course, following the removal of kiore from Lady Alice next year.

Frequent trips to the Chickens by Conservancy staff in the 1992/93 season enabled us to monitor about 30 kukupa (kereru) nests – hard to avoid tripping over them when some nests are sited at ground level. Productivity was surprisingly high on Coppermine (80%), but only 30% on Lady Alice Island where there was a high level of egg predation. Several kukupa were also fitted with radio transmitters to help determine whether there is significant dispersal from the Chickens to the mainland, 15 km away.

Next spring–summer the Conservancy will be setting in place some additional programmes including quadrats for measuring long-term patterns of plant regeneration, seabird quadrats, and count stations for forest birds. Just excuses for island R & R? Not entirely, because of the immense scientific and educational value of this sort of information, not forgetting also the cultural interest in these studies, particularly that expressed by Ngatiwai of Taitokerau.

Ray Pierce
Conservancy Advisory Scientist,
Northland

Effects of clay discharges on streams

Suspended solids are perhaps the most important of all water pollutants in terms of damages. We took the opportunity afforded by alluvial gold mining activity on small streams of the West Coast of the South Island, to study the effects of fine suspended solids on stream ecosystems, in the virtual absence of confounding factors and other contaminants such as biochemical oxygen demand, micro-organisms, nutrients, toxic materials and other aesthetically degrading materials. Impacted stream reaches, downstream of mining, were paired with upstream "control" reaches, and a range of possible effects of suspended solids were investigated, including the optical character of the stream water, the permeability of the streambed gravels, the character of stone-attached algae and biofilms, and the communities of benthic invertebrate animals, the latter being a valuable indicator of overall "environmental health".

The clay discharges from mining were rather variable, but often visually obvious, with turbidity increasing from a median of 2.4 NTU upstream (visual clarity = 2.3 m) to a median of 15 NTU downstream (visual clarity = 0.33 m). We found that the strong light attenuation by the discharged clays had the effect of appreciably decreasing light penetration into the stream waters, so that, even at depths of a few tens of cm, the lighting at the stream bed was reduced by about 50% on average. In turn, the lower lighting reduced benthic algal biomass. Entrapment of clay particles in the biofilms reduced their organic content and, therefore, food value for stone-browsing benthic invertebrates. The reduction in food quantity and/or quality was probably responsible for the observed reduction in abundance of benthic invertebrates in the stream gravels downstream of mining. There is no need to invoke other potential mechanisms, such as avoidance reactions or gravel bed siltation, to explain the effect on the invertebrates.

Although our study examined alluvial mining discharges, we expect our findings to have relevance to most situations where fine mineral suspended solids are discharged into streams, from both point and non-point sources. We expect that, generally, the optical effects of fine suspended solids are of greater environmental concern than their effects once settled on the sediment bed or their direct effects on aquatic animals. (Coarser sediments may well have severe direct effects on benthic ecology). These optical effects of fine suspensoids are *reduced light penetration*, which affects the stream ecology via reduced primary production, and

reduced visual clarity, which, of course, is of major aesthetic concern as well as of concern for sighted animals including fish and birds.

These insights should assist the management of streams by providing scientific criteria to underpin the setting of (a) standards in consents to discharge and (b) restrictions on activities that increase suspended solids loadings on streams. Our findings indicate that stringent controls (e.g., not >5 NTU turbidity increase) on discharges of clay-sized particles are required to prevent ecological degradation of these, particularly susceptible, West Coast streams. Even more stringent controls would be required to avoid (temporary) aesthetic degradation.

Rob Davies-Colley, John M. Quinn, and Chris Hickey
NIWA

Deep-diving Yellow-eyeds

DoC scientist Peter Moore, in a novel study of the behaviour of yellow-eyed penguins at sea, has come up with a verified dive depth of 126 metres. That sort of depth is intolerable for human divers operating with Scuba. The pressures would be crushing. Yet hoiho seem happy enough. And they may well dive deeper!

The study, the first of its kind in New Zealand, carried out over the summer, deployed only three recorders, which were used on eight birds from Otago Peninsula and three in the Catlins. Season and location are factors influencing the penguins' diving patterns. Small electronic dive recorders attached to the birds returned information about how deep they dived and how many dives they made per trip. Peter says the Otago Peninsula birds spent most of their time diving to depths of 40-60 m. In the Catlins, though, the dives were in the order of 80-100 m, with one bird managing 120 metres repeatedly.

The different depth patterns confirmed that hoiho tend to feed on the sea floor, where they forage for small fish, notably red cod juveniles. Off Otago Peninsula there is a wide flat area 40-80 m deep, whereas off the Catlins coast the slope is steeper and levels off at 80-130 m.

The recorder showed that dives usually last two to three minutes, with the birds resting at the surface for about a minute between dives during a feeding episode. None of the five birds in the study dived at night. It seems they lie on the surface, resting or sleeping.

Peter calculates that a bird may make up to 300 dives a day in summer when food is abundant and it is feeding chicks. Some of these dives will be shallow and made during travel to and from the breeding ground. Given the energy expended in all this diving and travelling, it is not difficult to imagine how stressed the penguins must get when food is in short supply and how difficult it must be to keep their chicks topped up.

The dive recording has gone hand-in-hand with radio-tracking work, the results of which indicate that individual birds have their own favourite fishing spots out over the continental shelf. Most birds keep within a 25 km radius of their nests, but one bird last summer travelled 42 km.

Neville Peat
Otago Conservancy

Women's involvement in Conservation: A focus on DoC staff

Margaret O'Brien talks to the Editor

Q.*Why is it important to look at what is going on for women within the Department?*
Well, for a start, we are very interested in understanding how women in the community could be more effectively involved in conservation and environmental issues. Investigating how and why our own female staff became involved in conservation seemed an appropriate place to start, particularly as the Heylen survey had provided us with some excellent groundwork.

Q.*So why is the involvement of women important?*
Well, when we talk about involving women in the community in conservation, we are talking about (a) wanting them to change their behaviour and (b) looking at the kinds of barriers that tend to inhibit change. People often have considerable awareness, or knowledge, about conservation issues, but they do not have the confidence to put that knowledge into action. They lack what the research jargon calls "self-efficacy", the belief that what they do will have an effect. Self-efficacy is stimulated by success experiences, such as when a community group successfully fights to have rubbish containers installed in the streets, or take a petition to parliament to save the local post-office, and so on. But success experiences and the change that accompanies them are also facilitated by good modelling by people who already have a "high self-efficacy". To this extent, understanding how women staff feel about their own effectiveness is vital.

Change in the community can be facilitated by every person working at the interface of the Department and the public, provided that their own sense of effectiveness or "self-efficacy" is nurtured.

Q.*Some of us are still very sceptical about the Heylen survey. Can we really rely on the results as much as some people suggest?*
A survey is only as good as the questions to be included, with each of the team members consulting with several other colleagues. Naturally, it was difficult to please everyone in settling on a limited number of questions and there was, of course, the ongoing problem of the interpretation of the results.

One difficulty is to clearly distinguish between "prompted" and "unprompted" questions. Prompted questions are those in which a selection of answers is provided for the respondents to choose from, while unprompted questions are open-ended so that the respondents could reply "freely". For instance, in a prompted situation, 70% of the staff indicated that en-couraging local councils to consider conservation was a very important area for DoC to be involved in, while in an unprompted situation, councils hardly rated a mention.

The validity of the information can be addressed by looking for trends across questions. In our case (looking at data on women), we also improved on the validity of the results by gathering data using alternative methods (called triangulation) such as noting feedback

from the questionnaire sent out by the Womens' Advisory Group and by discussing the findings with the women in several conservancies.

Q.*How many women did, in fact, reply to the questionnaire?*
At the last count, 1071 members of staff had replied to the survey, with the ratio of responses (742 men to 323 women) being a reasonably accurate reflection of the proportion of men to women in the Department, i.e., about two to one.

Q.*Did women really differ in the way they responded?*
Yes, there were several themes that came through over and over again, no matter whether we considered "prompted" or "unprompted" questions. These included: educate and involve the public (the strongest theme); involve us with the public; and communicate more with us in the Department (i.e. involve us more in the Department).

Educating and involving the Public

Q.*So what did women say about educating and involving the public?*
In comparison to men, women more strongly advocate the education and involvement of the public in conservation. They want the public to be more aware and believe that public education is the most important activity with which the Department should be involved. There were several examples of this:

- The unprompted response for the staff as a whole (i.e., men and women considered together) indicated that the most important activity for DoC was the protection of the environment in all respects, but when women were considered separately, they indicated that public education is the Department's most important activity (men 17% and women 27%; difference 10%).
- In a prompted situation, men and women again indicated that hands-on protection of habitats is a very important activity for DoC. On the other hand, when women were considered separately, they were more likely to say that raising public awareness (an integral part of public education), is a very important activity for the Department (men 64% and women 76%; difference 12%). Interestingly, less than 40% of staff believe this is an area where DoC "performs well".
- Women are also more likely than men to consider the following activities as being important for DoC involvement:
  - teaching school children (women 69%, men 59%),
  - teaching people about wildlife habitats (women 61%, men 47%),
  - teaching people about how to behave in the wilderness (women 57%, men 44%), and
  - running information centres with displays (women 55%, men 36%)
- In conjunction with these results, women are also more likely than men to say that their ideal conservation organisation would actively promote conservation (as distinct from, for instance, having enough money from government) and would encourage other groups to do conservation tasks rather than doing all the work itself (women 61%, men 44%).

Q.*And what about women's involvement with the public?*
Women are more likely to be office bound, yet indicate (a) that one of the most enjoyable aspects of their work

is contact with other people and (b) that they wish to work more with the public. Over 40% of women are in personnel, administration and finance positions (36% more than men), 60% spend no time in the field (45% less than men) and 70% spend all their time in the office (47% more than men). Despite this, there are few differences between the major likes and dislikes men and women have of their work. Most enjoy their job (81%), find work rewarding (81%) and feel they are achieving something (79%). On the other hand, unprompted, women are more likely than men (51% cf 30%) to indicate that they enjoy the contact with other people more than any other aspect of their work. Along with this, over half of them indicate (when prompted) that they want more contact with schools, the general public, local communities and local and regional councils.

Talking to each other

Q.*And what views did women hold on communication within the Department?*
While most staff agree that the Department is limited by lack of funds (90%) and lack of staff (80%), women are less likely than men (29% cf 41%) to say that the Department takes notice of what other people want, more likely than men (55% cf 43%) to disagree that managers are good at passing on information and more likely than men to report that to work more effectively in conservation there needs to be improved communication and information sharing.

Q.*Well, is this information really all that new? Haven't we heard it all before?*
It is always useful to have figures to support your claims, but it is also the interpretation of results that is important. Whether we are talking about involving the public in conservation, or involving women staff with the public, or the better involvement of staff within the Department (through communication), we are talking about the need for better networking.

Q.*Why is networking so important?*
Firstly, to avoid duplication. Almost 70% of staff indicated that there is duplication of work from lack of communication. Secondly, the present economic climate means that DoC, like many other organisations, is expecting continuing budget decreases. 90% of the staff see the Department as being hampered by the lack of funds and 80% by the lack of staff. When staff numbers are cut or individuals are not replaced when they leave, it means that fewer staff are available to do the work. Rosabeth Moss Kanter, Professor at the Harvard Business School, points out that such a direction can lead to "organisational anorexia" where resource starvation can lead to overload and "burnout" in the staff. The only way we can do MORE with less is by working more effectively together, i.e. through networking. Moss Kanter also talks about the need to become PALs: Pooling, Allying and Linking across companies. Women, more than men, are aware that we need to do this across divisions, across conservancies and across the community.

Q.*So the horizontal dimension of the Department has to become stronger?*
Yes, the women are already asking for this through a formalisation of the Women's Advisory Group network throughout the conservancies and I believe that a number of task forces

have come to the same conclusion. Women believe that their networking requires legitimation. Collaboration requires more meetings and more travel. It is a time-consuming process and cannot always be documented easily as part of a business plan:

> ". . . what is important is not how responsibilities are divided but how people can pull together to pursue new opportunities."
>
> Moss Kanter (1989, p.166).

Researchers in organisational effectiveness are also predicting that change will need to occur because, in a lean organisation, the individual staff do not have the increasing opportunities that accompany the expansion of the organisation. We at DoC don't have long term prospects with the expectation that rewards of promotion will come in the future. While many women staff believe that it is predominantly competent women who have left the Department because they have limited prospects, it is evident in the Heylen survey that both men and women have problems in this direction. 70% feel they lack the opportunities to be promoted and 60% feel that little use is made of their education and training.

Changes in the Department

Q.*What changes do women want from the Department?*
Well, primarily, women want to be better represented in the managerial ranks. The Heylen survey indicates that only 6% of women (compared to 21% of men) are involved in managerial positions.

They also want recognition for their contributions rather than for their status. At the moment, there is no guarantee that one's best efforts will be rewarded. There needs to be the opportunity to take on challenging projects which require an increasing number of skills – skills that can be transferrable to new work places.

Q.*So, what you are suggesting is that in the absence of long term employment security we should be providing a form of "employability security" in the form of skills training?*
Well, this has been suggested by some of the women. We need to know that whatever work we are involved in at the moment will work to enhance our future employment prospects – no matter who the employer.

Q.*But I thought women were primarily concerned with being able to work flexible hours, so they could have time for their families?*
Yes, that is correct. It is a point that came up frequently in discussions. It is linked with (a) the need to do more with less as an organisation and (b) with making the most of the contribution of women. Most of us are involved in information transfer rather than building bridges or making things. It is not essential for us to be together all of the time, although we need to network with colleagues frequently. Charles Handy, Professor at the London Business School, made the point a couple of years ago that almost everything has, for a long time, been organised for adult male convenience.

As he says:

> "At work, it is very convenient, is it not, that one should have a work-home-from-home that requires our presence just for those forty or fifty hours when homes need cleaning and kids need caring. Inevitably, it is a custom that excludes one person from that work home and

there are no prizes for guessing which that person is! . . . I bet that we males would not have organised things that way if it was us who had also to run a home and take the kids to school. I think that if we started to organise things for female convenience, with more flexibility, more control over where and when one did one's work, more personal flexibility and less minute by minute supervision, men might like it just as much as women."

(Handy, 1991, p.137)

In effect, he is saying that we might all gain a bit more "self-efficacy" from a bit more flexibility in the work place. Add to this a legitimation of our networking processes, an acknowledgement of our contribution rather than our status and a chance to improve our skills, and we should all become very effective change generators.

REVIEWS

ESTABLISHMENT OF MARINE RESERVES

Marine Reserves: a Survey and Community Reactions

by Jean Enid Wolfendon. Univ. of Auckland – Abstract from an unpublished Masters thesis. 1993.

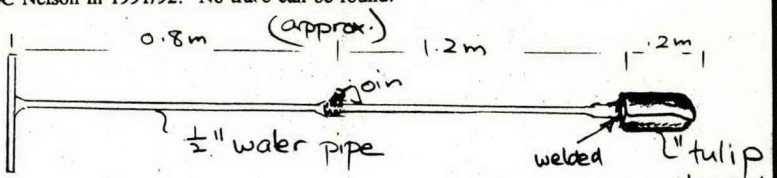
The social aspects in relation to the establishment of marine reserves have received little attention compared to the study of bio-physical phenomena. Subsequent to the passing of the Marine Reserves Act (1971), New Zealand led the world in protection of the marine environment with an area of non-extraction at Goat Island, Leigh. During the intervening years, no additional mainland marine reserve was created until the designation of Cathedral Cove marine reserve in 1993, an area central to the present study. The media provides supportive evidence that following a proposal for a marine reserve, diverse opinions among local communities in the vicinity of the marine reserve typically lead to intergroup conflict between people supporting and people opposing the marine reserve, frequently resulting in postponement or cancellation of the proposal. The present research examined the nature of community reactions to marine reserve proposals. Beliefs, attitudes and knowledge regarding marine reserves were explored, especially relating to the stance of the respondent (i.e., supporting or opposing a proposal for a marine reserve in their vicinity). Sample populations of two hundred rate payers from four target areas (two high impact and two low impact control areas) participated in a questionnaire study. A combination of qualitative and quantitative research strategies were considered appropriate for the issues being addressed. The independent variable s examined were areas of study, age, sex and stance. Results confirmed the hypotheses that the establishment of marine reserves would be supported by the majority of respondents, dependent on the implementation of comprehensive Social and Environmental Impact Assessments resulting in the identification of appropriate sites. Results of the present study revealed that communities in a high impact area formed 'concrete' (i.e. social) groups and were vulnerable to the

effects of third party authority intervention in relation to the maintenance of a positive social identity. In contrast, communities in areas where the proposal for a marine reserve was not a salient issue (i.e., low impact) respondents related to 'conceptual' or 'reference' groups with no established social identity or intergroup relations. Public involvement in the planning process, concomitant with communication, compromise and superordinate goals were identified as strategies for reducing intergroup conflict. The findings of the present research may be applied to legislation, implementation, policy making, management and public relations relevant to the establishment of marine reserves within new Zealand and overseas.

LOST AND FOUND

DUTCH SOIL AUGER

From S&R, this auger lent to erstwhile Otago University PhD student who returned it to DoC Nelson in 1991/92. No trace can be found.



This is designed to take samples of soil, not for postholes!

Any knowledge of this rare specimen, please advise **Kevin Jones, S&R, Tory Street, by EMail**. Appropriate reward offered (e.g. free soil samples).

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