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CONTENTS

GUEST EDITORIAL 1
Tony Walton
REPORTING BACK 2
Busman's Holiday 2
NOTES AND NEWS 5
Site stabilisation in U.S.A. 5
Dive data 5
Editorial revisions 5
Going under in Milford Sound 6
New series 6
RESEARCH IN PROGRESS 7
Fiordland kina project 7
Wasp impact study 7
Yellow-eyed penguins 8
Feral horses 9
NEW S&R PUBLICATIONS 11

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.

GUEST EDITORIAL

Caught by Words

A commentator has recently noted that journalists, diplomats, and the UN have increasingly adopted the language of the Serbs in talking of the conflict in Bosnia. This has made it more and more difficult to think about events there other than in a framework created to further Serbian interests. This sort of "linguistic capture" can come about in all sorts of different ways. There are, for example, modern accounts of the New Zealand Wars written partly in the language of last century. The authors have unconsciously picked up the anachronistic language, and often something of the framework that went with it, from their 19th century sources. It is all too easy to do.

Scientists are as likely as anyone else to be ensnared in this sort of trap. In an article in a recent *Conservation Science Newsletter*, for example, there was a discussion of seabird bycatch. In the course of the article, the author refereed to "the main culprits attempting to steal the bait off hooks", and to "bait thefts". This language is presumably the

language of the fishermen themselves and to adopt it is to ignore the fact that words like "culprits", "steal", and "theft" all come with a substantial moral freight. One function of this language is to shift the responsibility for the death of the birds away from the fishermen. The words suggest that the birds are the real offenders and that the fishermen are their innocent victims. And if some birds die while attempting to "steal" the bait then they obviously brought the consequences upon themselves. It is one thing to state the point of view of some group using their own words: it is quite another to unwittingly adopt their language as one's own.

Tony Walton
S&R Division, Tory Street

CYBER SMILEYS

The computer chat-line codes
(Tilt 90 degrees clockwise to read)

(:-*	*Kissing*
(:-...	*Heart-broken*
!-(	*Black eye*
#-)	*Partied all night*
%-|	*Been working all night*
;-)	*Wink*
(:-#	*Said something I shouldn't have*
(:-&	*Angry*

REPORTING BACK

Busman's Holiday

Geoff Park spent a recent holiday visiting South Westland's lagoons.

It was a kayaking trip with friends rather than work, but the opportunity to be in several of the country's most intact coastal wetland/lagoon systems in one compressed time period, and in similar weather conditions has given me some impressions I haven't had before about these ecosystems and their long-term conservation.

We concentrated on the larger, higher-quality lagoon and meander systems between Waiatoto and Mahinapua. Some of them are well known to ecologists, but others I believe no ecologist has seen quite as we did. Encountering these places from small silent craft like kayaks that can get well into places completely inaccessible by foot or dinghy, gives an impression of their ecological quality that I suspect few have. I tried to find someone who had been into Saltwater Lagoon, and the adjacent Hikimutu Lagoon and Hinatua Creek by kayak, for example. No one at the DoC Conservancy office had, although Don Neale confirmed the route in down the Poerua as the way to go. Eventually Ian James at Okarito gave us a few pointers. In the event, the Hikimutu and Hinatua appeared to be the most intact and richest in birds (especially kereru) of all the places we visited.

The places we went to, in order northwards from the Haast Plain are:

- Waiatoto (Hindley Creek, Dawn Rivulet)
- Tauwharekiri (the lakes and Bayou Creek)

- Ship Creek estuary
- Moeraki lake to estuary
- Okarito (Okarito River estuary, Windermere, Whataroa and Waitangiroto estuary)
- Poerua mouth – Hikimutu Lagoon – Hinatua Creek – Saltwater Lagoon
- Mahinepua; lake, down creek to Hokitika River estuary

The coastal lagoon/meander systems of South Westland, because of their relative intactness, their minimal degradation from urban effects and the relative contiguity (from mountains to sea) of the wider natural landscape in which they lie, include the very best prospects for the conservation of these systems anywhere in New Zealand. Based on what we know of the ecological processes that govern their integrity as natural ecosystems and what has caused the degradation of similar ecosystems elsewhere, the key to their future is the condition of their wider landscape. Some of them, like the Saltwater and Hikimutu Lagoons, have been "protected" (as Scenic Reserve) for many years, but with ecologically ridiculous boundaries. Some, like Saltwater and Okarito, have benefitted from the lowland forest conservation campaigns of the 1970s and 1980s. Others, despite their extremely high ecological quality and conservation value (on the national scale) are still coping with unprotected land and incompatible land uses in their immediate vicinity.

The key to maintaining the ecological integrity of these ecosystems long-term, lies not with boundary lines around selected representative habitats and plant communities, but with the wider landscape with which they connect via hydrology, wind and bird movements.

Despite their high ecological quality, and the impression most conservationists seem to have that ecosystems like this in South Westland are soundly protected, each of them has problems of the kind that, in the long-term, could degrade them. Just two examples:

Saltwater and Hikimutu Lagoons, Hinatua Creek, and their link to the Poerua River flats

In terms of its linkages inland, and the contiguity within it, this is the most ecologically intact truly coastal lagoon/meander system we saw. It is largely protected, and most who glanced it from the maps, would say adequately so. But one side of the superb Hikimutu Lagoon is privately owned, as are some of the kahikatea-forested lower Poerua Flats, especially on the north bank.

For what reason I'm not particularly clear, but Hikimutu and Hinatua had by far the greatest number of kereru we saw in the entire trip, in superficially identical vegetation (low riparian forest of kowhai, harakeke, porokaiwhiri, ribbonwood, kamahi, cabbage tree, etc.) to what we encountered in most other places. If kereru is the same reliable indicator of a contiguous coast <—> inland ecosystem here as elsewhere, then these birds are telling us something important.

Tauwharekiri Creek and lakes, Bayou Creek, Haast Plain

Nowhere in New Zealand any more is there a lowland landscape to compare with this. Its significance and ecological quality, its inclusion within the World Heritage Area, its proximity to growing nature-tourism centres and its accessibility to small craft like kayaks means it is likely to grow in importance in coming years.

Apart from the Coast Highway, the sequence of natural ecosystems from sea to mountains is intact right across the Haast Plain. The absence of farming and human settlement in its low-lying, meandering catchment means the mosaic of lowland wetlands is free of the weeds that have had such permanent impact in similar wetland systems elsewhere.

Hydrologically and ecologically it is dynamically healthy, with all its successional stages in apparent good condition. However it is a very delicate system, acutely susceptible to impact from inland sources. For this reason the sections of privately owned lowland forest (including a system of paper roads) inland between the Tauwharekiri wetlands and the Mataketake Range – at the head of the wetlands' catchment – must be viewed with apprehension by anyone who appreciates Tauwharekiri's significance.

We kayaked all day in this wetland system getting as far inland as Bayou Creek. We could have gone far further. Whilst the meandering creek is deep enough to make a lot of progress, it could easily be degraded by upstream land development and artificial drainage of the kind that has ruined so many other coastal lowland plains of this kind. The Tauwherekiri Lakes in particular are rich in water birds, but their shallowness and fine mud base suggests they are acutely vulnerable to any artificial increase in sediment input to the system.

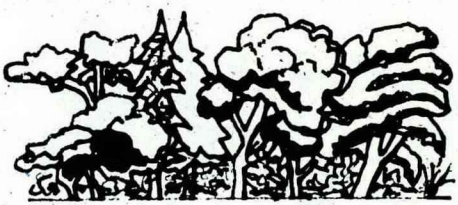
What these two examples suggest to me is the need for a priority focus to be placed on South Westland's coastal lagoon and meander systems to:

- Look at each and its wider landscape as an ecosystem.
- Carefully and systematically investigate each one to assess the stresses in its landscape (present and future), and its tenure.
- Identify the parts of the landscape where action is needed to improve/consolidate the future wellbeing of the lagoon's catchment and/or wider ecosystem (in terms of the flow of water and the exchange of energy, nutrients and species).
- Develop strategies for land acquisition and local advocacy of the dependence of these precious natural ecosystems on their wider landscape.

The conservation estate in South Westland is more ecologically comprehensive and of higher quality than elsewhere. It is also the only part of New Zealand where the conservation estate contains coastal and lowland ecosystems in approximate proportion to their former – pre-settlement – abundance in the region. However, as far as its best lagoon/meander/riparian ecosystems go, they are nonetheless, in *deteriorating* landscapes.

The evidence from the rest of New Zealand is that ecosystems of this kind are unable to cope, in their natural state, once there is agriculture in their immediate landscape. For some of South Westland's lagoons, the protection of the lowland forest in their landscape in recent decades has kept the spread of agriculture at bay.

Geoff Park
S&R Division



NOTES AND NEWS

Site stabilisation in the U.S.A.

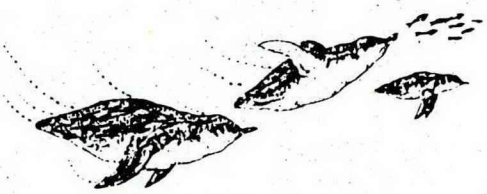
Kevin Jones has returned from a Churchill Fellowship study trip to the United States. He travelled to North Dakota, Illinois, Mississippi, Alabama, and Virginia to learn from efforts at site stabilisation and reconstruction.

One of his first visits was to Fort Union Trading Post National Historic Site, North Dakota, reconstructed by the National Park Service from 1987-1989. Much of the impetus to reconstruct came from local interest groups impatient to see the federal dollar being put into development of potential tourist attractions. However, there was in the extensive excavation of the ground in the areas to be reconstructed, especially the palisade line. Some intact structures were left exposed (such as the kitchen and dairy attached to the main house) or not excavated and their plan "ghosted" with wooden beams. The National Park Service architect spoken to by Kevin gave top marks to the value of the archaeological advice received in the course of the reconstruction.

At the University of Mississippi, Oxford, Missi: sippi, Kevin went on field visits and had detailed discussions, including a videotaped interview, with Dr Robert Thorne, an authority on archaeological site stabilisation whose assistance is frequently called on by the National Park Service. Kevin also interviewed Leslie Sauer, an ecological restoration consultant renowned for her espousal of the use of native plants in landscape design. Leslie has worked extensively on battlefields in the U.S. National Park Service system.

Other highlights were visits to the early English settlements of about 1610 - in the lower James River, and visits to Cold Harbour and the Petersburg Battlefields, all in Virginia. At the last, mixed success has been gained in converting earthwork fortifications to native grasses such as the short prairie grass *Andropogon virginiacus*.

Kevin is currently writing up his report for the Fellowship Board, and will be writing draft guidelines for site stabilisation in New Zealand.



Dive data

In the last few weeks Murray Douglas has been completing the program for analyzing yellow-eyed penguin dive recorder data for Peter Moore. After looking through some of the dive summary files the yellow-eyed penguin is certainly an amazing diving beast showing incredible endurance. They are doing between 200 and 600 dives per day, some Catlin's birds on occasions are going very deep, up to 127 meters.

Editorial revisions

Mary Cresswell has resigned from the Unit as of early December 1993. We will miss her excellent editing of S&R manuscripts, but wish her well in her free-lance work with the wider science community.

From 20 December 1993 through 14 January 1994 Dan Crisp and Kaye Green will both be away on leave. Science Publications will be run by Ian Mackenzie during this period, there will be no issuing of material to DoC staff or our clientele. Upon his return, Dan will answer all urgent requests received in the office while he was on leave.

Going under in Milford Sound

For two weeks in October a combined Science and Research and Southland Conservancy team of five divers worked in Milford Sound, to establish sites, experimental designs, and techniques for monitoring the effects of the new Milford Sound Marine Reserve - which was opened on 1 November. Not only was the whole scheme devised and tested (including a resident statistician on board the Renown!), but the first of a series of annual monitoring surveys was carried out. Jane Turnbull (Southland Conservancy) planned and organised the exercise, and beside moving to a new job in Head Office, is writing up the monitoring scheme with our first year's results.

Chris Pugsley
S&R Division

TWO NEW PUBLICATIONS

Department of Conservation Technical Series

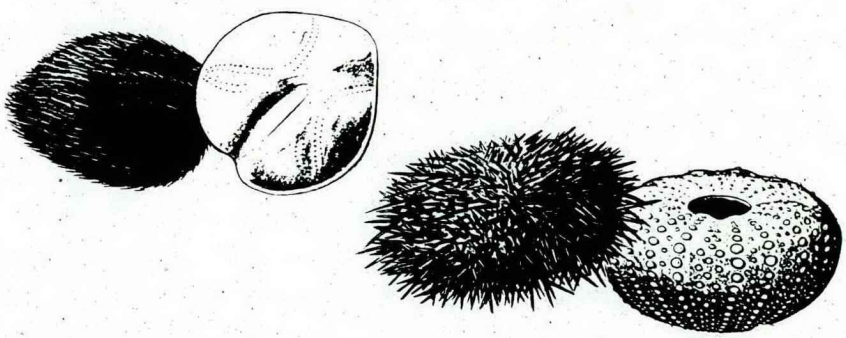
This new series will fill a long existing need as a place to publish technical and instruction guides, handbooks and reports. The first numbers include Ian Mackenzie's **Preparing instruction guides for publication in the Department of Conservation Technical Series**, and Martin Cawthorn's **Census and population estimation of Hooker's sea lion at the Auckland Islands, Decen.ber 1992-February 1994.**

Coming in the new year will be **The wasp control plan, Monitoring and control of mustelids,** and a new edition of **The bird banding guide.**

Ecological Management

No. 1, October 1993

The Threatened Species Unit is producing a journal of practical conservation management reports. Alan Tennison, the editor, hopes to put out two issues a year. The first issue, which came out in October, has been very favourably received. Our congratulations to Alan Tennyson and Alan Saunders.



Fiordland kina project

The Fiordland kina project in Dusky Sound is now at the stage of monitoring the effects of the experimental removal of urchins carried out last autumn at eight sets of paired sites. On the last two week field trip in August we saw a dramatic increase at the cleared sites in the number of young seaweeds, particularly the big browns (*Sargassum* and *Cystophora*). This was to be expected when you remove a major grazer. However the rate and successional changes as the seaweeds scramble to clothe the bare or coralline crusted rocks are not so predictable.

By monitoring the reaction to our 100% urchin "harvest" across over 50 species, which include a wide range of invertebrates, as well as rare and common seaweeds, we will also get an important look at how this remote and little studied coastal ecosystem functions. Our "control" sites are providing new data on the flora and fauna of Fiordland, including details on seasonal changes in species composition/ recruitment, habitat types, and variability within the Sound.

The study was initiated in response to the MAF concern that the environmental impacts, as well as the sustainability of the kina fishery were properly researched during the course of the three year experimental commercial kina fishery licensed by MAF. However, since starting this work last October, we have also gathered a wealth of new information on the subtidal marine community that fringes the heart of our largest World Heritage Area. There will also be important spill over effects on our understanding of how Marine Reserves work – our comparisons across the stark "kina removal" boundaries of the eight pairs of sites has parallels with the "no fish" boundary effects of a Marine Reserve.

Chris Pugsley
S&R Division

Wasp Impact Study

The attempt to measure impact of wasps on the native ecosystem as a basis for management strategies continues to lead us a merry dance. The basic experiment is to reduce the wasp population, measure the response in the bird and invertebrate populations and compare the results with non-poisoned areas. In the poisoned areas last season we measured significantly more insectivorous birds (tomtits, fantails, warblers, robins and riflemen). We have not had time to do the number-crunching yet for this season, but we did find that wasp densities were twice as high in the areas poisoned last year compared with those which had been left alone. This supports the prediction from the population model that low density in one year is followed by high density the next. (Gratifying though that is, it is most unhelpful for our experimental design of course). The mechanism for this compensatory response could be that queen quality is better in nests adjoining the poisoned areas because competition for food is reduced. Those high-quality queens then have more success in establishing nests the following Spring. This has important implications beyond the needs of our study: Managers controlling wasps with large-scale 1080 operations may be faced with even higher densities the following year. Queen

quality seems to be higher in parasitised nests too (see *Progress with Parasitoids*) so the whole question of how to manage wasps effectively remains very open.

We will continue with this experiment despite the problems. In the coming year we hope to get a very much better measure of invertebrates to mesh into the study of wasp diet on the one hand, and bird diet on the other. This study is partly funded by DoC.

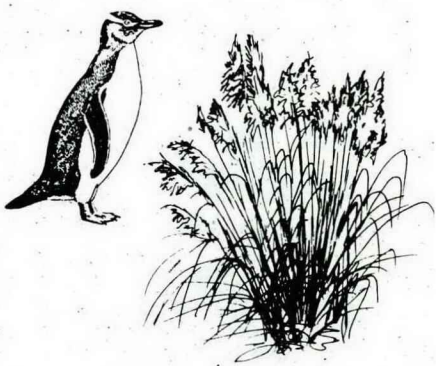
From "Wasp Times" August, 1993 published by Landcare Research

Yellow-eyed Penguins – How they make their living

Last summer S&R Division and Otago Conservancy conducted the second full field season investigating YEP marine-based activities. We have used radio-telemetry to estimate foraging ranges and activity patterns, taken diet samples and monitored breeding success. Fortunately at Otago Peninsula, the same 14 birds we radio-tracked last season were still present, so we were able to confirm that individuals show preferences for foraging areas. Three birds habitually moved a short distance down the coast or offshore and foraged in relatively shallow water (20–50 m deep). The other birds were more mid-range to offshore feeders, spreading out over the wide part of the continental shelf (50–70 m deep), generally <25 km from the breeding area but up to 57 km was estimated. The mean distance of all locations at sea was 16 km. There was less of a seasonal pattern of foraging movements than the previous season, although feeding patterns could change quickly, as shown by several birds feeding almost on the coastline for a number of days in October, presumably because of a change in food availability. Also, there were shorter incubation shifts (usually 1–2 days and up to 4 days, rather than the 3 day average in 1991/92). By the time birds had chicks they were taking shorter foraging trips of <24 hours.

Some exciting results came from our first use of dive-depth recorders (see ConScience 2 for a report). We used three recorders from Platypus Engineering (Australia) to get the first 3-D look at how YEP forage, and showed that as well as making travelling and mid-water dives they spend much of their time diving to or near the sea bottom to search for food; at Otago this was about 40–70 m, but even at the Catlins where the feeding areas v ere mostly 80–130 m deep, birds were diving to the bottom. **Murray Douglas** beavered away in Wellington writing a computer program to summarise the screeds of data produced (a depth record is taken every 5 seconds, most of the approx. 250 dives per day are 2–3 minutes in duration, and the recorder runs for about a week before the memory is full).

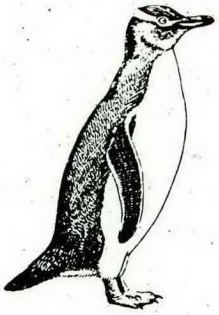
We have collected 185 diet samples from YEP since the study began in 1990/91, using a standard water-



flushing technique, followed by a replacement meal of fish fillets so that the birds don't go hungry. **Mike Wakelin** has had the meticulous job in the lab of sorting the samples and picking out identifiable remains, mostly the calcareous otoliths of the small fish which are the mainstay of the diet. Although 37 prey species or types were identified, 9 fish species and one squid made up 95% of the estimated weight and 67% of the prey number eaten. Opalfish, a bottom living species was the most important item on the menu. There were some individual differences too, for example most of the krill taken were by one particular bird.

There has been some respite for the YEP in recent seasons since the crash in January 1990, and the 1992/93 season was particularly successful in terms of nesting numbers and chick production. Most of the work is continuing, but as 1993/94 has been shaping up to be another reasonable season, we are holding off from intensive radio-tracking until a bad season allows us to find out what effects this has on foraging patterns and behaviour.

Peter Moore
S&R Division, Tory Street



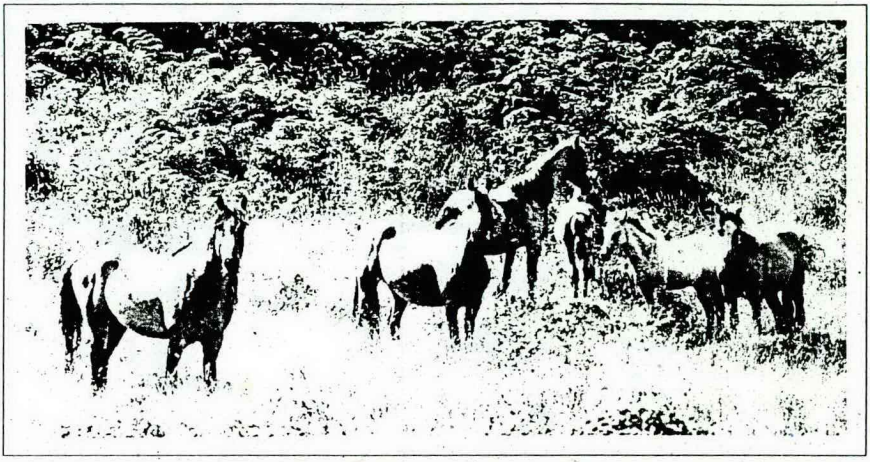
Feral horses

Alison Franklin has been conducting research on the feral horses in the Army Training Area east of Waiouru since March 1993. She is investigating aspects of the ecology of the horses, including reproduction, behaviour, and carrying capacity of the horse range. The Department of Conservation supports this study through Science Contracts.

The outcome of the 1992/93 horse breeding season was determined from data collected by field observations between March and June. The widely publicised muster at Queen's Birthday weekend also provided information about ages, physical wellbeing, and pregnancy rates. This information was presented at the Ecological Society conference in August.

The foal-to-adult ratio was 0.3, and this result was similar to that found in feral horse populations studied elsewhere, particularly the United States. The number of yearlings sighted was 67 compared with 203 foals and this suggested a high mortality in the first year of life. Blood samples collected during the muster showed that approximately 80% of mares sampled were pregnant at that time. Post mortem data showed that 76% of those mares were pregnant, and that they were aged between 2 and 11 years.

Home range data was presented as polygons drawn of the locations of re-sightings of known horse bands. Based on horse density, the predicted size of these polygons would be 152 hectares. The actual measured size was 45 hectares. Three positively identified bands have been re-sighted in the same area since March. This suggests a strong site attachment for some horses.



Population growth models were presented at the conference. In Geoff Rogers' paper (*N.Z. Journal of Ecology*, 1991), an exponential line was fitted to the aerial census data from previous years suggesting that the population was growing rapidly. Using the data collected since that time, including both the 1992 aerial census and the 1993 field observations, Alison plotted two more points on the graph. A logistic line was fitted to these points, suggesting that the population was approaching carrying capacity.

However, aerial census data and observations on foot are not directly comparable and so more census information would be required to show whether population growth was actually stabilising. In that time though, the muster has occurred and so it is impossible to know which model was the most appropriate.

This season, I am investigating time-activity budgets, reproductive success, and the movements of horses on a daily basis. The 1993/94 foaling season has begun and will be compared with previous results. Aging by dental wear of teeth removed from skeletons will provide some information about mortality. Exclosure cages are in place for the measurement of plant productivity in the absence of horse grazing. By combining this information with the daily energy requirements of the horses, the carrying capacity of part of the horse range will be estimated.

Alison Franklin
Department of Ecology
Massey University

NEW SCIENCE & RESEARCH PUBLICATIONS

REPORTS

Copies have been sent to all CAS, to librarians and to the Head Office library.

Lloyd, B. and Hackwell, K. 1993. **A trial to determine whether kaka consume carrot baits, Kapiti Island, May 1993.** *Science & Research Series No. 62.*

Carrot baits treated with a fluorescent biotracer were broadcast over c. 170 ha of forest. Kaka were caught and examined for traces. No tracer was observed in kaka droppings, but it occurred in many weka and rat droppings, and one pigeon and one robin dropping.

Mackenzie, I.W. 1993. **Preparing instruction guides for publication in the Department of Conservation Technical Series.** *Department of Conservation Technical Series No. 1.*

Gives hints on planning, writing, refereeing, editing, proof-reading, indexing and publishing instruction guides. Also lays out the various parameters for this new series.

Cawthorn, M. 1993. **Census and population estimation of Hooker's sea lion at the Auckland Islands, December 1992–February 1993.** *Department of Conservation Technical Series No. 2.*

A census was taken between 11 Dec. 1992 and 5 Feb. 1993. Several methods of counting were used at all rookeries and the most effective at each was selected as the standard for future use.

CONSERVATION ADVISORY SCIENCE NOTES

Copies have been sent to all CAS, to librarians and to the Head Office library. Further copies are available from Science Publications, at $1.50 per copy + GST and postage.

Mitchell, C., 1993. **Monitoring impacts of water abstraction from the Takahue River.** *Conservation Advisory Science Notes No. 52,* Dept. of Conservation, Wellington. 8p.

Miller, C., 1993. **Fire for conservation management of pakihi.** *Conservation Advisory Science Notes No. 51,* Dept. of Conservation, Wellington. 5p.

Robertson, C.J.R., 1993. **Timing of egg laying in the Royal Albatross (*Diomedea epomophora*) at Taiaroa Head 1937–1992.** *Conservation Advisory Science Notes No. 50,* Dept. of Conservation, Wellington. 8p.

Johnson, P.N., 1993. **Emerald Creek, Nenthorn: Botanical report on wetlands.** *Conservation Advisory Science Notes No. 49,* Dept. of Conservation, Wellington. 11p.

Robertson, C.J.R, and Richdale, L.E., 1993. **The breeding phenology of the Royal Albatross (*Diomedea epomophora sanfordi*) 1937–1974.** *Conservation Advisory Science Notes No. 48,* Dept. of Conservation, Wellington. 13p.

NEW CONTRACT REPORTS

LIMITED COPIES are available to DoC and conservancy libraries only. Please consult your librarian.

Hosking, G.P. 1993. **Application of airborne video to coastal resource inventory, PNA, and archaeological site surveys.** N.Z. Forest Research Institute Ltd, Rotorua. 25p.

This report is accompanied by a 30-minute video: "Airborne video demonstration" illustrating the evaluations in the text.

SCIENTIFIC PAPERS

(With the permission of the copyright holders.) LIMITED DISTRIBUTION to DoC libraries and CAS!

Robertson, H.A., Hay, J.R., and Saul, E.K. 1993. **Age and sex determination of kakerori *Pomarea dimidiata*.** *Notornis* 40: 179–187.

SEASON'S GREETINGS

CONSERVATION
TE PAPA ATAWHAI

PO BOX 10-420, WELLINGTON, NEW ZEALAND