

FISHERIES AND WILDLIFE

INTRODUCTION

The history of fish and wildlife conservation in Victoria may appear to be a catalogue of somewhat isolated and unrelated activities. Most of them are not initiated by governments but governments formalise them in response to community ideas and demands. The resource comprises hundreds of different kinds of animals, and their diversity presents a wide range of opportunities, ideals, and problems to different people.

Some people now regard animals as entities with inherent rights to be respected but there have been fluctuating demands to use fish, mammal skins, bird feathers, and game meat for commerce. Some want to use animals from the wild for sport hunting and angling. The animals are variously regarded as a tourist attraction, a cultural and aesthetic asset, a basic resource for advances in science, medicine, and technology, for education, or as essential components of natural systems. For farmers, some animals help to control insect pests, but others damage crops and pastures and should, themselves, be controlled.

Ideas regarding the proper conservation or wise use of the resource sometimes develop slowly with economic or social conditions; sometimes they are spontaneous reactions to events such as a major drought, a land development scheme or a sudden change in commercial markets.

The organisation now known as the Fisheries and Wildlife Division of the Ministry for Conservation has been in existence as a distinct entity for more than 75 years. Although the Division had slightly different names and was included in different Ministries, continuity of senior staff meant that recognisable policies and a distinct pattern of activities for the management of fish and wildlife has persisted in Victoria since the first decade of this century.

The Fisheries and Game Branch of the 1930s was the end-product of a conservation movement which began much earlier. The first fish and wildlife laws were passed by the Victorian Parliament in the middle of last century. In 1901, they were administered as a minor function of the Ports and Harbours Branch of the Public Works Department. In 1909, the public demand for the release of trout to improve fishing in Victorian lakes and streams, led to government financial support for the hatcheries operated by angling clubs and the building of the Branch's own hatchery at Studley Park in Melbourne. At the time, there was also considerable controversy over the timing and duration of the hunting seasons for ducks, quail, deer, and mutton birds.

This public interest led to the establishment of a Fisheries and Game Branch in the Department of Agriculture on 8 December 1909. The special functions of fish culture and game protection were designated for the new Branch. In 1913, control of the Branch passed to the Chief Secretary's Department, and in 1973, the Fisheries and Wildlife Department, as it was publicly known at that stage, became a Division in the newly formed Ministry for Conservation.

In 1934, the agency had a total staff of 10 and an annual budget of \$17,400. This hardly changed until after the Second World War, but in 1941 the first professional biologist A. Dunbavin Butcher, was appointed to the staff. He became the first Director in 1949. He developed the agency until 1973 when he became Deputy Permanent Head of the new Ministry for Conservation. By 1952, there was a staff of 40 and a budget of \$120,800. In 1982, the staff numbered 320 with a budget of \$10m.

MANAGEMENT AND LEGISLATION

Since the first Fisheries and Game Acts last century, the objectives of the management of the two resources have differed. The management of fish has uniformly emphasised production, usually in terms of catch for commercial or sporting purposes. On the other hand, public interest in wildlife, although often utilitarian, has been much more diverse and controversial. The motivation and the objectives for the conservation of such diverse creatures as kangaroos, wild duck, possums, and lyrebirds differed so greatly that a consensus of public opinion about what should be done was usually lacking.

The legislation for conservation of fish and wildlife in Victoria has been mainly to control direct killing. Many other activities necessary to conserve the animals, such as preservation of the breeding and feeding habitat, have not been specified by law during most of the time. Consequently, law enforcement was the primary management tool used by the Branch in the period 1935 to 1960, as a direct response to public opinion about the serious decline in numbers of fish and wildlife. Close-seasons, bag-limits, restrictions on the methods or the areas which may be fished or hunted, and increases in the penalties for killing non-game species were all tried in a bewildering array of combinations. In the 1970s, there was a shift of emphasis away from law-enforcement, mainly toward habitat preservation, reflecting the increased public interest in environmental issues.

PRESERVING THE HABITAT

From the outset of the foundation of the Fisheries and Game Branch, it was generally recognised that fish and wildlife habitat should be preserved. Loss of the natural bushland due to agriculture was patently obvious. Many prominent naturalists, who were also specimen collectors and bushmen, realised that fishing and shooting laws alone would not prevent the loss. It was a problem to find any other practical method for the conservation of fish and wildlife. Efforts to counter loss of wildlife led to the first extensive reservations specifically for the preservation of natural habitat, for example, at Wilsons Promontory and Wyperfeld.

During the next 50 years, the number of significant large areas which could be set aside from development was severely limited because of the competition with agriculture. Under the Game Act, it was relatively easy to declare "sanctuaries" in which hunting was prohibited during the open season. From 1920 to 1950, more than 350 such sanctuaries were proclaimed on freehold land or on public land managed by authorities with no official responsibility for wildlife. The owners were under no obligation to protect habitat and most did not.

In the 1930s, an overwhelming need for economic development of the land dominated community attitudes toward the preservation of fish and wildlife habitat. This continued through the next two decades. By the 1970s, a change in community attitudes made the acquisition of land specifically for wildlife purposes much easier. By 1980, more than 100 separate State Wildlife Reserves had been set aside. In these areas the primary purpose was conserving wildlife and its habitat and, in this, they differed from all other categories of land-use in Victoria. It was not until after the Second World War that the Fisheries and Game Branch built up the technical capacity to acquire and care for wildlife habitat. The mutton bird colony at Cape Woolamai was one of the first areas to be preserved and the same procedures were greatly developed in the 1960s for game management purposes. A comparable example of habitat management in marine fisheries was the use of artificial reefs. Early Victorian oyster farmers in fact used frames to provide additional habitat. In 1965, approximately 400 tonnes of concrete pipes were dumped in Port Phillip Bay near Carrum to encourage the growth of marine organisms, and during the 1970s old ship hulks and specially designed reefs were used for the same purpose. In 1979, the first Marine Reserve was established near the entrance to Port Phillip Bay for the protection and management of the marine environment.

PUBLIC PARTICIPATION IN CONSERVATION

Many of the practical activities of the agency have been a direct response to public requests. A strong incentive exists in the community for individuals to be personally involved in practical projects for the husbandry of fish and wildlife. Sometimes, the

Victorian Government has responded to these community initiatives by providing a service even before the scientific implications or justification had been defined or fully understood. The enthusiasm of those who became involved ensured that several of these initiatives would develop into long-term projects of considerable importance to wildlife conservation. Two examples of this community motivation can be outlined: the stocking of streams to improve angling, and the banding of ducks.

Since 1909, close to 46 million trout have been raised in hatcheries throughout Victoria and liberated into lakes and streams to satisfy public demand. Almost 10 million were liberated before 1940, mostly from hatcheries operated by angling clubs. For more than 50 years, Victorian anglers put thousands of man-hours per year into catching brood trout from the wild, stripping and fertilising the eggs, raising the young fish, and transporting fry and yearlings in twelve-gallon milk cans throughout the State. Long train journeys, or packing the cans on horseback were necessary to get the fish to the very remote streams in the early days. More than 633,000 brown and rainbow trout were distributed in 1935. After the Snobs Creek Hatchery reached full production in 1958, the potential output was well over 2 million per year.

**NUMBER OF FISH RELEASED FROM SNOBS CREEK
FRESHWATER HATCHERY INTO VICTORIAN WATERS:
1955 TO 1981**

Year	Type of fish		
	Brown trout	Rainbow trout	Salmon
1955	199,332	292,035	29,755
1960	406,604	383,205	—
1965	527,873	1,008,586	—
1970	416,611	728,760	3,558
1975	411,136	449,771	—
1980	408,513	172,546	110,311
1981	435,098	227,664	52,301

Source: Fisheries and Wildlife Division, Ministry for Conservation.

In the 1920s, angling clubs were given official encouragement for their efforts to enhance fishing in their own districts. The Traralgon Club moved Macquarie Perch across the Great Dividing Range to the La Trobe River and in the 1930s the Horsham Club released Murray Cod into Taylors Lake. Without modern equipment these were technically difficult and arduous undertakings.

In earlier days there was little formal experience on which to judge the suitability of streams for stocking or assess the survival of fish after release or the impact they might have on the natural fauna. How many of those millions of fish actually provided better angling will never be known but the more important result was the personal involvement of so many anglers in practical work which was intended to improve their resources. This was of immeasurable value because it provided an essential basis of community support on which the Branch was able to develop later projects.

During the game management programme from 1953 to 1963, almost 100,000 wild duck were trapped and banded to find the cause of the large fluctuations in this important game population from year to year. By mapping the band recoveries across the Australian continent, a picture was built up of their movements in and out of the State and the measures necessary to safeguard the population and to improve hunting.

But, from the point of view of a government agency serving the public, the most important result was the direct communication opened between the Branch and the hunters, a large section of the public with a very significant traditional use of wildlife. By returning bands found on wild ducks, many thousands of hunters participated with the Branch in a large-scale community programme to preserve a game species and its habitat. During each duck season for more than ten years, as many as 3,000 duck shooters per year wrote to the Branch giving their experiences. This provided a level of support for a wildlife management programme not previously seen. It precipitated the request for a Game

Licence, the proceeds of which were to be used by the Victorian Government in a State Game Development Programme aimed at breeding up the wild duck populations in a series of game reserves managed by the Fisheries and Wildlife Division.

NUMBERS OF GAME LICENCES AND GAME STAMPS
ISSUED ANNUALLY: VICTORIA, 1958-59 TO 1980-81

Year ended 30 June—	Number of licences (a)	Game Stamps (b)		
		Duck	Quail	Deer
1959	34,863	..	..	..
1960	20,816	..	..	..
1961	32,445	..	..	..
1962	18,295	..	..	..
1963	18,152	..	..	..
1964	30,744	..	..	..
1965	41,147	..	..	..
1966	29,289	..	..	..
1967	31,979	..	..	..
1968	16,344	..	..	..
1969	34,809	..	..	..
1970	36,480	..	..	..
1971	33,947	..	..	..
1972	35,359	..	..	..
1973	..	29,639	6,241	529
1974	..	36,516	5,516	617
1975	..	50,003	10,813	796
1976	..	49,888	11,790	1,034
1977	..	52,188	11,472	1,234
1978	..	47,934	8,242	1,359
1979	..	56,532	9,972	1,093
1980	..	56,149	12,510	2,106
1981	..	53,428	10,031	2,238

(a) The Game Licence Fee was increased from \$2 to \$3 in 1970. Licences were replaced by Game Stamps in 1973.

(b) Game Stamps were introduced in 1973 — Duck \$3, Quail \$2, Deer \$10.
Source: Fisheries and Wildlife Division, Ministry for Conservation

DEVELOPMENTS IN FISHERIES AND WILDLIFE

From 1934 to 1943

In the early 1930s, the Victorian Piscatorial Council and the Gun Clubs Association asked the Victorian Government to consider a system of licences which would provide finance for research and development. A Trout Licence was introduced in 1933. At that time at least ten trout hatcheries were being operated by angling clubs, notably Ballarat, Geelong, Narbethong, Traralgon, Bright, and Warburton. In 1937, a number of amateur fishermen formed the Victorian Freshwater Fisheries Research Committee to promote more effectively the idea that without better biological knowledge simply to liberate more fish into streams was not a sure way to improve angling.

Wildlife conservation in the 1930s centred on two main issues—the timing and length of the hunting seasons, and the need to educate the public about the unique features of the Australian birds and mammals.

At this time, the only legal native game species were ducks, quail, snipe, and bronze wing pigeons. It was apparent to most observers that the ducks had declined in numbers in the past 30 years. The remedy favoured by non-hunters was to prohibit shooting entirely. The sportsmen in the game protection societies advocated protecting game during the breeding season when it needed it most and limiting the harvest to the surplus. Restrictions included prohibition of the marketing of game, banning of punt-guns, restrictions on the size and type of gun, daily bag-limits, and shortening of the season from 18 weeks to 10 weeks.

Many persons attributed the decline in game birds to progress in agriculture, spread of settlement, and the great increase in the number of motor cars and improved roads which

made the remote shooting areas more accessible to hunters. It was observed that the great increase in the rabbit and the laying of poison for its destruction had caused the deaths of much fauna, both game and non-game, such as pigeons, broilgas, and bustards. Other factors considered important were the fox; the domestic cat, both tame and feral; the alienation of river frontages and the destruction of trees on the banks; some forms of destructive mining; the snagging of logs from the streams; agistment of stocks on Crown land reserves, and the consequent burning of forests and grasslands; and the use of modern firearms, decoys, traps, bird-lime, snares, and poisons. The main activities of the Branch were policing the close seasons for possums, ducks, and quail; seeing that protected species were not killed; creating more sanctuaries; and tightening of the law against trespass.

An integral part of this approach was the education of the young against the killing of birds and mammals, and particularly against hunting. Mass media techniques were used for the first time on behalf of wildlife: still and movie photography, radio broadcasts of voice recordings, and special articles in the newspapers and periodicals using the growing popularity of nature writers.

By the mid-1930s, the number of koalas in Victoria appeared to have declined seriously but some had been introduced to the islands of Western Port Bay early in the century and had flourished there to the extent that they were now overbrowsing the food trees. Great public concern was aroused by the press, and between 1935 and 1981 Fisheries and Wildlife Officers removed about 8,000 koalas from the islands and relocated them in about 65 localities within their former range where they were safely re-established. World wide interest was created by the operation which turned out to be one of the most successful of its kind yet undertaken.

KOALA TRANSLOCATIONS BY THE FISHERIES AND WILDLIFE DIVISION: VICTORIA, 1935 TO 1981

Period	Number of koalas			
	Captured	Released	Held captive	Exported
1935-1939	68	57	11	—
1940-1944	2,483	2,477	4	2
1945-1949	798	778	16	4
1950-1954	1,069	1,060	9	—
1955-1959	1,049	1,020	29	—
1960-1964	261	261	—	—
1965-1969	214	191	—	23
1970-1974	484	462	14	8
1975-1979	1,025	989	—	36
1980-1981	380	369	—	11
Total	7,831	7,664	83	84

Source: Fisheries and Wildlife Division, Ministry for Conservation.

Under the Victorian Government's wartime powers commercial fisheries became a protected industry and ultimately benefited from the re-organisation needed to increase food production. Problems such as spoilage of fish during transport and production of oil from shark liver received special attention. Although the number of professional fishermen decreased, fish production reached its peak in 1944.

From 1944 to 1953

Background

The post-war years were characterised by technical development of facilities for the conservation of fish and wildlife. In 1945, a laboratory was established at 605 Flinders Street Extension, Melbourne, devoted to a technical assessment of the biological problems. One of the first problems to be investigated was the declining bream fishery of the Gippsland Lakes.

The efficient hatching and rearing of trout, which had formed such a large part of the voluntary effort contributed by angling clubs, was a major area of conservation to benefit from the application of scientific methods and government funds. In 1947, a site containing 51 hectares at Snobs Creek, was selected for a large government hatchery. The first ponds were installed by 1949. Over the next 20 years, the operation of this hatchery transformed trout culture. Technical solutions were found for problems which had restricted hatching and rearing success for more than 70 years. The first success was a greatly improved survival of eggs and young. The carrying capacity of the ponds and water raceways was greatly increased. Better food supplies were organised for improved nutrition and more economic supply in larger quantities. The older methods of transporting fish for release in remote parts of Victoria, based on the use of twelve-gallon milk cans holding 50 fish per can and 100 cans per train, were replaced by aerated containers holding thousands of fish in a fraction of the space previously needed.

The later stages of the technology of "fish culture", which had its beginnings at Studley Park in 1909, are to be seen in commercial fish-farming of the 1980s. Using a pure strain of rainbow trout and the methods developed at Snobs Creek, some 14 commercial trout farms produced about 475 tonnes for the market in 1980.

The change to a professional and technical department commenced in February 1949. This was followed by the appointment of additional graduate biologists to study particular problems in fish and wildlife conservation. The initial fields of study chosen between 1947 and 1953 were marine fisheries, native fish, trout, non-game fauna, hatchery science, and game management. The following sections describe topics which assumed importance in the period between 1944 and 1953.

Marine fisheries

A biological investigation of the cause of the depletion of the off-shore fisheries commenced in February 1947, with particular reference to flathead, snapper, and whiting.

Native fish

The freshwater fisheries were virtually the realm of the amateur angler, and native fish anglers outnumbered trout anglers four to one. Native fish species included Murray cod, Macquarie perch, callop or golden perch, blackfish, and bass. A survey of the fisheries resources of the Murray River and its tributaries was the next major project, commencing in 1948.

Trout

In February 1951, a biologist was appointed in charge of the Snobs Creek hatchery and Freshwater Research Station, and another in December 1952, to investigate trout food. The work expanded at Snobs Creek, so that by 1954, a full-time manager was necessary, and by 1958, a research officer to study fish diseases was appointed.

Non-game fauna

The need for increased protection of native fauna, based on a knowledge of their life histories and habitat requirements, prompted the appointment of a fauna biologist in March 1949. A second faunal problem recognised at that time was the need to rationalise the issue of permits to kill native fauna causing damage to agricultural properties, and, in April 1958, a research officer was appointed to study the particular problems of kangaroo damage.

Game birds

Because of public demand, there was a need to manage the open seasons on ducks, quail, and snipe and to improve hunting opportunities. A waterfowl research project commenced in 1953. The game biologist compiled detailed reports on duck shooting and duck swamps and formulated the game management programme of the Branch throughout the 1950s and 1960s.

Law enforcement

The post-war years saw the expansion of the law enforcement activities of the Fisheries and Game Branch. Eight additional inspectors were appointed in 1947 and 1948, the first significant increase in strength since the early 1930s. In particular, the new inspectors were stationed in country districts, living in the communities with which they were to work. By 1949, there were 19 inspectors, 13 of whom were in country stations. The first Fisheries and Game Inspectors Conference was held in Melbourne in 1950.

From 1954 to 1963

The keynote for the activities of the Fisheries and Game Branch during the 1950s was the development of public awareness concerning the conservation of fish and wildlife. The aim of this public awareness was to clarify the principle that the resource was the property of the State and that the Branch was responsible for its husbandry on behalf of the people. It was to be preserved, protected, and managed. It should only be taken or used under such conditions as would provide continued supplies.

To put this policy into action, work tools were required: law enforcement, hatcheries, a duck banding project, habitat surveys, and wildlife population censuses. Occasionally direct manipulation of animal numbers was required, as in trout liberations or translocation of koalas.

It became an integral part of the Branch's conservation programme to gain public understanding and support. This was done most successfully with respect to the anglers in the post-war years, with the hunters from 1955-56, and with the environmentally conscious public in the 1960s and 1970s. The principal media used were personal lectures by officers and exhibitions or open day demonstrations. This was not an attempt to gain public acquiescence in a technical decision but a conscious effort to involve the community in a co-operative process of conserving its own natural resources. The process could only succeed through an exchange of information and ideas, and public participation. An Information Officer was appointed in July 1957 to co-ordinate this approach. By December, *Fur, Feathers and Fins* first appeared as a staff newsletter but quickly won a much wider following, disseminating the Branch's ideas for the next fifteen years.

The Branch fostered in the 1950s and 1960s the upsurge in public interest in participatory movements which became so important in political and economic debate by the late 1960s. From 1957 to 1962, the Branch actively supported and assisted the formation of public-interest groups, ranging in scope from hunter/conservation societies, such as the Field and Game Association, to wildlife management co-operatives, such as Para Park and amateur research groups such as the Victorian Ornithological Research Group and the Mammal Survey Group. These societies fulfilled a most important role in the history of fish and wildlife conservation in Victoria.

In May 1960, the title of Fisheries and Game Branch, first conferred in 1909, was changed to Fisheries and Wildlife and the "platypus" emblem was adopted. Among the major activities of the Branch at this time, law enforcement was the one with the most direct contact with the public. The Fisheries and Game Inspector was re-named the Fisheries and Wildlife Officer, the person who established direct contact with the public.

The Fisheries and Wildlife Officer was instructed to obtain the respect of the public as well as of the courts. He was directed to protect the rights of the people to share in the harvest as well as prosecute the violators of the laws. To do this effectively, he spent as much time explaining conservation in meetings, as he did in detection work. The Branch did not measure him by the number of convictions but by the contribution made to the overall programme for the public understanding of the work of the Branch. One side-effect of this approach, characteristic of the 1950s and 1960s, was the marked change in attitudes between the Branch and the fishermen and hunters. Instead of regarding this sector of the public as the "cause" of the decline in the resource, to be restricted, caught and prosecuted, the Branch instructed its officers to meet with the fishing and hunting organisations, to work out conservation solutions together.

By the mid-1950s, the direction of the fish and wildlife research activities crystallised into identifiable programmes, largely concerned with satisfying the predominant public demands.

Marine fisheries research concentrated on certain local fishing industry problems, for example, alleged shortages of snapper, flathead, and whiting in Port Phillip Bay, with some attention to Corner Inlet and Western Port. The research was primarily concerned with population assessment and management of the catch but environmental pollution, in the form of oil spillage, was early on the list of factors implicated. The biologists responsible for the native fish investigated the status of Murray cod and callop. They studied feeding and breeding habits, with the ultimate object of recommending changes in the fishing regulations and developing hatchery techniques suited to these species.

At the Snobs Creek Hatchery and Freshwater Research Station, the new technology for fish culture was responsible for a great increase in the number of trout available for liberation. The total number of fry and yearlings produced at the Station rose from about 60,000 in 1952 to 600,000 in 1955 and 1.5 million in 1958. Three Californian raceway fish-rearing ponds were built in 1956, each 40 metres long. These were modelled on the cross-section of a fast moving stream and were far more efficient in carrying large numbers of fish per unit volume than were the type of ponds previously used.

News about game bird seasons, hunting success, and scarcity of game dominated the newspaper coverage about wildlife during the 1950s. A duck-banding programme had commenced in 1952 at "Serendip" near Lara, as part of the assessment of the game shortage. By the mid-1950s, 20,000 ducks had been banded and thousands of these were recovered throughout the continent. More than 3,000 hunters per season returned bands at the height of this activity.

For 50 years after the first major reserves at Wilsons Promontory and Wyperfeld were established, there had been no effective system for preserving wildlife habitat in Victoria. A total of 350 sanctuaries, covering about 600,000 hectares had been proclaimed under the Game Act. But the majority of these were used for agriculture which took no account of the needs of wildlife. The regulations gave no protection to wildlife habitat, and the law was used purely to restrict hunting during the open season.

A review of sanctuaries conducted in 1955, highlighted the need to find another method of preserving wildlife by protecting habitat. A survey of the Crown land swamps was carried out to complement the banding project. The main finding was that although a large number of the good duck swamps were publicly owned, virtually all were leased for agriculture, most were heavily grazed by cattle or sheep and the vast majority had severely deteriorated because of "river improvement" and drainage works funded by the Victorian Government for agricultural development. Meetings were held by the hunters throughout Victoria between 1956 and 1958. The Field and Game Association was formed in 1958, to obtain effective co-operation with the Fisheries and Game Branch in a programme for the management of wild ducks and their habitat. The proposal was that a chain of game reserves be established along the flight paths of the ducks. These would be managed by the Fisheries and Game Branch as shooting areas for the public during the normal open duck season and feeding or breeding areas during the closed season. Moreover, the hunters requested that a Game Licence costing \$2 be levied on all duck-shooters to pay for the work. When this began in February 1959, almost \$70,000 was available for game management, ten times the amount allocated in the previous year for this work.

Game Management Officers were employed and equipment purchased for the work of preparing the ground for game production, in particular, the planting of food and cover for waterfowl. The Branch purchased the grazing property, "Serendip", in December 1959 to develop the lake and the surrounding paddocks as a management area for ducks. The whole farm was to become a demonstration of how it was possible to grow wildlife on farmland.

In 1959, the Premier of Victoria established the State Wildlife Reserves Investigation Committee to advise the Victorian Government on what land was needed for wildlife conservation and how it might be reserved. By 1965, some 30 State Wildlife Reserves amounting to more than 40,400 hectares, were reserved under the Lands Act. Regulations were proclaimed giving the Fisheries and Wildlife Branch the power to control public-use and to protect and manage wildlife habitat as a land-use authority on a system of special purpose reserves throughout Victoria. The significance of this development went far beyond the importance of the particular Game Reserves, such as Tower Hill and Jack Smith Lake; the Game Refuges, such as Sale Common; or the State Faunal Reserves, such as Quail

Island for koalas and Wathe Faunal Reserve for mallee fowl. The practical experience gained by the State Wildlife Reserves Investigation Committee in more than 10 years of assessing public need and recommending on the reservation of land for wildlife purposes, significantly contributed toward the establishment of the Land Conservation Council in 1970.

With regard to non-game fauna, the dominant area of concern was complaints of damage by water rats, cormorants, kangaroos, wallabies, and black swans. Possum complaints were numerous in the suburbs. The standard method of containing the problem was to issue permits to kill the offending wildlife. Although the Branch consistently advocated a controlled open season to allow a regular harvest of water rat and possum skins for commercial purposes, this was against the tide of public sentiment for full protection of wildlife. The numbers actually being taken under the permit systems were high (permits for killing almost 20,000 water rats were issued in 1953), but the licensed open seasons caused so much controversy that they were not repeated.

Following the 1952 Parliamentary Public Works Inquiry into the salinity of the Gippsland Lakes a biologist was appointed in 1956 to follow up earlier investigations by the Branch to establish the causes of the decline of fisheries due to changed ecological conditions in the Lakes.

From 1964 to 1973

The 1960s saw a large expansion in the staff and funds of the Branch concerned with the preservation and management of wildlife habitat. The first Game Management Officers to be posted to State Wildlife Reserves were in residence at the Serendip Wildlife Research Station and at the Tower Hill State Game Reserve by October 1964. One of their priority tasks was the building up of the numbers of the rare species which once had been relatively common in parts of Victoria. Special expeditions were undertaken to capture specimens for breeding nuclei in captive flocks to be bred in parts of their former range. One hundred and thirteen magpie geese, 25 bustards, 45 Cape Barren geese, and 15 brolgas were obtained, many of them from other States. Breeding colonies were established at the Serendip Wildlife Research Station in order to study the requirements of these birds under the developed conditions on Victorian farmland. Breeding was very successful and within a few years there were more geese flying free in this part of Victoria than had been recorded for the whole of the State for the previous 80 years.

A special game management project, called the Para Park Co-operative, was formed in 1966 between a group of hunters and the Victorian Government in order to protect an island on the Gippsland coast. Sunday Island was private land within the boundaries of the Nooramunga State Wildlife Reserve. The management of para or hog deer in the only known colony outside its native range in Asia, was the chief purpose for the project. The special feature of this unusual arrangement was the personal involvement of hunters and their families in a practical project for the conservation of all wildlife on the island.

A growing emphasis towards studies of the total environment stimulated the commencement of the Port Phillip Bay Study in 1968. This programme, undertaken by the new Marine Pollution Studies Group, in co-operation with the Melbourne and Metropolitan Board of Works and the universities, aimed at establishing the environmental *status quo* of Port Phillip Bay, so that the effect of the proposed discharge of effluents into the Bay could be assessed. Similar studies on Western Port Bay, the Gippsland Lakes, and other regions were carried out from 1973. The most significant aspect of these multi-disciplinary environmental studies was the acceptance that the land mass in the respective catchments was an integral part of the study area.

One highlight of the early 1960s was the establishment and development of a major scallop fishery in Port Phillip Bay. For almost 12 months after the establishment of the fishery in September 1963, the catch continued at a high level, but soon dropped markedly and a continued decline was predicted when the ecology and economics of the fishery were investigated. A basis for forecasting natural fluctuations in the fishery was established.

The serious side effects of pesticides on fish and wildlife came to the attention of the Branch in 1954 when the poison 1080, used to control rabbits, was found to also destroy native wildlife. The continued concern of the Branch, expressed in numerous lectures and journal articles, was instrumental in the establishment of an investigating group in 1962

and the appointment by the Victorian Cabinet, in September 1964 of the Committee of Inquiry into the Effects of Pesticides. It was the task of the Committee to define which pesticide chemicals were dangerous, to report on their toxic effects, and to examine what controls were needed in their use. The report of the Committee was presented to the Victorian Government in 1966. The Environmental Studies Group, established in 1965, was expanded to monitor pollutant levels in fish and wildlife and their habitat.

In the mid-1960s, a number of significant surveys of the fish and wildlife resources commenced. In 1965, a benthic survey of Western Port Bay was undertaken to determine the effects of industrial development on the marine environment. In 1967, a study of the seal population at Phillip Island was commenced.

In 1967 and 1968, amendments were made to the Fisheries Act to include substantial increases in licence fees to provide for the better management of particular fisheries. For example, a Master Fisherman's Licence was introduced, covering such species as scallops, crayfish, and abalone. The money derived from these fees, initially about \$100,000, was paid into a Trust Fund to be used for fisheries research, education, and extension development. In the first instance, staff were appointed to work on abalone and crayfish. Other matters covered in the new legislation included the control of noxious fish, fish culture in public waters, and a limited entry policy for certain fisheries. The Minister could refuse the issue of a commercial fishing licence on the grounds of the welfare of the industry. The legislation was further amended in 1975 and provided for the direct participation of fishermen in the management of their own industry through representation on the Fisheries Management Committee, the Commercial Fisheries Licensing Panel, and the Licensing Appeals Tribunal.

Mercury contamination in certain species of fish caused severe restrictions to be imposed on the sale of school shark during 1972. Diversification of the fisheries was undertaken to find alternative work for the fishermen whose livelihood was severely cut. The shark research project and the exploratory fishing project led to the discovery of major stocks of Gem fish, Blue Grenadier, Trevally, Spotted Ling, and Dory on the continental shelf off Portland. The development of this fishery required a change from the traditional Danish seine techniques to the use of otter board trawling. The Fisheries and Wildlife Division subsequently also became involved in the assessment of the Bass Strait squid fishery from 1978 onwards.

An important development in conservation research came with the opening of the Arthur Rylah Institute for Environmental Research at Heidelberg in April 1970. The main objectives of the Institute were to provide basic information about the environment: what it consists of, what is found in it, and what changes it. Such information is essential to plan the proper use of Victoria's natural resources.

A shooters' licence, with Game Stamps for the hunting of ducks, quail, and deer, was introduced in 1973. Revenue from the new hunting licence system contributed to the Wildlife Management Fund established in 1972 for wildlife conservation projects.

From 1974 to 1982

Background

In the 1970s, with increased awareness of environmental problems in the general community there was a call for "environmental impact statements" before implementation of major projects. This led to a number of studies being let by the Fisheries and Wildlife Division on contract to scientists in Australian and overseas universities, or specialist consultants. On the other hand the Division was able to undertake surveys and investigations on behalf of other government agencies and semi-government authorities who were responding to community concern or new legislative requirements and including environmental issues among their other planning constraints.

By the mid-1970s, the Division comprised the senior executive staff with its central administrative support plus five technical sections which will be described in sequence: Wildlife Research, Field Operations, Marine Fisheries, Freshwater Fisheries, and Environmental Studies.

Wildlife Research Section

Traditionally each scientist in the Wildlife Research Section had studied a few species, usually of some economic significance, but in 1975 three wildlife research units were set up. One unit would map the distribution of all vertebrate species in Victoria and relate this to their broad habitat needs; one would study the ecology of the wetland and coastal fauna (especially birds); and one would study the ecology of fauna in harvested forests. This would enable the Division to make better recommendations for the management of wildlife in areas where rapid changes were expected to occur. However, with the general financial constraints of the late 1970s, the restructuring of the Division in 1981, and more insistence on applied research, there was a return to studies of endangered species and those of economic importance.

The Wildlife Management Section was responsible for planning such activities as game hunting seasons, the translocation of koalas, and the re-establishment or protection of habitat for several species which had declined seriously, such as the helmeted honeyeater, mallee-fowl, and brolga. It also carried out general conservative maintenance on the State Wildlife Reserves which by 1980 numbered more than 100 and comprised some 100,000 hectares.

The restructuring of the Division in 1981 saw Wildlife Management and Field Operations combined into a new Field Management Branch.

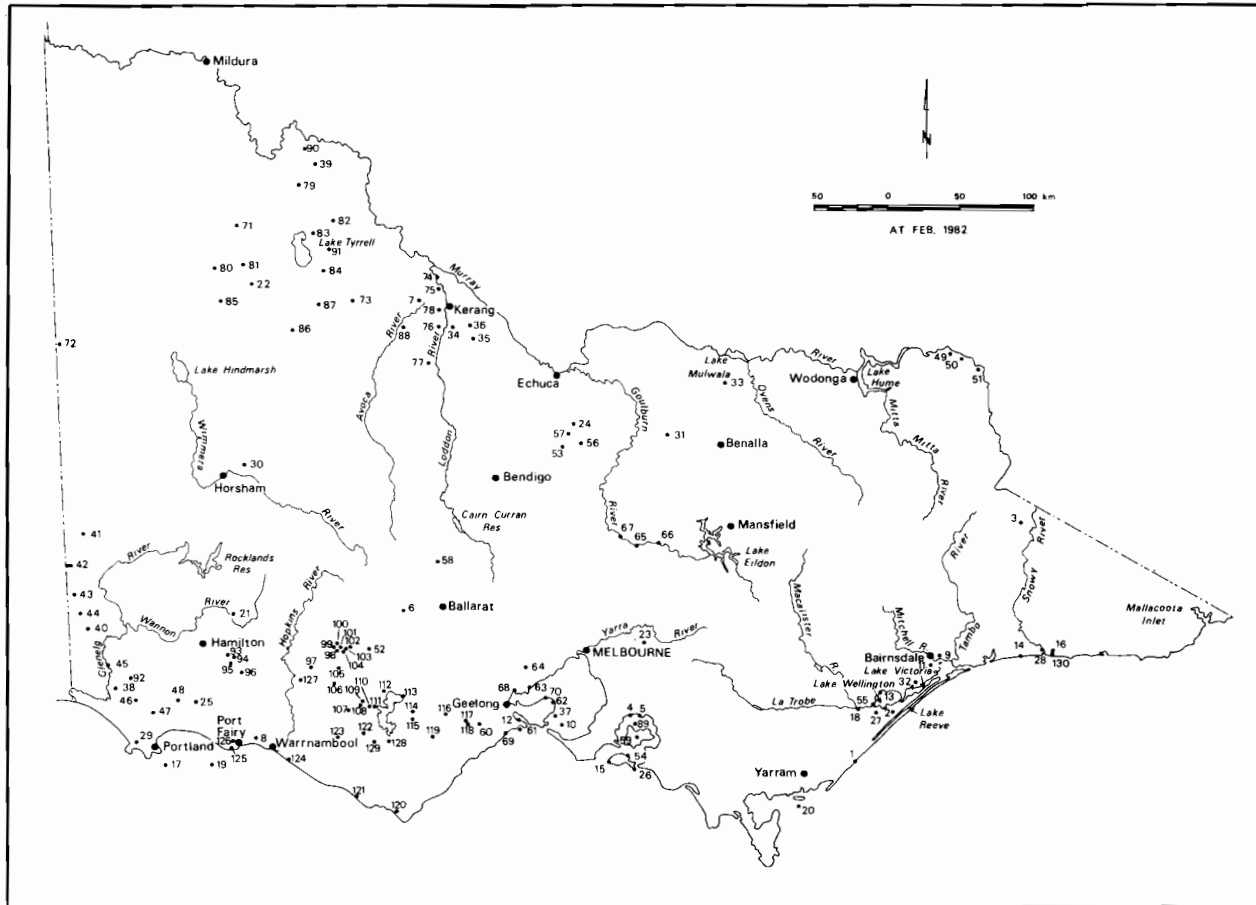


FIGURE 21. Victoria—State wildlife reserves, 1982. (Names of reserves are shown in the table on pages 336-7.)

STATE WILDLIFE RESERVES: VICTORIA, AT 1982 (a)

Number (b)	Reserve	Location	Main species or feature	Area hectares
* 1	Jack Smith Lake	Woodside	Waterbirds	6,870
* 2	Lake Coleman	Sale	Waterbirds	1,996
3	Rocky Range	Bruthen	Rock wallabies	4,453
4	Quail Island	Warneet	General wildlife	810
5	Chinaman Island	Warneet	General wildlife	61
* 6	Lake Goldsmith	Beaufort	Waterbirds	879
* 7	Koorangie	Kerang	Waterbirds	2,840
* 8	Tower Hill	Koroit	Waterbirds	609
* 9	Jones Bay	Bairnsdale	Waterbirds	111
10	Mud Island	Sorrento	Seabirds and waders	56
* 11	Macleod Morass	Bairnsdale	Waterbirds	516
* 12	Lake Connewarre	Geelong	Waterbirds	3,256
* 13	Clydebank Morass	Sale	Waterbirds	637
* 14	Ewing Morass	Orbost	Waterbirds	7,300
15	Seal Rocks	Phillip Island	Seals and seabirds	3
* 16	Lake Curlip	Orbost	Waterbirds	950
17	Lawrence Rocks	Portland	Gannets and other seabirds	8
18	Sale Common	Sale	Waterbirds	308
19	Lady Julia Percy Island	Off Port Fairy	Seals and seabirds	134
20	Nooramunga	Corner Inlet	General wildlife and deer	9,996
* 21	Bryan Swamp	Dunkeld	Waterbirds	648
22	Wathe	Lascelles	Mallee fowl	5,763
23	Yellingbo	Yellingbo	Helmeted honeyeater	300
* 24	Mansfield Swamp	Stanhope	Waterbirds	110
25	The Stones	Macarthur	General wildlife	6,218
26	Cape Woolamai	Phillip Island	Muttonbirds	308
* 27	Dowd Morass	Sale	Waterbirds	1,501
* 28	Lake Corringale	Orbost	Waterbirds	800
29	Bat Ridges	Portland	Bats and general wildlife	324
* 30	Darlot Swamp	Horsham	Waterbirds	271
* 31	Morphett Swamp	Benalla	Waterbirds	22
* 32	Blond Bay	Bairnsdale	Waterbirds	735
* 33	Dowdle Swamp	Yarrawonga	Waterbirds	291
34	Tragowel Swamp	Kerang	Waterbirds	279
* 35	Hird Swamp	Kerang	Waterbirds	350
* 36	Johnson Swamp	Kerang	Waterbirds	467
37	Edward Point and Duck Island	St Leonards	Seabirds and waders	250
38	Burgess Swamp	Dartmoor	Waterbirds	52
39	Wandown	Annuello	Mallee fowl	1,591
* 40	Church Swamp	Casterton	Waterbirds	71
* 41	Benlugh Swamp	Casterton	Waterbirds	215
* 42	Tooley-Lake Mundi	Casterton	General wildlife and waterbirds	4,012
43	Kaladbro Swamp	Casterton	Waterbirds	126
* 44	Kerr Swamp	Casterton	Waterbirds	228
* 45	Red Hill Swamp	Dartmoor	Waterbirds	53
* 46	Lake Crawford	Dartmoor	Waterbirds	115
* 47	Lake Sinclair	Heywood	Waterbirds	22
* 48	Lake Condah	Macarthur	Waterbirds	230
49	Clarke Lagoon	Corryong	Waterbirds	7
50	Jeremal	Corryong	Waterbirds	65
51	Tintaldra	Corryong	Waterbirds	58
52	Mt Fyans	Dundonnell	General wildlife	45
* 53	Gaynor Swamp	Rushworth	Waterbirds	362
54	Rhyll Inlet	Phillip Island	Waterbirds and waders	32
* 55	Heart Morass	Sale	Waterbirds	298
* 56	Two Tree Swamp	Stanhope	Waterbirds	168
* 57	Wallenjoe Swamp	Stanhope	Waterbirds	266
* 58	Merin Merin Swamp	Clunes	Waterbirds	317
59	French Island (c)	Western Port Bay	General wildlife	8,149
* 60	Brown Swamp	Winchelsea	Waterbirds	37
61	Lonsdale Lakes	Pt Lonsdale	Waterbirds	150
62	Salt Lagoon	St Leonards	Waterbirds and waders	24
63	The Spit	Pt Wilson	Orange bellied parrot and waders	300
* 64	Freshwater Swamp	Little River	Waterbirds	8
65	Homewood Swamp	Yea	Waterbirds	30
66	Molesworth Swamp	Molesworth	Waterbirds	30
67	Horseshoe Lagoon	Yea	Waterbirds	43
68	Limeburners Lagoon	Corio	Waterbirds and waders	30

STATE WILDLIFE RESERVES: VICTORIA, AT 1982 (a)—continued

Number (b)	Reserve	Location	Main species or feature	Area
69	Breamlea	Breamlea	Waterbirds	120
70	Point Richard	Portarlington	Short-nosed bandicoot	50
71	Bronzewing	Ouyen	Mallee fowl	11,200
72	Red Bluff	Kaniva	General wildlife	9,800
* 73	Lake Lalbert	Culgoa	Waterbirds	750
* 74	Dartagook	Lake Charm	Waterbirds	450
* 75	Stevenson Swamp	Lake Charm	Waterbirds	90
* 76	Lake Murphy	Kerang	Waterbirds	230
* 77	Lake Yando	Boort	Waterbirds	90
* 78	Wandella Forest	Kerang	Waterbirds	1,060
79	Bolton	Manangatang	General wildlife	200
80	Patchewollock	Patchewollock	General wildlife	230
81	Turriff	Speed	General wildlife	250
82	Towan Plain	Chinkapook	General wildlife	820
83	Chillingollah	Chillingollah	General wildlife	243
* 84	Waitchie	Ultima	Waterbirds	100
85	Cambacanya	Hopetoun	General wildlife	95
* 86	Lake Marlbed	Birchip	Waterbirds	230
87	Wangie	Lalbert	General wildlife	220
* 88	Lake Gilmour	Quambatook	Waterbirds	50
89	Western Port	Western Port Bay	General wildlife and marine fauna	1,650
* 90	Lake Powell and Carpul	Robinvale	Waterbirds	680
91	Lake Timboram	Waitchie	Waterbirds	2,060
* 92	Peiracle Swamp	Strathdownie	Waterbirds	130
** 93	Lake Kennedy	Hamilton	Waterbirds	230
* 94	Krause Swamp	Hamilton	Waterbirds	20
* 95	Tabor Swamp	Penshurst	Waterbirds	57
* 96	Yatmerone Swamp	Penshurst	Waterbirds	11
97	Lake Eyang	Woorndoo	Waterbirds	107
98	Lake Oundell	Streatham	Waterbirds	78
** 99	Nerrin Nerrin	Streatham	Waterbirds	288
** 100	Lake Jolicum	Streatham	Waterbirds	77
* 101	Lake Kornong	Streatham	Waterbirds	14
102	Blue Lake	Streatham	Waterbirds	38
103	Pink Lake	Streatham	Waterbirds	44
104	Salt Lake	Streatham	Waterbirds	88
* 105	Lake Terrinallum	Dundonnell	Waterbirds	174
* 106	Lake Bernie Buloke	Darlington	Waterbirds	40
* 107	Lake Bookar	Camperdown	Waterbirds	473
108	Round Lake	Camperdown	Waterbirds	74
109	Melingal Lake	Camperdown	Waterbirds	125
110	Kooraweera Lakes	Leslie Manor	Waterbirds	345
111	Lake Terangpom	Colac	Waterbirds	213
* 112	Lake Struan	Foxhow	Waterbirds	51
113	Lake Rosine	Cressy	Waterbirds	175
114	Lake Cundare	Colac	Waterbirds	395
115	Lake Beeac	Colac	Waterbirds	647
* 116	Lake Murdeduke	Winchelsea	Waterbirds	1,500
* 117	Lake Dubban	Winchelsea	Waterbirds	15
* 118	Lake Gherang Gherang	Winchelsea	Waterbirds	97
* 119	Lake Ayrey	Colac	Waterbirds	19
* 120	Aire River	Glenaire	Waterbirds	170
* 121	Princetown	Princetown	Waterbirds	73
122	Lake Purrumbete	Camperdown	Waterbirds and amateur fishery	570
** 123	Cabrico Swamp	Cobden	Waterbirds	13
124	Lake Gillear	Warrnambool	Waterbirds	20
125	Lake Aringa	Port Fairy	Waterbirds	22
126	Goose Lagoon	Port Fairy	Waterbirds	10
127	Cobra Killuc	Hexham	Native grasses and general wildlife	450
128	Stoney Rises	Stonyford	General wildlife and flora	13
129	Floating Islands	Stonyford	Natural phenomenon	85
130	Brodribb River	Marlo	Cabbage fan palm and fauna	44

(a) Managed by the Fisheries and Wildlife Division, Ministry for Conservation.

(b) The location of reserves is shown in Figure 21 on page 335.

(c) State Park.

* Reserves open to duck hunting during the open season.

** Reserves under review to open to duck hunting in season, but presently closed to such hunting.

Balance of reserves closed to hunting at all times.

Source: Fisheries and Wildlife Division, Ministry for Conservation.

Field Operations Section

The Field Operations Section was involved in maintaining the daily contact with the outdoor public and enforcing the provisions of the Fisheries and Wildlife Act and the Federal fisheries laws and regulations. Since 1975, the staff has increased from 30 to 54 and in 1978 the Section was reorganised to include six regional offices.

Marine Fisheries Section

The major marine fisheries research programmes undertaken since the 1940s have been on commercially important fish species, namely, bream, snapper, King George whiting, abalone, and scallops. From 1970 research was carried out in assessment of commercial fish stocks, fisheries development, recreational fishing, fish quality studies, and consumer attitude studies. Assessment of commercial fish stocks involved the expansion in June 1978 of the catch collection system started in 1911, and the commencement of a number of biological programmes such as the study of growth and reproductive rates, migration studies, and abalone, scallop, and rock lobster surveys after 1972. Until 1976, the Fisheries activities of the Division were divided into the Freshwater Fisheries and the Marine Fisheries. In March 1976, a Commercial Fisheries Section was formed and although it was concerned principally with management and licensing of fisheries it also included the Marine Fisheries Research Station at Queenscliff.

In 1979, legislation established a Victorian Fisheries Industry Council representing various aspects of the fishing industry. It aimed to promote, obtain, and secure markets for Victorian fish, advise industry and government, and meet the educational requirements of the industry.

Freshwater Fisheries Section

The freshwater fisheries of Victoria are of two main types: the commercial fisheries producing food for the market, and sport or recreational fishing. The commercial fisheries include the eel fishery with an average annual catch of 200 tonnes, the carp fishery averaging 50 tonnes per year, and trout farms producing 150-200 tonnes per month. Providing fish for sport and recreation has in the past been largely based on the introduced species, brown and rainbow trout, European perch, and the chinook salmon.

The first carp were illegally released in Victoria about 1960. In May 1962, emergency legislation was passed declaring the species noxious, giving the Fisheries and Wildlife Branch power to destroy the fish in private dams. In a large-scale effort to destroy the carp before they had a chance to breed, at least 1,300 dams were treated with poison. Carp had already been released illegally in public waters connected to the stream systems in the La Trobe Valley and other rivers tributary to the Gippsland Lakes. In the mid-1960s, carp were found in the Murray River. By early 1974, they had spread up the Murray River to the Yarrowonga Weir, the Avoca River further than Charlton, the Loddon River as far as Cairn Curran Reservoir, the Campaspe River as far as Elmore, and the Goulburn River as far as the Goulburn Weir.

Early attempts to eradicate the introduced carp failed and another major project was commenced in the late 1970s to study the effects of this species on natural systems and to learn how to make the best of a bad situation.

For many years the introduced redbfin or English perch had not been stocked in parts of Gippsland where this species did not already occur. The same applied to trout in East Gippsland. Murray cod, golden perch, catfish, and others, were not stocked south of the Great Dividing Range. The Wonnangatta and Barwon Rivers were declared blackfish streams, while others in Gippsland were reserved for the grayling.

In 1970, the minimum size and bag-limits on trout, which had been used for more than 50 years to restrict the catch, were abolished and a much more rational basis was devised for selecting streams to be restocked with hatchery bred trout. In the latter half of the 1970s the surveying and assessment of trout waters and fish survival was greatly accelerated by the appointment of a full-time specialist group to refine further the guidelines for a selective stocking policy.

In some waters the introduced fish fail to survive or fail to grow, or the fish already in the streams can supply the anglers' needs adequately by natural breeding. In some places

the trout had undoubtedly contributed to the decline of valuable native species. It was wasteful to continue to release trout into many Victorian streams. On the other hand, the level of stocking in some highly productive waters could be increased with great advantage. The total number of waters stocked fell from 250 to 100 and the number of fish released from 1.5 to 0.5 million but on the other hand the total weight of fish released more than doubled, the larger fish having much better prospects of survival.

For almost 50 years, chinook or quinnat salmon were regularly imported into Victoria from America and New Zealand and released into special waters such as Lake Bullen Merri. After import was banned in 1966, methods of rearing and breeding chinook were developed at the Snobs Creek Hatchery. This is the only institution which has succeeded in rearing this species under hatchery conditions. Since 1976, there have been regular releases of yearlings raised from the domestic brood stock in the Camperdown area. Improved fishing resulted with as many as 5,000 anglers being recorded at an opening on one 600 hectare lake. The catch rate was about 2 fish per angler on opening weekend, with up to 16,000 salmon being taken in the season. The growth rate of the salmon in Lake Bullen Merri approached that of the salmon in the Pacific Ocean, with three year old fish weighing as much as 10.5 kilograms only 20 months after release as 20 gram fish.

As demands for water increased and more reservoirs were built in the 1970s, streams could not be reduced beyond a certain level without losing many natural values, including their fish. The minimum stream flow study was designed to give the information needed by planners and engineers to provide for the protection of these values in their plans to use water from the rivers.

In 1979, the Freshwater Fisheries Section employed 57 persons, and was responsible for conservation and management of the 52 species of fish which occurred in 40,000 kilometres of river and 180,000 hectares of lakes in Victoria. Some 600,000 persons fished each year in the inland waters. Victorian Government expenditure on freshwater fishing was \$2.5m, of which \$500,000 was raised by the sale of licences. This expenditure supported the operation of the trout hatchery at Snobs Creek, in addition to research and management on species such as blackfish, carp, eels, estuary perch, Macquarie perch, trout cod, and Murray cod.

Native fish evolved in streams which frequently flooded in winter but became sluggish and warm in summer. Reservoirs change the patterns of flow. Removal of trees alter the structure and stability of stream banks and beds. The turbidity and oxygenation of the water changes and its chemistry is changed by agricultural chemicals and effluents from towns and industry.

In the face of such changes native fish populations have declined significantly during the last 50 years, with respect to both the range of most species and their abundance. Macquarie perch and trout cod were widespread throughout the tributaries of the Murray River early this century. Now these fish are rarely encountered by the angler. Murray cod, golden perch, and catfish have also declined although their status is less precarious. In the early 1980s, more studies were being conducted into the nature of these changes and ways of conserving native fish in some waters.

Lake Charlegrark, in western Victoria, supports a breeding population of Murray cod, which was first established in the early 1950s by the Fisheries and Game Branch. In 1976, a pilot project was started for the intensive rearing of juvenile cod in captivity using small fish produced by natural breeding in the lake. An additional aim was to develop a practical method of inducing Murray cod to spawn in captivity. In 1980, a similar project for trout cod and Macquarie perch commenced at Seven Creeks near Strathbogie.

Environmental Studies Section

The move away from the traditional biological research on individual animal species towards the overall assessment of the environment was featured in the work of the Environmental Studies Section in the 1970s. The major projects carried out by the Section this decade included assessing the effects of industrial waste discharges such as the Loy Yang outfall toxicity study and biocides study; and determining the effect of new chemicals on native mammals. Other activities of the Section were investigations into the use of molluscs as indicators of aquatic contamination, the cause of eutrophication of Lake

Burrumbeet near Ballarat, the cause of egg-shell thinning in certain bird species, and monitoring of pesticides in areas of intensive farming.

COMMERCIAL FISHERIES

Commercial fishing in Victoria prior to the Second World War was a small industry employing traditional methods of fishing and centred around Victoria's bays and estuaries. Fishing in ocean waters was an inshore fishery exploiting a limited number of species such as rock lobster, barracouta, and shark. The involvement of the Fisheries and Game Branch with the commercial fishing industry was minimal and largely restricted to the licensing of fishermen, the collection of basic information on fish production, and the enforcement of fisheries regulations mainly at the port of landing.

The shark fishery which commenced during the late 1920s gradually developed during the 1930s and received encouragement when the liver oil from sharks was extracted to produce Vitamins A and D. As the outbreak of war threatened to cut Australia's supplies of cod liver oil, a firm in Melbourne began to extract shark liver oil in 1939. By the end of the war five firms were engaged in this trade.

The rock lobster fishing fleet which was largely based at Queenscliff during the early 1900s gradually moved west and east as more productive grounds were opened up off western Victoria and around the islands in Bass Strait.

A bream study in the Gippsland Lakes was a significant step in fisheries research in Victoria because for the first time it was clearly demonstrated that a decline in the abundance of a species was due to modification of the environment.

During the early 1940s, the fishery for Australian salmon developed as canneries were built and wartime needs for canned foodstuffs grew. Salmon were generally caught on their migratory movements along ocean beaches and the shoals of fish were spotted from vantage points on dunes and cliff tops. The later use of spotting planes added a great deal to the efficiency of the industry and salmon became one of the nation's important fisheries.

After the war many returned servicemen took advantage of post-war rehabilitation courses in fishing and later moved into the fishing industry. Prior to the war fishing had been a cottage industry handed on within families. The influx of new men into the industry after the war prepared the way for the rapid development of the industry that took place during the 1950s and 1960s.

In 1952, a number of Danish seine trawlers from Eden in New South Wales moved to Lakes Entrance and landed encouraging catches of trawl flathead and other commercial species. The extensive trawling grounds adjacent to Lakes Entrance attracted other fishermen to the port and within the space of a few years an important trawling industry was firmly established and Lakes Entrance became a major fishing port in the State.

The 1960s and 1970s saw significant developments in the fishing industry with exploitation of new fish resources, the introduction of new fishing methods, and a general improvement in the standard of fishing boats and equipment used. In response to developments in the industry additional fishing enforcement staff were deployed at coastal locations to service the needs of the industry and to protect the resource by policing fisheries regulations.

In 1963, a scallop fishery commenced in Port Phillip Bay as a result of information provided from a survey of the marine resources of the Bay conducted by the Fisheries and Game Branch. By 1964, over 200 boats were dredging for scallops in the Bay and Victoria had become the largest scallop producing State in the Commonwealth. In 1964, a number of divers commenced harvesting abalone for sale and rapid developments in the export of the product resulted in abalone becoming Victoria's second most important fishery.

Developments in fishing gear technology saw the introduction of monofilament nets into the shark fishery which greatly increased production in that area, and the development of a purse seine fishery at Lakes Entrance. Each year abundant shoals of anchovies and pilchards occur in the inshore coastal waters of East Gippsland and the introduction of purse seine fishing allowed this resource to be harvested commercially. The catch from the purse seine boats was processed in a fish meal plant constructed on Bullock Island at Lakes Entrance and produced high quality fish meal which is used as an additive to stock food.

In 1968, a new Fisheries Act was introduced which required that consideration be given to the welfare of the fishery and the persons engaged in the industry when issuing

commercial fishing licences. This allowed the concept of limited entry fisheries to be introduced in those fisheries where the resource was under threat from over-exploitation or where the welfare of the persons engaged in the industry was jeopardised by factors such as over-production. The Act also established a number of advisory committees which, for the first time, gave fishermen a say in the management of their industry.

In 1979, the Victorian Fishing Industry Council Act was passed which established a Fishing Industry Council to promote and develop Victorian fish and fisheries, educate persons involved in the fishing industry, and to advise the Victorian Government on matters affecting the industry. Four years later legislation was proclaimed which created a legal and administrative structure, the objective of which was to rationalise the role of the Commonwealth and the States in managing Australia's fisheries.

LICENCES ISSUED UNDER THE FISHERIES ACT:
VICTORIA, 1968 TO 1981-82 (a)

Type of licence	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977-78	1978-79	1979-80	1980-81	1981-82
Abalone	164	99	107	105	103	100	100	100	100	100	99	89	89	91
Bait	9	13	12	20	32	37	38	36	35	38	33	44	48	55
Barracouta	1	1	—	1	8	11	21	24	39	44	43	6	—	—
Crayfish	154	163	178	178	183	181	189	195	204	202	202	202	202	202
Shark	—	—	—	9	5	7	6	2	2	(b)	—	—	—	—
Trawl	—	—	1	6	5	36	27	19	19	22	—	—	—	—
Processor	—	—	18	40	38	42	52	42	56	62	63	66	62	76
Scallop	169	112	123	111	130	118	114	117	124	117	117	116	116	116
Master fishermen	863	773	753	738	824	861	844	878	913	1,038	1,094	1,132	1,153	1,104

(a) Years 1968 to 1976 are calendar years, and thereafter years ended April.

(b) Not issued.

Note. A computer-based licensing system was introduced on 1 April 1977. From that time, all licences fell due on 1 April of each year. Trawl licences were issued in 1977-78 only to fishermen involved in the prawn fishery.

Source: Fisheries and Wildlife Division, Ministry for Conservation.