

FISHERIES AND WILDLIFE

FISHERIES AND WILDLIFE IN VICTORIA

Fisheries and Wildlife Division

Introduction

Conservation of Victorian fisheries and wildlife requires the management of widely diverse species and the habitats which support them. With sound management goes the research upon which it is based. Consequently the responsible authority, the Fisheries and Wildlife Division of the Victorian Ministry for Conservation, deploys its resources according to priorities prompted by the intrinsic value of the State's fauna and the recreational and commercial needs of the community.

Until the 1940s, fisheries and wildlife activities in Victoria were mainly restricted to limited enforcement programmes and the stocking of streams and lakes with trout. Before Federation the functions were the responsibility of the Department of Trade and Customs, and after 1901 they were transferred to the Department of Public Works. In 1909, the activities were taken over by the Department of Agriculture, and in 1913 a Fisheries and Game Branch was formed, under the control of the Chief Secretary. In 1933, a 50 cent trout licence was introduced and by 1940 the Branch had an annual budget of \$21,000.

The development of a research and management organisation began in the 1940s. By 1952, the Branch had a staff of 40 with a budget of \$82,000, \$5,000 of which was spent on research. Research into ducks resulted in a \$2 game licence being introduced in 1959.

In January 1973, the Ministry of Conservation was formed, and the functions and the Branch became the Fisheries and Wildlife Division in the new Ministry. By then there were 250 people on the staff and half of the \$1.8m budget was spent on research.

Research

Conservation research had become a most important function in 1973 and there were 18 scientific officers and 45 support staff in the Marine Pollution Section of the new Division. Early in 1978, this section was transferred to the Ministry itself in order to join a newly formed Marine Studies Group. In spite of this reduction in staff, the Division's permanent and exempt establishment numbered 287 by mid 1978 and was supported by a budget of \$5m. Research also covered a variety of other fields including commercial marine fishing, inland stream and lake stocking, and fauna control and environmental studies.

The fauna of Victoria, the fishes, mammals, and birds, can be considered in two categories. The first category comprises the species which have special value in so far as they form part of the unique ecosystem of the continent and which, because of environmental changes, require skilled management of their populations if they are to be maintained. The majority of native freshwater fishes, many of the marsupials, and some birds fall into this category.

The second category contains those species which because of their abundance and capacity for survival are available for food or provide recreation for the community. Examples are large numbers of fish species, mostly sea water types, ducks, quail, and deer.

Current wildlife research studies

A survey and classification of wetlands of Victoria is now in progress. Although this work has strong links with game management objectives, its significance is much greater because for the first time inland waters are being related to wildlife survival. From the results it may be possible to draw up a list of priorities for conservation on the basis of their value to many species beyond those of game interest.

Similarly, a general survey of the distribution and abundance of animals and birds in Victoria is a long-term undertaking which will provide the basic information for which future changes in the status of wildlife can be measured.

To accelerate the gathering of information about species requiring urgent attention, the Division has funded and supervised a number of projects being undertaken by universities and other organisations. One project is being carried out at Yellingbo Swamp on the helmeted honeyeater, while in other parts of the State the peregrine falcon is being studied. The latter has a declining world-wide population, apparently as a result of the effect of pesticides which reduce the strength of its egg shell.

Another co-operative study concerning the ecology is that on native rodents which will lead to a better understanding of their susceptibility to fire in heathland. In the forest environment it is hoped that some of the detrimental effects of commercial forestry on native animals may be reduced by a programme developing artificial lair and nest boxes.

Liaison with service groups

In its wildlife studies, the Division has continued to assist various government and private organisations. Groups such as the Bird Observers Club, the Victorian Field and Game Association, and the Victorian National Parks Association have benefited from Divisional participation. Amongst the Government authorities are the State Rivers and Water Supply Commission, the Forests Commission, the National Parks Service, the Town and Country Planning Board, the Country Roads Board, and the State Electricity Commission.

Wildlife management

Historically most wildlife management and research in Victoria has been oriented towards game or pest control. Work of this nature is continuing, but in recent years the need to undertake other kinds of research has been recognised. This additional requirement has been related to a general community interest in conservation.

At one time, control of wild animal pests in agriculture and forestry involved exploring techniques of removing as many of the offenders as quickly and cheaply as possible. This older approach has gradually evolved into the specialised management of wildlife which requires the basic understanding of the ecology of each species, its relationship with other species, and the use of that knowledge as a basis for control. The control of rabbits by myxomatosis is an example. Studies of native fauna in Australian universities have influenced this change in approach and the knowledge gained has been of great value to the wildlife manager.

Research undertaken by the Fisheries and Wildlife Division is now oriented towards providing a better basis for management decisions. Programmes are now increasingly directed towards conservation, although the long established monitoring of duck and seal populations will continue, even if on a smaller scale.

Research, which has long-term objectives, or objectives which are difficult to define, does not easily attract the necessary funds. This type of research contrasts with that in which short-term objectives have popular appeal. Recently, government support has been made available for a number of such longer-term projects which would not have previously attracted financial assistance.

Reserves management

Fish and wildlife require a congenial environment if they are to thrive, or in some cases even survive. Therefore, to offset ever increasing demands made by an expanding human population, areas reserved for the natural propagation and maintenance of fauna and fish must be adequate. In order to be self sufficient, the Division's policy is directed to making reserves large and free from undesirable influences exerted on them by surrounding land which may be used for agricultural or other purposes. A continuing land purchase programme is in operation.

Reserves which have been proclaimed or purchased now number 58 and cover about 57,000 hectares. More than 8,000 hectares have been added since 1958 and the Division is continuing to establish and consolidate the habitat of wildlife throughout Victoria by purchasing land and recommending additions to the existing sanctuaries to form wildlife management co-operative areas. The Land Conservation Council has made final recommendations involving an additional 47 reserves of about 35,000 hectares in total area.

Wildlife habitat on reserves and other Crown land is either restored to the natural regime or maintained by the replanting of vegetation, installing water control structures, and sometimes by releasing wildlife formerly present in the area. Koalas are regularly captured and relocated, and emus and magpie geese have been re-introduced into areas around Puckapunyal and Sale Common, respectively. Rare species are propagated at the Division's Wildlife Research Station near Lara. In the animal world a similar project is being carried out for hog deer. The deer are trapped on Snake Island near Corner Inlet and transferred to the Dutson Downs-Lake Reeve region of Gippsland.

Monitoring habitat

Visual observation often indicates that physical interference has affected the indigenous animal inhabitants unfavourably. Such interference may be much less apparent and sometimes insidious.

However, as the cost of monitoring and thereby forecasting threats to all of Victoria's habitats is excessive, corrective action can often only be taken after an adverse effect on land or water is observed on the animal or fish populations; this is usually indicated by an increase in the number of fish or animal deaths or by an easily detectable decline in numbers.

Lake Burrumbete near Ballarat was the subject of investigation after excessive input of pollutants into the lake was first indicated by the production of dense masses of algae which caused the death of fish and livestock. Similar signs in the Gippsland Lakes have led to a comprehensive study of the lake system. This will incorporate investigations of water movement, inventories of aquatic and land species, and basic measurements of productivity, all of which are essential to the development of effective conservation policies and management techniques.

Fisheries management

The practical management of fisheries in Victoria is complex in the freshwater environment. Water, because of its susceptibility to physical and chemical influence, plays an important role in determining the range and density of fish populations. In the sea the primary concern is the continued adequate yield of fish for either the fishing industry and recreation, or both.

Victoria's commercial fisheries provide about 16,000 tonnes of fish worth around \$9m annually and thus considerable research and management is directed towards this industry. The Division is also aware of the importance of the recreational demands on the estuarine and inshore fish stocks. Some of the salt water species of primary importance to the fresh fish market (which constitutes about 17 per cent of the total Victorian catch) are also sought by anglers. Snapper, whiting, and flounder are examples, and in the case of snapper it is estimated that the quantity of the commercial catch is matched by that taken by amateur fishermen.

Unlike the recreational fishermen of the inland lakes and streams, those amateurs who fish the bays and coastal waters of Victoria do not contribute to the special research and development trust funds partly financed from licence fees. Because of this, money set aside for marine fisheries investigations is mainly directed towards commercial fisheries, which make a contribution through substantial licence payments.

The unrestricted exploitation of natural resources often results in irreparable damage being done to the resource itself with the consequent unfavourable effects ultimately being passed on to the exploiter and the community at large. Many of Victoria's fisheries are, therefore, subject to controls which limit exploitation by imposing ceilings on either the number of fishermen or the number of boats licenced and the quantity of fishing gear which may be used.

The licensing provisions of the Fisheries Act are, therefore, particularly important in the process of management of the fisheries. They establish the Director's prerogative, on the recommendation of the Commercial Fisheries Licensing Panel and the Fisheries Management Committee, to grant or refuse an application for a licence. Such decisions are within the context of "having regard to the welfare of the fishery concerned as well as the persons engaged in the industry". During the year, limited-entry status was afforded the non-culture segment of the eel fishery and certain of the bay and inlet scale fish fisheries. Previously licence limitation had been applied to the scallop, abalone, lobster, and some bay and inlet fisheries.

As well as maintaining research and monitoring studies on the State's established fisheries, the Division has directed attention to the development of hitherto unexploited resources. Intermittently since 1975-76, the Division has operated its research vessel in the west of Victoria with the aim of establishing an offshore trawl fishery adjacent to Portland. This work initially involved surveys of the seabed to determine suitable conditions for trawling and later led to the vessel being engaged, early in 1977, in simulated commercial trawling together with the vessel chartered by the Commonwealth Government. The results obtained were sufficiently encouraging to attract commercial interests, and participation in this fishery is now growing. The trawling ground so far discovered is in waters of from 300 to 400 metres deep and covers almost 300 square nautical miles. It is expected that the fishery will shortly support from 10 to 20 moderately large trawlers which will be based in Portland.

A major task completed during 1978 was the computerisation of the issue and renewal of commercial fishing licences. Apart from simplifying the storage and retrieval of licensing data it has meant that accurate up-to-date lists of licence holders can be prepared.

Fisheries extension work

Traditionally, extension or advisory work has been one of the duties of the Fisheries and Wildlife officers of the Field Operations Section. To a large extent this function remains, particularly in relation to advice on fisheries laws, licensing, and general information about the activities of the Division. Recently the Division's extension capability was strengthened by the employment of two liaison officers specifically appointed to assist with the management and development of commercial fisheries.

The role of these officers is to communicate to fishermen results of research conducted both by the Division and other agencies, and assist them in understanding the principles involved in fisheries management and the development of new techniques for improving their efficiency and that of Victoria's fisheries. Conversely, the liaison officers provide an effective channel by which the views of fishermen are conveyed to the Division. Apart from making individual contacts with men in the industry, the officers organise seminars at fishing ports which discuss papers presented by both government and industry. They have also been responsible for the planning and publication of a quarterly *Fisheries Newsletter* which is designed to keep the industry advised of research development and management activities relevant to commercial fisheries in Victoria.

The following table shows certain particulars about the fishing industry in Victoria for the years 1972-73 to 1976-77 :

VICTORIA—FISHERIES : MEN, BOATS, AND EQUIPMENT

Year	Registered crew members	Boats registered		Value of nets and other equipment
		Number	Value	
			\$'000	\$'000
1972-73	1,573	806	7,090	1,390
1973-74	1,530	781	8,805	1,597
1974-75	1,533	772	9,469	1,633
1975-76	1,427	752	10,864	2,308
1976-77	1,565	825	11,918	2,532

The following table shows the catch of fish, crustaceans, and molluscs for the years 1973-74 to 1977-78 landed at Victorian ports irrespective of the waters in which they were caught. Up to and including 1973-74, fish, etc., landed by Victorian fishermen in South Australia are also included.

VICTORIA—FISHERIES : QUANTITY OF CATCH
(tonnes)

Year	Fish (a)	Crustaceans	Molluscs	Total
1973-74	10,138	666	9,234	20,038
1974-75 (b)	9,445	387	5,391	15,223
1975-76 (b)	7,314	531	5,295	13,140
1976-77 (b)	10,089	316	5,868	16,273
1977-78 (b)	9,209	345	6,831	16,385

(a) Includes freshwater.

(b) Collected from main points of disposal since 1974-75. Collected from fishermen before 1974-75.

Trust fund projects

Trust funds now have a special relevance to the maintenance and development of inland fisheries. A recent amendment to the Fisheries Act made provision for anglers' fees to be paid into the Fisheries Research Fund. A significant increase in these fees has now permitted an annual commitment averaging \$200,000 to projects which would otherwise not have been undertaken.

One such project is the study of the Seven Creeks River System, a small tributary of the Goulburn River. In the past it has supported natural populations of Macquarie perch and trout cod which in recent times have been restricted to a limited stretch of the stream by changes in the environment and the introduction of carp. Because the Seven Creeks is one of the few remaining streams in which trout cod and Macquarie perch are known to breed, it is being used to provide the information on home range and movements of these species, their food requirements, growth, and spawning habits; all of which will be used in the search for methods of artificial propagation and rearing. Both these species are regarded as endangered.

Trout surveys

In response to anglers' concern at the apparent general decline in Victoria's trout fishery, a Trout Management Group was formed late in 1977 to survey and report on the status of the species in all major streams. The Group has so far intensively investigated 20 streams in the eastern parts of the State. Many rivers affected by the recent droughts have been found almost devoid of trout over two years old, although the quantities of younger fish detected point to a reversal of the current decline.

The streams which now contain very few trout have been restocked with over 250,000 young fish with the objective of restoring the population to the desirable density of from 70 to 90 kilograms per hectare.

European carp

In Victoria over the past decade the introduced species known here as European carp has received considerable attention as a threat to native fish and wildlife habitat. Although harmful effects of this species are still being investigated, their present numbers have prompted the development of a small commercial fishery. Electro-fishing techniques are used. They pulse a direct current through the water thus stunning the carp which are then easily netted. Soon after the introduction of this method, the carp catch was about 1.5 tonnes per annum, but in 1973-74 had reached a level of over 300 tonnes per annum.

There is now some evidence that in particular waters electro-fishing operations are considerably reducing carp numbers, making it more difficult for the operator to maintain the supply demanded by the pet food manufacturers. Thus, the use of carp fishing as a means of lowering carp numbers below the level which has a marked impact on native fish and wildlife is thought to be limited. Carp is marketed as either fresh fish for human consumption, bait for the rock lobster fishery, or for use in the manufacture of pet food. Prices in late 1976 were about \$180 per tonne.

Carp control

In 1976, the Victorian Government approved a three year study aimed at assessing the impact of carp on fish and waterfowl. The study was planned after consultation with other fishery authorities in south-eastern Australia and with the knowledge of the Australian Standing Committees on Fisheries and Nature Conservation. Staff are now being appointed and investigations should begin late in 1978. Should this assessment programme show that carp are damaging the aquatic environment significantly, remedial action will have to be taken. With this prospect in view, a study has already begun exploring alternatives to poisoning and netting the fish, a control method used with only a limited degree of success elsewhere.

A control method being investigated in co-operation with the Ministry of Agriculture, Fisheries and Food in England and the Hebrew University in Israel is the possible use of a virus which is thought to be specific to the species which has become established in Victoria. The effect of the virus not only on carp but also on Australian native species will be studied.

Samples of the Australian strain of carp have been tested already, with some degree of success, and the collection of indigenous species for consignment to Britain for testing is now in progress.

Environmental studies

Developmental projects involving Victoria's watersheds may produce marked alterations in stream flows which are of some consequence to the aquatic environment and the conservation and management of both amateur and commercial fisheries.

One example is the construction of major dams on the head-waters of streams which enter the Gippsland Lakes System. This activity may well result in a change to the existing salinity of the lakes and the fish populations supported by them. Before management procedures aimed at counteracting these effects can be implemented, base line data on the tolerance of individual fish species to changes in temperature, salinity, acidity, alkalinity, and dissolved oxygen are required. At the moment little is known of the influence or effect of these factors on individual fish or on fish populations.

As a first step towards understanding the behaviour of native fishes under different conditions, on-site studies of estuarine, warm, and coldwater inland species have begun. These studies use a divisional hut on the Nicholson River (in Gippsland) which was equipped with constant temperature aquaria for carrying out a number of basic fish tolerance experiments. Initial observations were related to the behaviour of fish under conditions of crowding and their acceptance of food of various types. The second stage of the experiment will be directed towards determining the tolerance of the chosen species to changes in salinity, dissolved oxygen, acidity, and alkalinity.

Suitable subjects for fish tolerance studies will be chosen from a number of species under examination including bream, estuary perch, mullet, flathead, flounder, whiting, luderick, garfish, and anchovy.

Field operations

The day to day responsibility of maintaining contact with the outdoor public and of enforcing the provisions of the Fisheries and Wildlife Acts rests with the 41 Fisheries and Wildlife officers of the Field Operations Section.

Twenty-seven of these officers are stationed in strategic rural and coastal areas according to the Fisheries and Wildlife demands of the particular regions of Victoria. There are, for instance, fifteen Fisheries and Wildlife officers who occupy offices in fishing ports and direct the major part of their activities towards the commercial fisheries. In the inland, where wildlife conservation and recreational fishing takes pre-eminence, the twelve districts into which Victoria is divided, each with its own resident officer, vary considerably in area and nature of responsibility.

The Victorian Fisheries and Wildlife officers also have the delegated responsibility of enforcing Federal fisheries laws and regulations which apply to the adjacent offshore seas. With the proclamation of the 200 nautical mile declared fishing zone, this aspect of their work will increase and be assisted by the acquisition during 1978 of a fast 17 metre sea-going patrol vessel.

Angling information

One of the questions of great importance to anglers is where and when to catch fish. In many cases information regarding particular species and size is also sought. To answer these questions, the Division has published an *Angling Guide* which lists over 50 inland angling waters in Victoria and describes the type of water, the surrounding country, and any special problems or fishing restrictions likely to be encountered. The Guide lists the fish type, their abundance and expected size, and in some cases it also gives advice on the best times to go fishing and the methods most likely to succeed. This publication has been in great demand since first launched, and is now in its second edition.

Further reference: *Water pollution, Victorian Year Book 1978*, pp. 347-8

BIBLIOGRAPHY

ABS publications*Central Office*

Fisheries (7603.0)

Fisheries (preliminary) (7602.0)