



Catchment Management – Waders, Wetlands & Forest Planning

Glen Clova and Glen Doll

March 2014

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For:
Esk Rivers and Fisheries Trust



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1.0 Introduction

This study was commissioned by Esk Rivers and Fisheries Trust. The key objective is to investigate potential biodiversity conflicts in order to inform catchment scale management and forestry plans in Glen Clova/Glen Doll (see *Fig 1. Study Area*).

Changes in land management across the glens and issues relating to climate change have given rise to concern over current and future populations of key aquatic species. Sedimentation is identified as an issue in the River South Esk catchment, with high rates of fine sediment a particular problem in Glen Clova. In response to this, proposals are being developed to expand woodland cover through contour and riparian planting.

The Glen Clova and Glen Doll part of the South Esk catchment is recognised as being important for breeding waders – lapwing, oystercatcher, snipe, redshank and curlew. Waders are known to be sensitive to trees and hedgerows and planting up of open areas can deter them from using these areas for breeding. A potential conflict of interests arises from the woodland creating additional perches and shelter for predators of wading birds.

1.1 Study Outputs

Map 1 – Tree Planting Zones & Key Wader Areas

To show

- Areas for riparian planting unlikely to adversely affect wader populations
- Areas for riparian planting where prior consultation is recommended
- Key Wader Areas where tree planting should be avoided

Map 2 – Wetland creation/restoration

To show:

- Opportunities to create/restore wetlands which would harmonise with current land use
- Opportunities to create/restore wetlands where a change of land use would be required

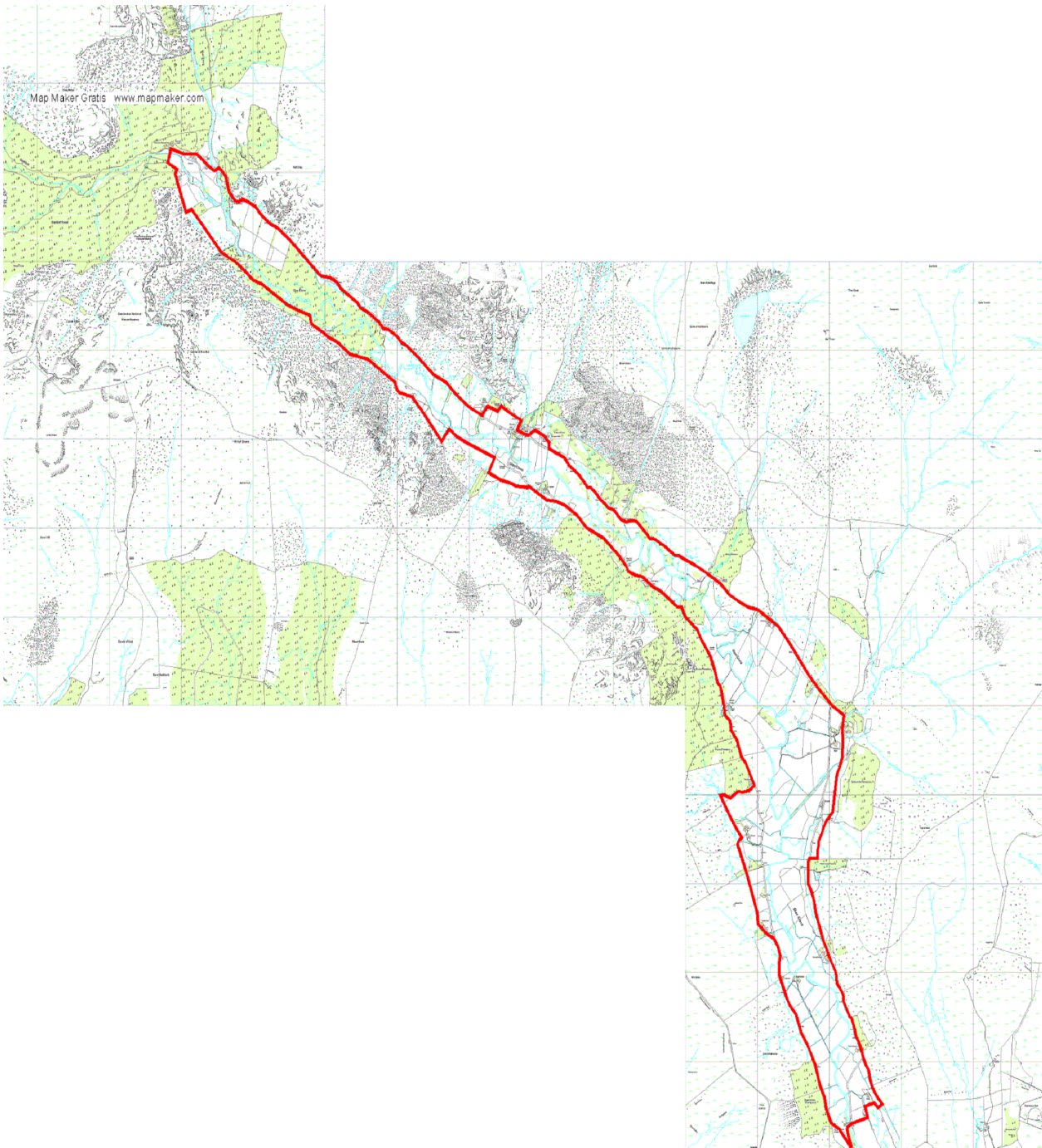
Both maps are accompanied by an explanatory note.

1.2 Study Area

The study area incorporates all improved farmed ground from OS grid ref NO3727 6528 at Gella Bridge, northwest to the area around Glendoll Lodge NO2803 7602.



Fig 1: Study Area



OS mapping license 0040063363



2.0 Background

2.1 Site Summary

Glen Clova and Glen Doll are located within the River South Esk catchment, designated as a Special Area of Conservation under the Habitats Directive as it supports internationally important populations of freshwater pearl mussel and Atlantic salmon. Both are currently assessed as being in unfavourable condition. This is associated with the degradation of habitat by land use pressures and channel modifications.

2.2 Geomorphology & Ecology

Concerns over threats to catchment ecology have led to the commissioning of numerous research studies.

The upper part of the catchment is an important spawning area for the early-running component of Atlantic salmon, a species in decline. Recent surveys have indicated that the long term viability of the freshwater pearl mussel population in the South Esk catchment is under threat due to a decline in the presence of young mussels, and that this may be linked to diffuse pollution impacts including accelerated fine sediment input to the river system (*Sniffer, 2011*).

Previous habitat and geomorphological surveys have shown sedimentation to be an issue in the River South Esk catchment, with high rates of fine sediment a particular problem in Glen Clova (*Milner & Gilvear 2005*).

In response, restoration measures have been identified which may help restore natural river forms and processes, thereby improving habitat conditions for these key aquatic species. The main land management recommendations focus on livestock exclusion and the need for improvements in riparian vegetation, one such measure being tree planting in the riparian zone.

3.0 Farmland Waders

3.1 Status

Across Scotland and the UK, there is considerable evidence to suggest there have been significant declines in the populations of several wader species over the last 15 years.

Parts of the Angus Glens have traditionally held large numbers of lowland farmland breeding waders, namely lapwing, oystercatcher, snipe, redshank and curlew. This is considered to be the result of traditional farming practices, which, alongside natural environmental conditions, provides suitable habitat for breeding waders. On-going research in Tayside led by RSPB aims to provide information on breeding densities in areas including Glen Clova and Glen Doll, to establish whether wader populations in these areas have followed the UK trend.

Newly published research (*Tayside Wader Survey 2012 Report, 2014*) has shown that the total number of breeding wader pairs across the Glen Clova survey area declined significantly between 1992 and 2012 surveys:



	<u>1992</u>	<u>2012</u>
Lapwing	155	67
Oystercatcher	118	60
Curlew	42	12
Redshank	51	6
Snipe	24	7

These declines have been attributed to major changes in farmland habitat and land management.

In arable farmland, there was a shift from spring-sown crops in 1992 to autumn-sown crops in 2012.

In grassland, the area grazed by cattle decreased while the area of short grass later in the season increased. Rough grassland increased in area while managed grassland decreased along with the number of farms with both arable and grassland.

There was also a noted decrease in areas covered by surface water and rush.

Woodland and scrub also increased between the surveys.

As Glen Clova has been identified as one of the few places left in Perthshire and Angus still with important numbers of breeding waders, there is concern that if ill-considered land management renders current wader habitat unsuitable, there are unlikely to be suitable alternative sites. The protection of the remaining high quality breeding habitat found in this area is therefore a conservation priority.

3.2 Habitat Requirements, Threats & Opportunities

Most waders will only nest and feed on open ground, avoiding hedges & trees. Most species prefer short vegetation or bare soil, breeding on lowland wet pastures with short grass or in arable areas, spring-sown crops.

Farmland waders rely on wetland habitats for breeding. Redshank are found on wet grassland that holds shallow surface water or pools and snipe are known to breed on pastures with rushes, tussocky grasses and the marshy edges of streams and rivers. Even small, wet field corners can be used. As well as open moorland, curlews breed on rough and damp pastures, unimproved hay meadows and boggy ground; they occasionally use arable crops and silage fields.

Waders, especially the chicks, feed on insects and invertebrates at the edge of pools, ditches and in wet grassland and grazed pastures. Lapwings nesting on arable land tend to move their chicks to adjacent wet areas and suitably short vegetation, such as grazed pasture, to feed.

3.2.1 Threats

Landuse changes known to affect habitat suitability for waders include

- alterations in livestock type and numbers
- changes in cropping extent, crop type and cultivations methods
- a reduction or deterioration of wetland habitats
- woodland expansion.



The presence of woodland can influence farmland wader numbers directly, by direct loss of wader habitat, or indirectly. Farmland waders avoid areas near woodland due to perceived presence of predators, such as crows and foxes, and because wooded or mixed landscapes can support a greater abundance and diversity of predators than open farmland.

Being ground-nesting, waders are especially vulnerable to predation. Preferred sites are those with a good all-round view, enabling waders to see approaching predators. Perching posts that allow predators to overlook nesting and brood rearing areas have a strong deterrence effect on the use of otherwise good habitat by waders. Quoted recommendations regarding the distance of this deterrence effect from boundary features varies and is often a summation of various reports and studies which have been accepted as best practice through the years. These reports cover a range of land uses - arable, grassland, lowland and upland. However, sufficient evidence exists to suggest that minimising the negative effects of wooded areas and associated boundary features should form part of an overall strategy for conserving breeding waders at a site level.

Where edge effects are important, small increases in one habitat type such as woodland can have greater influence than the change in size alone would suggest (*Davies et al 2014*). The effects of an increase in woodland/scrub depend on the type and siting of woodland planting and regeneration. However, information is difficult to source on the varying effects of different species of woody shrubs and trees on waders, effects of planting densities, composition, compartment size, etc. Consultations from this study indicate that both shrubs and taller-growing trees are likely to provide perches for crows or harbour mammalian predators. Therefore the perceived risk to waders remains (RSPB, *pers comm*).

Boundary fencing of areas for growing trees is another issue which can affect waders, particularly if the fence incorporates rabbit netting which can cut off potential nesting areas and feeding areas. As fencing excludes grazing, a subsequent build up of dense vegetation can also create a barrier to the movement of chicks.

3.2.2 Opportunities

There may be scope for restoring and increasing the extent of wetlands and standing water if the future economics of livestock production in marginal areas are offset by new Scotland Rural Development Programme (SRDP) initiatives.

Currently, the SRDP is under review. The next programme period for Rural Development is 2014-2020, with a new suite of options to be available from January 2015. It is highly likely that packages will be available post 2015 targeted at benefiting groups of species, such as farmland waders. Possible options will include the management of existing wetlands through adoption of an appropriate grazing regime and opportunities to create new wetland habitats. Through SRDP, compensatory payments will be offered to the applicant to offset losses through, for example, a reduction in land available for livestock grazing. In addition to annual recurrent management payments, grants will be available to support capital works associated with wetland creation and/or management for waders, such as fencing, rush topping, creation of open water/wader scrapes, etc.



4.0 Woodland Expansion in Glen Clova/Glen Doll

A forestry initiative is being developed in the upper catchment of the South Esk which aims to provide multiple benefits. In addition to mitigating effects of climate change, carefully planned woodland expansion can bring a range of environmental, ecological and agricultural benefits to the catchment. The current project, led by a steering group of all the main stakeholders and landowners, involves plans to extend woodland cover through both contour planting and riparian planting.

To reduce the supply of fine sediment to the channel it is proposed to improve the riparian zone along both banks of the River South Esk to reduce the rate of bankside erosion. Alongside other measures, riparian improvement would include promoting natural vegetation recovery and tree planting especially around the outside of bends (*SNIFFER, 2011*)

Native riparian woodland can improve bankside stability, contribute to restoring natural channel morphology, provide a food source (leaf litter, invertebrates, etc) to a range of aquatic species and create dappled shade to stabilise water temperatures, as well as provide a wildlife corridor for commuting and foraging wildlife.

Although some bird species, notably wading birds, are known to avoid woodland, sensitive management and establishment of woodland and scattered trees can benefit certain other birds.

Black grouse are recorded as present in parts of the glen, with a number of lekking sites on higher ground above the floodplain. Well planned new contour woodland is unlikely to affect black grouse (*RSPB, pers comm*). However, where birds are known to be present, care needs to be taken with fencing as collisions can be a significant source of mortality. Fences that are necessary to protect young trees from high deer populations should be well marked to make them more visible to flying birds, thereby reducing the number of collisions

5.0 Wetlands in Glen Clova/Glen Doll

One of the identified land management changes in Glen Clova and Glen Doll is the reduction in wetland habitats, mirroring UK-wide trends. Increased drainage activities over the past decade have contributed to the input of silt into the River South Esk, leading to accelerated diffuse pollution into the water environment. A range of species dependant on wetland habitats may have been affected as a result.

Wetland creation can involve a variety of land management techniques and substantial changes to landuse, for example through scrub clearance, ditch diversion and/or blocking. In some cases, wetland restoration may be feasible through small alterations to current land management such as a modifying of grazing regimes.

To prevent sediment release into the River South Esk, suggested measures include ceasing maintenance of the ditches, replacing ditches with buried (perforated) pipes to allow drainage and back filling, encouraging vegetation colonisation within the ditches and blocking ditches (*SNIFFER, 2011*).

Land managers in marginal areas such as the Angus Glens may be encouraged to consider a programme of restoring and increasing the extent of their wetlands and standing water through adoption of the SRDP initiative, to be launched in January 2015. Details on the new scheme, including available management options and grant rates, are yet to be announced.



6.0 Methodology

6.1 Consultation and desk-based research

Information from a range of organisations was gathered during the reporting and mapping process. Liaison and input from RSPB, Esk Rivers and Fisheries Trust, UPM Tilhill and Tayside Ringing Group was key in the development of zones for potential riparian planting in Glen Clova and Glen Doll. Consultation with stakeholders was considered paramount in order to produce meaningful and practical mapped results to be used in the forest planning process.

6.2 Site visits

Following consultations and research, site visits were made to the glen in order to ground-truth as far as was possible suitable breeding wader sites, potential for wetland restoration/creation and sites for woodland expansion.

It should be noted that due to time constraints, access had not been pre-arranged with individual landowners. Thus ground-truthing was carried out from vantage points along public access routes, potentially limiting accuracy of identified locations.

6.3 Mapping

Mapping was carried out using 1:10,000 tiles (OS licence 0040063363) using Mapmaker Version 3.5 and presented in jpeg/pdf format.



7.0 Study Results

7.1 Map 1 – Tree Planting Zones & Key Wader Areas

Map 1 is presented in Appendix 1

Map 1. aims to show

- Areas for riparian planting unlikely to adversely affect wader populations
- Areas for riparian planting where prior consultation is recommended
- Key Wader Areas where tree planting should be avoided

7.2 Map 1 – Background Notes

This map was produced according to the methodology outlined in Section 6 above.

Mapped site selection was based on the *Draft Indicative Species maps* produced by UPM Tilhill while taking into account data on breeding wader populations supplied by Tayside Ringing Group and RSPB, particularly *Tayside Wader Survey 2012 Glen Clova Important Wader Areas*. Recommendations outlined in the 2011 SNIFFER report were also considered.

- Areas for riparian planting unlikely to adversely affect wader populations

On the map legend, areas marked in green as 'Tree Planting Areas – unlikely to impact on waders'. Mapped areas are those outwith Important Wader Areas, flat floodplain ground and the 200m buffer (see *Section 7.2.1* below).

- Areas for riparian planting where prior consultation is recommended

On the map legend, areas marked in amber as 'Tree Planting Areas – consultation recommended'. These coincide with areas positioned on flat floodplain ground with potential for habitat enhancement for waders and/or within a buffer of 200m of key breeding wader sites.

It should be noted that wader surveys have not been carried out in all parts of the glen. In particular, parts of the moorland edge have not been studied and there is potential here for nesting curlew to be affected by tree planting. This should be considered before tree planting takes place.

- Key Wader Areas where tree planting should be avoided

On the maps legend, areas marked red. Two main sections are considered to be locations where any tree planting will have a detrimental effect on waders and should be avoided. These are

1. Floodplain fields around Wheen and south to Gella Bridge
2. Floodplain fields immediately north of Clova Bridge and Hotel, upstream to Atton.

7.2.1 Woodland and Edge Effect on Waders:

As highlighted in Section 3.2 above, quoted recommendations regarding the distance of a deterrence effect from boundary features varies and is often a summation of



various reports and studies which have been accepted as best practice through the years.

RSPB guidance recommends that for lapwings, avoid planting trees, shrubs or hedges within 30 metres of lapwing nesting and feeding areas. The minimum viable area of open ground is approximately three hectares, but the ideal is to have more than ten hectares of open ground (*Farming & Crofting for birds, Lapwing guidance leaflet*), with no surrounding trees and no tall scrub or single trees, either within the area or on the edges

A paper by Sheldon *et al* (2010) on lapwing suggests that nests that were more than 50m from the nearest field boundary has a higher daily survival rate than nests that were closer.

Further research has shown that the deterrence effect from perching posts on waders can extend up to 200m from the woodland edge (*Wilson et al 2014, RSPB pers communication*).

This distance was thus adopted in Map 1 as a buffer around known key wader sites within which consultations are recommended during the riparian woodland planning process.

7.2.3 Limitations:

The following were *not* taken into account in the preparation of this map:

- Land manager views
- Soil data & ground conditions
- Archaeological, botanical and other wildlife interests
- Practicalities e.g. access, fencing routes
- Eligibility for inclusion in government (or other) agri-environment funding schemes

7.3 Map 2 – Wetland creation/restoration

Map 2 is presented in Appendix 2

Map 2. aims to show:

- Opportunities to create/restore wetlands which would harmonise with current land use
- Opportunities to create/restore wetlands where a change of land use would be required

7.4 Map 2 – Background Notes

This map was produced according to the methodology outlined in Section 6 above.

Mapped site selection was based on site visits with additional input from Tayside Ringing Group. Potential wetland sites were selected on the following criteria:

1. Topography - flat floodplain ground can offer ideal opportunities for wetland creation. Smaller pockets of rush and open water amid undulating or sloping ground may hold some limited potential.



2. Size of areas of flat ground – where sites are considered too small for an expansive wetland creation project, such as a narrow bankside strip, these were discounted.
3. Current land use – this was noted during site visits and categorised as arable, improved grassland, rough grassland, plantation woodland, recent felling, etc. Presence of *Juncus* spp (rushes) and standing water was also recorded.
4. Distance from existing plantation and scattered/riparian woodland

- Opportunities to create/restore wetlands which would harmonise with current land use

On the map legend, areas marked in light blue as 'Wetland Creation Potential - little landuse change required'. Selected areas occur on permanent grass leys (improved or semi-improved) or rush pasture

Only minor land management adjustments would be anticipated in order to enhance these sites for breeding and foraging waders. Typically, these sites already offer opportunities to breeding waders; care should therefore be taken to avoid adopting new management techniques which could compromise the suitability of these habitats. Minor adjustments to current management practices might include adoption of a suitable livestock grazing regime, cessation of ditch maintenance, rush cutting and provision of wader scrapes.

- Opportunities to create/restore wetlands where a change of land use would be required

On the map legend, areas marked in dark blue as 'Wetland Creation Potential - landuse change required'. Upstream of Clova Bridge, selected areas occur on recently felled plantation ground. As well as sites which are currently under a different land use, this category refers to ground where a raising of the water table might be required in order to provide suitable wader habitat. Here, alterations to drainage might be appropriate, such as ditch blocking or diversion of a water supply via a perforated pipe.

7.4.1 Other considerations:

As no landowners were contacted as part of this study, site access was limited to observations from vantage points along public roads. This may have limited the extent and accuracy of identified locations for wetland creation/management. Thus, areas of potential wetland illustrated on Map 2 should be considered as indicative and a starting point upon which further ground investigations and land manager discussions may be based.

7.4.2 Limitations:

The following were *not* taken into account in the preparation of this map:

- Land manager views
- SEPA/CAR regulations
- Soil data, ground conditions, water levels
- Archaeological, botanical and other wildlife interests
- Practicalities e.g. access, fencing routes
- Eligibility for inclusion in government (or other) agri-environment funding schemes



8.0 Study Conclusions

8.1 Waders and new woodland

To avoid impacts on waders, concentrate new woodland planting:

- outside the floodplain
- Adielinn plantations upstream to Clova Bridge - landscape is characterised by undulating drumlins through this section of the glen with substantial woodland cover (plantations, riparian and scattered native broadleaves) already present.
- In the stretch between Clova Hotel and Glen Doll, consider replanting area of clearfell while avoiding the margin within 20m of the riverbank which holds good populations of waders on the islands and gravel beds

With little guidance available on establishing scrub versus standard trees in the presence of breeding waders, the main focus in forest planning in the Glen Clova/Doll catchment should be on location of new woodland rather than composition.

8.2 Wetland creation/restoration

Potential wetland creation/restoration should focus on the floodplain. Flat floodplain ground offers ideal opportunities for wetland creation. Surrounding undulating and sloping ground linking the floodplain to perimeter roads and outlying rough hill ground offers less opportunity for wetland creation. Here there are small pockets of lower-lying ground where rushes occur and water table is higher, but frequency of existing woodland cover precludes any expansive wetland creation.

The majority of sites earmarked for wetland creation/restoration will require minor alterations in land management in order to maximise suitability for waders. Techniques to be considered include installation of wader scrapes, halting of ditch clearing activities, enhancement or maintenance of open rush structure through topping and altering timing and density of livestock grazing.

Care should be taken to avoid degrading existing suitable breeding wader habitat

Further time and resources should be directed towards the development of potential wetland creation, restoration and management sites within the glen. This should be assessed on a site-by-site basis alongside land manager discussions. It would be advisable to delay efforts until more detail is available on options and grant rates under SRDP 2014-2020.



9.0 References

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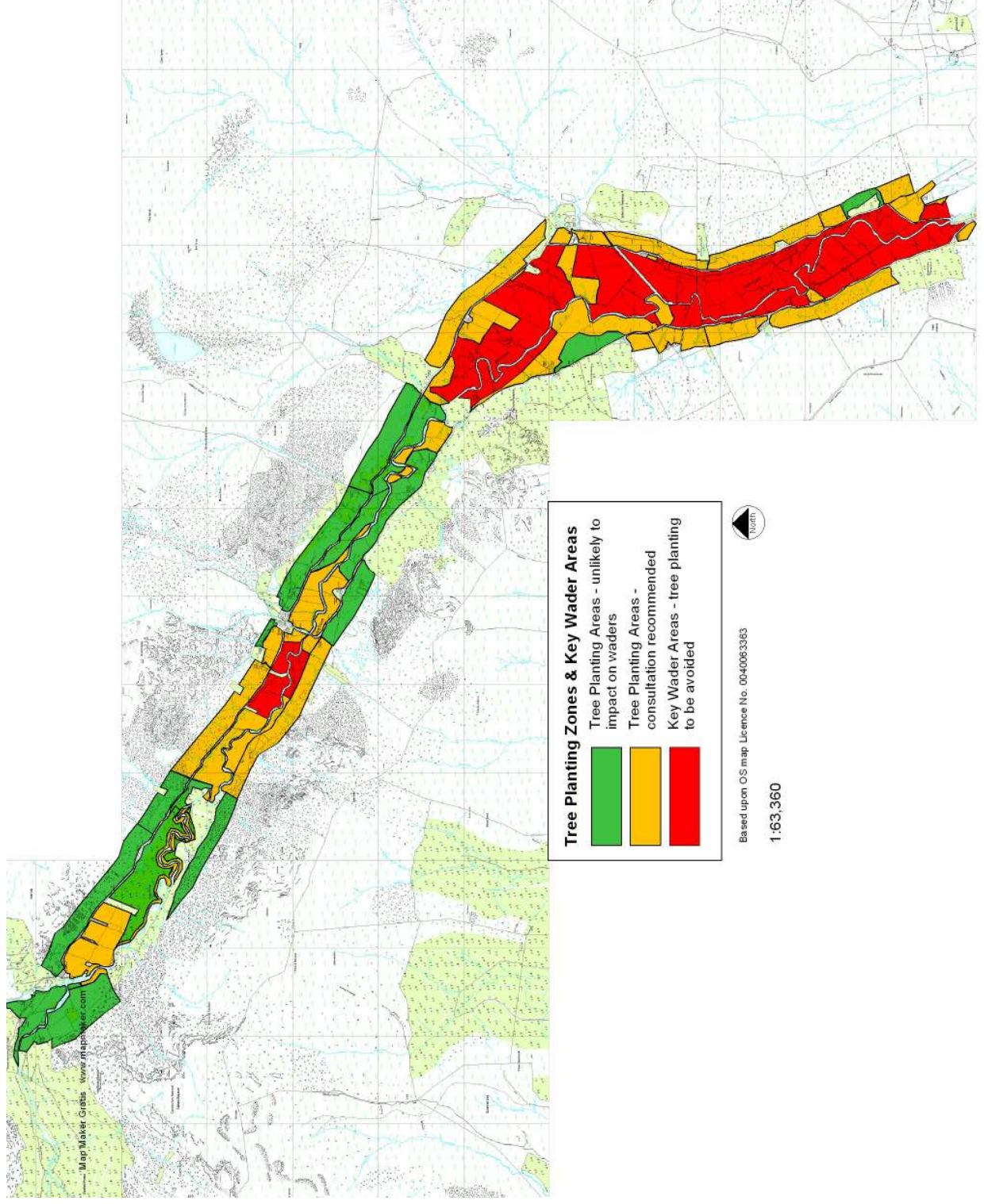
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Appendix 1

Map 1 – Tree Planting Zones and Key Wader Areas



Appendix 2

Map 2 – Wetland Creation/Restoration

