increased yield of between 20 to 30 per cent in the catch and in the long run a permanent increase of about 10 per cent could be expected. At the present time the Tasmanian crayfish production averages a little over three million pounds (weight). In the past 10 years the lowest production was 2.5 million pounds in 1952 and the highest 3.9 million in 1961. There are approximately 300 vessels engaged in crayfishing in the State and these employ some 700 fishermen. Mr. Atkins said he would be submitting the proposals, which were of such a far-reaching nature, to an early meeting of Cabinet in the New Year.

In conclusion, the Minister issued a warning against the taking of crayfish other than those of the present legal size. Adequate notice of any change would be issued if the new regulations are to be adopted."

TAMMAR ON HOUTMAN ABROLHOS

The report immediately below, written by Dr.A.R. Main, Reader in Zoology at the University of Western Australia, is reproduced here because of its high general interest. It was prepared for the information of the Fauna Protection Advisory Committee and was tabled at the last meeting of the Committee held on April 5, 1963. Dr. Main, the leader of the party, was accompanied by Professor W.R. Dawson, Professor of Zoology at the University of Michigan, and a team of graduate research students. The report is reproduced in full.

Report following visit to East Wallabi Is., Abrolhos, February 11 - 15, 1963.

Personnel: A.R. Main; J. Kinnear; D. Bradshaw; W. Lane; W.R. Dawson and V.Shoemaker.

Transport: F.V. "Dampier" : A. Pearce, L. Frizzell.

Preamble

Evidence from various sources has indicated that the exceptionally long and hard summer of 1961-62 had caused almost catastrophic reduction in numbers of quokka on Rottnest as well as tammar on Garden Island

and at the Tutanning Reserve, East Pingelly. These indications prompted the visit to the Wallabi Islands in order to see whether similar decline was apparent there. In addition to the major purpose of the visit it was decided to obtain some physiological measures of the status of the population as well as clinical indication of virus disease present. These measures involved killing animals and were to be used only if it was apparent that the population had not been subject to a decline.

Results

Numbers of animals present.

No census or accurate population estimate has ever been made for either of the Wallabi Islands and the duration of the present visit precluded a comphrehensive study of the population by making estimates based on mark and recapture techniques. This being so it was necessary to base opinions of numbers present on experience in other areas; in particular the following were used:-

(a) grazing pressure (heavy; population numbers high)

(b) evidence of regeneration (good regeneration; population numbers low)

(c) tracks, runways and scats (roughly indicative of presence or absence of animals in an area)

Evidence from the above suggested that tammar occurred everywhere and were relatively uniformly dispersed. Grazing pressure was high and regeneration almost absent. Traverses made at night as well as collections of animals made at night suggest that the density is about 1 tammar per 1.5 acres which gives a minimum population of about 600 animals.

As soon as the abundance was assured the planned collections were made.

Water.

Diplolaena leaves everywhere were rolled, presumably signifying absence of summer rain. The sand was powder dry even under rocks. An additional three

wells were located making a total of 7. Of this total the water was not accessible to the tammars in five, though two contained drowned animals. The two which were accessible bore every indication of being used regularly. One had ample water in a deep sheltered cavern, the other was open, exposed and had little water which was unlikely to last through the summer. It appears that a large proportion of the total population on the island does not have access to drinking water during the summer.

Collections.

Night of Feb. 12th, 15 animals caught, tagged, sexed and weighed on morning of Feb. 13th. 4 males selected for thyroid uptake measurement. Serum collected for Professor N.H. Stanley, Professor of Microbiology, - at slaughter. These were :

No.	Wt.	Serum No.	Thyroid uptake Measured by I_{31}	Hind foot
4403	3.8 K	21	6.1%	133.5 mm
4406	3.7 K	22	10.8%	130.6
4411	3.8 K	23	6.1%	132.0
4413	3.7 K	24	8.3%	134.3

The remaining animals were retained for transport to the University.

No.	Wt. at capture	Sex	Wt. March 11, 1963
4402	4.4 K	M	4.24 K
4404	3.5 K	F joey	died
4405	4.0 K	M	4.06 K
4407	4.6 K	M	3.83 K
4408	1.2 K	F	1.02 K
4409	3.0 K	F joey	3.02 K
4410	2.5 K	F joey	2.52 K
4412	3.3 K	F joey	3.38 K
4414	2.0 K	M	died
4415	3.7 K	F joey	3.32 K
4416	1.3 K	M	1.32 K

On Feb. 14th, 6 animals captured, 1 subsequently escaping overnight, the remaining five transported to the University.

No.	Wt. at capture	Sex	Wt. March 11, 1963
4619	unknown	F	1.52 K
4620	"	F joey	3.14 K
4621	"	F joey	2.36 K
4622	"	F	2.48 K
4623	"	M	4.2 K

The weights of animals at capture are, on the average lower than for a similar sample from say Garden Island, at the same time of the year. The lower average weight does not appear to be a serious reduction.

Physiology.

Morning of February 13, 1 animal shot for blood and urine. Evening of February 13 members of the party captured 8 animals. These animals were killed shortly after capture. Blood and urine samples were collected to measure urea, sodium and potassium concentration. Bladders were near empty or empty. Analysis of urine was hampered for this reason. In addition serum for Professor Stanley was collected.

The following morning February 14, 3 animals were shot to complete the sample. Blood and urine collected.

Summary.

Total number of animals caught 33 - 1 male escaped from confinement.
Total number of males caught 17 - 1 juvenile.
Total number of females caught 16 - 2 juveniles

All mature females except one (which was barren) carried very young joeys. 16 animals were brought back to the University - 14 survived to date. 17 animals slaughtered for physiological measurements, i.e. thyroid uptake, urea, Na, K levels in blood and urine.

Results from physiological analysis

Thyroid uptakes averaged 8.1% with a range of 6.1% - 10.8%. This compares favourably with a value from 1 animal resident in yards for 1 year whose uptake was 9%. The low thyroid uptake supports the hypothesis that the tammar has a low metabolic rate.

Blood urea levels average 30mg%. This is lower than the euro by approximately 20% when compared at the same time of the year. Urine analysis was hampered by the small quantities collected, but the general impression gained from the limited amounts of urine was that the concentration of urea was low. This implies that the tammar is conserving urea. Na, K, blood levels are on the expected range. Interpretation of Na, K levels in the body fluids will have to await the collection of more data particularly from different seasons of the year.

Discussion and Conclusions.

These collections are interesting from the standpoint of population size and structure. The total number caught (including 1 male escaped) is 34, of these only 3 were juveniles (= to births summer 1962). Night observations over the whole island indicate that juveniles were everywhere in similarly low numbers. However, 13 of the 14 mature females handled had small joeys which from experience would have been born in January 1963. This is the typical picture of high fertility among female macropods. What is unusual is the low recruitment of young into the population from the previous year's births. The reason for the poor recruitment of the young appears to be that the island area is at maximum density; and that territoriality of adults is killing off the young recruits which can only find a place to live when an established adult dies. This interpretation suggests that the population is in a healthy state. Density is high and there are more than sufficient recruits to fill possible places made available by natural deaths of established adults. Moreover we can conclude that the hot severe summer of 1961-62 had no effect on the population of East Wallabi because experience with quokkas suggests that under stress of drought both old and young have an equal

probability of dying, consequently the end result is a fairly high proportion of recruits in the surviving population.

Precisely similar population structures were obtained for the lizards Egernia stokesii, Amphibolurus barbatus mimus and Gymnodactylus milii. That a mammal and 3 distinctive reptiles should all show a stable mature age structure indicates that the biotic part of the environment is complex, well integrated and possibly a climax. That this should be so for an island less than 1000 acres in area is extraordinary and all care should be taken to see that nothing disturbs the balance already present. Two obvious ways to upset the climax would be to (i) burn or clear part of the area and (ii) remove the predators such as sea eagles which prey on these tammars unable to hold territory with adequate cover. In view of the demonstrated high fecundity of the tammar it is not expected that removing 20-30 animals for study will do anything other than allow more young to recruit into the population.

The results suggest that the tammar population on East Wallabi Island is responding to the arid environment physiologically. The conservation of urea allows an efficient and high level of recycling of urea which must contribute substantially to the nutritional status of the population. That blood urea levels in the tammar from this locality are lower than for euros from the Pilbara is quite unexpected.

What information we have clearly indicates that following further laboratory work more elaborate field analyses should be undertaken on a long-term basis with sampling from season to season. As at present visualised this should not necessitate removal of many animals from the island and none need to be killed on the island.

SIX LECTURES ON CRAYFISH

The Adult Education Board in a recent leaflet advises that a series of lectures will be given on various aspects of the Western Australian crayfishery, and of the life history of the crustacean on which it is based. The venue of the lectures will be the Western Australian Museum,