

by Tom Dalrymple **Management of water levels and salinity** Shallow water and exposed mud are necessary from March to October to allow wading bird species access to the invertebrates in the mud. Throughout this period water levels should fluctuate if water availability and salinity limits allow. This gives aquatic invertebrates the opportunity to re-colonise areas that have been lowered to allow waders to feed. Ideally the silt should not be allowed to dry out as this kills benthic invertebrates. The shallow water also prevents large fish species becoming established that might over graze the invertebrate population, the shallow water makes them easy prey for avian predators.

The water level in Priors Lagoon must be maintained at a high level from April until the end of August when water is in short supply so that fresh water is available to allow target salinities to be maintained. Water levels should be lowered in Priors Lagoon as soon as water is available as the north east corner is an important roost for passage waders.

Water levels should be raised during the winter to accommodate wintering waterfowl and to retard vegetation growth on the edges of the islands, so that suitable habitat for breeding waders is created for the spring. The water levels mustn't be raised so high that the islands are rendered useless as high tide roosts for waders in the winter time.

The aim of the salinity management is to keep the salinity as close to 10 parts per thousand as possible as this is calculated to produce the highest biomass of benthic invertebrates. In order to maintain the target salinities an adequate supply of fresh and salt water is needed. The volumes of salt and fresh water required will vary from year to year depending on rainfall, evaporation and transpiration. The amount of saltwater available is determined by the number of tides higher than about 12.5 meters, this figure will vary with wind conditions and the amount of freshwater coming down the Severn. The salinity of these tides will also vary with rainfall. During the winter it may be possible for the tidal flaps to be kept almost permanently open, whilst conforming to the salinity targets. Keeping the flaps open maximises the opportunity for invertebrates in the Severn to colonise the lagoons. Due to salinity stratification in Goldcliff Pill very often only water from the lowest tidal flap will be more saline than the water in the lagoons. Care must be taken not to exceed water level targets on winter spring tides.

Freshwater can be pumped from Monks Ditch, however this is restricted by our abstraction licence and the availability of fresh water into the pill. A small amount of water can be taken from Priors Lagoon. If water levels are very low it is possible to pump water from the transfer ditch on the grasslands into the lagoons, but care must be taken not to over abstract.

Freshwater is essential for grazing animals as well as maintaining salinity levels. In extreme cases tap water can be brought down on a tractor trailer for stock, but this is a very last resort as it is expensive and causes additional disturbance to breeding waders.

Managing grazing

Grazing has a significant effect on emergent vegetation as well as the grassland habitat immediately surrounding the lagoons. Without cattle grazing emergent vegetation like Common Reed would colonise

the shallow edges of the lagoons, making them unsuitable for waders at any time of the year.

For these reasons cattle grazing also reduces the frequency of mechanical ditching works. If cattle can be grazed early enough in the year they will significantly reduce the reed growth in the ditches, particularly if any reed straw is cut in the autumn. This creates a much more open aspect

benefitting

waterfowl and

birdwatchers

alike. Cattle grazing produces cow pats and the invertebrates that feed on these can be useful additional food for waders and their chicks.

Grazing on the surrounding grassland within the fox fence should aim for a tight sward of less than

50mm

for breeding Lapwing and wintering Wigeon. A short sward also helps to reduce predation as small mammalian predators are more easily seen by the birds. However the desire to create a short sward has to be tempered with the risk of trampling ground nesting birds' nests. Grazing within the fox fence between the beginning of March and the middle of May should be limited to low numbers of cattle. These should be shut out of areas densely populated with nesting waders. This is complicated by the need to ensure the cattle have access to fresh water.

Grazing with cattle can be increased between May and the end of June, but stock need to be

kept out of areas with incubating ground nesting birds, where possible without losing the habitat condition. Adult cattle are preferred as they are quieter and less likely to run around and trample nests. Sheep should be avoided as studies have shown that they can eat nestlings.

When water levels are very low and cattle can walk to the islands where most of the nests are it may be necessary to graze with sheep. From July to the beginning of March stocking densities should be altered to achieve target sward heights. If possible target sward height should be achieved grazing only with cattle as this is likely to achieve more species diversity and more breeding opportunities for

Redshank

. If sward targets can be met without over wintering stock this is preferable as stock checking cause's disturbance to wintering birds.

Depending on the growing season it may be necessary to cut, bale and remove the grass from the lagoons after all the waders have fledged, as the grass may have become too rank for the stock to keep up with it. Too much rush in the sward will need to be wiped with glyphosate

to kill it, and then it can be topped or preferably cut and baled. If the rush isn't removed it will proliferate as it's unpalatable to stock and would create a sward unsuitable for waders.

Outside of the fox fence the objective is to graze the vegetation hard enough to prevent it touching the first electric wire on the fox fence. Farmers are obliged under the European regulation "Cross compliance" to check their grazing stock every day. Whilst this causes disturbance the benefits of grazing far outweigh this relatively minor disturbance.

Ditch management

The ditches within the fox fence are brackish in nature. The ditches are the main conduits of saline and fresh water to the lagoons because of this water and salinity levels fluctuate significantly. Despite this the ditches support large populations of nektonic fauna, particularly shrimp (

Palaemonetes

Varians

), these are safe from avian predation due to the depth of the ditches. These shrimp are probably flushed into the lagoons where they provide important food for birds, when ever water is let on to the lagoons. The highest densities of shrimp appear to be in and around stands of Common Reed.

Grazing pressure and mechanical casting and de-weeding should aim to keep the ditches clear enough that their water carrying function is not impaired, without completely removing the emergent vegetation that

harbours

high densities of shrimp. Management of emergent vegetation should seek to create an open aspect for birds between Saline Lagoons. Where possible emergent vegetation should be managed by allowing cattle to graze the new growth. Despite grazing pressure ditches may need mechanical de-weeding periodically.

Lagoon edges including the island edges should be cast when the open aspect is in danger of being lost. Care should be taken to ensure that the gradual shoreline gradient is maintained.

To avoid stripping too much organic material no more than one tenth of a lagoon's shoreline should be cast in any one year.

Managing scrub and rank vegetation including islands

All scrub should be removed within line of sight of the lagoons as it provides perches for predatory birds. Scrub cutting should be done in August, September or the end of February avoiding high tides if possible.

In years when it is not possible for livestock to keep up with the summer's growth, rank vegetation should be cut, baled and removed after the last waders have fledged. Damp sedge dominated areas should be left as they provide refuge for wader chicks and habitat for wintering Snipe. Reed should be cut after the waders have fledged and whilst still green to prevent it dominating damp areas and impinging on the open aspect of the lagoons.

If vegetation on the islands is becoming so dense in July that it prevents wader chicks from walking through it, then it should be sprayed (or micro-wiped) with Roundup (or similar herbicide that doesn't harm aquatic life), in August and allowed to die before being cut and removed. Some vegetation on the islands is important to give wader chicks a chance to evade avian predators.

The islands should have any vegetation cut and removed soon after the waders have fledged, so that the islands can function as winter high tide roosts. The water levels should be at minimum level to allow tractor access. Any saplings should be removed by hand at this time.

Managing siltation

Lagoons must have silt removed when the lagoon islands become connected to the mainland when water levels reach 5.500 A.O.D. or when common reed is spreading significantly through its rhizomes.