Technical Report - 2009 - 034

EUROPEAN UNION MANAGEMENT PLAN 2009-2011

GOLDEN PLOVER

Pluvialis apricaria

EUROPEAN COMMISSION

environment

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server (http://ec.europa.eu).

Luxembourg: Office for Official Publications of the European Communities, 2009

ISBN 978-92-79-13219-3
N° Catalogue KH-31-09-004-EN-N

The European Commission (DG ENV B2) commissioned this Management Plan for the Golden Plover.

This plan was completed in June 2006 by Arnaud Béchet (Station Biologique de la Tour du Valat, Le Sambuc, 13200 Arles, France). It was finalised by the European Commission in June 2009.

Comments, data or general information to the final version were generously provided by:

Gerald Adams, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Bonn, Germany.
Sten Asbirk, Danish Ministry of the Environment, Forest and Nature Agency, Copenhagen, Denmark.
Nicola Crockford and James Pearce-Higgins, RSPB, UK.
Olivia Crowe and Steve Newton, Birdwatch Ireland, Ireland.
Cy Griffin, Federation of Associations for Hunting and Conservation of the EU (FACE).
Heikki Korpelainen, Finnish Ministry of the Environment, assisted by:
Markku Mikkola-Roos, Finnish Environment Institute,
Juha Tiainen and Martti Hario, Finnish Game and Fisheries Research Institute,
Matti Osara, Ministry of the Environment,
Madeleine Nyman, Ministry of Forestry and Agriculture, Helsinki, Finland.
Domingos Leitão, SPEA, Portugal.
Krister Mild, Swedish Environmental Protection Agency, Stockholm, Sweden.
Bertarnd Trolliet, Office national de la Chasse et de la Faune sauvage, France.

Contents

Tables

Executive summary

The Golden Plover *Pluvialis apricaria* is listed on Annex I, II/2 and III/2 of the EU Birds Directive as a species for which hunting is permitted. The Golden Plover has been identified as a bird species with an unfavourable conservation status within the EU due to a moderate historical decline in its EU breeding population. However, its pan-European population as a whole has a favourable conservation status (BirdLife International 2004a, b).

This Management Plan outlines management prescriptions to maintain existing breeding populations, tentatively, restoring them where it seems feasible and maintaining favourable staging and wintering conditions along the flyway.

It is aimed at all 27 Member States with breeding, wintering and staging populations of Golden Plovers. This plan outlines the managements to be taken in the period 2009 - 2011, and should be followed by new versions with revised objectives that take into account the results achieved during the first and following phases.

Although some of the threats on this species have been clearly identified, most existing knowledge on this species comes from a few localised studies, mainly in the UK and in the Netherlands.

The main threats to the Golden Plover in the EU are identified as (1) destruction/modification of the breeding habitats, linked to afforestation, agricultural intensification and possibly abandonment, (2) land-use change in staging and wintering areas and (3) hunting and climate change as possible aggravating factors.

To reach its target, the Management Plan identifies thirteen operational objectives or Results that have to be achieved during its 3 - year (2009-2011) running period. These are:

1. Golden Plover hunting in EU Member States relies on reliable bag size statistics and on appropriate evaluations of the harvest potential.

2. The Golden Plover breeding habitat is managed where appropriate according to scientific empirical and experimental evidence favouring breeding productivity. In particular, areas should be managed to maintain populations of invertebrate prey, accessible to the Golden Plover through short swards.

3. Important staging grounds for the Golden Plover are managed according to scientifically empirical and experienced evidence securing access to feeding opportunities.

4. Golden Plover wintering habitat is managed according to scientific, empirical and experimental evidence favouring winter survival. In particular, nature-friendly agriculture is encouraged to maintain soil earthworms (and other invertebrates) populations.

5. In areas with breeding population of the nominate subspecies, measures are taken to minimize predation as appropriate.

6. Common and specific threats faced by the Golden Plover on their breeding, staging and wintering grounds are identified.

7. Management options for breeding, staging and wintering habitat enhancement, resulting from research promoted under Result 12 is communicated.

8. Knowledge about wintering populations' numbers of the Golden Plover in South-West Europe and North Africa is improved and made available.

9. A European-wide survey of winter populations of the Golden Plover is agreed and launched in coordination by all Member States, to be repeated every 5 years.

10. Bag statistics are available for all Member States where the Golden Plover hunting is allowed.

11. Ongoing ringing schemes are pursued, new ones are started and data are widely disseminated in order to monitor the long-term trends in survival of the species in the face of global changes.

12. An international study is undertaken using colour ringed birds which are either radio or preferably satellite tagged to determine the extent of seasonal and cold weather movements of birds breeding in Britain and Ireland to France and Portugal, where they remain quarry species.

13. Research is pursued to experimentally determine optimum management options for improving breeding and wintering habitat quality.

For each Result, corresponding activities and verifiable indicators are proposed, assuming that both the European Commission and the Member States guarantee the conditions required for their implementation. It is the responsibility of the relevant authorities of each Member State to decide how to implement the management prescriptions of this plan.

0. Introduction

The European Golden Plover *Pluvialis apricaria* is listed on Annex I of the EU Birds Directive as a bird requiring special conservation measures for its habitat in order to ensure its survival, and at Annex II/2 and III/2 as a bird for which hunting is permitted only among some of the Member States. The Golden Plover is also listed at Annex III of the Bern Convention so Golden Plover exploitation should be regulated in order to keep the populations in a favourable conservation status.

Although this species is now considered as secure at Pan-European level (Birdlife International 2004a), in the EU25 it is of unfavourable conservation status, being depleted due to moderate historical declines in breeding population (Birdlife International 2004b). According to Delany (Delany et *al.* 2007), the subspecies *P. a. apricaria* is declining whereas the subspecies *P. a. altifrons* is more or less stable.

With a few exceptions the format of this management plan follows the single Species Management Plan format developed by BirdLife International for UNEP/AEWA Secretariat.

The first chapter of the Management Plan presents concise information on European Golden Plover populations. Chapter 2 focuses on the key-knowledge for the 27 EU Member States. Chapter 3 analyses the threats that are believed to be the causes of the decline while chapter 4 lists the policies and legislation relevant for the Golden Plover management in Europe. Chapter 5 evaluates the status of Golden Plover in the EU and sets out long-term and immediate objectives for its future management. Finally, Chapter 6 describes the actions to be taken for the period 2009-2011. These activities cover all 27 countries.

It is the intention that this management plan shall be revised in 2011.

1. Biological Assessment

General information	The Eurasian Golden Plover is a medium-sized Palearctic wader which breeds in continental arctic, arctic-alpine and boreal tundra, but secondarily on temperate oceanic unenclosed upland moors and peatland. In winter, the Golden Plover occupies harvest fields, stubbles, mown grass, close-grazed pastures, fallows and other farmland of open character including floodlands. Its breeding range extends from Iceland to Russia and its winter quarters stretch from Morocco to Asia Minor including South Europa (Geroudet 1983; Cramp & Simmons 1983).
Taxonomy	The species *Pluvialis apricaria* (Order Charadriiformes, family *Charadriidae*) is tought to include two subspecies, which are *P. a. apricaria* (the nominate race) breeding from Ireland and Britain to the Baltic states and *P. apricaria altifrons* breeding at higher latitudes from Iceland to North Central Siberia. Sweden is generally assumed to have the nominate subspecies in the south and ssp. *altifrons* in central and northern part but the situation is unclear.
Populations	• The nominate southern subspecies *P. a. apricaria* nests in Ireland, Great Britain, Denmark, Germany, Latvia, Lithuania and Estonia. This subspecies winters in North-West Europe, form Ireland to South Britain, France and Iberia. • The northern P. a. *altifrons* subspecies is generally split into three populations based on their different flyways that overlap in winter. They are defined as: - *Icelandic* (or East Atlantic): breeds in Iceland, the Faeroe Islands and Greenland and winters in Ireland, West Britain, France, West Iberia and North-West Africa. - *Northeast European* (or *West Continental*): breeds in North Norway and Russia (east to 70°E) and winters in West and South continental Europe, East Britain and North-West Africa (Morocco to Tunisia). - *North-Central Siberia* populations. The last population, breeds in North-Central Siberia (east to 100°E) and winters in the Caspian Region, Asia Minor and the Eastern Mediterranean.

Population developments	*Southern population (P. apricaria apricaria)* More than 80% of this population which totals 47,900-72,200 breeding pairs (Thorup 2006, 140,000 - 210,000 individuals, Wetlands International 2006) breeds in the United Kingdom, where they have declined by 20% from the 1960s to the 1980s, particularly due to afforestation, and both moorland reclamation and over maturation as a result of changing management priorities (Crick 1997). The size of the United Kingdom population is 38,400 - 59,400 breeding pairs. Marked contraction of southern limits of range in north-west Europe has been recorded since mid 19th century (Cramp & Simmons 1983). The Golden Plover no longer breeds in south England, south Ireland, Belgium, the Netherlands and Poland. The breeding population is now relict in Germany with 13 pairs in 2003, in Denmark with 4-5 pairs in 2001 and in Lithuania with 40-50 pairs in 1999-2001. The size of the breeding populations in Ireland (200 breeding pairs) and in Latvia (350-450 breeding pairs) should be of concern. *Icelandic population (P. apricaria altifrons)* Approximately 50% of Golden Plover European population breed in Iceland with a total of >300,000 breeding pairs (Thorup 2006, 930,000 individuals, Wetlands International 2006). Trends in this population are not well known. The relatively small Faeroese population is declining. *Northeast European population (P. apricaria altifrons)* Approximately half of this population is found in Norway, 22% in Finland, 17% in Sweden and 9 % in Russia with a total ranging from 217,000 to 362,000 breeding pairs (Thorup 2006, 500,000-1,000,000 individuals, Wetlands International 2006). This population is considered stable (Wetlands International 2006). The total European breeding population size of this species is 460,000-740,000 pairs, constituting more than half of the global total (BirdLife International 2004). The total wintering population in Europe and North Africa is in excess of 2.2. million birds (Wetlands International 2006). The largest breeding populations in the EU are Sweden (11-12%), Finland (9-11%) and the UK (8%). While the Swedish population declined during 1990-2000, the Finnish population increased by a similar amount. The greatest declines have been of the relict populations of this subspecies in Denmark and Lithuania; the Estonian, Latvian and German part of this subspecies have, however been stable. According to Birdlife International (2004), the overall wintering population in the European Union trend for this species is *moderate increase* while the breeding population trend (1990-2000) is *unknown*. It is unknown mainly because of lack of knowledge of the trend in Iceland, which has by far the largest national population, holding 42-54% of the European total. (Norway has the next largest population with 11-14% of the total). In contrast, the UK wintering population has shown a marked increase over the same period, but this includes birds from the Icelandic and West Continental population as well as the native breeding nominate race. The French wintering population is probably increasing. According to AEWA, while the *P. apricaria apricaria* is *declining*, *P. apricaria altifrons* is considered as *stable*.

Distribution throughout the annual cycle	The Golden Plover is partially migratory in Britain and Ireland; wholly migratory elsewhere. Many British birds seem to winter in lowland habitat adjacent to nesting grounds. British breeding grounds are vacated from early July; return starts February if weather not too severe. Birds ringed in Iceland winter mostly in Ireland with a lower proportion in west Britain and on the continent (France, Iberia). Main departure from Iceland is late September to early November. Return movements to Iceland may begin in March. Icelandic territories are reoccupied mid-April to early May. Faeroe Islands bird movements are probably similar to those from Iceland. Birds breeding in Scandinavia migrate south-west in autumn to winter in western maritime countries and the west Mediterranean basin. Based on birds ringed on passage and in winter in the Netherlands, and breeding from Norway to Western Siberia concentrate in northern Europe in September-October and move to Britain, Belgium, France, Iberia and Morocco from November to April. Gradual departures from breeding areas during July: adults late July to late August and juveniles October-November, to moult in northern Europe. Main southwards movements through temperate Europe in October-December; arrivals in Morocco from November, and peak numbers observed there in January. Return passage begins mid-February in Mediterranean basin, and in North-West Europe (e.g. Netherlands, West Germany) numbers build up through April to peak in early May prior to onward movement. Breeding areas re-occupied during May, or early June on northern tundra (Cramp & Simmons 1983). Wintering Golden Plovers will use traditional areas each year but individual roosting and foraging sites within the traditional areas may differ widely within and between years (Wernham et al 2002).
Survival and productivity	Few studies have been carried out on the demography of the species. The first published estimate of the Netherlands-ringed Golden Plovers annual survival was of 0.61 ± 0.054 based on 123 recoveries of "autumn caught full grown birds" ringed before 1957 (Boyd 1962). Recent analyses based on 1,834 recoveries and 400 recaptures of 77,069 ringed Golden Plovers in the Netherlands established that from the first to the second winter Golden Plover true survival rate is 0.71 whereas it reaches 0.82 for the subsequent years of their life. Local survival was 11% lower, indicating that some birds permanently emigrate from the Netherlands (Piersma *et al.* 2005). The lower survival rate of first year birds was also found for a Scottish breeding population (Parr 1992). Adult survival rate in the South Pennines, England estimated at 88% based on two years resighting data of colour-ringed birds (Pearce-Higgins & Yalden 2003b). In Iceland, true survival rate of Golden Plovers of more than 1 year was estimated at 0.65 based on 152 recoveries (Gudmundsson 1997). Piersma et al. (2005) also showed that around 1964 Golden Plovers exhibited a not clearly explained stepwise increase in the annual apparent survival rate from 0.552 to 0.735. Survival rates are affected by winter severity in the Netherlands. Accordingly wintering numbers and ring recoveries in Portugal are positively correlated with cold weather in the UK and the Netherlands (Leitão & Peris 2004). Winter weather linked to population fluctuations in the South Pennines, England, presumably through cold-related mortality (Yalden & Pearce-Higgins 1997).

Life history	**Breeding:**	**Feeding:**	**Outside breeding season:**
	Monogamous. Lifelong, pair-bond probably maintaining contact outside breeding season. Laying starts at end of March in Northern England, mid-April in Scotland, early April in the Netherlands, mid-May in Iceland and end of May in Finland. As a general rule: one clutch of 4 eggs (rarely 3, 2 or 5). One brood. Replacement clutches laid 24 days after loss of 1st clutch, if not well incubated. Incubation 28-31days by both sexes. Hatching synchronous. Young precocial and nidifugous. Cared by both parents. Self feeding. Fledging period 25-33 days. Become independent soon after. Breeding success: of 50 nests in Britain, 62% hatched at least 1 egg, 38% failed completely. Mean brood size at hatching 3.64 young per successful pair and 2.2 young per breeding pair. Exo (2005) showed that the productivity of the small German (lower Saxony) population was far too small to maintain this population.	Wide spectrum of invertebrates, but principally beetles (*Coleoptera*) and earthworms (*Lumbricidae*); also some plant material including berries, seeds, and grasses (*Graminae*). Most food taken from surface, or by probing for 1-2 cm. During breeding season, chiefly earthworm, insect adults and larvae (beetles and *Tipulidae*). Adults can commute up to 7km to feed outside breeding territory. In UK, often on enclosed farmland where earthworms and tipulid larvae the main prey. On blanket bog, adult and larval Tipulids dominated chick diet, and chick growth rates correlated with adult tipulid abundance. Proportion of vegetable content increases in July and can be predominant in August. Outside breeding season, insects, especially beetles again predominate in the diet but also moth caterpillar, fly larvae, molluscs, land snails, amphipods crustaceans, nereid worms and plant material.	Gregarious. Roosting movements at dusk and soon after dawn. Low growing crops (winter cereals), ploughed land, and grassland preferred.

Habitat requirements	**Breeding**. Mainly in higher latitudes in continental-arctic or arctic-alpine and boreal tundra conditions, but secondarily on temperate oceanic unenclosed upland moors and peatlands sharing similar cool, misty, and often windy climate beyond normal tolerance for tree growth. Lives independently of all kinds of marine or inland water, but in the Arctic inhabits coastal and riparian tundra. In uplands, stops short of mountainous terrain, inhabiting sub-montane and montane zones, mainly between 240-600 m in Britain and Ireland and c. 1200 m at maximum on European Continent. Sometimes overlaps with Dunlin *Calidris alpina* on moist cottongrass *Eriophorum* moors but differs in tolerating drier terrains without small pools, and burnt heath. Prefers flattish or gently slopping ground with some raised placed suitable as look-outs, and some blending of open patches with very sparse low vegetation and other areas providing partial cover, which are still not tall enough to block the distant view (Cramp & Simmons 1983). Breeding success lower on slopes than on flat ground (Whittingham *et al.* 2002). Adjacent enclosed field sometimes used for feeding during incubation in moorland (Whittingham *et al.* 2000b). Often a temporary inhabitant of habitat in transition through ecological succession (e.g. towards tall heather moor) or recovering from effects of burning surface or disturbance, or stunted by prevailing wind or late snow cover, or locally saturated by impeded run-off of precipitation. For most part, it however seeks well drained ground, if most surfaces offer firm footing and ready access in all directions (Cramp & Simmons 1983). In Ireland wet- and dissected- blanket bog is used. In southern Sweden the population breeding on dry (grazed or moved) heathland, moors and other grazed grassland have declined drastically during the last 100 years due to changes in agricultural practices, which have been mainly a reduction in grazed/moved grasslands changing into of shrubs and tree-covered areas which are not suitable for the species. In all of Sweden also breeding (in rather small numbers) on large open mires. The numbers of the southern population breeding on mires appears fairly stable. In northern Sweden the population breeding on alpine/arctic moors is large and appears stable. Fairly common, being 50 - 90.000 pairs recorded approximately. No habitat changes (although climate change may be a long term threat to all arctic habitats). A larger part of the population settled in Lower Saxony on industrially used areas which requires special conservation measures. **After breeding**, shift with young to neighbouring areas offering more suitable food resources and shelter. **On migration and in winter, the** Golden Plover is attracted to winter cereals, stubbles, fallows, harvest-fields and to closed-grazed pastures. In France, the Golden Plover marks a preference for winter cereals fields (Trolliet, 2007). This habitat is very common. On coast it tends to neglect tidal flats of mud or sand and to prefer open grounds above the foreshore, thus overlapping more commonly with Lapwing *V. vanellus* than with other waders.

Table 1. *Geographical distribution of Golden Plover Pluvialis apricaria during the breeding and wintering periods.*

Breeding	**Wintering**
• Denmark • Estonia • Finland • Germany • Ireland • Latvia • Lithuania • Netherlands • Poland • Sweden • United Kingdom	• Belgium • Bulgaria • Cyprus • Denmark • France • Germany • Greece • Ireland • Italy • Malta • Netherlands • Portugal • Slovakia • Slovenia • Spain • United Kingdom

Information about breeding and prenuptial periods available in "Key Concepts of Article 7(4) of Directive 79/409/EEC"

2. Available key knowledge

This chapter provides a summary of up-to-date knowledge on the biology, distribution and trends of the populations of Golden Plover that occur in the EU. It also gives information on the hunting status in the Member States.

A major problem in developing a Management Plan for the Golden Plover is that the biological information available is mainly restricted to a few well studied populations in the UK and the Netherlands. This makes it difficult to suggest management options at the flyway level.

A large part of some Golden Plover populations' lifecycles takes place outside the borders of the EU, where it is also difficult to assess the wintering populations (e.g. North Africa).

Furthermore the knowledge of the bag statistics and the year to year variation in the number of Golden Plovers taken throughout Europe and North Africa is simply inadequate to assess the extent and variation of hunting pressure.

The breeding and wintering population estimates for each of the European Member States are given in Tables 2 and 3.

Table 2. *European breeding populations of Golden Plovers Pluvialis apricaria.*

Country	Breeding pairs	Year(s)	Trend	References
Belarus	110 - 140	97 - 00	+	Birdlife International 2004a
Denmark	4 - 5	01	-	Birdlife International 2004a
Estonia	3,000 - 5,000	98	?	Birdlife International 2004a
Finland	40,000 - 80,000	98 - 02	+	Birdlife International 2004a
Germany	*12	2003	-	Exo 2005; Wennerberg & Exo 2004.
Iceland	250,000 - 310,000	99 - 01	?	Birdlife International 2004a
Ireland	200	2002 - 04	-	Birdlife International 2004a
Latvia	350 - 450	90 - 00	0	Birdlife International 2004a
Lithuania	40 - 50	99 - 01	-	Birdlife International 2004a
Norway	50,000 - 100,000	90 - 03	(0)	Birdlife International 2004a
Russia	24,000 - 95,000	90 - 00		Birdlife International 2004a
Sweden	50,000 - 90,000	99 - 00	**-**	Birdlife International 2004a
UK	38,400 - 59,400	80 - 00	-	Birdlife International 2004a

Breeding population trends
+ increase, 0 stable, - decreasing, F fluctuating, ? unknown
() quality of data: poorly known, with no quantitative data available

* The larvae inventory numbers for Germany needs updating. In 2003, 12 pairs were registered from which only four could breed (2004: 8/3) (Exo 2005; Wennerberg & Exo 2004).

Table 3. *European wintering populations of Golden Plovers Pluvialis apricaria.*

Country	Wintering population size	Year(s)	Trend	References
Albania	240 - 2,300[1]	95 - 02	(F)	Birdlife International (2004a)
Azerbaijan	350 - 1,500[1]	96 - 02	(0)	Birdlife International (2004a)
Belgium	400 - 400[1]	95 - 00	(0)	Birdlife International (2004a)
Bulgaria	0 -50[1]	97 - 01	F	Birdlife International (2004a)
Cyprus	500 - 5,000[1]	94 - 02	(0)	Birdlife International (2004a)
Denmark	1,500 - 2,500[1]	99 - 00	-	Birdlife International (2004a)
France	1,510,000[2]	2007	?	Trolliet (2007)
Germany	2,500 - 10,000[1]	95 - 00	-	Birdlife International (2004a)
Greece	500 - 3,000[1]	95 - 99	F	Birdlife International (2004a)
Ireland	200,000[3]	05	?	Crowe in Gillings (2005).
Italy	15,000 - 20,000[4]	05	?	Serra & Sorrenti in Gillings (2005).
Malta	?	?	?	
Netherlands	50,000 - 60,000[1]	99 - 01	0	Birdlife International (2004a)
Portugal	44,500 - 450,000[5] (*)	99 - 05	(F)	Leitão in Gillings (2005).
Serbia & MN	200 - 1,000[1]	90 - 02	F	Birdlife International (2004a)
Slovakia	0 - 20[1]	90 - 99	?	Birdlife International (2004a)
Slovenia	0 - 2[1]	90 - 00	F	Birdlife International (2004a)
Spain	20,000 - 100,000[1]	90 - 01	?	Birdlife International (2004a)
Turkey	900 - 1,800[1]	91 - 01	(0)	Birdlife International (2004a)
Ukraine	0 - 50[1]	90 - 00	(F)	Birdlife International (2004a)
UK	310,000[1]	81 - 92	+	Birdlife International (2004a)
Total	**2,677,622**			

It is not a regular winterer in Sweden, in mild winters merely odd birds or a few small flocks, although during mild winters fairly large flocks are often staying until mid-December in extreme southernmost Sweden.

Wintering population trends

+ increase, 0 stable, - decreasing, F fluctuating, ? unknown. () quality of data: poorly known, with no quantitative data available

Table 4. *Information concerning hunting*

Country	Status	National Hunting Season	Annual bag	References
Belgium	H	No hunting season		
Cyprus	P	-		Cyprus Game Fund
Denmark	P (since 1984)	-		
Estonia	?	-		
Finland	P	-	-	
France	H	Public coastal land ("Domaine public maritime"): 1st Saturday of August. Inland waters: last Sunday of August to 31/01. Other areas: overall opening (North: 2nd Sunday of September, South: 4th Sunday of September)	62960 ± 12.4% (hunting season 1998/99) 15,000	(Trolliet & Girard 2000) (Fédération nationale des Chasseurs, survey 2007/08 unpublished)
Germany	P	-		
Greece	?	?		
Ireland	H	1st September to 31st January	None available	
Italy	P	-		Istituto per la Fauna Selvatica (INFS)
Latvia	?	-		
Lithuania	?	-		
Malta	H	1st September to 31st January	1,250	Maltese association for hunting and conservation (FKNK). 1,437 in 2003/04, 1,191 in 2004/05.
The Netherlands	P	-		
Portugal	H	1st October to 28th February	Average estimated 31,000	D.Leitão (unpubublished data) SPEA/ BirdLife Portugal
Poland	?	-		
Slovakia	?	-		
Slovenia	?	-		
Spain	P	-		Federación Española de Caza
Sweden	P	-		
United Kingdom	H	1st September to 31st January	None available	

STATUS: P: Protected, H: Hunted. The Golden Plover is not hunted in the other Member States.
Data extracted from Hirschfeld & Heyd (2005).

3 Threats

This chapter gives an overview of current human activities, along with climate changes, that are believed to have a negative impact on Golden Plover populations. Although not located in the European Union, the threats to the species in the wintering areas are also taken into account, as those areas are believed to be of critical importance for the Golden Plover. The question of the possible genetic isolation of birds breeding in Germany would require additional analysis and is not treated in this plan.

To describe the importance of threats to Golden Plover populations, the following categories are used:

Critical*:* a factor causing or likely to cause **very rapid declines** (>30% over 10 years);
High: a factor causing or likely to cause **rapid declines** (20-30% over 10 years);
Medium*:* a factor causing or likely to cause relatively **slow, but significant, declines** (10-20% over 10 years);
Low: a factor causing or likely to cause **fluctuations**;
Local: a factor causing or likely to cause negligible declines;
Unknown: a factor that is likely to affect the species but it is unknown to what extent

1. Habitat loss/modification

Breeding

Stroud et *al.* (2001) summarised as follows the main results of recent studies on breeding habitats of the Golden Plover. Substantial range contractions and declines in breeding numbers in Britain and Ireland have as elsewhere in Europe, been attributed to afforestation (especially in Scotland), and to the agricultural intensification of permanent pastures and overgrazing by sheep (Fuller & Gough 1999). Losses in the uplands of Britain have further been attributed to a reduction of moorland burning, resulting in the development of tall vegetation that is avoided by breeding birds and reduced predator control due to a decline in game-keepering.

Many of the factors interact, with for example, loss of game management and keepering on moorland (which appear to provide beneficial conditions), leading to sale for afforestation which in turn results in greater predator pressure on Golden Plovers nesting on adjacent moorland (Parr 1992; Parr 1993). This has resulted in the extinction of some local populations (Parr 1992).

Effects of grazing are complex. Some of the highest densities of Golden Plovers in the UK occur in the South Pennines (Brown 1993), where there are high levels of moorland grazing. Whittingham *et al.* (2000a) found equivalent densities on grazed blanket bog and heather moorland, and suggested grazing can be important to prevent heather becoming rank, as breeding Golden Plovers appear to favour short heather. Abundance of the Golden Plover across 85 moorland sites in south Scotland correlated with area of short, open habitat, indicating the value of grazing or burning management to maintain short swards (Pearce-Higgins & Grant 2006). Whilst severe overgrazing may be detrimental to Golden Plovers through the loss of dwarf shrubs, high grazing levels of in bye pasture close to moorland edges may be important to maintain areas of short sward used by feeding birds during the breeding season (Pearce-Higgins & Yalden 2003).

Wintering
Important shifts from interior farmland use toward coastal grassland have been reported in North Europe. Modern farming practices on coastal farmland have resulted in less land in winter being under permanent pasture (Parr 1992) which has been said to force the Golden Plover to move to coastal areas.

However, in Great Britain (Mason & Macdonald 1999) the Golden Plover tends increasingly to use stubble and recently ploughed fields together with a major proportion of winter cereals. In France, most of wintering Golden Plovers use winter cereal fields (Trolliet, 2007).

Importance of habitat loss/modification

- For **breeding areas** in the EU the importance of habitat loss/modification is set at Low/Medium.
- For the **winter areas** in the EU the importance of habitat loss/modification for is set at Medium

2. Climate change

A 9-day advancement of Golden Plover first laying dates occurred during the 1990's in the UK (Pearce-Higgins *et al.* 2005). This has been shown to result from increased spring temperatures that are negatively correlated with laying dates. Predicted ongoing climate changes could result in a mismatch between the first laying dates and tipulid (the main food resource for chicks) emergence, which advance more slowly. This could in turn possibly reduce overall breeding success by about 11% based on the well-studied population of the Pennines, although direct effects of climate on tipulid abundance could have greater negative consequences (Pearce-Higgins *et al.* 2005). Recent analysis suggests that late summer warming has more serious consequences for Golden Plover populations, by reducing the abundance of their tipulid prey in the following year. This factor alone explains a significant proportion of variation in Golden Plover abundance in the Pennine population, and given future warming predictions, is likely to result in future population declines, or even extinction, by the end of this century (Pearce-Higgins *et al.* 2009)

Widescale departures of the Golden Plover with the onset of severe winter cold have been noted from the British Isles (i.e. Britain and Ireland) (south to France and Iberia) and other European countries and could result in increased winter mortality (Wernham *et al.* 2002). In contrast, warm and dry autumns could become the norm in southern England and Ireland which could favour rapid growth of winter cereals to heights which are unfavourable, thereby causing rapid abandonment by Golden Plovers (Mason & Macdonald 1999). Dry winters in Portugal can force Golden Plovers to concentrate in a few favourable sites, making them more vulnerable to hunting pressure (D.Leitão, unpublished data).

In the last years in Germany the remained pairs are observed to breed very late (Exo 2005). This development is contrary to observations in other areas. The causes for this are at present not known.

Importance

- The importance of climate change in breeding and wintering area is provisionally set at Low/Local as far as its current impact is concerned, but could become High/Critical in the Medium/Long term.

3. Hunting

Being listed in Annex II/2 of the Birds Directive, the Golden Plover could in theory be hunted in the following Member States: Belgium, Denmark, France, Greece, Ireland, Malta, the Netherlands, Portugal and UK. However, it has to be stressed that only four Member States actually allow hunting of the Golden Plover: Ireland, France, Portugal and Malta. Hunting pressure is thus localised. Harvest rates have not been evaluated properly until now.

A likely decrease in bags in France from 1998-1999 is suggested by Trolliet & Girard (2000) while

Piersma *et al.* (2005) report fluctuating but increased survival rates since the 1970's for birds transiting through the Netherlands. In Portugal hunting activities can be responsible for very high mortality rates not only due to direct kills, but also due to disturbance in areas of concentration during extreme dry winters (D.Leitão, unpub.data). The harvest rate in France is probably lower than 4% of the population at the beginning of the hunting season[1].

Studies in Britain (Parr 1992, Yalden & Pearce-Higgins 1997 in Wernham *et al.* 2002) have shown that overwinter survival is important in regulating breeding populations. The impact of hunting in France and Portugal on the nominate subspecies which breeds in the British Isles is not known, however a part of this population winters in the British Isles not being hunted. The birds coming from the Netherlands are more exposed to hunting. The specimens breeding in Lower Saxony leave Germany in autumn, meeting probably other populations in France and Spain which are not endangered as in Germany. It is here where they are exposed to hunting. However the main problem for this very small population is the lack of productivity.

Importance

- For **wintering range states** in the EU (Member States where hunting is allowed) the importance of hunting is set at Local/Low but potentially medium for the nominate subspecies.

- For the **wintering areas** outside Europe, the importance of hunting is set at Local/Low.

4. Disturbance

The use of the countryside has increased dramatically in recent years. A study made on the Pennine population showed that nesting Golden Plovers were indeed sensitive to people wandering around a footpath and avoided areas within 200 m of it. After resurfacing the footpath, 96% of walkers kept to it, which resulted in Golden Plovers only avoiding areas within 50 m of it (Finney *et al.* 2005).
Furthermore, a growing number of studies show that disturbance is a secondary effect of hunting but its impact is not assessed.

Importance

- For **breeding** in the EU the importance of disturbance is set at Low/Local.

- For the **wintering areas**, the importance of disturbance at Low/Local or unknown

5. Predation

Predation can have significant impact on the productivity of Golden Plover (Parr, 1992, Exo 2005). The increase of predation is referred as one of the main causes of the decline of a Scottish breeding population (Harding *et al.* 1993).

More widely, Golden Plover densities are significantly greater on grouse moors than non-grouse moors, having accounted for habitat variation (Tharme *et al*. 2001). Whilst part of this difference may result from heather burning which will create areas of short sward for the Golden Plover, it is likely that there is additional benefit from the predator control associated with grouse moor management. Although, analyses have thus far failed to link variation in Golden Plover population trends to the intensity of

[1] 1998/99 bags : 62,960 Golden Plovers +/- 12,4% compared to the wintering population in France (1,510,000 - 2007), Portugal (200,000) and Spain (100,000). The wintering population in Maroc and Algeria should be added but is not known.

grouse moor management (Pearce-Higgins *et al*. 2006), it is possible that declines in some areas may be linked to increases in predator abundance (Pearce-Higgins *et al*. 2009)

Importance

- For **breeding** in the EU the importance of predation is set at Medium locally/Unknown at continental scale.

Table 5. *Threats importance at national level*

Country	Habitat loss and modification	Climate change	Disturbance	Hunting
Belgium	Ph	Ps	Ps	-
Cyprus	Ps	Ps	Ps	-
Denmark	Ph	H	Ps	-
Estonia	?	Ps	Ps	-
Finland	N	Ps	N	
France	N	Ps	Ps	N/Ps
Germany	H	?	S	-
Greece	?	Ps	Ps	-
Ireland	H	H	Ps	Ps
Italy	Ph	Ps	Ps	-
Latvia	?	Ps	Ps	-
Lithuania	?	H	Ps	-
Malta	?	Ps	Ps	N/Ps
The Netherlands	Ph			-
Portugal	Ph	Ph		Ph
Poland	?	Ps		-
Slovakia	?			-
Slovenia	?			-
Spain	Ph			-
Sweden	?	Ph	N	-
United Kingdom	H	H	Ps?	-

H – High relevance, S – some relevance, N – No relevance, Ph – Potentially high relevance,
Ps – Potentially some relevance.

4. Policies and legislation relevant for management

Table 6. *International conservation and legal status of the Golden Plover Pluvialis apricaria*

World Status[2] (Criteria)	European Status[3]	SPEC category[4]	EU Birds Directive Annex	Bern Convention Annex	Bonn Convention Annex	African-Eurasian Migratory Waterbird Agreement	Convention of International Trade on Endangered Species
Least concern	Provisionally Secure	non-SPEC[E]	I, II/2 and III/2	III	II	listed	Not listed

Member States / Contracting parties' obligations

The Golden Plover is listed on Annex II/2 of the EU Birds Directive that implies that it can be hunted in all Member States which have defined a hunting season for this species.

[2] BirdLife International/IUCN Red List assessment 2005.
[3] BirdLife International 2004a
[4] BirdLife International 2004a
SPEC 1: Species of global conservation concern. Species which are globally threatened, conservation dependent or data deficient, according to Collar *et al.* 1994.
SPEC 2: Species whose world populations are concentrated in Europe (i.e. over 50% of the total population or range occurs in Europe) and which have an unfavourable conservation status.
SPEC 3: Species whose world populations are not concentrated in Europe, but which have an unfavourable conservation status in Europe.
SPEC 4: Species which have a favourable conservation status but whose populations are concentrated in Europe.
non-SPEC[E]: Species which have a favourable conservation status but whose populations are concentrated in Europe.
non-SPEC: Species which have a favourable conservation status and whose populations are not concentrated in Europe.

5. Framework for Action

Priority statement/evaluation

The Golden Plover has been in decline as a breeding bird in some EU countries. Meanwhile, its population likely reaches maximum numbers at other staging and wintering countries (Piersma *et al.* 2005; Trolliet *et al.* 2005). Ongoing changes of habitat and distributions within several countries remain partially unexplained (Gillings 2003).

The main factor identified as causing declines in breeding populations is land change often due to modifications in agriculture practices, especially sheep overgrazing and afforestation. Similarly, pastures, the former major wintering habitat of Golden Plover have been widely converted to arable land with few studies assessing its impact.

These modifications of land-use are mainly driven by European subsidies and agri-environmental schemes which should thus be oriented to take into account the biological requirements of this species.

Efforts should therefore be addressed at improving habitat quality and preventing habitat loss and degradation and ensuring that protection measures are applied in a coordinated fashion throughout the flyway.

Whilst it is likely that loss of breeding habitat has been a factor involved in some recent local declines, the potentially additive role of hunting remains unclear, particularly in relation to the impact of hunting in France, Malta and Portugal on the British and Irish breeding population. Therefore, demographic parameters and bag statistics should be monitored carefully in order to evaluate harvest sustainability.

Purpose of the management plan

The Management Plan aims at restoring the depleted and declining populations of the nominate subspecies, especially in Britain and Ireland and maintaining breeding population levels of the *altifrons race* while, maintaining favourable staging and wintering conditions along the flyway.

Results for the period 2009-2011

This section outlines the Results to be achieved during the first 3-year period of Golden Plover management within the EU. The results outlined below (and the corresponding activities) are targeted at the European Commission and the authorities responsible for the implementation of the provisions of the Birds Directive in the Member States. The results listed below aim initially at addressing the most urgent issues to safeguard the Golden Plover population in the EU but at the same time restrict the corresponding activities to be carried out in the 3-year period to a realistic level.

The running period of the Management Plan is 2009-2011, and this version will be followed by versions with revised objectives that take into account the results achieved during the first phase.

The required Results for the initial Golden Plover Management Plan period (2009 - 2011) are listed below.

Policy and legislative actions

The Golden Plover is hunted in Ireland, France, Portugal, Malta and the UK. The harvest rate is not known with enough accuracy. It is thus impossible to determine whether hunting of this species is sustainable or not, in particular given the ongoing and simultaneous changes in breeding habitats and wintering habitats.

Golden Plover bag limits/harvesting rates in the EU Member States must be determined on the basis of estimates of breeding success in the preceding season in the relevant countries and appropriate population model projections relying on survival estimates. Such an approach could allow evaluating if harvest rates are sustainable. A result of the implementation of this Management Plan should therefore be that by 2011:

1. Golden Plover hunting in EU Member States relies on reliable bag size statistics and on appropriate evaluations of harvest possibility.

Management of breeding, staging, wintering populations and habitats

The major factors reported to be causing local, slight declines or limiting populations include habitat loss and modification.

In the blanket bog habitats of the UK, the creation and maintenance of mosaics of cotton grass and dwarf shrub vegetation benefits Golden plovers (Pearce-Higgins & Yalden 2004). Probably the best means of achieving this is through the maintenance of appropriate grazing levels that will also limit sward height.

On dry heaths, vegetation height is probably best controlled using rotational burning of small vegetation patches ('muirburn'), which creates patches of bare ground, grass and short heather in which Golden Plovers can nest and rear chicks (Whittingham *et al.* 2001).

The benefits of muirburn are likely to account, in part, for the strong association between Golden Plovers and grouse moor management, although the control of generalist predators associated with such management will also be beneficial. Whereas heavy grazing on such dry heaths can also create habitat mosaics, through the fragmentation of heather moorland, habitat patches tend to be mixes of tall, ungrazed heather and short dry grassland, neither of which provide good foraging habitat. Grazing of dry heaths therefore needs to be managed with appropriate shepherding to ensure even grazing on dwarf shrubs, so as to produce the appropriate structure.

Agricultural habitats of the UK are enhanced by summer grazing and poor drainage. Groups of enclosed fields regularly used by the Golden Plover during the breeding season should be afforded specific protection under conservation schemes (e.g. environmentally sensitive area agreements). Conservationists wishing to identify suitable fields should look for areas with high earthworms populations, for example, as indicated by molehills, or high tipulid larval densities close (<74km) to nesting areas of Golden Plovers. Note that birds may use different feeding areas during the day, and at night (Whittingham *et al.* 2000a, Pearce-Higgins & Yalden 2003). Where action is being taken to protect populations of breeding Golden Plovers, the groups of

fields regularly selected for feeding by the target birds should be afforded specific protection.

Where heather becomes rank, an appropriate burning or grazing regime should be adopted to prevent it becoming too dense and long. Areas of calcareous grassland on, or near moorland should be retained.

Both management for Red Grouse and grazing by sheep could be beneficial or neutral to Golden Plover. Management for Red Grouse provides younger patches of heather that are less avoided by Golden Plover than the rank heather that they replace. It is worth noting that lower levels of sheep stocking are necessary to cause heather to become highly fragmented, within mixed grass/heather areas, on slopping as opposed to flat ground (Whittingham *et al.* 2000a).

In South Portugal dry-grassland areas of high importance for wintering Golden Plovers are highly threatened by permanent crops, irrigation and afforestation (Leitão & Peris 2003, Silva *et al.* 2004)

For non-breeding habitat, lowland permanent pastures with high earthworm densities within the traditional range of Golden Plovers should be conserved (Wernham *et al.* 2002).

A result of the implementation of this Management Plan should therefore be that by 2011:

2. Golden Plover breeding habitat is managed according to scientific empirical and experimental evidence favouring breeding productivity. In particular,
    a. Afforestation is stopped on Golden Plovers breeding grounds;
    b. Sheep grazing schemes focus on maintaining the appropriate open structure required by Golden Plovers;
    c. Muirburn is encouraged to control heather vegetation height;
    d. Traditional Red Grouse hunting is supported where appropriate.

3. Important staging grounds and stopover routes for the Golden Plover are managed according to scientific empirical and experimental evidence securing access to feeding opportunities.

4. The Golden Plover wintering habitat is managed according to scientific empirical and experimental evidence favouring winter survival. In particular, nature-friendly agriculture is encouraged to maintain soil earthworms (and other invertebrates) biodiversity, especially through encouraging conservation and appropriate management of permanent pasture.

5. In areas with breeding population of the nominate subspecies, measures are taken to minimize predation as appropriate.

International co-operation

The Golden Plover breeding range covers nine EU countries and its wintering range 21 countries. International exchanges of knowledge and expertise is thus required to increase knowledge on common and specific issues of the Golden Plover conservation.

The Golden Plover is a fully migratory species and part of its population migrates through, or winters in countries outside the EU. By 2009 the following international activities should be on schedule:

6. Common and specific threats faced by the Golden Plover on their breeding, staging and wintering grounds are identified.

7. Management options for breeding, staging and wintering habitat enhancement, resulting from research promoted under Result 12 is communicated.

8. Knowledge about wintering numbers of the Golden Plover in South-West Europe and North Africa is improved and made available.

Research and monitoring

Adequate population monitoring is vital to check the achievement of the goal of restoring the nominate subspecies to, and maintaining the *altifrons* subspecies at, favourable conservation status. This must be done at local, national and international level.

Monitoring in the breeding season would provide an assessment of annual productivity, and this information should subsequently form the basis for a decision on the annual hunting pressure the species can tolerate. Thus, every five years, a European-wide survey of Golden Plover should be organised in October, when the wintering population ranges is the most restricted and a total European population estimate is made possible (Gillings 2005).

The Golden Plover is a quarry species with very poorly known but likely significant harvest rates in the Member States where hunting is permitted. Therefore, it is essential to assess the harvest rate of Golden Plover populations.

Increased knowledge is needed of the breeding origins of the Golden Plover which are subject to hunting in EU Member States. In addition increased knowledge is needed on the impact of cold weather movements of the Golden Plover and on the impact these movements have, especially the extent to which they affect hunting bags.

Finally, improved knowledge of demographic parameters is required to monitor the population dynamics and assess its viability in the light of global change.

Results of the implementation of this Action Plan should therefore be that by 2011:

9. A European-wide survey of winter populations of the Golden Plover is agreed and launched in coordination by all Member States, to be repeated every 5 years.

10. Bag statistics are available for all Member States where Golden Plover hunting is allowed.

11. Ongoing ringing schemes are pursued, new ones are started and data are widely disseminated in order to monitor the long-term trends in survival of the species in the face of global changes.

12. An international study is undertaken using colour ringed birds which are either radio or preferably satellite tagged to determine the extent of seasonal and cold weather movements of birds breeding in Britain and Ireland to France and Portugal, where they remain quarry species.

13. Research is pursued to experimentally determine optimum management options for improving breeding and wintering habitats quality.

6. Activities

Table 7. *Prioritized activities and results in all countries in the EU with populations of Golden Plover Pluvialis apricaria (scale for Priority and Time Scale is given at the bottom of this Table).*

Result	Priority	National activities	Time scale	Means of verification
1. Golden Plover hunting in EU Member States relies on reliable bag size statistics and on appropriate evaluations of the harvest potential.	High	Ensure that national harvest is in accordance with Golden Plover population viability in the EU.	Medium	-Publications/web-pages with official bag statistics in Member States available by 2011. -Leaflets, press releases, etc. targeting hunters to inform them of the importance of providing their bags.
2. Golden Plover breeding habitat is managed where appropriate according to scientifically robust evidence favouring breeding productivity.	High	2.1. Member States will support conservation projects (e.g. agro-environmental schemes) based on the management of the Golden Plovers breeding habitats through controlled shepherding and "muirburn". 2.2. Member States will also pay attention to ongoing programs of land regrouping, and will avoid within these programs the afforestation of moorland, and other favourable habitats for the Golden Plover 2.3. Member States administrations will advise landowners, farmers and other relevant stakeholders about the importance of maintaining blanket bog and moorland habitats.	Medium	- Public awareness raising, including distribution of publications and brochures produced and distributed to private landowners, local authorities and other relevant stakeholders. -Project reports presenting quantified results of conservation and restoration of moorland and other management prescriptions targeted at the Golden Plover.

Result	*Priority*	*National activities*	*Time scale*	*Means of verification*
3. Important staging grounds and stop-over routes for the Golden Plover are managed according to scientifically robust evidence securing access to feeding opportunities. 4. Golden Plovers wintering habitat is managed according to scientifically robust evidence favouring winter survival. In particular, nature-friendly agriculture is encouraged to maintain soil earthworms (and other invertebrates) biodiversity.	High	3 & 4. Member States will support nature-friendly agriculture, e.g. the development of set-asides and organic farming (earthworm fauna preservation). 3 & 4. Member States will support conservation projects focusing on reconciling agricultural practices and grassland preservation for staging and wintering Golden Plovers. 2, 3 & 4. Dissemination of information on the response of Golden Plover populations to specific management prescriptions.	Medium	- Public awareness raising, including distribution of publications and brochures produced and distributed to private landowners, local authorities and other relevant stakeholders. -Project reports presenting quantified results of conservation and restoration of moorland and other management prescriptions targeted at the Golden Plover.
5. In areas with breeding population of the nominate subspecies, measures are taken to minimize predation as appropriate.	High	5. Member States investigate measures to lower predation and disseminate the measures proved to be effective.	Medium	- Papers and/or reports produced and disseminated documenting new information about the species predator's management.
6. Common and specific threats faced by the Golden Plover on their breeding, staging and wintering grounds are identified. 7. Management options for breeding, staging and wintering habitat enhancement, resulting from research promoted under Result 12 is communicated.	Medium	6 & 7. Collaborative international studies, monitoring scheme and workshops are supported by the European Commission in order to create European wide knowledge about the Golden Plover population dynamics and conservation options.	Medium	- Papers and/or reports produced and disseminated documenting new information about the species management requirements.

Result	*Priority*	*National activities*	*Time scale*	*Means of verification*
8. Knowledge about wintering population numbers of the Golden Plover in South-West Europe and North Africa is improved and made available.	Medium	8. Monitoring of wintering populations of Golden plovers (census, ringing surveys, bag analysis) are supported by Member States through multilateral research and conservation project.	Short	- Papers and/or reports produced and disseminated documenting results of North Africa censuses.
9. A European-wide survey of winter populations of the Golden Plover is agreed and launched in coordination by all Member States, to be repeated every 5 years.	Medium	9. Member States reach an agreement on a coordinated winter population survey every five year and implement it.	Short	- Minutes of Ornis Scientific Working Group and of specific Golden Plover meetings.
10. Bag statistics are available for all Member States where Golden Plover hunting is allowed.	Medium	10. Regular bag surveys are implemented in Member States where Golden Plover hunting is allowed, in co-operation with local, regional and national hunters associations.	Medium	- Reports and websites from hunters associations and Member States game and wildlife administrations reports.
11. Ongoing ringing schemes are pursued, new ones are started and data are widely disseminated in order to monitor the long-term trends in survival of the species in the face of global changes.	High	11. Member States support the long-term ringing programs and the initiation of new ones on the Golden Plover.	Short	- Scientific publications. EURING reports.

Result	*Priority*	*National activities*	*Time scale*	*Means of verification*
12 An international study is undertaken using colour ringed birds which are either radio or preferably satellite tagged to determine the extent of seasonal and cold weather movements of birds breeding in Britain and Ireland to France and Portugal, where they remain quarry species.	High	12 Member States support an international study to determine movements of birds from Britain and Ireland to the countries of the continent where they are hunted.	Short	- Scientific publication.
13. Research is pursued to experimentally determine optimum management options for improving breeding and wintering habitat quality.	High	13. Member States support research programmes aimed at experimentally determining optimum management options for the Golden Plover.	Short	- Scientific publication.

The **Priority** of each Result is given, according to the following scale:

- Essential: an action that is needed to prevent a large decline in the population, which could lead to species or subspecies extinction.
- High: an action that is needed to prevent a decline of more than 20% of the population in 20 years or less
- Medium: an action that is needed to prevent a decline of less than 20% of the population in 20 years or less
- Low: an action that is needed to prevent local population declines or which is likely to have only a small impact on the population across the range.

The **Time scales** attached to each Activity use the following criteria:

- Immediate: completed within the next year.
- Short: completed within the next 1-3 years
- Medium: completed within the next 1 - 5 years.
- Long: completed within the next 1 - 10 years
- Ongoing: an action that is currently being implemented and should continue.
- Completed: an action that was completed during the preparation of the Management Plan.

Table 8. *Summary of objectives/results and activities of the Golden Plover Pluvialis apricaria Management Plan 2009-2011.*

DESCRIPTION	***VERIFIABLE INDICATORS***	***MEANS OF VERIFICATION***	***ASSUMPTIONS***
Purpose: To restore the depleted and declining populations of the nominate subspecies, especially in Britain and Ireland to its former historically documented abundance and range and maintain breeding population levels of the *altifrons* race while maintaining favourable staging and wintering conditions along the flyway.	Causes of decline in Golden Plover populations determined, and population restored.	National and international publications document that Golden Plover numbers have reached former level and range is restored.	Golden Plover Management Plan approved and supported by EU and Member States.
Results 2008-2010:			
1. Golden Plover hunting in EU Member States relies on reliable bag size statistics and on appropriate evaluations of the harvest possibility.	1. Bag statistics are reported annually within each Member State where hunting is allowed.	Publications/web-pages with official bag statistics in Member States available by 2011.	For all results: Member States have adequate resources and commitment to take responsibility for Golden Plover management in accordance with the Birds Directives requirements.
2. Golden Plover breeding habitat is managed where appropriate according to scientific empirical and experimental evidence favouring breeding productivity.	2, 3 & 4. Favourable habitats are conserved or restored. There is not more net loss of favourable habitats for Golden Plover. Pilot-projects with agri-environmental incentives or other similar actions are implemented.	Publications and statistics about landscape and farming practices evolution.	For result 2, an assumption is that environmental issues are taken into account by Member States ministries of agriculture.
3. Important staging grounds and stop-over routes for the Golden Plover are managed according to scientific empirical and experimental evidence securing access to feeding opportunities.			
4. Golden Plovers wintering habitat is managed according to scientific empirical and experimental evidence favouring winter survival. In particular, nature-friendly agriculture is encouraged to maintain soil earthworms (and other invertebrates) biodiversity.			
5. In areas with breeding population of the nominate subspecies, measures are taken to minimize predation as appropriate.	5. Member States investigate measures to lower predation and disseminate the measures proved to be effective.	Papers and reports documenting new information.	
6. Common and specific threats faced by the Golden Plover on their breeding, staging and wintering grounds are identified.	6, 7 & 8. Synthesised information on the Golden Plover common and specific requirements on their breeding and wintering grounds is available.	Papers and reports documenting new information.	
7. Management options for breeding, staging and wintering habitat enhancement, resulting from research promoted under Result 12 is communicated.			
8. Knowledge about wintering populations numbers of the Golden Plover in South-West Europe and North Africa is			

improved and made available.			
9. A European-wide survey of winter populations of the Golden Plover is agreed and launched in coordination by all Member States, to be repeated every 5 years.	9. Coordinated annual productivity census is established.	Annual productivity and Five-year European census reports.	For result 10, an assumption is that hunters and hunters association are willing to provide annual bags For results 11, 12 & 13, an assumption is that Member States with relevant populations of the Golden Plover are interested in developing research activities across their borders.
10. Bag statistics are available for all Member States where Golden plover hunting is allowed.	10. New information on bags is available for each Member State where hunting is authorised.	Annual report on bags is available.	
11. Ongoing ringing scheme are pursued, new ones are started and data are widely disseminated in order to monitor the long-term trends in survival of the species in the face of global changes.	11. New information is available on migration pattern, survival rates, etc. from CMR programs.	Scientific publications.	
12 An international study is undertaken using colour ringed birds which are either radio or preferably satellite tagged to determine the extent of seasonal and cold weather movements of birds breeding in Britain and Ireland to France and Portugal, where they remain quarry species.	12. New information is available on the extent to which breeding birds from Britain and Ireland are shot on the continent.	Scientific publications.	
13 Research is pursued to experimentally determine optimum management options for improving breeding and wintering habitat quality.	13. New information is available on different succesfull management options for the Golden Plover.	Papers and reports documenting new information.	

7. References

Birdlife International (2004a). - Birds in Europe: population estimates, trends and conservation status. Cambridge, U.K.

Birdlife International (2004b). - Birds in the European Union: a status assessment. Birdlife International, Wageningen, The Netherlands.

Boyd, H. (1962). - Mortality and fertility of the European Charadrii. *Ibis*, 104, 68-87.

Byrkjedal, I. & Thompson, D.B.A. (1998). - Tundra Plovers: the Eurasian, Pacific and American Golden Plovers and Grey Plover. T & AD Poyser, London.

Brown, A. F. (1993). - The Status of Golden Plover *Pluvialis Apricaria* in the South Pennines. *Bird Study*, **40,** 196-202.

Cramp, S. & Simmons, K. E. L. (1983). - Handbook of the birds of Europe, the Middle East and North Africa: the birds of the Western Palearctic. Oxford University Press, Oxford.

Crick, H. Q. P. (1997). - *Pluvialis apricaria* Golden Plover, in W. J. M. Hagemeijer & M. J. Blair, eds. *The EBCC Atlas of European Breeding Birds: their distribution and Abundunce.* pp. 266-267. Poyser, London.

Delany, S., Scott, D., Dodman, T. & Stroud, D. (2007). - An atlas of wader populations in Africa and Western Eurasia. Wetlands International an International Wader Study Group.

European Commission (2008). - Key Concepts of Article 7(4) of Directive 79/409/EEC. Period of reproduction and prenuptial migration of Annex II Bird Species in the 27 EU Member States.

Exo, K-M. (2005). - Die Brutpopulationdes Goldegenpfeifers *Pluvialis apricaria* im westlichen Kontinentaleuropa: zum Aussterben verurteilt? *Vogelwelt* 126: 161-172.

Finney, S. K., Pearce-Higgins, J. W. & Yalden, D. W. (2005). - The Effect of Recreational Disturbance on an Upland Breeding Bird, the Golden Plover *Pluvialis Apricaria*. *Biological Conservation*, **121,** 53-63.

Fuller, R. J. & Gough, S. J. (1999). - Changes in Sheep Numbers in Britain: Implications for Bird Populations. *Biological Conservation*, 91, 73-89.

Geroudet, P. (1983). - Limicoles Gangas et Pigeons d'Europe. Delachaux & Niestlé, Neuchâtel - Paris.

Gillings, S. (2003). - Plugging the gaps - winter studies of Eurasian Golden Plovers and Northern Lapwings. *Wader Study Group Bulletin*, 100, 25-29.

Gillings, S. (2005). - International workshop on passage and wintering Eurasian Golden Plovers. *Wader Study Group Bulletin*, 108**,** 5-12.

Gudmundsson, G. A. (1997). - Winter distribution of Icelandic Golden Plovers *Pluvialis apricaria*. *Bliki*, **18,** 55-58.

Harding, N. J., Green, R. E. & Summers R. W. (1993). - Upland Futures. RSPB, Sandy

Leitao, D. (2005). - In International workshop on passage and wintering Eurasian Golden Plovers. Annual Conference of the International Wader Study Group. Ireland, 7-10 October 2005. (FR)

Leitão, D. & S. Peris (2003). - Distribuição e abundância do Abibe *Vanellus vanellus* e da Tarambola-dourada *Pluvialis apricaria* em Portugal. *Airo*, 13**,** 3-16. (BL)

Leitão, D. & S. Peris (2004). - The origin of Lapwing *Vanellus vanellus* and Golden Plover *Pluvialis apricaria* wintering in Portugal. *Ornis Fennica*, 81**,** 49-64. (BL)

Mason, C. F. & Macdonald, S. M. (1999). - Habitat use by lapwings and golden plovers in a largely arable landscape. *Bird Study*, 46**,** 89-99.

Parr, R. (1992). - The Decline to Extinction of a Population of Golden Plover in North-East Scotland. *Ornis Scandinavica*, 23 **,** 152-158.

Parr, R. (1993). - Nest Predation and Numbers of Golden Plovers Pluvialis Apricaria and Other Moorland Waders. *Bird Study*, 40**,** 223-231.

Pearce-Higgins, J.W., Dennis, P., Whittingham, M.J. & Yalden, D.W. (2009). - Impacts of climate on prey abundance account for fluctuations in a population of a northern wader at the southern edge of its range. *Global Change Biology*, in press.

Pearce-Higgins, J.W., Grant, M C, Beale, C M, Buchanan, G M & Sim, I M W (2009). - International importance and drivers of change of upland bird populations. In Bonn, A, Allott, T, Hubacek, K & Stewart, J (eds). Drivers of Environmental Change in Uplands. Routledge, Abingdon, UK

Pearce-Higgins, J.W. & Grant, M.C. (2006). - Relationships between bird abundance and the composition and structure of moorland vegetation. *Bird Study,* 53, 112-125.

Pearce-Higgins, J. W. & Yalden, D. W. (2003). - Variation in the Use of Pasture by Breeding European Golden Plovers *Pluvialis Apricaria* in Relation to Prey Availability. *Ibis*, 145**,** 365-381.

Pearce-Higgins, J.W., & Yalden, D.W. (2003b). - Golden Plover *Pluvialis apricaria* breeding success on a moor managed for shooting Red Grouse *Lagopus lagopus*, *Bird Study*, 50,170-177.

Pearce-Higgins, J. W. & Yalden, D. W. (2004). - Habitat Selection, Diet, Arthropod Availability and Growth of a Moorland Wader: the Ecology of European Golden Plover Pluvialis Apricaria Chicks. *Ibis*, 146**,** 335-346.

Pearce-Higgins, J. W., Yalden, D. W. & Whittingham, M. J. (2005). - Warmer Springs Advance the Breeding Phenology of Golden Plovers *Pluvialis Apricaria* and Their Prey (Tipulidae). *Oecologia*, 143**,** 470-476.

Piersma, T., Rogers, K. G., Boyd, H., Bunskoeke, E. J. & Jukema, J. (2005). - Demography of Eurasian Golden Plovers *Pluvialis apricaria* staging in the Netherlands, 1949-2000. *Ardea*, 93**,** 49-64.

Silva, P, Costa, LT & Silva, JP (2004). - Caracterização da avifauna estepária e suas relações com o uso do solo na ZPE de Vila Fernando/Veiros, *Airo*, 14**,** 41-54.

Stroud, D. A., Chambers, S., Cook, S., Buxton, B., Fraser, P., Clement, P., Lewis, P., McLean, I., Baker, H. & Whitehead (2001). - The UK SPA Network: its scope and content. JNCC, Petersborough.

Tharme, A. P., Green, R. E., Baines, D., Bainbridge, I. P. and O'Brien, M. (2001). - The effect of management for red grouse shooting on the population density of breeding birds on heather-dominated moorland. Journal of Applied Ecology 38: 439 - 457.

Thorup, O. Breeding waders in Europe 2000. (2006). - International Wader Study Group, UK. International Wader Studies.

Trolliet, B. (2007). - Recensement national de vanneaux huppés et des pluviers dorés - Janvier 2007. Rapport interne ONCFS. Office national de la chasse et de la faune sauvage, Paris.

Trolliet, B., Fouquet, M. & Girard, O. (2005). - Recent local increases in Eurasian Golden Plover in western France. *Wader Study Group Bulletin*, 108.

Trolliet, B. & Girard, O. (2000). - Le Vanneau huppé, le Pluvier doré & autres limicoles, in Ph. Landry & P. Migot, eds. *Enquete nationale sur les tableaux de chasse a tir. Saison 1998/ 1999.* Faune Sauvage. Cahier techniques. 251.

Wennerberg L. & Exo M. (2004). - Conservation genetics of Golden Plover in Germany: A breeding population close to extinction? *Wader Study Group Bulletin,* 105: 21.

Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Sirwardena, G.M. & Baillie, S.R. (eds) (2002). - *The migration atlas:\movements of the birds of Britain and Ireland.* T & A D Poyser, London.

Wetlands International (2006). - *Waterbird Population Estimates – Fourth Edition*. Wetlands International, Wageningen, The Netherlands.

Whittingham, M. J., Percival, S. M. & Brown, A. F. (2000a). - Time Budgets and Foraging of Breeding Golden Plover Pluvialis Apricaria. *Journal of Applied Ecology*, 37**,** 632-646.

Whittingham, M. J., Percival, S. M. & Brown, A. F. (2000b). - Time Budgets and Foraging of Breeding Golden Plover Pluvialis Apricaria. (Vol 37, Pg 632, 2000). *Journal of Applied Ecology*, 37**,** 895].

Whittingham, M. J., Percival, S. M. & Brown, A. F. (2001). - Habitat Selection by Golden Plover Pluvialis Apricaria Chicks. *Basic and Applied Ecology*, 2**,** 177-191.

Whittingham, M. J., Percival, S. M. & Brown, A. F. (2002). - Nest-Site Selection by Golden Plover: Why Do Shorebirds Avoid Nesting on Slopes? *Journal of Avian Biology*, 33**,** 184-190.

Yalden, D. W.; Pearce-Higgins, J. W. (1997). - Density-dependence and winter weather as factors affecting the size of a population of Golden Plovers *Pluvialis apricaria*. *Bird Study*, 44, Issue 2, 227 – 234

KH-31-09-004-EN-N

ISBN 978-92-79-13219-3