WESTERN AUSTRALIA TURTLE RESEARCH: DEPT. CALM

NEWSLETTER

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(PROJECT SUPPORTED BY AUSTRALIAN NATIONAL PARKS AND WILDLIFE SERVICE)

Seasonal Factors

The 1990/91 season work was notable on three counts; maintenance and expansion of the volunteer involvement in beach work, continuing additional support from North West Shelf oilfield operators (West Australian Petroleum Pty Ltd {WAPET} and Hadson Energy Ltd) and their staff, and the lowest seasonal nesting intensity so far observed for Western Australian green turtle populations.

CALM Operations division staff assisted with maintenance of the Exmouth District volunteer program, expansion of investigations focussed on the coastal Pilbara, and further visits to the Cape Domett flatback rookery in the north Kimberley.

Aboriginal community participation in the west Kimberley work continued, with ongoing support received from the Contract Employment Program for Aborigines in Natural and Cultural Resource Management (CEPANCRM) administered by the Australian National Parks & Wildlife Service.

Tagging Work - 1990/91

Green turtle

Work at rookery beaches of the Lacepede Islands, Barrow Island, and in the Exmouth Gulf area was planned during the main summer nesting period, as in previous years, but results obtained were affected by the substantially reduced nesting attendances at each rookery. Practically no green turtles visited the Barrow Island and Exmouth Gulf area beaches. Nesting intensity at the Lacepede Islands was *c.* 10-15% of the peak observed during the 1989/90 season.

To date, the numbers of green turtles tagged at these major study rookeries have been:

	Progress 90/91	Previous Total	Progress Total
Lacepede Islands	222	3 213	3 435
Barrow Island	5	2 011	2 016
Exmouth Gulf area			
Muiron Islands	3	188	191
Ningaloo Marine Park	8	1 013	1 021
TOTAL	238	6 425	6 663

In addition, 180 green turtles have been tagged at a number of other locations.

Other Species

With the reduction in numbers of green turtles nesting during the 1990/91 season and the expansion of the volunteer support program it was possible to improve our knowledge of flatback, hawksbill and loggerhead turtles.

Small numbers of loggerheads were again found nesting on the Exmouth Gulf area beaches. Another 22 turtles were tagged on beaches of the Ningaloo Marine Park over the summer. Two short duration visits to the Muiron Islands resulted in tagging of another 28- Progress totals = 44 at Ningaloo and 46 at Muirons. It is now confirmed that the Muiron Islands are the most important loggerhead site in this area. An additional volunteer observer report, supported by video-tape documentation made overnight on 31 December 1990, also confirmed the relative importance of Turtle Bay, Dirk Hartog Island, as a Shark Bay loggerhead turtle rookery.

Flatback turtles were tagged at five different locations during 1990/91; 45 at the Pilbara mainland study, 26 at Barrow Island, 13 at each of Rosemary Island and the Lacepede Islands, and 8 at Varanus Island;- Season total = 105 - Progress total = 286, all sites.

The ongoing hawksbill work focussed on Varanus Island in the Lowendal group was continued. The more extensive effort focussed on Ningaloo Marine Park beaches in 1989/90 was also maintained, and the rookery at Rosemary Island in the Dampier Archipelago was subject to further investigation. This latter work confirmed the major status of Rosemary Island as a hawksbill rookery - 56 turtles were tagged over 4 nights. Season totals for Varanus Island and the Ningaloo-Muirons rookeries were 29 and 9 respectively. Season total

all sites = 94, and Progress total = 312 (218 of these on Varanus Island over 5 seasons to date).

Occasional site visits to the Monte Bello Islands group over the past few years have confirmed use by hawksbills of a number of beaches on several islands. These observations, plus observations made during the tagging studies noted, clearly suggest that islands on the North West shelf are the major focus of nesting by western Australian region hawksbill turtle populations.

Dispersal of Tagged Turtles

A further 7 reports were received from around the northern Australian coast over the past year, but full detail for the latest report has not yet been completed.

All 6 completed recovery reports were for green turtles - 5 originally tagged at the Lacepede Islands rookery, and 1 from the Ningaloo Marine Park area (tagged January 1990). This latter is only the second report of a recovery of a green turtle from the Pilbara-Exmouth region rookeries. Like the first report, for a Barrow Island turtle, this second was also from a west Kimberley location.

The five additional recoveries of Lacepede Islands turtles included the second report received from a Gulf of Carpentaria location. Like the first, this turtle was also tagged in the 1987/88 season. The remaining 4 turtles included two 1988/89 season and one 1987/88 season nesters taken inside King Sound, WA. The last was a 1989/90 season nester taken at Kalumburu, WA.

Of the 30 Lacepede nesting turtles now reported as recovered we have two from the Gulf of Carpentaria, another 10 scattered along the northern coast of the Northern Territory, including multiple recoveries from Croker Island (4), South Goulburn Island (2) and the Melville Island area (2), and 18 from Kimberley coastal areas of Western Australia. To date, all of the green turtles reported recovered outside of Western Australian coastal waters have been from the groups tagged at the Lacepede Islands in the 1986/87 and 1987/88 seasons only - latest reports, April 1991.

The multiple recovery reports summarized suggest that nesting groups attending the Lacepede Islands rookery from year to year may include different proportions of animals from different feeding ground aggregations. However, the important feeding grounds for at least some of the green turtles nesting at the Lacepede Islands are apparently

located in coastal waters around the Western Australian Kimberley coast, around the Northern Territory coast, and within the Gulf of Carpentaria.

Dedicated searches for tagged turtles further offshore, and also along the poorly visited parts of the Kimberley coast in the western Australian region, aimed at correcting apparent bias in the reported recovery data have not yet been done. Further attention to stimulate better reporting of recoveries is still needed.

Remigrants (turtles returning to nest at known rookery)

Green Turtle

Despite the low numbers of nesting turtles this season, further remigrant green turtles were seen at our Barrow Island and Lacepede Islands study rookeries.

At Barrow Island, one turtle from 300+ tagged while nesting at John Wayne Beach during the 1987/88 season was resighted this year, making a total of three 3-year remigrants only seen to date. The low return rate observed so far must be judged against the low intensity of nesting at Barrow during the 1989/90 season, and the scarcity of turtles attending to nest in 1990/91.

Another twelve remigrants were sighted at the Lacepede Islands this year - another 5 from the 1986/7 nesters, and another 7 from the 1987/88 nesters- Progress totals = 25 from the 1986/7 season, and 10 from the 1987/8 season. We have now observed 3 turtles returning after a two-year absence, 27 after a 3-year absence, and 5 after a 4-year absence (the latter being the maximum available to date). We have not observed any returns in consecutive years.

Apart from noting the facts above, these observations are not yet further interpretable. Any possible comparison between 1989/90 and 1990/91 is also obscured by the substantial differences in nesting intensity between the two initial tagging seasons and during the two years over which remigrants have now been observed.

Other Species

Observations of remigrant flatbacks and hawksbills improved during 1990/91.

Flatback Turtle
Three of only six flatbacks tagged at the Lacepede Islands in the 1987/8 and 1988/9 seasons were resighted this year.

At Varanus Island one flatback, first tagged in the 1986/7 season, has now been resighted three out of the past four seasons, being missed only in 1988/9. Three other turtles from the 1986/7 group of 11 tagged have also been seen as remigrants, the last one after a four year absence in 1990/91. Two of ten tagged in 1987/8 have also been resighted, but there have not yet been any resightings of turtles tagged in 1988/9 or 1989/90.

Two remigrant flatbacks have been seen at Barrow Island- both two years after tagging. At the coastal rookery near Cape Thouin five remigrants have been observed - these include one of six tagged in the 1986/7 season seen during 1990/1, and two each from the much larger groups tagged in the 1988/9 and 1989/90 seasons. Three of the latter four were seen in the next season after being tagged; the last after a two year absence. No tagging work was done at this rookery in 1987/8.

Hawksbill Turtle
All the hawksbill records relate to Varanus Island. Another seven individuals were recorded as remigrants this season - Progress total = 8. The new records include resighting of the first turtle tagged in our project after a five year absence, another after a four year absence, four at 3 years, bringing that group total to five, and one at two years.

Summary

We are a long way short of being able to properly interpret the remigrant observations noted above. However, the hawksbill and green turtle data appear quite similar to each other, and are generally in accord with prior expectations. The flatback data to hand appear to differ in comparison, with a high proportion of consecutive season sightings, coupled with some relatively high accumulated resighting rates for small groups of turtles tagged at several locations. Perhaps these flatbacks are nesting more frequently than the hawksbill and green turtles while still having good survival prospects.

Seasonal Variation in Nesting Intensity, etc

Nesting Activity

The relatively low nesting attendance of green turtles at the Barrow Island and Exmouth Gulf area rookeries observed in 1989/90 was followed this year by a practical absence of nesting green turtles at those rookeries. At the Lacepede Islands there was also a substantial decline in nesting

intensity this season, in contrast with the 1989/90 result, but there were still substantially more nesting green turtles attending there than was the case for the more southerly locations.

The generally low nesting intensity observed for green turtles at western Australian rookeries this year was consistent with seasonal observations at north-eastern Australian rookeries, but the apparent separation of our results for Kimberley and Pilbara-Gascoyne rookeries last season requires further explanation.

The only extensive data we have for other species is for the hawksbills at Varanus Island. The best season observed so far was 1988/89, when apparently some hundreds of hawksbills nested. The other three seasons to date have seen much smaller numbers attending - perhaps only 25-30% or less of the numbers seen in 1988/89 in each year. Nesting this season was particularly patchy prior to the new year, and had ceased by mid-February 1991.

Other

Several tropical cyclones again affected beaches in the first quarter of 1991, but we do not know how these events relate to the changes in nesting intensity that preceded them. Fewer egg clutches laid at the various rookeries would have been vulnerable to destruction than in previous years when cyclones affected the same places.

Following our preliminary attempt to examine the developmental environment within naturally selected green turtle nests and the sex ratio of hatchlings produced at one of the Ningaloo Marine Park beaches in 1989/90, which was aborted due to destruction of the instrumented nests mid-term by cyclone induced beach erosion, we decided to refocus our attention on hawksbills at Varanus Island for 1990/91. This choice was based on the fact that there was a paucity of this sort of information for hawksbills, and that we had particular knowledge of nesting patterns, clutch size and hatching success already available for that rookery.

The decision to shift our focus was fortunate, in light of the subsequent scarcity of nesting turtles at Ningaloo, but we still had limited success in our endeavour because of the erratic hawksbill nesting that occurred at Varanus Island. Despite our elaborate plans for the investigation to be mounted, the turtles did not fully cooperate. We were only able to set up two nests laid in reasonably safe locations at times which then turned out to be late in the season that unfolded, and the turtles that provided these limited

opportunities then laid quite small clutches relative to the accumulated rookery data (85 and 60 eggs only *cf.* previous averages >110). The first nest produced 75% females; the second 100%; but hatching success was also relatively low, particularly for the second nest. This latter observation was consistent with results of excavations of other non-instrumented nests laid this season. The results obtained suggest that the beaches were relatively 'hot'. This investigation will be continued in 1991/92, and results reported in detail later as appropriate.

Genetic Studies

As reported previously, the mtDNA signature of the Western Australian rookery source green turtles is quite distinct from that of eastern Australian nesting animals.

Further collection and analysis of adult and hatchling material to expand our knowledge of genetic structure of the marine turtle populations found in the western Australian region is in progress in collaboration with colleagues at the University of Queensland.

Recovery of Tagged Turtles from Other Rookeries in WA

No new reports have come to notice in the past year. We have still not had success with extensive enquiries re a green turtle bearing a tag with an Indonesian return address that was taken in the west Kimberley in September 1989.

Leatherback Turtles in WA Waters

Leatherback turtles have not yet been recorded nesting on any western Australian beaches, and those recorded nesting elsewhere in Australia may properly be considered 'waifs'. Noting this, the scarcity of nesting green turtles at western Australian rookeries this past season permitted several observations suggesting that 'waif' leatherbacks probably do occasionally make crawls on beaches in this region, as in other Australian locations.

Efforts to improve reportage of sightings and salvage of leatherback turtle carcasses that may become available are continuing. We have had some reasonable success in recent times in this endeavour, but have not yet been fortunate enough to secure, tag and sample any live entangled turtles, with a view to 'stock identification' and later reporting of sightings on rookery visits that might subsequently occur after release.

Extension Work

Efforts to establish working contacts with Indonesian colleagues have continued. Liaison with fisheries managers and fishermen is being pursued with a view to further consideration of potential by-catch problems that may adversely affect marine turtle populations in the western Australian region. Working liaison with other groups involved in marine turtle management and research is being maintained.

Further Development of the Project

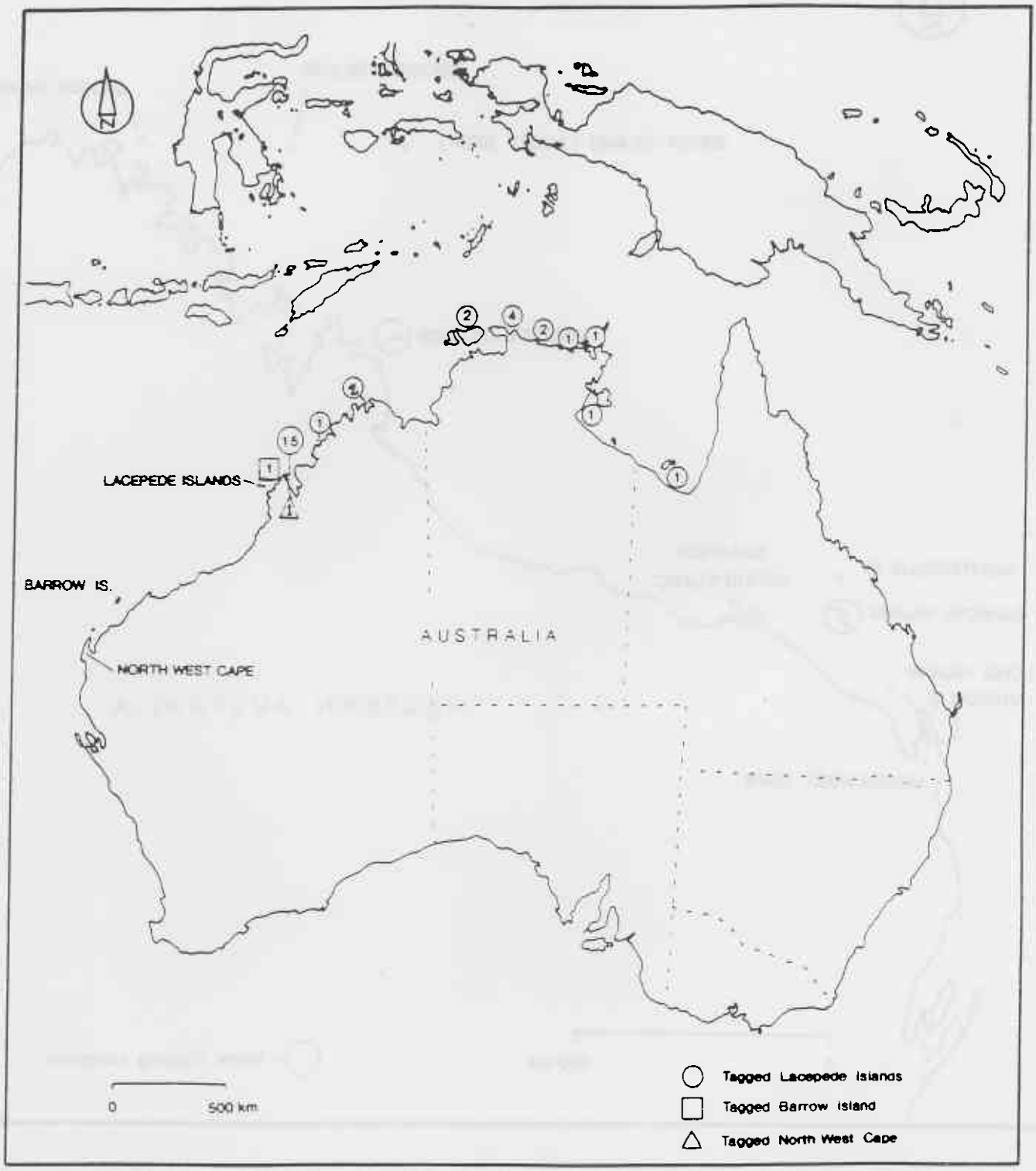
Beach work focussed on tagging and monitoring of nesting female turtles at selected rookeries provides the foundation for our project. Volunteer participation in this work continues to provide essential support, and needs continuing active encouragement . The Lacepede Islands work rests on continuing Aboriginal involvement on a more formal basis. Identifiable interests of northern Australian Aboriginal people in resource management issues relevant to these marine turtle populations are of particular importance, and need to be pursued further.

Secure funding plus our integrative management support will ensure adequate progress and enable further investigation of feeding ground and recruitment matters. Opportunities for student research project involvement are also opened up by maintenance of core project work at the more accessible sites.

The identification of pressing conservation problems for loggerhead turtle populations in the Australian region has coincided with our recent location of the important rookeries in the Exmouth Gulf and Shark Bay areas. New project work focussed on these populations is to be started.

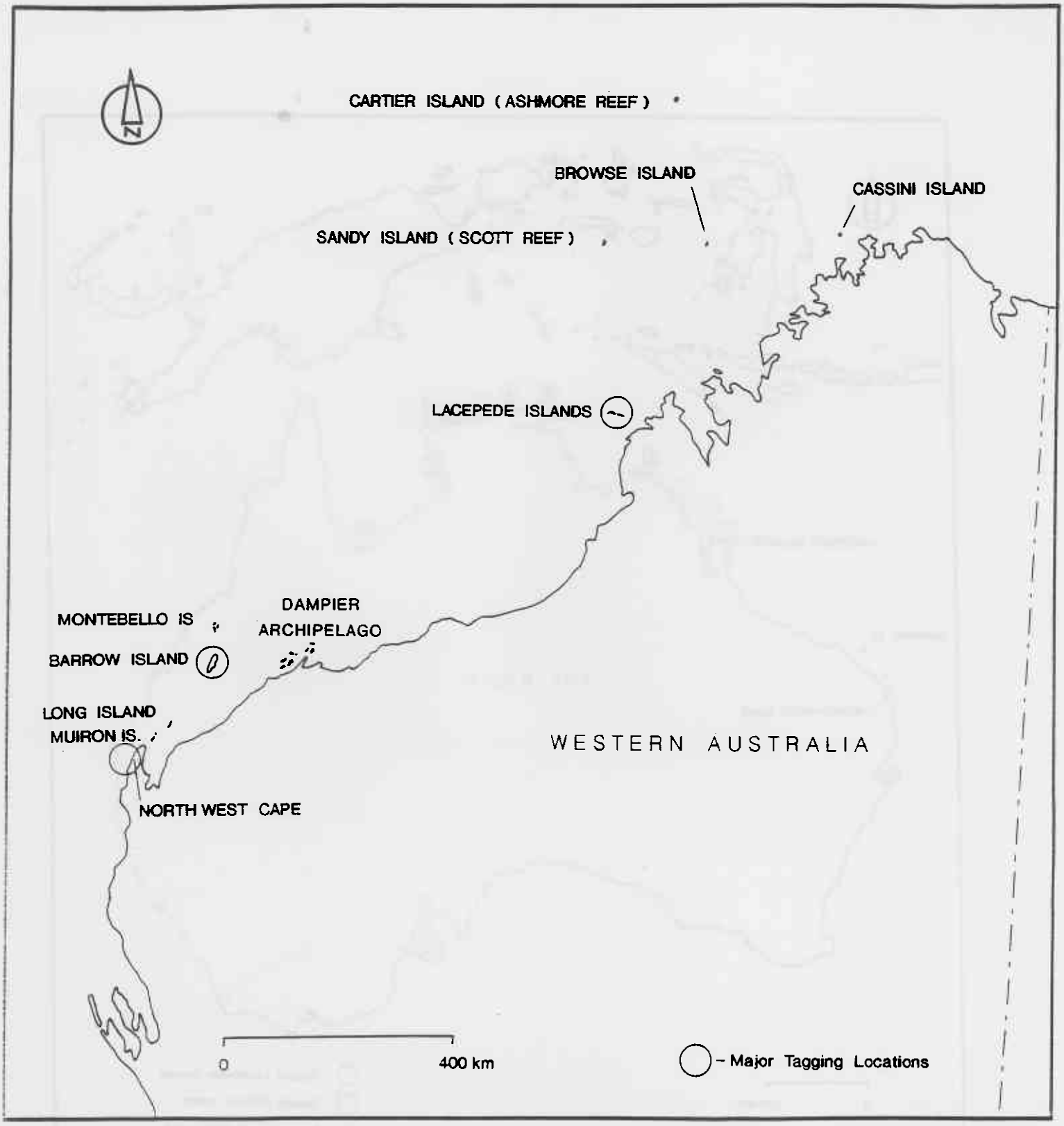
General work aimed at obtaining further information on distribution of populations and nesting sites will be continued. Observer network participation is also a vital component in this regard. We look forward to your continued interest and support.

[Editors Note: This newsletter is intended to provide information for persons who have assisted with the work in any way, and as an information sheet for restricted



GREEN TURTLE RECOVERIES FROM WESTERN AUSTRALIAN ROOKERIES

TO JUNE 1991



GREEN TURTLE ROOKERIES IN WESTERN AUSTRALIA