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THE WATER REGIME AT BOGGY POND, LAKE WAIRARAPA

by

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Background

Through the detailed study of wildlife use of wetlands around Lake Wairarapa done in 1982/83 (Moore *et al.* 1984), and the patterns of plant distribution there (ibid; Ogle and Moss 1984; Ogle *et al.* 1988), it is now clear that much of the conservation value of the wetland complex lies in its diversity of habitat.

The entire area has been modified to a greater or lesser extent, by factors such as livestock grazing, weed invasion and artificial manipulation of water levels. The reason for having such a variety of habitats is that these impacts have occurred very unevenly. As a first example, some areas are grazed heavily and regularly, some lightly and infrequently, and others have not been grazed for many years. Secondly, not only does the depth of water vary from place to place, but also the frequency of inundation, the length of time in which areas remain wet, and the quality of the water such as silt loading and soluble nutrients.

The result, often more by chance rather than informed management, is that habitats have been maintained or even created which are ideal for certain nationally threatened or regionally local species of native animals and plants. Some of the species concerned are found in extremely small areas and are very susceptible to changes in, say, water regimes and water quality, grazing, and weed invasion.

Boggy Pond

(a) Water and vegetation

Boggy Pond and Matthews Lagoon were isolated by stop banking as part of the Lower Wairarapa Valley Development Scheme, and were separated from each other by a common stopbank. The work of Peter Moore at Lake Wairarapa from November 1982 to October 1983 included regular counts and observations of birds and bird habitat in adjacent wetlands, including Boggy Pond and Lagoon. His use of the Wellington Acclimatisation Society (WAS) hut at Boggy Pond meant that this area was studied more intensively than other parts of the wetlands, which gave a very detailed picture of wildlife usage around Boggy Pond at that time.

The complete stopbanking of Boggy Pond meant that, until April 1983, no streams or drains entered the reserve, and water input was by precipitation and ground seepage only. A considerable summer draw-down was normal in Boggy Pond. In April 1983 the WAS approached the Wildlife Service and obtained permission to bulldoze a cut through the stopbank which separates Matthews Lagoon from Boggy Pond.

Matthews Lagoon receives water pumped from the Te Hopai farm development block and water level fluctuations are less here than in Boggy Pond, even after the cut through the stopbank. Waters of Matthews Lagoon are certain to be nutrient-rich, compared with those of Boggy Pond, although this difference will have been reduced once waters were allowed to mix.

One of the highlights of work at Boggy Pond was the discovery of unsuspected wildlife and botanical values in "Wader Pond", a concave basin with stopbanks around three sides, in the south-west of Boggy Pond reserve. Differences in vegetation of Matthews Lagoon and Boggy Pond reflect the differences in water quality and water regimes, eg the presence of beds of Purua Grass (*Bolboschoenus fluviatilis*) and clumps of *Carex maorica* and *Eleocharis sphacelata* in the former but not the latter. In March 1989 found a large bed of *B. fluviatilis* on the edge of "Wader Pond" nearest the cut in the stopbank. This is likely to have arrived since 1983 from Lagoon. Until recently, the raupo and willows of Matthews Lagoon were conspicuously more vigorous than in Boggy Pond. These differences have become less obvious as water nutrient levels in the two reserves have become similar.

In March 1983 Wader Pond was dry and the native turf vegetation contained pillwort (*Pilularia*), a native water fern. This is a scattered plant in New Zealand, but with only about four North Island locations. Given (1981) categorises it as "local" in his checklist (p. 144). (A small amount was found on the shore of Lake Wairarapa near Jury Island in August 1982, but has not been relocated since). Wader Pond also contains a tall sedge, *Bolboschoenus caldwellii*, which is not in Matthews Lagoon, but in March 1989 was seen to have spread on the main lake shore at the south end of ‘J K Donald Reserve’.

One other notable occurrence is a rare native grass, *Amphibromus fluitans*, on the seasonally dry edge of Boggy Pond. This was found in March 1984, and was still present in March 1989. The species has been recorded only six times in New Zealand in the past 50 years (Ogle 1987). In March 1989 we found another colony on the seasonally dry bed of Toi Lagoon, in JK Donald Reserve.

b) Water Levels and Bird Usage

Peter Moore's work revealed some marked differences in bird usage of these two pond systems, which relate well to their separate water regimes and vegetative covers (see below).

In January 1983 Wader Pond had shallow water over a mat of native turf plants and, through evaporation, the water area became progressively smaller through the summer. Species seen here regularly were pied stilt, banded dotterel, white-faced heron, sharp-tailed sandpiper, pectoral sandpiper, and, less often, wrybill and lesser yellow-legs.

The shore of Boggy Pond became exposed progressively in summer-autumn of 1983, and was used continually by numbers of stilts and banded dotterels. Neither species used Matthews Lagoon to any extent. In March 1989 we observed black-fronted dotterels as well as banded dotterels in the same part of Boggy Pond.

(c) Past Recommendations

In 1984, I prepared an in-house report for the Director of Wildlife Service, expressing concern that wildlife and botanical values of Boggy Pond Reserve had been undermined by the bulldozed cut which allowed water free access from Matthews Lagoon. In essence, Boggy Pond would become a similar habitat to Matthews Lagoon, and hence the two reserves would be duplicates rather than a complementary pair. In other words, the total habitat diversity of the Lake Wairarapa wetlands was being reduced by this action.

Taking account of all these matters, it was agreed by Wildlife Service and WAS in 1984 that a control gate be placed across the cut in the stopbank. This would have allowed the water regime to be controlled for wading bird habitat. It would not, however, retain the low fertility status of Boggy Pond. This control structure has not been built, some five years later.

(d) The Current Proposal

An inspection of Boggy Pond and other parts of the wetlands on March 23 resulted from concerns of WAS that water levels in Boggy Pond and Matthews Lagoon are currently inadequate for attracting or hunting waterfowl. This appears to result from a drier than usual summer, and from progressive drainage of land outside the reserves. The WAS suggest that water be diverted from the Oporua floodway into Boggy Pond (and possibly Matthews Lagoon, either separately or via the 1983 cut in the stopbank).

The water level of Boggy Pond was certainly low, though not obviously lower than in 1983, and, as stated above, was used by dotterels and pied stilts, as well as numerous white-faced herons, shags, shoveler duck, mallards, and black swans. Water Pond was completely dry, and its turf mat cut up by cattle which were grazing the area. Pillwort (*Pilularia*) could not be found, although the habitat seems sufficiently intact to retain the species. On the other hand, raised fertility of the water may have eliminated this nationally threatened plant. As stated above, the rare grass *Amphibromus* was still present around the main pond, and is locally common. The only imminent threat to it seems to be the spread of Mercer grass, (*Paspalum distichum*) which is undoubtedly benefitting from increased nutrients. (At Matthews Lagoon and J K Donald Reserve, Mercer grass is rampant in seasonally flooded areas, to the exclusion of most other plants, especially native species).

Conclusions

The two major advantages of Boggy Pond as habitat for certain animals and plants over other parts of the Lake Wairarapa wetlands were

a) extreme seasonal fluctuations in water, but with some water right through the driest seasons;

b) low water fertility, which reduces competition with native plants by exotic plants (weeds).

Construction of a weir across the cut in the stopbank could retain the first condition, but not the second.Similarly, water pumped from Oporua floodway could be controlled to preserve seasonal water fluctuations in Boggy Pond (though not if the diverted water were then over-flowed into the Wairio wetlands, as suggested by Ian Buchanan, WAS). Again there would be no control on water fertility.

Weed control can be obtained chemically, as is already done for raupo in several of the L. Wairarapa wetlands, but this has costs in human and monetary resources. There is a high chance that artificial weed control may not be maintained. (In passing, it is noted that WAS agreed to remove pussy willows and gorse from JK Donald Reserve as early as 1981, but this has not been done, and both species are spreading there. Draft management plans prepared by WAS advocated plantings of native trees from local sources, but plantings done at JK Donald Reserve and Boggy Pond have not adhered to this policy. In other words, verbal assurances of procedures to be followed are easily by-passed, to the detriment of the habitat for many of the species we are charged with protecting).

I believe that before WAS undertake works at Boggy Pond it is incumbent upon them to show that their water management proposals will

a) have no adverse effects on the presence, seasonal use, and abundance of species of native plants and fauna currently using the wetland,

b) achieve what they aim to do.

<u>Summary</u>

1. Extreme seasonal fluctuations in water level have been a feature of Boggy Pond since its separation from other wetlands by stopbanks.

2. Until 1983 there was seasonal use of shallows in Boggy Pond reserve by a variety of wading birds, including rare Arctic wading species and wrybill. This usage extended over a long period each year, as more and more edge habitat was exposed through the season, beginning with Wader Pond in the spring.

3. The construction of a cut in the stop-bank between Lagoon and Boggy Pond in 1983 has reduced ecological diversity in the latter, and led to changes in the abundance and growth rates of some species, and others may have been lost since 1983.

4. Late summer/autumn drawn-down of water still occurs, with subsequent use of the habitat by wading birds. It is not certain whether shallows now occur for spring use by migratory waders, because of inflow via Matthews Lagoon.

5. Weed invasion is occurring in Boggy Pond, through a rise in fertility of the water and substrate.

6. Many waterfowl do use Boggy Pond, even at low water levels.

7. The maximum range of conservation values can be retained at Boggy Pond by

    a) closing the bull-dozed gap in the stopbank;

    b) not proceeding with any diversion water into the Reserve.

This is my preferred and recommended option.

8. If point 7 is not acceptable, the next most preferred options are

    a) construct a control structure in the bull-dozed gap in the stop bank.

    b) divert water, if needed, from Oporua floodway ONLY for a short period immediately prior to and during the hunting season.

    c) obtain guarantees that water control structures (a) and (b) will be operated to maintain other conservation values.

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