Creating Islands for Waterbirds

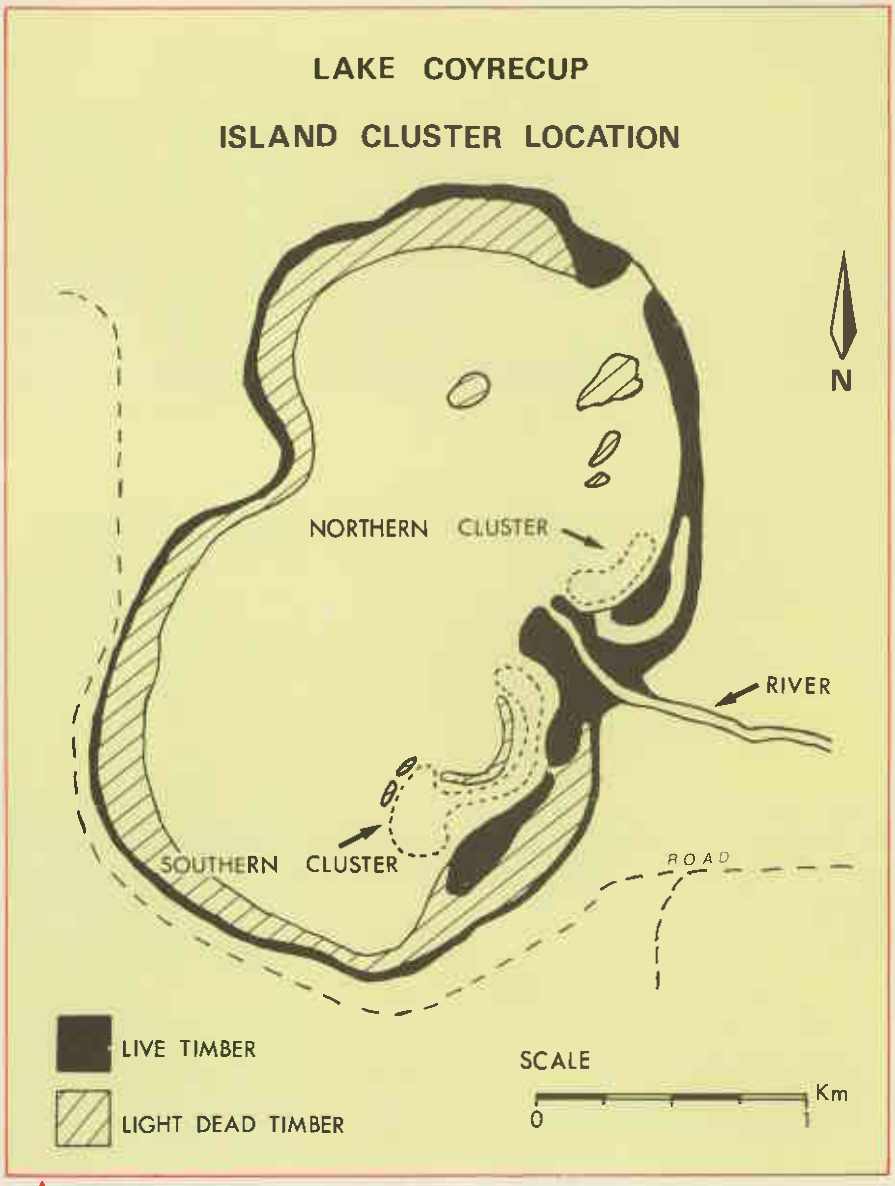
By D. R. Munro, Technical Officer, W.A. Wildlife Research Centre

Most of us are aware of the progressive degradation of waterbird habitat which has become a major area of concern among conservationists, ornithological groups and duck hunting organizations. Large areas of wetland have been drained, cleared and become saline with the inevitable loss of natural vegetation. Wetland management programmes to date have been directed toward reinstating water levels and acquisition of adjacent bushland for the protection of water quality. Because of the considerable cost involved, and the limited funds available, there are obvious limitations to what can be achieved in this field. As an extension to these existing programmes, other measures to improve waterbird habitat have been under consideration.

Acting on a proposal by Mr Neville Beeck; the Bird Committee of the Western Australian Wildlife Authority recommended the allocation of $5 000 from the Wildlife Conservation Trust Fund for the construction of artificial islands on selected lakes in the Great Southern district. The scheme was devised as a pilot study to determine the most suitable type of islands and to assess their value as nesting and refuge areas for waterbirds. It is worthy of note that duck hunters, through the purchase of their duck hunting licenses, provide the principal source of revenue to the Wildlife Conservation Trust Fund.

With the advantage of dry lake beds, resulting from recent years of drought, we were provided with an opportunity to complete the earthworks phase of the project late last summer.

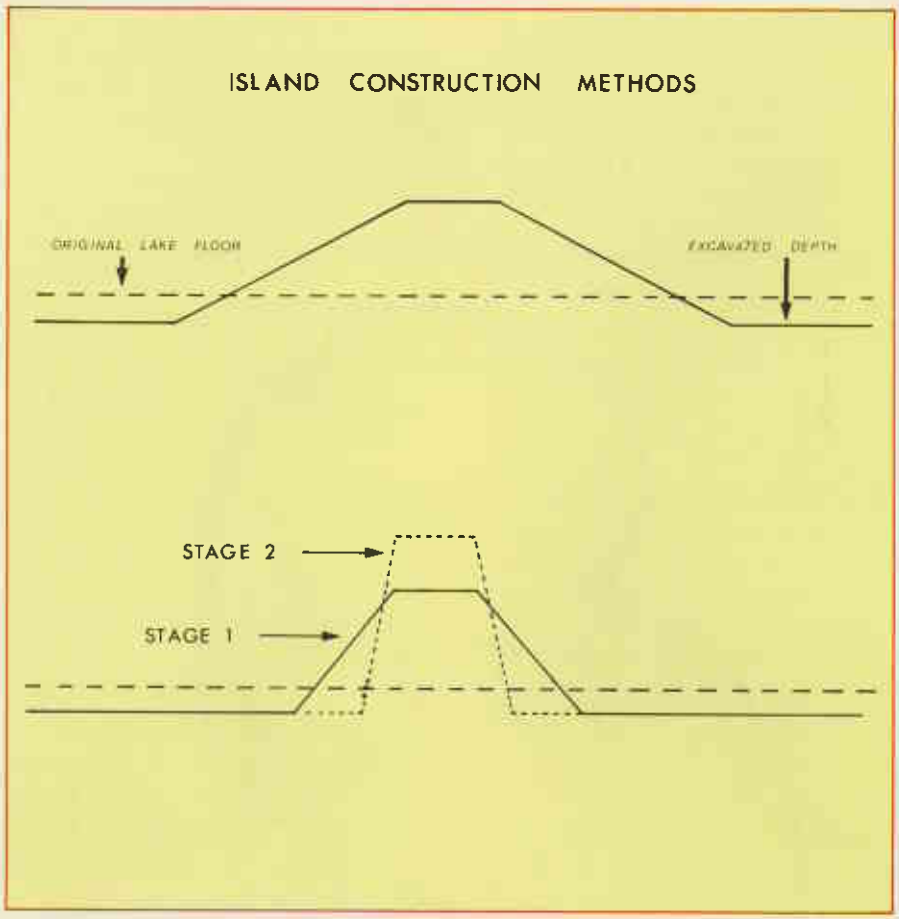
The two lakes selected for the project were Coyrecup and Little White. The drainage system from Lake Coyrecup flows down the Coblinine Flats into Lake Dumbleyung. Only in years of well above average rainfall does Lake Dumbleyung overflow in which event the flow continues through the Wagin and Woodanilling lakes system before it enters the Beaufort River near Albany Highway.



▲ Map of Lake Coyrecup showing positions of Northern and Southern clusters of artificially created islands

Little White Lake is situated in the Arthur River drainage system at the lower end of a series of lakes, the uppermost being Lake Toolibin. Little White Lake however receives additional runoff from an independent catchment area to the north and west which receives greater rainfall than the catchments of the other lakes in the system, consequently it usually carries water well into summer even in years of below average rainfall when the other lakes dry out.

Preliminary investigations, surveys, estimates, planning and the hiring of earthmoving contractors were conducted during the latter part of February 1980 in preparation for the commencement of stage I at Lake Coyrecup in March.



▲ The top diagram shows original concept with long sloping banks and wide undisturbed base. Bottom diagram shows technique actually employed at Lake Coyrecup with steep banks and a narrow undisturbed base.

Numerous island shapes were considered but for economic and practical reasons only three basic shapes were decided on as being suitable, these were:

(i) a simple mound which would provide an area above maximum high water of approx. 2m to 3m in diameter.

(ii) a three-armed shape with the length of each arm being from 5m (smallest island) to 20m (largest island). The width of each arm above maximum high water being approx. 1.5m; and

(iii) an arc shape with a diameter of approx. 10m and a width above maximum highwater of 1.5m.

To achieve these dimensions it was necessary to form the islands to a height up to 2.5 metres above the natural lake floor. Although the lakes only attain depths up to 1.5 metres, additional height was necessary to allow for consolidation and erosion.

During actual construction at Lake Coyrecup additional islands were created by the building of protection banks and from spoil which was excavated to provide moats. These banks or islands are in the shape of an arc of varying lengths, heights, widths and acuteness of bend.

Islands at both lakes were constructed in "clusters" comprising twenty odd islands, each being spaced an average of 50 metres apart. This arrangement of the islands is intended to provide additional protection (from wave action) to one island by another. There are two clusters on each of the lakes. When selecting sites for the island clusters, foremost consideration was given to those areas provided with protection from the prevailing weather.

A total of forty-four islands were formed at Lake Coyrecup requiring 25 hours plant operation over three days. The combination of island types at Lake Coyrecup were 28 mound, 11 three-arms, 2 small arc, 2 long arc and 1 long bank which resulted from moat spoil.

To provide additional protection to the islands of the northern cluster against terrestrial predators, it was decided to build a moat around the shallow side of the entire group opening at each end into the nearby deep section of lake. The same system was not practical for the Southern cluster because of the larger area involved. Alternatively, each of the moats around the individual islands (created when the islands were formed) were connected by one common channel. This channel also entered a deep section of lake at each end of the cluster. The principle of these systems was to maintain a water barrier around the islands for the "life" of the lake each season.

The two clusters at Little White Lake comprise a total of 43 islands with a combination of 32 mound, 10 three-arm and 1 arc. No deep moats were excavated but each of the islands was connected with a shallow channel similar to that as described for the south cluster at Lake Coyrecup.

Although a balance of $2 500 remained for the works at Little White Lake, total expenditure was only $2 100. Because of continuous rain during the 2nd and 3rd days, operating conditions deteriorated considerably so that at the completion of the 43rd island it became impractical to continue. However, it was felt that a sufficient number of islands had been constructed in respect to the size of the lake and the purpose of the exercise.

With the completion of stage II at Little White Lake a total of 87 islands and banks had been formed which involved a total of 46 hours plant operation. The hire cost for bulldozers was $100 per hour for both the T.D.25 employed at the Coyrecup and the D8 used at Little White Lake; therefore expenditure

for the earthworks totalled $4 600. There were other incidental costs involved but taking all factors into consideration this phase of the project exceeded preliminary capability estimates.

Only a minimum amount of compaction was possible at Lake Coyrecup because of the fine composition of the clay. Even though it was only slightly wet to touch and very firm prior to excavation, it became very "puggy" during the building of an island. Subsequently compaction could not be effected because the clay was unable to support the bulldozer when an attempt was made to climb the island.

Because of the different soil structure at Little White Lake operating conditions were much improved. Here there was a higher sand and silt content which when combined with the clay enabled it to support the bulldozer. Maximum compaction was therefore possible on a majority of the islands until the last day when, due to the persistent rain, the soil became too wet.

Erosion is bound to occur in varying degrees at all locations but in particular at Lake Coyrecup. This can be expected to be considerable during the first year or two as the islands consolidate and while they are unvegetated.

In respect to plant germination, it is probable that samphire and some grasses will become established naturally. Trials will be conducted on a selected number of islands to artificially germinate *Casuarina*, *Melaleuca* and scrub species common to each of the areas. For this exercise it is planned to either broadcast seed which has previously been extracted, or by simply laying seed-pod bearing branches on the islands.

Ultimately, of course, the merit of this type of management activity will depend upon the extent to which waterbirds use the islands for nesting and other purposes.

Evaluation of the programme has not yet been possible because of the continuing drought.

▲ View of southern island cluster of Lake Coyrecup facing north. (Photo: J. Lane).

▲ Close up view of northern island cluster on Lake Coyrecup facing west. (Photo: J. Lane).

▼ View of both north and south island clusters of Lake Coyrecup facing north east, with the northern most cluster in the foreground. (Photo: J. Lane).