THE CONSERVATION OF WATERBIRDS AND THEIR HABITAT IN NEW ZEALAND

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Author's Foreword

THIS brief account of one of New Zealand's big wildlife problems was prepared in 1957 as a submission to the Soil Conservation and Rivers Control Council by the Department of Internal Affairs. Its purpose was to introduce a subject fraught with vital consequences for waterbirds, particularly waterfowl, and the sport of game shooting in New Zealand.

After being received by the Council, it was suggested that an outline of this conservation problem be prepared as a pamphlet for distribution to a wider audience.

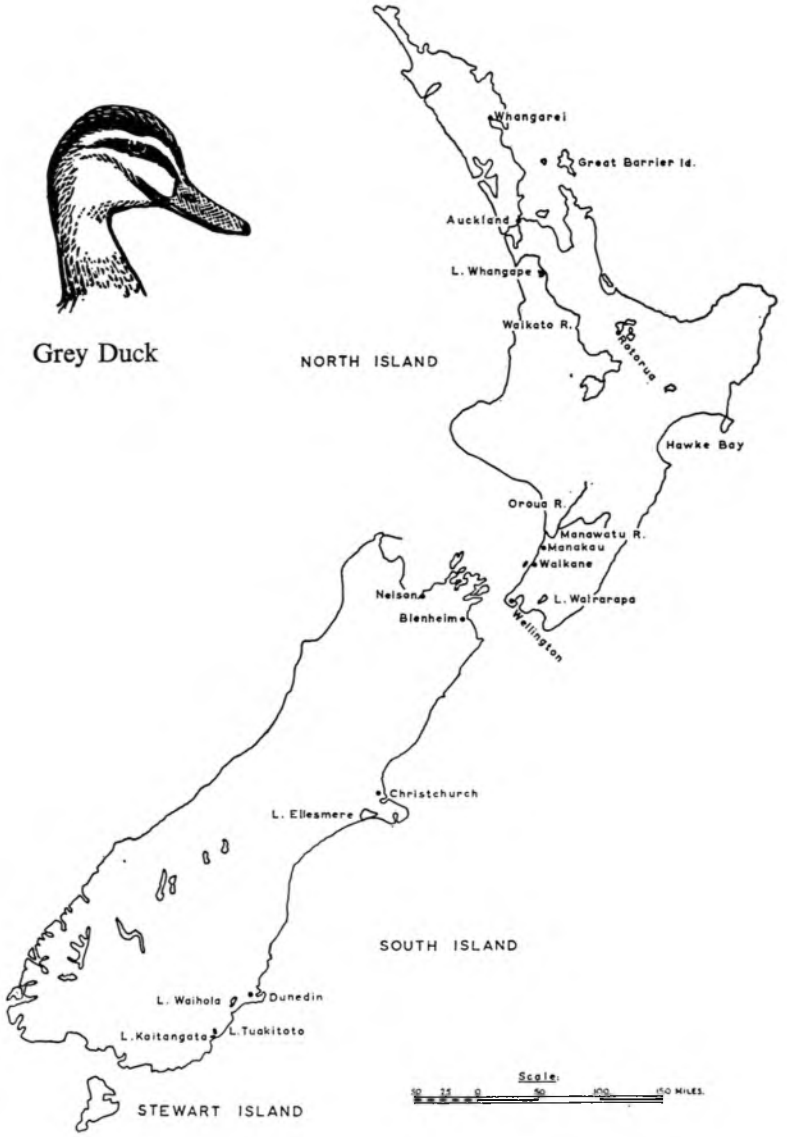
My thanks for helpful discussions are due to the Controller of the Wildlife Branch, Mr. H. D. Kelly, Mr. T. H. F. Nevins of the Soil Conservation and Rivers Control Council, and to my colleague, Mr. K. H. Miers.

Introduction

With the variety of habitats utilised by some species of birds at varying times of the year the term " waterbird " needs to be treated with elasticity. " Waterbird " here is meant to cover those species which are entirely or to a great degree dependent on areas of still fresh water whether large or small, e.g., lakes, lagoons or ponds, or whether there be free water merely interspersed amongst vegetation, e.g., swamps, or whether the ground surface is merely damp or wet.

Commonly, people think of these areas as being the haunt of only a few ducks, but let us exclude the classes of birds known as sea and shore birds, those species known only as stragglers to New Zealand, and those generally regarded as extinct. Having made these deletions in the North and South Islands, the waterbirds found in this particular habitat form nearly one-third of the number of remaining species. They therefore constitute an important segment of the country's avifauna and consist of the following:—

Two grebes, two herons, Royal Spoonbill (*Platalea leucorodia regia*), Bittern (*Botaurus stellaris poiciloptilus*), four shags, Canada Goose (*Branta c. canadensis*), two swans, seven ducks, a rail, two crakes, Pukeko (*Porphyris porphyris melanotus*), two stilts, two fern birds, with the possible addition of the Cape Barren Goose (*Cereopsis novaehollandiae*). One further species, the White-eyed Duck (*Aythya a. australis*), vanished from the fauna, probably through injudicious shooting, before 1900.



From Past to Present Times

Primitive New Zealand was well supplied with this type of habitat and early reports indicate a widespread abundance of waterbirds. As was to be expected, and indeed was inevitable as a necessary step in settlement, swamp drainage was one of the earliest forms of land development. Balham in "Grey and Mallard Ducks in the Manawatu 1952" graphically portrays the ecological changes in this rich farming district. Sixty-thousand acres of swamp in the lower reaches of the Manawatu and Oroua Rivers in 1890 was reduced to one thousand acres of undeveloped swamp by 1949. Commenting

on Grey Duck (*Anas s. superciliosa*), he said that while it had adapted itself to the changed environment it had suffered to an unknown extent through loss of the indigenous vegetation. The district's carrying capacity for waterfowl had been reduced, firstly through loss of water by drainage; secondly through replacement of swamp vegetation by the close green turf typical of stock grazing areas. While much of the original food supply had been destroyed another in the form of grasses, grain and weed seeds had appeared.

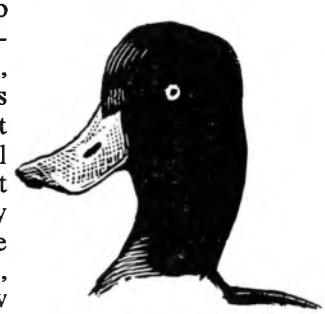
The relative numbers of the duck species present in 1949 was held to be mainly determined by the suitability of each species for the new environment. The formerly common Brown Duck (*Anas aucklandica chlorotis*) had disappeared entirely. The New Zealand Shoveler (*Anas rhynchotis variegata*) never plentiful, remained in small numbers but had not been able to utilise new foods due to its specialised feeding habits. The Grey Duck, undoubtedly affected by change, had survived by reason of some ability to adapt itself to new feeding and nesting conditions. During this development, the Mallard (*Anas p. platyrhynchos*) had been established.

While this relates to the Manawatu area, by and large it depicts a story not uncommon over many parts of the country. It is of course absurd to suggest that swamp drainage should not be undertaken. What is of concern is the preservation, as widely distributed as possible, of limited areas of waterfowl habitat, especially shallow open waters. The heyday of waterfowl has inevitably departed; can we not stop before elimination?

Black Swan (*Cygnus atratus*) and Canada Geese on being introduced found suitable niches in the environment. They have become established where conditions are favourable, the former species in both Islands, and the latter in the South Island. Paradise Duck (*Tadorna variegata*) in the North Island has extended its range, apparently owing to favourable changes in the habitat, e.g., from bush lands to grass lands. Other species of waterbirds similarly show a varying reaction to changed conditions. Some have been able to adapt themselves to the changing environment, while others only persist where the habitat basically has been little altered.

Present Status of Protected and Game Species of Waterfowl

One of the eight species of duck in New Zealand, the Blue or Mountain Duck (*Hymenolaimus malacorhynchos*), was not included in waterbirds as here used because it has always been restricted to fast flowing water. The Brown Duck, once widespread, now survives in a very few areas only, e.g., Great Barrier Island, perhaps half a dozen places in the North Auckland Peninsula, and Stewart Island. The New Zealand Scaup or Black Teal (*Aythya novae-seelandiae*) is more widespread but its range and numbers have both been drastically reduced. It has recently shown signs of increase and spread in a few areas where conditions suit it, e.g., on the habitat provided by some of the new Waikato hydro lakes. The Grey Teal (*Anas gibberifrons gracilis*) never widespread, and always few in numbers still has a very limited distribution. In a few suitable small



New Zealand Scaup

areas there are remnants of primitive swamp, it does show signs of increase. These four species have been absolutely protected for many years, New Zealand Scaup being the last species to receive protection in 1934. The introduced Mute or White Swan (*Cygnus olor*) is also protected.

Apart from Pheasants (*Phasianus colchicus*), quail and Chukar (*Alectrios graeca chukar*), which are absent from large parts of the country, there are seven species left for sportsmen. These are Grey Duck, Mallard, Paradise Duck, Shoveler, Pukeko, Black Swan and Canada Goose. As a contrast to New Zealand conditions the Waterfowl Hunters' Guide issued by the Canadian Wildlife Service lists forty-three species of swan, goose, duck, gallinule, coot and rail. Of these only two swans and one goose are entirely protected. The Pukeko, as with rails in other countries, is not highly prized by sportsmen. Paradise Duck, despite an extension of range in parts of the North Island, is still not generally available to sportsmen. The Shoveler, always restricted in distribution remains so, and only in a few restricted areas does it form any significant portion of the game bag.

Black Swan, in general, are restricted to large shallow water areas, whether fresh or brackish, carrying extensive beds of aquatic plants. For many years they were not utilised greatly but in some districts now they are much more widely utilised than formerly as ducks available become more scarce. Canada Geese, found in large numbers between Otago and North Canterbury, have not been utilised to any extent owing to the difficulty in stalking the birds, with the result that they have had to be regarded as pests. Recently appropriate aids and hunting methods have been imported. These include decoys, the use of goose calls and records on which to train hunters in their use. These introductions indicate that this species, with a greatly increased kill by sportsmen, eventually could become an important game species here as it is in North America.

The two remaining species, the native Grey Duck and the introduced Mallard, have a wide distribution between them and form New Zealand's two main game species. It is upon their survival in worthwhile numbers that the average sportsman depends for his shooting. Broadly speaking, in the eastern part of the South Island from Southland to North Canterbury, the Mallard now predominates over the Grey, as it does in the Wellington and Hawkes Bay districts. Elsewhere, the Grey Duck still provides the bulk of sportsmen's bags.

While it is a moot point as to whether or not it was a wise thing to establish the Mallard, this species is here to stay. Banding records have shown that there is a differential rate of kill between the two species which favours the Mallard's survival. Policy now is to discourage further establishment of the Mallard while research seeks out what is essential for the management of each species. While the Mallard appears to flourish more in improved farming districts than under conditions of primitive vegetation and the Grey Duck the reverse, it is not as easy as this. There are too many cases where this easy distinction does not wholly apply. The Grey Duck and its allied sub-species spread over much of the Pacific largely takes the place there of the Mallard in the Northern Hemisphere. They are closely allied species with similar habits. As far as we know, basic habitat requirements are similar but certainly not identical. At least, they both require shallow water areas for survival.

Decreasing Habitats versus Increasing Sportsmen—a History of Increasing Restrictions and their Limitations

While duck habitat has drastically decreased in extent, numbers of shooters have increased. Decrease in habitat results in an increasing concentration of birds and shooters on remaining areas, thus accentuating kill. This decrease in general habitat is paralleled by similar effects on wildlife refuges. In a review of wildlife refuges under way over the last three years, over half of the areas which have had to be revoked or substantially altered in area are those which have been affected by drainage or land reclamation. Of 116 refuges classified as water areas 16 have been thus affected over the last 25 years.

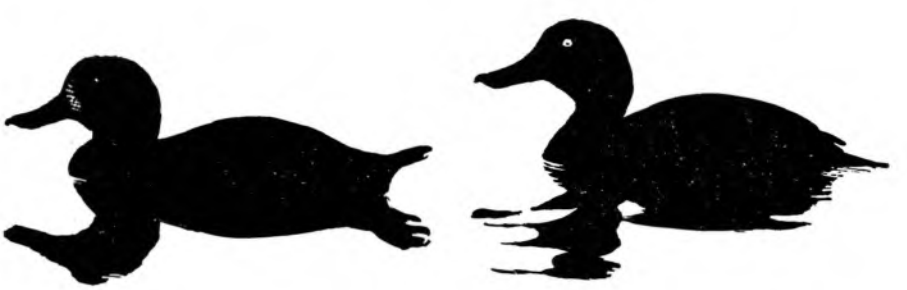
As property owners may shoot without licences we cannot establish the true number of shooters, but those shooting under licence have grown from less than 9,000 in 1932 to 21,000 in 1948, and to just on 25,500 in 1956. To this number must be added the large number of property owners who shoot on their properties without a licence. At present there appear to be some 30,000 game shooters in the country.

The rise in the number of licences follows the general increase in population but such matters as the long weekend, more availability of motor cars, better road access and a more general prosperity of the community all play their part. In common with other countries, having the ills as well as the benefits of Western technical civilization, shooting provides some relaxation from the ties and stresses of that civilization and its material progress. We can, therefore, expect an increase in demand on a decreasing resource seriously threatened by a still further lessened area of habitat already greatly reduced in extent.

This problem of an increasing number of sportsmen against a background of shrinking habitat and decreasing numbers of birds, has in New Zealand, as in America, been tackled first of all on a basis of restriction. Restrictions applying in New Zealand for the 1932 open game season contrasted with those pertaining in 1956 are illuminating:—

	1932	1956
Bag Limits Grey or Shoveler	5 } 25	5-10
Mallard	6 }	6-15
Length of Season	60-90 days	16-31 days
No. of decoys allowed	15-25	0-10

Limits vary in different districts.



In 1932 shooting on the water was permitted, feeding allowed, and the restriction of two shots only per automatic gun was easily evaded.

In 1956 shooting on the water was prohibited, feeding was not allowed, except by a Minister's special consent in six out of twenty-seven districts, and the restriction to two shots per automatic gun more easily enforced.

These restrictions are the ones in which there has been marked change. Other restrictions in general remained the same. Research work (commenced in 1948) has, from the return of bands, indicated that there is some widespread movement of Grey Duck. This has supported the decision of a New Zealand wide bag limit of ten as a maximum for Grey and Shoveler. An analysis of the banding carried out over seven years, which is now in progress, shows a big kill of Grey Duck, almost the largest proportional kill known anywhere in the world where this kind of research has been carried out. Owing to the difficulty when shooting of distinguishing between Mallard and Grey, and the development of hybrids between the two species, a bigger differential bag limit between Grey and Mallard, which might be considered as a further conservation measure, may not be fully effective. The analysis also indicates such a large proportion of the season's kill being taken on the opening weekend that any further decrease in the length of the shooting season is unlikely to be of any great value.

The restrictions generally have served conservation purposes, although not entirely. Indeed, it could be held that prohibition of shooting on the water may have a reverse effect owing to an increase in wounded birds which are not recovered for the bag as compared with birds killed on the water and recovered. One manner in which the loss may be reduced is by the use of a gun dog to retrieve downed birds. Desirable as this is, restrictions imposed to date are so drastic that many shooters naturally hesitate to keep a gun dog forty-eight weeks of the year for work during four weeks.

Enforcement of Restrictions will always be Difficult

At present restrictions are reasonably enforced in some districts with laxity in others. In these latter districts there are rumours of over-the-limit bags being common on the opening weekend. Efforts are steadily being made to bring about an improvement in law enforcement, both as regards stipendiary and honorary officers, but enforcement of the law can never be anywhere near 100 per cent effective. At present, there are only approximately thirty stipendary officers available to cover the whole country. Even envisaging an increase in this number the total likely to be able to be employed from existing sources of revenue will still not make 100 per cent law enforcement possible. It is doubtful if any further restrictions would be more effective without a much greater increase in facilities for enforcement, which is unlikely.

Other Efforts at Management

Besides restrictions, other devices in the past have been considered in an effort to preserve a head of waterfowl for sport. These include the attempted control of predators, such as stoats and hawks; the breeding of Mallard and their liberation, and the introduction of new species. In brief, each of these devices comes up against the limitations of habitat. Provided

habitat is in good heart predators are held to be unlikely to adversely affect the stocks. If it is not, such control is likely to be both costly and ineffective. The further breeding and liberation of Mallard is being discouraged. It is considered inadvisable where they are not already established because it tends to replace a Grey population with a Mallard population, the habitat remaining the same, and as being unnecessary where Mallard are already established. The introduction of further new species is held to be unwise, owing to possible effects on existing species, especially as a habitat by its limitations will control duck carrying capacity.

The Modern Approach to Management

Modern ideas of game management, as evolved in North America, point to the habitat as the key factor on which waterbird numbers depend, and envisage, as far as game species are concerned, the taking of a yearly maximum crop. Research work in New Zealand has provided some information on which to base game management and continuation of banding is planned. Other aspects will be opened up as work proceeds, but it will be many years before we know the detailed habitat requirements of our game ducks, let alone other waterbirds, dependent as these requirements are on the life histories of the various species, their food and other habits. In the meantime results of work done overseas, especially in North America, can be utilized by trial and experimentation under New Zealand conditions. We can also utilise in suitable cases the end result of New Zealand experience where results have been successful, although we may not be able to isolate the individual factors responsible for that success. As with soil conservation, a new approach, a new class of work is now evolving—game management by management of habitat.

A professional Game Management Officer (Mr. K. H. Miers) has recently been appointed to the staff of the Wildlife Branch. He will be given the assistance of two other professional officers as the work develops. Important aspects of their work will include advisory services on the construction of artificial duck waters and the regeneration of old waters gone out of use through the natural succession of vegetation, including here such aids as swamp blasting and manipulation of water levels. Liaison with technical officers in other government departments and organisations will be equally important, especially with those organisations having responsibilities for development and utilisation of land, vegetation and water resources.

Further Action Taken

In addition to the above activities, the Wildlife Branch has made a pilot survey and inventory of wet lands in the Marlborough, Nelson, West Coast and Westland Acclimatisation districts; this is still proceeding in the Southern Lakes and Rotorua Acclimatisation districts. A biologist (Dr. R. W. Balham) was assisted in a four year's post graduate course in wildlife managament in America, and has since returned to New Zealand. Representations some years ago were made by the Minister of Internal Affairs to the Minister of Works requesting consideration for wildlife interests when planning drainage projects. Although the reply given was favourable, we have had no evidence in any case of this having been done.

The dangers of the Grey-Mallard differential kill have been pointed out to acclimatisation societies, and a recommendation made to discourage liberations of Mallards in fresh areas. An article has been published, " Farm Ponds to Increase Wild Ducks," in the June, 1957, issue of " The New Zealand Journal of Agriculture." The North Canterbury Acclimatisation Society recently issued a pamphlet entitled " Grey Duck Rehabilitation " which stresses the habitat needs of this species for distribution to farmers and others. To assist in the preservation of protected waterbirds a booklet on the identification of this class of bird is in production, while a further booklet on techniques of making artificial duck waters is expected to be published within twelve months. Resulting from suggestions made by officers of the Wildlife Branch, a preliminary trial of swamp blasting has been carried out.

Under the Town and Country Planning Act, all local authorities have to prepare planning schemes for their areas. Advantage has been taken of notifications sent out by the district officers of the Ministry of Works, regarding the various planning schemes. By this means, local bodies are being informed as to the value of shallow water areas, the need to preserve them and for reference to be made in their plans to this end. In addition, more specific attention is being drawn to the need for preservation of wildlife refuges and closed game areas of this type.

Negotiations have commenced with the Lands and Survey Department for the control and development of a swamp reserve on the shores of Lake Ellesmere; also, for another area at Tuamarina, near Blenheim. In the latter case, the Catchment Board has been informed of the Department's interests in the area. Enquiries have been made from the Lands and Survey Department, both direct, and through the Minister of Internal Affairs, regarding the Lake Ellesmere reclamation scheme, to enable a submission on behalf of wildlife conservation interests to be put forward. Representations were made to the Soil Conservation Council and the Manawatu Catchment Board relative to the proposed drainage of a useful lagoon at Waikanae.

Not Only For Sportsmen

Shallow water areas provide sport for some 30,000 sportsmen, while members of specialised organisations such as the Ornithological Society, the Forest and Bird Protection Society and scientific organisations find recreation, special interest and study value in such areas. The membership of these groups runs into several thousands. For example, the Ornithological Society alone has 750 members. Apart from these people with a special interest, there is the citizen who finds pleasure in seeing such birds about, or enjoys recreation in places enlivened by their presence. It was not for nothing that Crosbie Morrison's wildlife broadcasts continued for such a very long time. There is widespread public interest in such matters, even if it is not very vocal, active or well informed. Judging from more highly developed countries overseas, as the population grows and habitat shrinks, remaining areas will become yet more highly prized and interest quickened.

Limitations to the Value of Existing Water Areas and Reserves

While New Zealand has numerous lakes, many of these are in the mountains, and especially with the ones which fill glaciated troughs, they

provide very restricted areas of shallow water. It is fertile, shallow water that supports high populations of waterbirds, especially the bulk of the waterfowl. Frequently where lakes have been specially protected by reservation, it is the main body of water only which has been reserved. The wet lands adjoining, which are valuable for feeding and nesting, have been allowed to deteriorate or have been actively destroyed. Many lakes, by reason of the nature of the soil beneath, or of the lands adjoining, or for other reasons, are not fertile waters. To this class belong many of the lakes and lagoons of the Waikato area where waterfowl usage of acid waters may vary from no use at all to moderate use only. Such relatively unfertile lakes serve some purpose, perhaps for flocking, refuge and shooting purposes, but are of little avail for food and nesting. These areas contrast strikingly with the use by perhaps 30,000 head of waterfowl of the fertile Lake Whangape of that district.

While we have many scenic reserves, forest reserves and national parks, there has been little conscious effort to preserve reasonable areas of wet lands. As in the days when forest covered much of the country and it was considered a useless hindrance to the use of the soil beneath, so, too, today there is a similar attitude to wet lands and shallow waters in the low country. The few limited areas being used for flax plantations are perhaps an exception. While this attitude still remains, it is a fact that in many districts such areas have now almost entirely vanished. This type of area is in effect a natural resource, a part of our national heritage, which should be conserved to, at least, some small degree, not just subjected to unlimited exploitation until the stage is reached when there is nothing left to exploit.

The Effects of All Out Drainage

Is it wise to drain all wet areas in a district, together with shallow lagoons and ponds? The value of the community of these areas has been mentioned. There are surely also farming values in times of drought, and rarely in any year is there some part of New Zealand which is not adversely affected by summer dryness. One has only to visit a property on which there is a good duck water, whether natural or artificial, to realise the big part it plays in the lives of the occupier and his family. Is it going to be a good thing to have a richly pastured countryside literally drained of much of the natural interest which helps to make life in the country more satisfying than life in the city; one of the big sporting, recreational and aesthetic assets eliminated? Again, drainage does not always result in good pastoral farmlands. Admittedly, slow moving drainage canals on the sites of drained lagoons or swamps provide free water of value to two or three species of ducks, if some aquatic and marginal growth of vegetation is permitted, but the overall effect on waterbirds is drastic.

Artificial Pond Making Is Not Enough

At the time when local interests are often urging drainage of shallow water areas and wet lands and this is being accelerated by the dragline programmes of catchment boards, the Department of Internal Affairs and acclimatisation societies are about to commence a programme for the making of artificial waters and the rejuvenation of old swamps. Already, apart from some individual farmers, at least four acclimatisation societies have expended

or are expending sums of money from their limited funds, derived from licence revenues, in either building or encouraging the building of artificial waters. In addition, the North Island and South Island Councils of Acclimatisation Societies have been able to build up funds from licence holders to subsidise this class of work. While this is all to the good, it is still necessary for this to be backed by some provision for the preservation of a reasonable number of limited areas of fertile, shallow waters and wet land. Otherwise, this work will be largely of no avail.

The artificial waters planned want to be something better than normal stock ponds, and need to have gently shelving banks and provide the greatest amount of shallow water under three feet. As far as maximum value to waterfowl is concerned, this sets them apart to some extent from fish ponds which actually require deeper water. So, too, with farm water storage ponds aiming at depths of five feet or more, or those being built to take the crest off flash floods. Nevertheless, in the former two classes some suitable modification should be possible in favour of waterfowl without unduly detracting from the efficiency of the main objective.

A Suggested Modification of Policy

The remnants of a natural resource, a part of the country's heritage, is rapidly being liquidated with no thought as to its wildlife value in its many facets, as compared with the economic values of the land beneath the water and its possible production in pounds of butterfat and wool. There is need for some modification of existing policy if something worthwhile is to be preserved for future generations. It is, therefore, suggested that the Soil Conservation and Rivers Control Council should declare that reasonably fertile shallow waters and wet lands generally have some wildlife values. These values are apart from the land beneath and lie in preserving a large section of the country avifauna, which provides sport, recreational, educational, scientific and aesthetic interest to many thousands of the country's population.

In the preparation and approval of schemes for the drainage or reclamation of such areas, full and careful consideration should be given to those values, as well as to the economic value of the resultant land beneath. Again such areas should not be destroyed except for very good reasons. If, after full enquiry, a scheme has to proceed, every endeavour should be made in conjunction with the Wildlife Branch to retain small areas in water or as wet lands so that a district is not denuded entirely of its shallow water and wet land assets.

Conclusion

Such instances as the lagoon at Waikanae already mentioned, proposals affecting Lake Wairarapa and adjacent lagoons, Lake Ellesmere, Waihola and Waipori; the recent almost complete drainage of Lakes Tuakitoto and Kaitangata; the formation of the Waikato Valley Authority and the proposed formation of a North Auckland Catchment Board all stress the feeling of urgency which has impelled the preparation of this statement. Acclimatisation societies are ill equipped with resources or staff to act in a liaison capacity with drainage and development authorities. This is one of the main reasons for the setting up of a specialised section of the Wildlife Branch to assist in bridging this gap.

From the viewpoint of wildlife conservation, it is highly desirable that suitable arrangements be developed whereby government departments and catchment boards, in the early planning stages of development schemes affecting shallow waters or wet lands, consult with the Wildlife Branch of the Department of Internal Affairs on behalf of wildlife conservation interests. The Department of Internal Affairs welcomes any suggestions aimed at setting up suitable liaison on a practical and effective basis between the Wildlife Branch and the Soil Conservation and Rivers Control Council, departments engaged on land and power development, and catchment and land drainage boards, in order to give a satisfactory degree of protection to the wildlife interests for which the Wildlife Branch is responsible under the Wildlife Act, 1953.

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