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DEPARTMENT OF FISHERIES AND FAUNA

REPORT III

REPORT

ON

WESTERN AUSTRALIAN FRESHWATER
FISHERIES

By

DONALD D. FRANCOIS

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1966

F O R E W O R D

Most of the Australian States have a comprehensive system of inland waterways. Western Australia, however, is in a less fortunate position. True, the maps of the State show many rivers, but in much of the southern, more populous part, with no summer rain and no winter snow, the majority are virtually a chain of waterholes during the long summer months. At the same time, in a relatively small section in the south-west corner, there is a series of permanent streams flowing through what was originally dense forest. But apart from the three indigenous freshwater crustaceans, the marron (*Cherax tenuimanus*), the coonac (*C. preissii*) and the gilgie (*C. quinquecarinatus*), very few fish species occur naturally in these waters, and what are there are of no value either for food or for sport.

In an attempt to remedy this lack, the now defunct Acclimatisation Committee introduced trout to the Avon and Preston Rivers about the turn of the century. The committee's records are very scanty, and it is not possible at this time to say precisely where the liberations took place. In the 1930's, trout acclimatisation was commenced in earnest and a hatchery was established at Pemberton. Many hundreds of thousands of both brown and rainbow fry have since been liberated in different localities. The committee also released Murray cod, but seemingly only at one place -- Grassmere Lake, near Ellerker -- were cod subsequently taken, and then only in very small numbers. English perch ("red fins") are quite common in certain rivers, notably the Blackwood and the Hotham, but it is not known by whom they were brought to the State, or when.

Although its files abound in scraps of information of a purely empirical nature, there are many gaps in the Department's knowledge of the State's inland streams. It is unable at this moment to give answers to such questions as may marron be bred successfully in ponds, has trout acclimatisation been successful, what is the carrying capacity of the freshwater rivers and creeks, should an endeavour be made to acclimatise exotic warm water fishes in streams not suited to trout, and so on. Dr. Francois, who has been associated with freshwater fisheries in both the United States and eastern Australia, was asked to come to the State to comment on these and other matters. He was also asked to express an opinion whether a freshwater research unit, if established within the Department, would serve a useful purpose and, if so, to outline its functions.

Dr. Francois' report will be found in the following pages.

A.J. FRASER,
Director.

Department of Fisheries and Fauna,
Perth, June 14, 1966.

REPORT ON WESTERN AUSTRALIAN FRESHWATER FISHERIES

By Donald D. Francois*

INTRODUCTION

At the invitation of the Department of Fisheries and Fauna, I visited Western Australia in November, 1965, to advise generally on the State's freshwater fisheries and the possibility of introducing exotic species to inland waters. In a number of the streams in the South-West, English perch and rainbow and brown trout had already been successfully acclimatised.

Earlier, on the suggestion of the Pemberton Hatchery Board, the State Department had presented a submission to the Commonwealth-States Fisheries Conference asking for approval to import channel catfish, large-mouth black bass and bluegills from the U.S.A. for liberation in local waters. This followed a visit to the United States by the Board's executive officer, who had studied these species in their natural habitat. Conference, in line with earlier decisions, had declined to recommend that the ban on the importation of exotic species be lifted.

FARM PONDS, PUBLIC WATERS AND INTRODUCED SPECIES

Prior to visiting Western Australia I had been told that there was considerable interest and agitation from anglers and property owners for the introduction of a suitable warmer water species for farm dams and other waters of the State. I also had the impression that the introduction of trout had not been particularly successful and that, except for marron, there was little food or sport to be had from Western Australian fresh waters. This impression, however, has been considerably modified as a result of my own observations and discussions with anglers.

I am not prepared to accept the view held by a section of the community that the introduction of trout into Western Australia has been relatively unsuccessful. Their distribution is certainly limited, but talks I had with local anglers, e.g., Mr. Ron Saw and Mr. E.H. Barthelmeh, of Pemberton, and Mr. P. Hainge, of Waroona, indicate that the very limited number of trout anglers in the State enjoy a calibre of trout fishing equal, so far as average size of trout and catch per effort are

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(Dr. Francois is now Director of that instrumentality).

concerned to the average angling on Lake Eucumbene in New South Wales. I have also been advised that trout have done very well in some farm dams.

Whilst I do not wish to detract from the importance of developing fishing in non-trout waters, I believe that the quality and potential of Western Australia's trout fisheries may have been grossly underrated.

Further, I cannot accept the opinion that development of a farm pond programme, with hand feeding of trout or an introduced fish, is imperative because of the lack of food in natural and artificial waters in Western Australia. I entertain grave doubts whether the emphasis in any State fisheries programme should be directed towards the interests of one group, in this case property owners who have dams, to the virtual exclusion of others. I feel that open public waters should have first priority in the expenditure of public moneys and that farm dam programmes should be given a slightly lower priority. I do not question the need for farm pond work or the need for money to be spent on the work, but I do feel that it should not take precedence over fisheries expenditures which benefit the community as a whole.

The Pemberton Hatchery Board is of the opinion that all that can be done with public waters has been done and that dams like Logues Dam do not have enough food to support good fish populations, the emphasis being on farm ponds because it is possible to hand feed the fish.

It is generally accepted in Western Australia that the fresh waters of the State contain little natural food for fishes. I do not have first hand field experience to contradict this, but if this were the case, possibly the introduction of forage animals might offer some possibilities for improvement. However, I find the concept that food is the limiting factor in many trout streams quite inconsistent with the average size of the trout taken.

With regard to Logues Dam, I subsequently learned from Mr. Hainge, of Waroona, that it is at present supporting a magnificent rainbow trout fishery. He himself had taken forty trout up to four pounds in one day. Apart from the implications of this with regard to the food supply in Logues Dam, the Pemberton Trout Board was not even aware that this fishery existed.

The idea that supplemental hand feeding is necessary or even desirable seems most inconsistent with what landowners usually want from their dams. For the odd farmer who likes to

feed his fish or wants to produce a very large poundage of fish, hand feeding is fine. However, the vast majority of property owners who have a dam use it primarily for agricultural purposes. They usually like to have a few fish in it and a reasonable chance of catching one when they want some relaxation or fresh fish for the table. Even for those who have a good dam, enjoy fishing and do not drastically lower the level of water by irrigation, it is difficult to imagine them hand feeding to produce large yields. Deficiencies in food in farm dams can be remedied by the well documented techniques of fertilisation.

Up to this point I have developed the ideas that trout fishing in certain waters, including some farm dams, is quite good and that more could be made of it, that more emphasis should be given to public waters, and that hand feeding of fish in farm ponds is impractical.

The importation of a fish that will do well in rivers, dams and farm ponds that are unsuitable for trout is quite sound. This problem, however, is not unique to Western Australia. It exists to a greater or lesser degree, involving both native and introduced species, in all States. In New South Wales these "problem waters" constitute the principal research of Mr. J.S. Lake, of the Inland Fisheries Research Station, Narrandera. He is at present compiling a list of New South Wales problem waters and the environmental factors that make them unsuitable for available food and sport fishes. It is believed that Victoria is also contemplating compiling such a list. When more is known of what constitutes the problem waters, when we can say with reasonable authority that indigenous species are unsuitable, and when the possible effects of a proposed introduction on established fisheries can be estimated, an introduction of a suitable exotic species may be indicated.

As it is rightly assumed that a fish introduced to any part of Australia will have access to the entire country (plastic bags, air transport and eager anglers), I believe the committee of the Commonwealth-State Fisheries Conference acted wisely, in refusing at this stage the Western Australian request to import exotic sport and food fishes.

It would appear that Western Australia should endeavour to learn more of its problem waters and to experiment with introducing indigenous Australian species. From information supplied by Mr. Lake, the eastern catfish Tandanus tandanus and the silver perch Bidyanus bidyanus seem to offer good possibilities for Western Australia.

It is therefore recommended that

1. greater emphasis be placed on the problems associated with public waters;
2. the Department of Fisheries and Fauna compile a list of the State's problem waters and commence studies to determine their characteristics;
3. an approach be made to the New South Wales Government to supply catfish and silver perch fingerlings for experimental introductions in Western Australia;
4. experimental introductions and associated investigations be made in selected farm ponds and weirs, such as Harvey Weir, rather than attempt to breed the fishes at a hatchery. Hatcheries, as a general rule, should be discouraged as they consume great amounts of money, give relatively little in return and are particularly vulnerable to external influences;
5. the Department make full use of the advice and information available from the New South Wales Inland Fisheries Research Station;
6. experiments in pond fertilisation be initiated.

The Pemberton Hatchery Board at present consists of the Director of Fisheries and Fauna as chairman and three Pemberton residents. I believe it would be greatly strengthened if there were added at least one consistent and experienced angler and a technically trained fisheries expert.

MARRON

Those who know this large Western Australian freshwater crayfish usually have a real affection for the sport of marroning, or for a "feed" of marron, or both. Large marron, however, are becoming scarce in some areas and the enjoyment of these delicious crustaceans is restricted by law to non-commercial activities. Marron are taken by licensed amateurs during a prescribed season and cannot be sold. Because they would command a premium price on a ready market, several people are giving serious thought to marron farming.

I have discussed marron and marron farming with many people, including Mr. Ross Elliott, M.L.A., who is particularly interested in the possibilities of commercial cultivation of the animal. Whilst I think it would be quite possible to "farm" marron, I do not believe it would be an economic proposition.

It probably could earn a few extra dollars for a farmer who had some marron ponds and would undertake it as a profitable hobby, but as a commercial venture, requiring capital investment for the sole purpose of producing marketable marron for profit, I do not think it is feasible.

This opinion is based on my belief that marron are relatively slow growing and long-lived. It is, however, one opinion only and a definite, authoritative answer cannot be expected until more is known of the crustacean.

If marron are relatively slow growing and their growth cannot be greatly accelerated by supplemental feeding, it is quite possible that it may take 5 or 6 years, or more, to produce a marketable crayfish of legal size. The very large specimens may be 10 or 15 years old. Females are sexually mature at a carapace length of 2.17 inches (total length 4.93 inches) and possibly smaller. Therefore, unless the sexes are segregated, they will breed before reaching a marketable size. At the same time this may not be a disadvantage.

As they are quite easy to catch, the reported scarcity and decline of marron in certain areas are undoubtedly because the larger, more desirable specimens have been caught. Recruitment is in no way endangered, because reproduction takes place well below the legal size. Streams where the larger specimens have been culled are now carrying larger populations of smaller marron. An understanding of the biology of the marron, including the dynamics of the populations, will likely lead to reductions in size limit, longer seasons and a greater yield.

It is therefore recommended that

1. studies on marron be commenced. These studies should include work on marron in farm ponds and open waters. Controlled conditions at the Pemberton Hatchery would make it ideal for growth studies and other aspects of the biology of marron requiring ready access to the animals;
2. prospective marron farmers be permitted and encouraged to experiment with marron farming, but that they should be advised against large investment in the experiment and warned of the possible need to "write off" their whole investment in the event of non-success;
3. departmental advice be made available to prospective marron farmers so that as much information as possible can come out of their work. In this respect, the Department may wish to carry out its own experiments in conjunction with a

prospective marron farmer. This would have advantages for both parties;

4. the Department give consideration to the problems posed by the sale of farmed marron and devise effective controls now to ensure that only farm-produced marron is sold when and if the problem arises;
5. marron introductions be carried out in an attempt to establish the animal as widely as possible in Western Australia as a source of food and recreation.

TROUT

As mentioned earlier, it appears as if the trout fishing is really quite good in Western Australia. However, this has not been documented. Also, it does not appear that anyone has accurate knowledge which waters require stocking, which are self-supporting and which waters do not require stocking.

Whilst brown trout are an excellent fish, they are harder to catch than rainbows and in moderately fished waters usually hold their own by natural reproduction. Because of this, it is my opinion that they seldom require restocking under most Australian conditions. New South Wales has discontinued the stocking of brown trout and is concentrating on raising rainbow trout to fingerling size. The advantage of fingerlings is that they can be marked by fin clipping and their survival is considerably better than that of fry.

If a system of angler log-books were introduced and selected waters stocked with fin-clipped fingerlings, the basic information needed to formulate a sound trout policy could be obtained.

It is recommended that

1. hatching of brown trout be discontinued;
2. as many fish as possible be raised to fingerling size and fin-clipped prior to release in selected waters;
3. log books similar to those used in New South Wales and made available to the Department of Fisheries and Fauna be printed and distributed to selected anglers;
4. feeding of some "pelleted" food be commenced;
5. consideration be given to shifting the hatchery to a site adjacent to the ponds.

STAFF

Should the Department consider proceeding with the recommendations contained in this report it will be necessary to divert the activities of the present staff or to appoint additional staff.

It is strongly recommended that the latter alternative be adopted and that a graduate biologist and a technical officer be appointed to undertake research on freshwater fisheries problems and other duties including -

1. The biology and commercial possibilities of marron.
2. Supervision of the operation of the Pemberton Trout Hatchery.
3. Supervision of the introduction of warm water species from eastern Australia.
4. Investigation of farm pond problems, including fertilisation experiments and the introduction of a warm water species.
5. Compilation of information on problem waters.
6. Supervision of log-book studies.
7. Carrying out fertilisation experiments.
8. Generally advising the Department on freshwater fishery matters.

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