

Coastal birds and marine mammals of mid Dorset

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Summary

This report summarises the results of a twelve month study in 1994 into the distribution and abundance of seabirds and marine mammals in the coastal waters off mid Dorset between Portland Bill and Durlston Head and south to latitude 50° 22' N. The emphasis of the study was to map seabird and cetacean distribution and abundance off mid Dorset over a 12 month period; to summarise existing data, including those collected under contract to JNCC, on the birds and mammals of the above area; to assess possible impacts of seismic, exploration drilling and related potential developments in the area and to provide recommendations for approaches to minimise impacts on birds and cetaceans from these activities.

Seabirds and marine mammals were counted from land in inshore areas and a boat was used for surveys beyond sight of land. In addition to results

from this study, a review of literature produced much additional and background information.

The most important seabird concentrations in the area are a little tern colony on Chesil Beach; wintering grebes, ducks and divers in Portland Harbour and Weymouth Bay; a roost of gulls during winter in Weymouth Bay; wintering wildfowl on the Fleet; wintering auks around The Shambles and cliff-nesting seabird colonies between St. Alban's and Durlston Heads and on the west cliffs of Portland. There are few seabirds present in late summer and autumn.

There is a semi-resident population of bottlenose dolphins in the east of the study area, which shows a seasonal presence in spring and autumn. There are no other marine mammal concentrations of note in the study area.



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Weymouth and Portland Borough Council, the Smedmore Estate, the Weld Estate and Pontins all generously allowed access and free parking on their land for the purposes of the survey. Major Mick Burgess of the Army gave considerable help in providing access to the coast around the Lulworth Ranges. Numerous volunteer birdwatchers contributed records to the Dorset Bird Reports, the Beached Bird Survey, the Seabird Colony Register and the Wetland Bird Survey over the years.

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Introduction

The aim of this report is to present the results of the 1994 Seabirds at Sea Team (SAST) survey of the coastal waters of mid Dorset. The survey was carried out to determine use of the area by seabirds and marine mammals, to put this use in context by comparison with coastal areas elsewhere in Dorset, the English Channel and nationally, and to assess the vulnerability of seabirds and marine mammals to oil pollution.

In the 14th round of offshore licensing, Amoco (UK) Exploration Company (in partnership with Deminex U.K. Ltd. and British Borneo North Sea Ltd.) and British Gas Exploration and Production (in partnership with Agip (UK) Ltd.) were awarded licences to explore for oil and gas off the coast of mid Dorset. Aware that existing information was incomplete, they initiated a range of studies (co-operatively and individually) to assist in environmental management planning and decision making.

The study, commissioned and jointly funded by Amoco (UK) Exploration Company and British Gas Exploration and Production and their partners, was designed to fulfil the following objectives:

- a) to map seabird and cetacean distribution and abundance off mid Dorset over a 12 month period.
- b) to summarise existing data, including those collected under contract to JNCC, on the birds and mammals of the above area.
- c) to assess possible impacts of seismic, exploration drilling and related potential developments in the area and to provide recommendations for approaches to minimise impacts on birds and cetaceans from these activities.

The survey area covered the coast between Durlston Head in the east and Portland Bill in the west, and south to latitude 50° 22' N (Figure 1). This covers the blocks licensed to Amoco (UK) Exploration Company, and British Gas Exploration and Production and their partners with small extensions to the east and west to ensure complete coverage up to the boundaries of other studies. Poole Bay, to the east of Durlston Head, was surveyed by SAST in 1990 (Aspinall and Tasker, 1990) and Lyme Bay, to the west of Portland Bill, was surveyed by Ambios Environmental Consultants Ltd. in 1994 for Kerr McGee Oil (UK) Ltd. Ambios were trained in SAST survey methods and close co-operation with them was maintained to ensure compatibility of results.

Prior to this survey, knowledge of offshore seabird distribution in this area was based mainly on aerial surveys carried out by SAST in 1991 (Barton *et al.* 1994). This previous survey was not sufficiently detailed for the requirements of Amoco (UK) Exploration Company and British Gas Exploration and Production. A quantity of information regarding seabird distribution in inshore waters was available in Dorset Bird Reports and the Seabird Colony Register, but there had been no previous effort-related seabird study in all months off the coast of mid Dorset. Seabird abundance varies on a daily, seasonal and annual basis. The reasons behind this variation are complex and are currently part of a detailed investigation being carried out by SAST. Around the coast of Dorset and in the English Channel there is little previous information on variation in the abundance of seabirds offshore to place the results of this project in context.

The physical, biological and human environment

The following sections summarise the biological and physical characteristics of the study area (see Figure 1). A number of literature sources have been used in compiling these accounts, but in particular Barne & Robson (1994); Dorset Bird Reports; Howard, Howson & Moore (1988); Perkins (1977); Prendergast & Boys (1983) and Seaby & Riley (1994).

The Isle of Portland

At the western end of the survey area, the Isle of Portland is an outcrop of Portland Limestone, 6 km long and up to 2 km wide. It is joined to the mainland by the shingle of Chesil Beach (Figure 1).

On the east and west of the Isle, almost vertical limestone cliffs up to 60 metres high have many horizontal faults which provide good nesting sites

for a number of seabirds. Portland is one of only two areas on the south coast of mainland Britain where puffins breed (the other is in Purbeck) and the cliffs are also home to small colonies of guillemots and razorbills. All these species showed marked declines up until the early 1970s, from which time numbers have been more or less stable. The current puffin 'colony' of two or three pairs is close to extinction. The cliffs also support a range of other breeding seabirds including kittiwake, fulmar and herring gull.

The Isle narrows to its southernmost tip, Portland Bill, which is one of the premier sites on the south coast for observing the migration of seabirds through the English Channel. During spring and autumn, numbers of seabirds passing may run into thousands of birds per day. Most of these birds fly straight past, but a few linger in the area for a while. In recent summers an increasing number of



The Coastal waters of the survey area are worked by small-scale local fisheries.

storm petrels have been trapped for ringing at Portland Bill, with 130 caught in 1994. In some years, flocks of shearwaters and gannets spend much of the summer in the area. Offshore, to the south and east of Portland Bill lie shallow ledges which extend up to 2 km offshore, at a depth of about 10 metres. Tidal currents around these ledges create good feeding conditions for a number of seabird species. Occasional large auk concentrations occur in winter in the waters off Portland Bill, such as in January 1965 when about 20,000 guillemots were present (Prendergast & Boys 1983).

The rocky shores on Portland support few waders. Oystercatchers are present at low densities around the Isle and a few pairs breed. One species of note is the purple sandpiper that winters annually on the Isle. The flock generally numbers about 30 birds, and is the largest regular concentration in Dorset.

The coast of Portland is little used for recreation; fewer rock climbers use the cliffs than in Purbeck, and the area is too exposed for most watersports. As with nearly all areas of coast in Dorset, the area is very busy with walkers and tourists, especially in the summer months. The north side of the Isle is heavily developed as a naval base, but most of the rest of the coast on the Isle is undeveloped. Small numbers of lobster and crab fishermen work in the inshore waters, and mussel dredging occurs offshore.

Portland Harbour

Portland Harbour was formed in 1872 by the building of breakwaters to enclose a bay bordered by the Isle of Portland to the south and Weymouth to the north and is sheltered from prevailing south westerly winds by Chesil Beach (Figure 1). The south side of the harbour is currently the site of a naval dockyard and airbase to be vacated in late 1995. Much of the western and northern parts of the harbour are less than 10 metres deep with areas of intertidal mud used by waders and wildfowl from the Fleet. This part of the harbour is also used extensively for recreational purposes. The only direct link between the Fleet and the sea is in the north-west corner of the harbour at Ferrybridge. The eastern section of the harbour is between 10 and 20 metres deep.

The sheltered waters of the harbour are favoured by grebes, divers and seaduck in winter and a flock of red-breasted mergansers occurs regularly in nationally important numbers. The harbour also supports a small flock of up to ten black-necked grebes and is one of the best locations on the south coast of England for black-throated divers, with up to ten present in most winters.

In summer, the harbour is used as a feeding area by little terns from their colony on Chesil Beach. A colony of up to 53 pairs of common terns used the breakwaters until 1990 but deserted the area due to disturbance. This colony contained occasional pairs of the rare and declining roseate tern. Most of the common terns have now relocated to Abbotsbury on the Fleet, but occasional pairs still breed around the harbour. The breakwaters are also used by breeding herring, great black-backed and (possibly) lesser black-backed gulls and several pairs of oystercatcher.

The sheltered waters of the Harbour are popular with watersports enthusiasts, particularly windsurfers around Ferrybridge. At low tide there is some disturbance to intertidal areas from bait-digging. The main fishing activity within the harbour is confined to small numbers of rod-fishermen, principally from boats.

The Fleet and Chesil Beach

The Fleet is a 13 km long, narrow (100-1000 metres), shallow (0.3-5 metres) lagoon, separated from the sea by the shingle of Chesil Beach and opening to Portland Harbour at Ferrybridge (Figure 1). It superficially resembles an estuary with saline water entering at Ferrybridge and by seepage from Lyme Bay through Chesil Beach; the fresh water input comes only from a few small streams and surface water run-off. The tidal range in the west Fleet is low and the water in this area is only slightly brackish. The resulting wide range of habitats are exceptionally rich and diverse and of international importance. The area is of note for its wintering wildfowl populations (Table 1), including an internationally important population of brent geese, with recent peak counts of 6000 birds.

The presence of colonial mute swans at Abbotsbury is one of the more notable features of the Fleet. The swannery has been in existence for about 900



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Weymouth Bay is sheltered by the Isle of Portland to its south, and is frequented by divers, grebes and a large gull roost in winter and by terns in summer.

years, and recently has numbered about 114 breeding pairs. The area is also important for its little terns. The colony at Ferrybridge has increased in size recently and peaked at 77 pairs in 1994. This is the only little tern colony in Dorset and south-west England and is nationally important. Up to 35 pairs of common terns now nest at Abbotsbury.

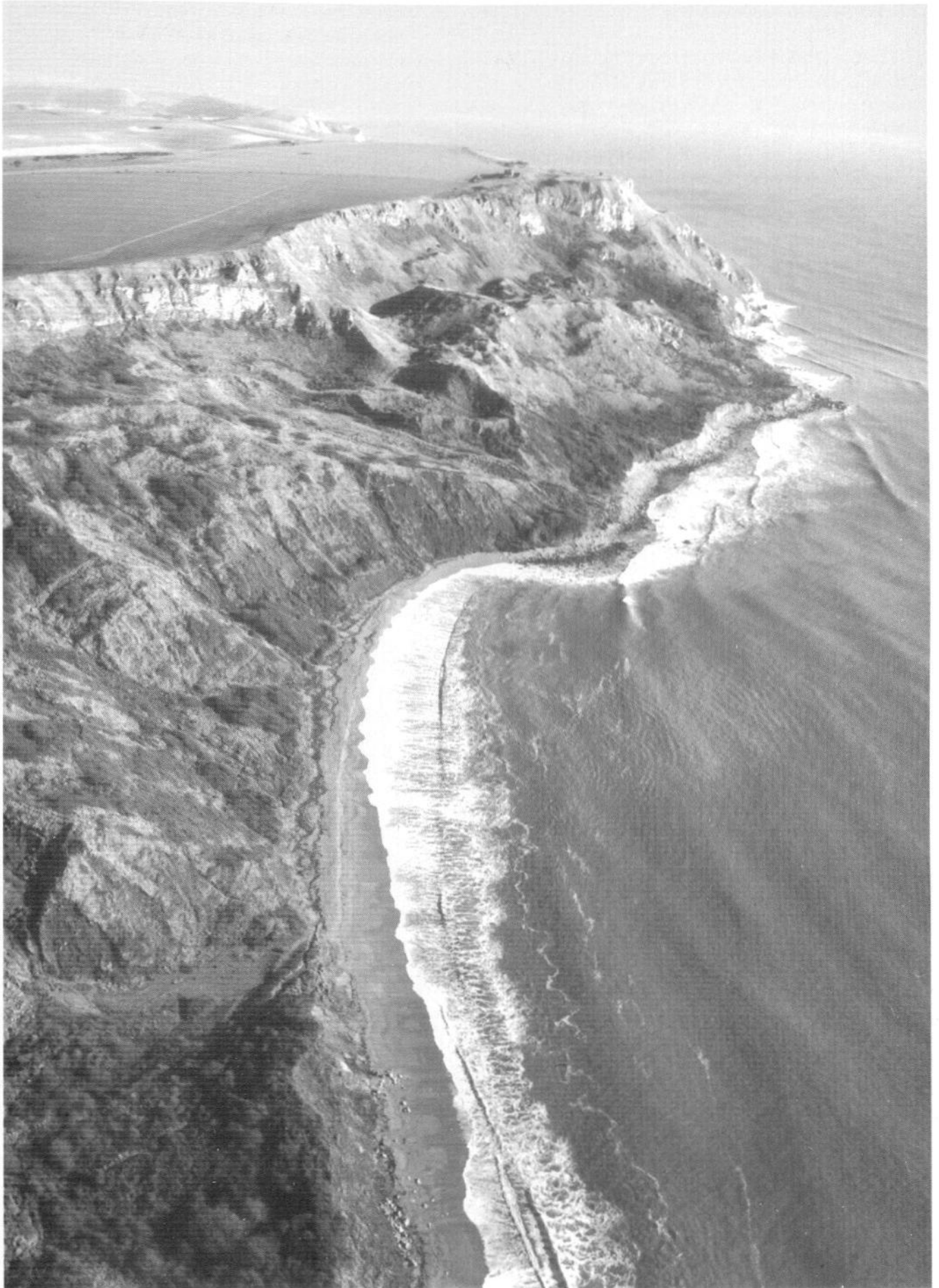
Most of the Fleet is undisturbed by human activity, and access to Chesil Beach is restricted between Abbotsbury and Ferrybridge.

Weymouth Bay

The sheltered, shallow (< 10 metres) waters of Weymouth Bay are bordered to the west by the town of Weymouth with its large sandy beach (Figure 1). The river Wey enters the south-west of the bay with the mouth of the river developed as a port and marina; the river is of low wildlife value except for the Royal Society for the Protection of Birds (RSPB) reserve at Radipole Lake 2 km upstream. The sand and shingle beaches of the bay

are poor food sources for waders and are heavily disturbed by human recreational activity. The bay together with Portland Harbour forms an important area for wintering grebes, divers and seaduck. Many of the birds in Portland Harbour also use Weymouth Bay and *vice versa*, but red-breasted mergansers are recorded infrequently in the bay. Common and little terns are regularly recorded in the area during the summer but are generally fewer in number than in Portland Harbour. There are no breeding birds in the immediate vicinity of the bay, with the exception of herring gulls nesting on rooftops in Weymouth. The bay is an important gull roost site throughout the winter.

Weymouth Bay is heavily impacted by human development and recreational activities associated mainly with tourism. In recent winters, the sheltered waters of the bay have been used by a fleet of fish-processing vessels (klondykers). These are present from November until April with up to eight boats there in 1994. The waste from their activities attracts large numbers of gulls into the bay.



Peter Sillson (Sillson Photography)

The chalk outcrop of White Nothe with Ringstead Bay in the foreground.

Redcliff Point to Ringstead Bay

This area is characterised by low, eroding, clay cliffs up to 20 metres high with areas of shingle beach at their base. The area is afforded some protection from the prevailing south-westerly winds by the Isle of Portland, but is not as sheltered nor as shallow as Weymouth Bay. Here the 10 metre depth contour comes within 1 km of the shore, compared with 2 km in Weymouth Bay. As a result the seabird species found in this area are a mixture of birds typical of the open coast, such as fulmar and shag and also some of the species more frequently associated with sheltered areas of coast

such as divers and grebes. There are no breeding birds on the cliffs between Redcliff and Ringstead as there are few suitable ledges or undisturbed areas. The beaches do not provide suitable substrates for feeding waders other than small numbers of oystercatcher and occasional migrants such as whimbrel.

There is little human development and recreation in the area, with the exception of relatively low impact activities such as coastal rambles. The offshore areas are used by small-scale lobster and crab fisheries.



Peter Sillson (Sillson Photography)

Looking east from White Nothe towards Durdle Door. Here the chalk cliffs and shingle beaches support relatively few seabirds.



The coastline at Worbarrow Bay reflects the wide variation in the geology of mid Dorset, with chalk, clays and limestone. The cliffs, beaches and offshore areas around Worbarrow Bay are little used by seabirds.

White Nothe to Gad Cliff

To the east of Ringstead Bay the clay cliffs disappear and a chalk outcrop dominates the coast with almost vertical cliffs up to 150 metres high, extending east to Bat's Head (Figure 1). From here to Gad Cliff the coastal exposures are a mixture of limestone, chalk and clays, and the topography of the coast reflects this variety. At Worbarrow Bay, the clay vale meets the sea giving rise to a wide, deep (>10 metre) bay. More famously, at Lulworth Cove the sea has broken through the limestone and eroded the inland clays giving rise to a sheltered, shallow (<5 metre) cove. At Gad Cliff the limestone reappears with 150 metre cliffs and a large area of undercliff. The intertidal zone is a mix of boulder-strewn beach, cliff and shingle beach.

The beaches attract few waders, other than occasional oystercatchers. East of White Nothe the coast is fully exposed to the prevailing south-westerly winds, and the offshore areas shelf to 10

metres within 500 metres of the coast. The birds of this area are typical of the open coast; shag, cormorant, gulls and fulmars with small numbers of auks but few divers, grebes or seaduck. The cliffs of this area provide good opportunities for nesting seabirds, in particular two cormorant colonies, at White Nothe and Gad Cliff, with 29 and 77 pairs respectively in 1994. There are also a few pairs of shag, herring gull and fulmar along this stretch; Bat's Head supported breeding auks until 1982 (Haysom 1993).

This area has little human development, but is particularly well used by tourists, most notably around Lulworth Cove. This use probably has little impact on seabird numbers or distribution in the area. The offshore areas are used on a small-scale by lobster and crab fishermen. The eastern end of the area is within the Lulworth firing range and as a result access (both to coast and sea areas), and therefore disturbance, is restricted for much of the year.

Kimmeridge to Houn's Tout

This is an area of coast dominated by low, soft, clay cliffs with gently shelving shallow beaches and inshore ledges. The softer rocks have in places eroded to form bays such as Chapman's Pool and Kimmeridge Bay. Offshore ledges extend the 10 metre depth contour to 2 km from the shore.

The beaches are generally of hard substrates and therefore attract few waders except occasional oystercatchers and redshanks. The cliffs are low (up to 30 metres) and constantly eroding, providing few secure nesting sites for seabirds. This area of coast is also very exposed, but the shallow nature of the inshore waters and the sheltered bays, such as Kimmeridge, attract small numbers of divers, grebes and seaduck. Cormorants and shags are present throughout the area.

Kimmeridge Bay is used by coastal rambblers and small numbers of surfers and windsurfers. The

Kimmeridge Voluntary Marine Nature Reserve is well used by sub-aqua divers. Away from Kimmeridge, the coast is largely inaccessible and little disturbed. The shallow waters limit the activities of fishermen to further offshore than in other areas.

St. Alban's Head to Durlston Head

An outcrop of limestone in the eastern end of the study area, known as the Isle of Purbeck, lies between St. Alban's Head and Durlston Head (Figure 1). As at Portland, the resistance of the rock to weathering gives rise to almost vertical cliffs up to 100 metres high, with numerous horizontal faults providing secure nest sites for a variety of seabirds. The coastline here is very exposed. There are no beaches except around St. Alban's Head where there is a large area of undercliff. Offshore, the water shelves rapidly reaching a depth of 20 metres within 1 km of the shore. An exception to this is around the



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The limestone outcrop of Gad Cliff supports the largest cormorant colony in mid Dorset, with 77 apparently occupied nests in 1994.



Looking east towards St. Alban's Head over the shallow Kimmeridge ledges.

St. Alban's ledge. Here a 9 km ridge, about 1 km wide, extends south-west from the head about 15 metres underwater. The sea bed to either side of the ridge is between 22 and 55 metres deep. Tidal circulation around the ledge creates good feeding conditions for shags, auks and gannets.

The most notable breeding seabirds in this area are the most easterly razorbills, guillemots and puffins on the mainland of the English Channel. As with the auk colonies at Portland and on the Isle of Wight, the numbers of these species in Purbeck have declined significantly from 1930 until about

1970, since when numbers have been relatively stable. The area also supports a number of other species of breeding seabirds, including fulmar, kittiwake, shag and herring and great black-backed gulls. The exposed nature of the coast results in relatively few divers, grebes, seaduck and cormorants in the area.

Most reported sightings of bottlenose dolphins in the survey area are from between St. Alban's and Durlston Heads.

As with much of the rest of the mid Dorset coast, the coast of Purbeck has very little human development with the exception of agriculture, with field boundaries often up to the cliff edge. Other human impact is related to activities such as fishing and recreation. In Purbeck large numbers of ramblers use the coastal paths and some parts of the cliffs are used extensively by rock-climbers. The offshore areas are generally unsuitable for many watersports, although sub-aqua diving is increasing in its popularity and large numbers of pleasure craft use the area in the summer. The area is also used by fishermen, principally for lobsters and crabs.

Offshore areas

Offshore the bathymetry of the area is generally uniform, with depths typically between 30 and 45 metres. There are a number of exceptions to this. The Shambles is a 3 km long gravel ridge 6 km due east from Portland Bill rising to four metres deep at its shallowest point. The Lulworth Banks lie about 2 km south of the coast between Lulworth and White Nothe. The area has a rocky substrate, generally about 15 metres deep. The Adamant Shoal, midway between The Shambles and the Lulworth Banks, is a small area of banks to a minimum depth of 10 metres.

The human impact in the area is limited. Commercial fisheries in the area exploit shellfish and, to a lesser extent, flatfish (Seaby & Riley 1994). In addition, there is some recreational rod-fishing in the area, especially around The Shambles.

The substrates in the survey area change from hard, rocky substrates in the south and east to softer, sand and gravel substrates in the north-west. It is likely that these changes will influence the distribution of food sources for seabirds and therefore the distributions of those seabirds when feeding and, to a lesser extent, breeding.



Richard White

The limestone cliffs between St. Alban's and Durlston Heads have horizontal ledges suitable for a range of breeding seabirds, including the only auk colonies in the survey area.



Peter Sillson (Sillson Photography)

The south coast of the Isle of Purbeck is dominated by the limestone outcrop of St. Alban's Head.

Methods

Boat-based surveys

Offshore seabird distribution was investigated by surveying a standard route at least once a month from January to December 1994. Two transects were surveyed on each occasion, an outer track between 15 and 30 km from the coast (south to 50° 22' N) and an inner track between 4 and 11 km from the coast (Figure 1). Each transect took about five hours to survey. Survey transect density was at a finer scale (about 5 km apart at their midpoints) over some of the more variable inshore marine habitat features than in other areas, such as further offshore.

Standard SAST methods were used on the boat-based surveys (Tasker *et al.* 1984), with a 300 metre band transect for birds on the water and snapshot counts for flying birds.

Land-based surveys

Land-based counts of all seabirds within 2 km of the coast were made from a series of fixed points twice monthly throughout the course of the year. A total of thirty count points between Durlston Head and Portland Bill gave good coverage of all inshore waters (Figure 1). Ten minutes were spent at each site counting all seabirds in the area and noting their behaviour.

The count points on the Isle of Portland were recorded using identical methods by Mick Rogers (Portland Bird Observatory and Royal Naval Birdwatching Society).

The gull roost in Weymouth Bay was counted on several occasions during the winter months. Two observers each counted gulls flying into the roost along separate, well defined, flight paths. Counts started about two hours before dusk and continued until dark.

Cetacean observations

Cetacean surveys were carried out at the same time as seabird counts. A dedicated cetacean observer during boat-based surveys recorded any cetacean activity in a 180° arc forward of the boat. Notes were made about the species involved, the number of animals and their range and bearing when first sighted. During land-based surveys any cetaceans seen by the seabird observer were recorded.

Bottlenose dolphin photo-identification

Many cetacean species are individually recognisable by a combination of the shape of the dorsal fin, the position and shape of any nicks in the trailing edge of the fin and the presence of any scars or blemishes on the skin of the animal (Hammond, Mizroch & Donovan 1990). Identification of individuals using this method is a well recognised method of assessing population size.

To establish the number of animals present in the Durlston area, photo-identification was carried out on a reactive basis by staff and volunteers from Durlston Country Park, with the launch of a rigid inflatable boat from Swanage when dolphins were sighted and weather conditions allowed. Several hours were spent on each occasion following the dolphins, observing behaviour and attempting to obtain close-up photographs of the dorsal fin of each dolphin present.

Seabird colony counts

Counts were made of all breeding seabirds (except gulls on the roofs of Weymouth) in the area using standard methods developed for counting seabirds at colonies (Walsh *et al.* 1995).

Bird species accounts: Divers & grebes

Introduction

A summary of the status of species in the survey area follows. This is based on information gathered during the current survey and a review of existing published information, principally Dorset Bird Reports (1970-1993), Prendergast and Boys (1983) and some unpublished sources. The species are dealt with following the sequence and nomenclature of Voous (1977) within each section. See Appendix II for scientific names.

Areas regularly supporting more than 1% of the British breeding or wintering populations of a species are nationally important for that species. Any area regularly supporting more than 1% of the north-west European breeding or wintering population of a species are of international importance. A site that regularly holds more than 20,000 wildfowl and waders of all species is also considered to be of international importance.

Red-throated diver

A regular winter visitor in small numbers to coastal waters. Up to five were recorded in Weymouth Bay and Portland Harbour in December 1992, but more typically one or two are recorded, as was the case during 1994. This species is thought to be involved in large migration movements of divers sometimes observed from Portland and Purbeck, occasionally numbering up to 100 birds per day. The species is more numerous in Lyme Bay, where the total population may exceed 1% of the British wintering population and therefore be of national importance (Colombé and Chown 1995).

During this survey, single red-throated divers were recorded off Houn's Tout and in Weymouth Bay in January, at Ringstead in February and at Osmington and Weymouth Bay in December. Single birds were seen in flight off Portland Bill in October, November and December. None was recorded during the boat-based surveys.

Black-throated diver

A regular winter visitor in small numbers to coastal waters. In mid Dorset, black-throated divers are

concentrated in Weymouth Bay and Portland Harbour, with typical peak counts of six or eight birds; sixteen in January 1991 was exceptional. This species is also recorded on migration through the area, but in lower numbers than the red-throated diver. The species is less common in Poole and Lyme Bays.

Black-throated divers were regularly recorded in Weymouth Bay and Portland Harbour during land-based counts in winter and spring (December to May) with a peak of seven in January. Elsewhere singles were recorded at Dancing Ledge in February and Winspit in March. Unusually, two spent the summer in the area between Ringstead Bay and Redcliff Point from June until August. On the offshore survey, two were seen in February in Weymouth Bay and may have been the same as those seen on land-based surveys.

Great northern diver

A regular winter and passage visitor in small numbers. This is the least numerous of the three diver species occurring regularly in Dorset. This species is often recorded in Poole Harbour, Poole Bay, Portland Harbour and Weymouth Bay, with counts of up to four in recent years.

In land-based counts made in 1994, this was the second commonest diver seen after black-throated, with most records from Portland Harbour and Weymouth Bay. Single birds were present from January until April and up to five were present in November and December. Elsewhere a single was at Lulworth in December. There were two records of this species during boat-based surveys; a single bird was flying east in January and a single bird was on the water in Weymouth Bay in November.

Great crested grebe

A regular winter visitor to the coast in small numbers. Occasionally flocks reach three figures in periods of prolonged cold weather. In mid Dorset, great crested grebes are regular winter visitors to Weymouth Bay and Portland Harbour with occasional records to the east.

In the first winter period the peak land-based count in Weymouth Bay and Portland Harbour was twelve in February with birds present until May. In the second winter period, birds were present from October with a peak of eight in December. Great crested grebes breed at Radipole Lake RSPB reserve; it is likely that birds in the bay and harbour are of local breeding origin. There were no records of this or any other grebe species during boat-based surveys.

Red-necked grebe

A scarce winter visitor to the coast, although regular in small numbers in Weymouth Bay and Portland Harbour and outside the survey area in Poole Harbour and Poole Bay. In most years no more than five are seen at any one site. In 1994 red-necked grebes were seen from land-based surveys in Weymouth Bay and Portland Harbour between January and March, and October and December, with peaks of two birds in both periods.

Slavonian grebe

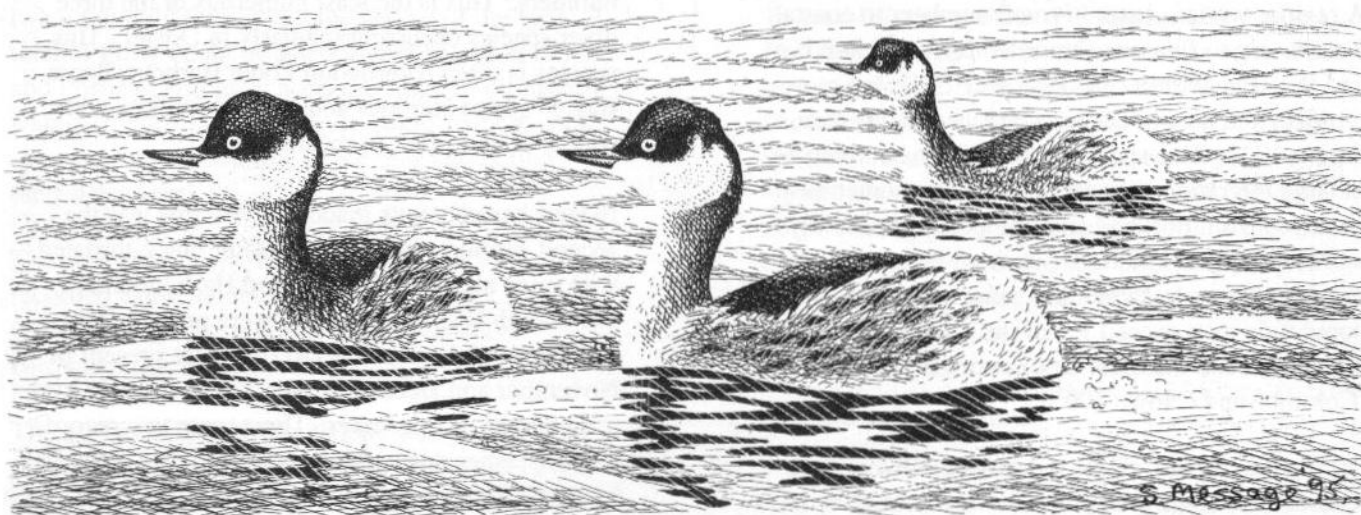
A regular winter visitor to the Dorset coast in small numbers. Occasionally flocks reach double figures

in Poole Harbour and Poole Bay, but the species is generally less common elsewhere, with a recent peak of five in Portland Harbour and Weymouth Bay in January 1990 and 1993.

During land-based surveys in 1994, Slavonian grebes were recorded in Weymouth Bay and Portland Harbour between January and March when numbers peaked at four, and between October and December with a peak of two. Elsewhere, two were recorded in Kimmeridge Bay in March.

Black-necked grebe

A regular winter visitor to both Portland and Poole Harbours, with flocks in both areas regularly reaching ten birds. During the land-based survey, birds were present from January to April and from November to December with a peak of five birds in both periods. Birds were occasionally seen in Weymouth Bay but none was seen east of Fursey Cliff.



Stephen Message

Small numbers of black-necked grebes winter in Portland Harbour. The peak count during the survey was of five in both winter periods.

Table 1 Five year mean counts of wintering waders and wildfowl in Poole Harbour and the Fleet 1987/88 - 1992/93.

	Poole Harbour	The Fleet
Little grebe	18	36
Great crested grebe	36	21
Cormorant	372 *	62
Mute swan	75	861 *
Brent goose	1125 *	2497 **
Shelduck	2543 **	105
Wigeon	608	6257 *
Gadwall	23	78 *
Teal	896	636
Mallard	357	767
Pintail	203	128
Shoveler	74	133 *
Pochard	814 *	756 *
Tufted duck	246	365
Scaup	29	23
Goldeneye	152 *	127
Red-breasted merganser	332 *	260 *
Coot	96	2251 *
Total wildfowl	6848	11,601
Oystercatcher	1469	34
Avocet	159 *	0
Ringed plover	122	10
Grey plover	260 *	37
Lapwing	3102	644
Knot	21	77
Dunlin	4701 *	276
Black-tailed godwit	1298 **	7
Bar-tailed godwit	327	6
Curlew	1535 *	16
Redshank	1469 **	78
Turnstone	25	13
Total waders	12,822	994

* : nationally important

** : internationally important

Figures from the Wetland Bird Survey counts.

Levels of significance taken from Waters and Cranswick (1993).

Wildfowl and waders

Numbers of dabbling ducks and geese in the survey area are generally low, with the exception of the Fleet, which regularly supports internationally important numbers. Similarly, numbers of seaduck in mid Dorset are low. Outside the study area to the east, Poole Harbour supports internationally important populations of wildfowl (Table 1).

Brent goose

A winter visitor to the sheltered estuaries of Dorset; the Fleet and Poole Harbour support respectively internationally and nationally important populations of this species.

In 1994, the peak brent goose count on the Fleet was 2962 in November (M. Cade pers. comm.), higher than the mean (2497) over the past five winters, reflecting the increase in numbers of this species at this site and at a national level. The five-year mean represents about 1% of the north-west European population of this species. A small proportion of the wintering brent geese based on the Fleet occasionally feed in Portland Harbour; for instance, a flock of 40 seen on a land-based count at Ferrybridge in February. Small flocks of brent geese were noted during their westward autumn migration, with a peak of twenty flying west at Furse Cliff in October.

Mallard

A common resident in freshwater areas; some birds move to estuarine and coastal areas in winter.

Small numbers of mallard were found off Rope Lake Head in January and February and from July until the end of the year, with a peak count of 38 in August.

Eider

A regular winter and occasional summer visitor to coastal waters of Dorset, normally in small groups of up to ten birds, occasionally up to 30.

Eider were seen during land-based surveys in Portland Harbour throughout the year, with a peak count of seventeen in March. Elsewhere a single bird was at Dancing Ledge in March and five were at Portland Bill in September.

Common scoter

A regular visitor to coastal waters of Dorset throughout the year. Flocks of more than 100 birds have been recorded annually.

During land-based surveys, common scoter were recorded in all areas and in all months except May. The highest counts of birds on the water were at Portland Bill, with a peak of 100 in November. Elsewhere the highest count was eleven in Portland Harbour in March. The peak count of birds seen passing through the area was 34 flying west at Durdle Door in September.

Common scoter were also recorded throughout the year during boat-based surveys, on both the inner and outer survey tracks, usually as small flocks in flight, with a maximum of thirteen in July.

Red-breasted merganser

A common winter visitor to the sheltered estuaries and harbours of Dorset. Both Poole Harbour and the combined area of Portland Harbour and the Fleet support nationally important populations of this species (Table 1).

During the year, maximum land-based counts in Portland Harbour were 118 in March and 143 in December. The peak counts on the Fleet in the same period were 457 in March and 400 in December (M. Cade pers. comm.). These counts probably involve some duplication as birds move freely between Portland Harbour and the Fleet. When compared to the mean of the peak counts made over the past five years the 1994 counts are above average. The combined area is of national importance for the species; the five-year mean of

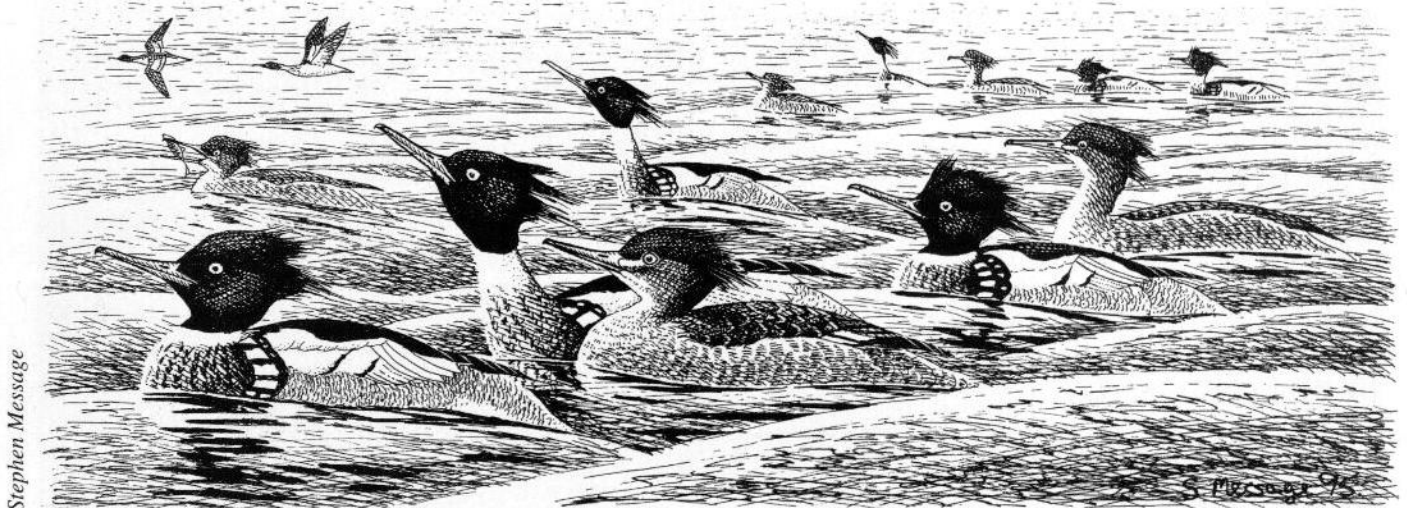
260 birds represents about 3% of the British wintering population. Small numbers were also seen in Weymouth Bay and a single bird at Rope Lake Head in March. Several single birds and a group of ten were seen in flight during boat-based surveys in the autumn.

Waders

Most of the coast within the survey area is exposed, often with little or no beach. The few beaches have rocky or shingle substrates and support little food for waders. The Wey estuary is unsuitable as wader habitat due to its small intertidal area and the large amount of development in Weymouth Harbour. Most of the waders using the Fleet (an average winter peak over the past five years of 994) remain in that area, although a few use Portland Harbour at low tide. The nearest area with important wader populations is Poole Harbour (Table 1), with nationally important populations of six species, two of which (black-tailed godwit and redshank) are present in internationally important numbers.

Small numbers of wader species other than those in Table 1 were recorded during land-based counts. None of the counts approached any level of significance. Birds such as whimbrel, common sandpiper and sanderling at Ringstead and Kimmeridge were recorded during migration periods. Flocks of up to twenty each of ringed plover, dunlin and turnstone in Portland Harbour are only a small part of the population based on the Fleet, and only use Portland Harbour occasionally. A regularly occurring flock of purple sandpipers spends the winter on the rocky foreshore around Portland Bill. The flock peaks at about 30 birds and is the largest concentration of this species in Dorset.

Oystercatchers are present throughout the survey area at low densities in all months. No more than ten were recorded at any land-based count site. Several pairs are thought to have bred on the Portland Harbour breakwaters. With a British wintering population of 290,000 (Waters & Cranswick 1993), and a breeding population of about 34,–43,000 pairs (Gibbons, Reid & Chapman 1993), the oystercatchers in mid Dorset are of little significance.



Stephen Message

Portland Harbour and the Fleet are nationally important for their wintering population of red-breasted mergansers.

Table 2 Overall density of seabirds in offshore waters during boat-based surveys, January to December 1994

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Fulmar												
Gannet												
Cormorant												
Shag												
Black-headed gull												
Common gull												
Lesser black-backed gull												
Herring gull												
Great black-backed gull												
Kittiwake												
Guillemot												
Razorbill												

Density values (birds per km²) represented by symbols:

no birds; 0.001-0.020; 0.021-0.050; 0.051-0.100; 0.101-0.500; 0.501+

Seabirds

Fulmar

A common visitor to the coast of mid Dorset throughout the year, although there is some seasonal variation in the numbers present. Small numbers breed in the area on cliffs.

Small numbers of fulmars were seen on the cliffs during the breeding season between Durlston and St. Alban's Heads, at Gad Cliff, Lulworth, Bat's Head and the east cliffs of Portland (Table 3). It was difficult to assess the number of pairs breeding or the success of breeding due to the difficulty in viewing nest sites. Numbers have increased in Purbeck since presence was first noted in the 1940s, although the rate of increase has slowed or stopped since about 1970 (Haysom 1993). This increase has been noted nationally and is continuing in many areas; it is thought to be linked to an increase in the exploitation by fulmars of discarded waste from fishing boats.

Fulmars were present at low densities between February and November during boat-based surveys (Table 2). Most records were from the outer survey track with a distinct increase in abundance in spring. Fulmars were recorded during land-based counts in all months of the year except October and November. The spring increase in abundance seen at sea was also noted during land-based counts, where the largest count of birds on the cliffs at any single site was fourteen on the east cliffs of Portland in March. Relatively few records of this species were of birds on the water, the largest count was nine at White Nothe in May.

Manx shearwater

A regular spring, summer and autumn visitor to the waters off mid Dorset. The nearest colonies are in the Channel Islands where there are two small colonies, numbering 15-30 occupied burrows in 1989 (Lloyd, Tasker & Partridge 1991).



D. Astins

Fulmars are common visitors to the coast of mid Dorset throughout the year; small numbers breed on areas of coast offering secure ledges as nest sites.

During land-based counts there were only three records, all from Portland Bill where there were 60 on the sea in April and two records of single birds flying past in June and August. Similarly, records during boat-based surveys fell into the expected spring and summer period. Single Manx shearwaters were recorded on six occasions between April and July, on both the inner and outer survey tracks. On one occasion in July, a group of three birds was observed plunge-diving over The Shambles, in an area where kittiwakes and gannets were feeding.

Storm petrel

An increasingly regular spring and summer visitor to the waters off mid Dorset. As with the Manx shearwater this is primarily an offshore species. The nearest colonies are in the Channel Islands where there were two small colonies with less than 100 occupied burrows in 1989, an apparent large

decline from 1000-9999 pairs in 1969 (Lloyd, Tasker and Partridge 1991). Ringing studies have shown that storm petrels, probably immatures, may move as far as Wales from Dorset in a matter of days (M. Cade pers. comm.).

Up to five were recorded during land-based counts from Portland Bill during May and June, which broadly matches the timing of sightings during boat-based surveys. Boat-based surveys recorded single storm petrels on nine occasions in May, June and July, with most records coming from the outer survey track.

Gannet

A regular visitor to offshore waters in Dorset, present in all months, with fewest in winter. From land it is most regularly seen from headlands such as Portland Bill, St Alban's Head and Durlston Head. The nearest colonies are the Channel

Table 3 Numbers of breeding seabirds in mid Dorset and adjacent areas in 1994

	Fulmar ²	Cormorant ³	Shag ¹	Herring gull ¹	G b-b gull ¹	Kittiwake ³	Guillemot ²	Razorbill ²	Puffin ¹
Ballard Down	6	122	0	6	7	0	0	0	0
Durlston Head to St. Alban's Head	43	0	59	69	2	83	567	23	8
Gad Cliff	5	77	6	3+	0	0	0	0	0
Worbarrow Bay to Durdle Door	9	0	1+	8+	0	0	0	0	0
Bat's Head to White Nothe	33	25+	0	2	0	0	0	0	0
Portland Harbour breakwaters	0	0	0	60	6	0	0	0	0
East Portland	31	0	0	3+	0	0	0	0	0
West Portland	41	0	0	10	0	48	173	11	3-4

Units: 1 = number of pairs; 2 = number of individuals on cliffs; 3 = apparently occupied nests

Islands, where there were approximately 5500 apparently occupied sites (AOS) in 1994, an increase from 4900 AOS in 1989 (Hill 1989; M.G. Hill pers. comm.).

During land-based counts, gannets were recorded in all months with a maximum single count of 60 fishing over the Portland Ledges in October, in association with a large flock of feeding kittiwakes and other gull species. A distinct decrease in the number of gannets present in mid-winter was noted. Whilst most of the records of gannets seen during land-based counts were of passing through the area, a few birds were seen fishing. During boat-based surveys gannets were recorded between February and November (Table 2), the same decrease in mid-winter numbers seen from land was also seen offshore. Gannets were recorded throughout the offshore survey area; the majority of records came from the outer survey track. Peak numbers occurred between April and August, particularly in the area around The Shambles where there were large concentrations of birds noted between May and August feeding with kittiwakes and Manx shearwaters.

Cormorant

A common resident which occurs throughout the survey area and breeds at two sites.

In the survey area, cormorants breed at Gad Cliff and White Nothe, with 77 and at least 25 nests respectively in 1994 (G. Pictor pers. comm.). Numbers of cormorants at Gad Cliff have been stable at between 80 and 110 nests since at least 1964, although this is a decrease from 200 pairs in 1932. The Ballard Down colony (just outside the survey area) has grown from between two to four pairs in the period 1948 to 1973 (Haysom 1993) to a peak of 172 nests in 1990 (Aspinall and Tasker 1990); it has subsequently decreased to 122 nests in 1994 (Table 3).

During land-based surveys, the highest counts of birds on the water were of twenty birds in Portland Harbour in December and of eighteen in Worbarrow Bay in May. Cormorants were generally commoner in shallower, more sheltered waters than shags. There were few records of cormorants during boat-based surveys (Table 2); all records were close inshore in areas of shallow (<10 metres) water, principally in Weymouth Bay.



Robert Dickson (Natural Image)

There are two cormorant colonies in mid Dorset, at Gad Cliff and White Nothe.

Shag

A common resident which occurs throughout the survey area and breeds at a number of sites.

Breeding birds were concentrated between Durlston and St. Alban's Heads, where there were 59 nests in 1994 (Table 3), although the shag is not a colonially breeding species in Dorset. Numbers of shags breeding in this area increased from nine occupied nests in 1964 to 57 occupied nests in 1974 (Haysom, 1980), at which level the population has remained relatively stable. Elsewhere there were six nests at Gad Cliff and at least one nest between Worbarrow Bay and Durdle Door. There were no shags breeding on Portland, despite apparently suitable habitat.

During land-based surveys, there were records throughout the survey area in all months, mostly of fewer than ten birds at any site. The greatest concentrations were in the Worbarrow area, where 26 in August was the highest count. No other site held more than twenty. During the boat-based surveys, shags were recorded throughout the year. This reflects the species' preference for feeding in deeper, more exposed waters. Shags were most regularly recorded in Weymouth Bay and between St. Alban's and Durlston Heads on the inner survey track.

Arctic skua

A visitor to the survey area during migration periods. Breeds in northern Britain and Europe and spends the winter in the south Atlantic. The only records of this species were during the boat-based surveys in August and September, when totals of one and five were seen respectively.

Mediterranean gull

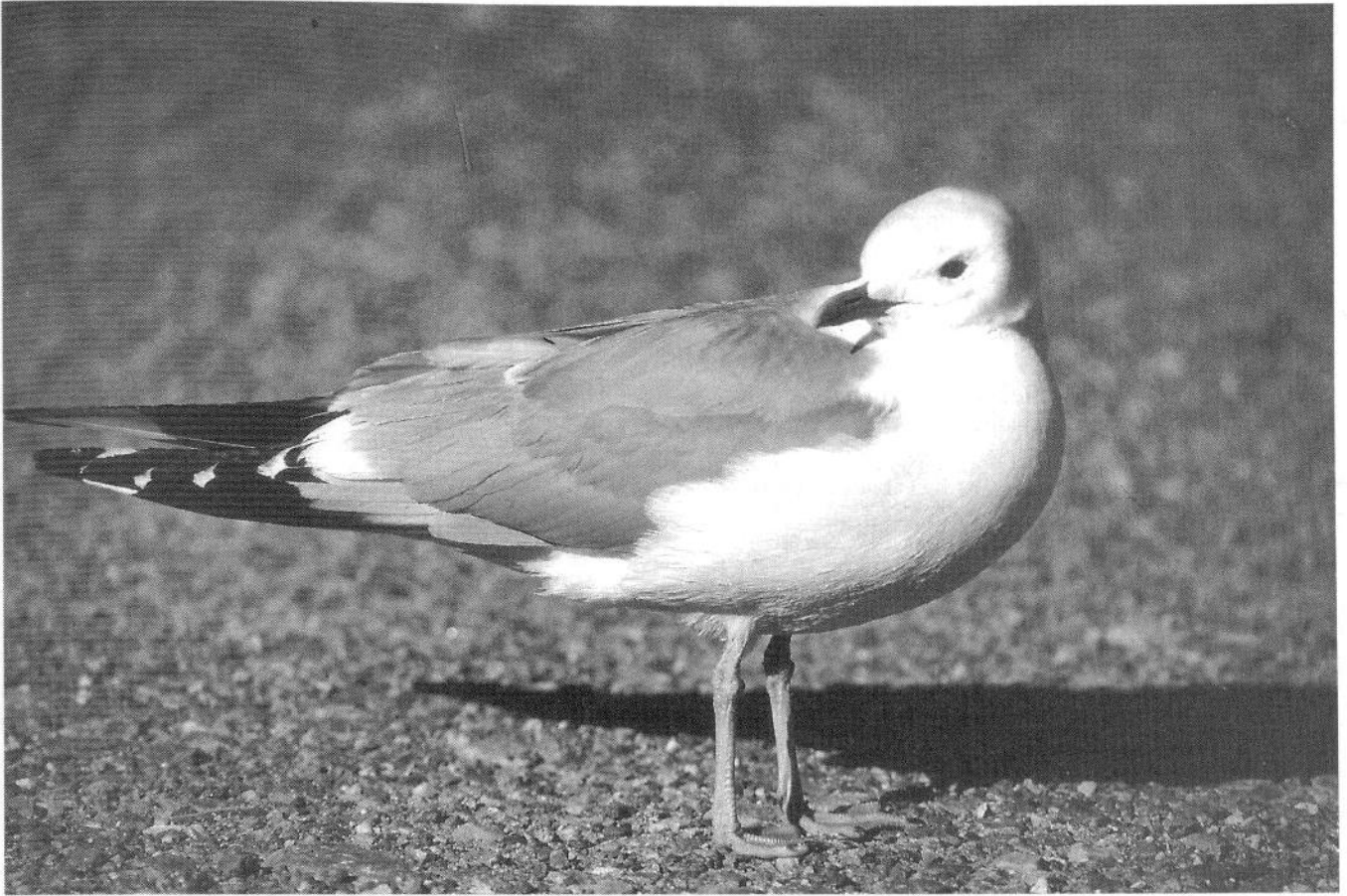
A scarce winter visitor to the Dorset coast, regular around Weymouth. This species is an annual visitor to the survey area, with up to ten present in Weymouth in the winter and occasional single birds along the rest of the coast.

During the land-based survey, two single adults were seen, at Rope Lake Head and in Weymouth Bay, both in February. On the offshore survey, two adults were seen 14 km south-east of Portland Bill and a first winter individual in Weymouth Bay, both during November. During gull roost counts, the species was regularly observed flying into Weymouth Bay to roost, with a maximum of eight in November.

Table 4 Numbers of roosting gulls in Weymouth Bay in 1994

	27 January	4 March	22 October	14 November	8 December
Black-headed gull	4286	4385	8053	3815	4929
Common gull	4542	4052	965	2069	1858
Lesser black-backed gull	15	32	20	3	3
Herring gull	339	nc	2710	455	nc
Great black-backed gull	42	nc	35	30	13
Total	9224	8469+	11,783	6372	6803+

nc : not counted



Large numbers of common gulls roost each night during the winter in Weymouth Bay.

Black-headed gull

A common species throughout the year on the coast of Dorset. In mid Dorset, the species is commoner in winter months than in summer; birds leave the area in spring to breed in colonies, the nearest of which are in Poole Harbour, with an estimated 5500 pairs in 1992 (Dorset Bird Report 1992).

During land-based surveys, the species was seen in all months. The largest flocks away from roost sites in the first winter period were of 270 in Portland Harbour in February, in summer 220 at Rope Lake Head in July and in the second winter period, 552 at Houn's Tout in October. During offshore surveys most records were in Weymouth Bay, where there were large numbers associating with the klondykers in the latter part of the year. Few were recorded away from Weymouth Bay. The spring and early summer decrease noted from land-based counts was also recorded during boat-based surveys (Table 2).

The peak count of roosting black-headed gulls in Weymouth Bay was just over 8000 in October

(Table 4), fewer than recent reports (Dorset Bird Report) which suggest that up to 15,000 birds may be present.

Common gull

A common visitor to mid Dorset during winter and migration periods.

This species was seen in low numbers during land-based counts, with the majority of records between October and April inclusive. The largest single count during land-based surveys in the first winter period was 70 at The Nothe in February. Between April and October there were only three records, each of between one and three birds in July. The largest single count during land-based surveys in the second winter period was of 24 at The Nothe in December. Common gulls were recorded at low densities throughout the offshore survey area between November and April, when overall densities were enhanced by large numbers associated with klondykers in Weymouth Bay, particularly in the latter part of the year (Table 2). None was recorded from May to October.

The gull roost in Weymouth Bay held a peak of 4500 common gulls in January (Table 4). This is the second largest concentration of common gulls in Dorset, the largest being at the roost in Poole Harbour.

Lesser black-backed gull

Regular in winter and on spring migration on the coast and offshore areas. Small numbers are present in summer and occasionally pairs breed.

During land-based counts lesser black-backed gulls were seen in low numbers throughout the survey area in all months, with a peak in the number of records in March during spring migration. A maximum of fourteen was recorded in Portland Harbour in August. During boat-based surveys, lesser black-backed gulls were present at low densities on both the inner and outer survey track, with slight peaks in the numbers of birds in April and November (Table 2). During the summer there were few records, although two pairs remained and possibly bred amongst herring gulls on the Portland Harbour breakwaters.

Small numbers were seen entering the gull roost in Weymouth Bay during both winter periods, with a peak of 32 birds in March (Table 4).

Herring gull

A common resident, breeding widely along the coast.

The largest breeding concentration was between Durlston and St. Alban's Heads, where there were 69 pairs in 1994 (Table 3). Numbers of herring gulls are known to have declined in this area in recent years from 208 nests in 1965 (Haysom 1993).

Large numbers of this species were recorded during land-based counts throughout the survey area during the year. Maximum single counts were of 213 in Weymouth Bay in January and of 200 in Portland Harbour in February. The species was recorded in all months during boat-based surveys (Table 2), with most records coming from the western end of the survey area. The largest



Andy Webb

Large numbers of herring gulls fed on waste from klondykers in Weymouth Bay

concentrations were around fishing vessels, particularly the klondykers in Weymouth Bay in the second winter period.

Large numbers were seen flying to roost in the Weymouth area during the year, with a peak count of 2700 in October (Table 4). Most of these birds are thought to roost on the Portland Harbour breakwaters, and so are not as vulnerable to oil pollution as other gull species roosting in the Weymouth area.

Great black-backed gull

A common resident, which breeds on the Dorset coast. Breeding was noted at several sites (Table 3), with no site holding more than ten pairs.

Great black-backed gulls were recorded throughout the survey area during land-based counts in all months. The largest single flock in the first winter period was of 30 off Portland in March. Between May and September there were no double figure counts, and the largest count in the second winter period was of 30 at Portland Bill in October. Great black-backed gulls were present at low densities throughout the offshore survey area, with occasional small groups of up to 25 birds and some larger concentrations around the klondykers in Weymouth Bay which caused an increase in overall densities. There were no records between July and September (Table 2).

Low numbers of this species were counted flying into the gull roost in Weymouth Bay, the peak count of 42 in January was not a true reflection of the numbers of birds present at that time. Gulls were counted as they flew over the coast from inland into the bay, however most of the great black-backed gulls remained throughout the day in the bay.

Kittiwake

Present throughout the year off the coast of Dorset, breeding at two sites in the county.

In 1956, kittiwakes bred for the first time in Purbeck. They spread along the coast and formed several colonies in the area peaking in 1982 at 292 apparently occupied nests (AON) (Haysom 1993). In 1994 there were 83 AON at Blacker's Hole. The

only other colony remaining in Dorset is on the west cliffs of Portland where there were 48 AON in 1994 (Table 3). This colony has also declined from a peak of 150-200 pairs in 1971 (Dorset Bird Report 1971).

Relatively few kittiwakes were seen during land-based surveys. The exceptions to this were counts in the breeding season at Dancing Ledge which peaked at 125 birds on the sea in July; this is the nearest count site to the kittiwake colony at Blacker's Hole. Outside the breeding season the highest count was at Portland Bill where there was a feeding concentration of 200 birds over the Portland Ledges in October associated with a large flock of gannets and other gull species.

Offshore, kittiwakes were recorded at low densities on both the inner and outer survey tracks in all months except August to October (Table 2). Occasional small concentrations were noted around fishing boats, and in May feeding with gannets over The Shambles.

Sandwich tern

A visitor to the Dorset coast in the summer and during spring and autumn migration, breeding at one site in the county outside the survey area.

The colony on Brownsea Island in Poole Harbour contained 117 pairs in 1993 (Dorset Bird Report 1993). Some of these birds may travel as far as Lulworth Cove to feed.

Sandwich terns were recorded throughout the land-based survey area between March and October. Most observations were in Portland Harbour and Weymouth Bay, with a peak of 44 in Portland Harbour in April. Observations in the east of the survey area were generally of fewer birds, with a maximum count of four flying west at Winspit in September. Sandwich terns were recorded on only one occasion during the offshore survey, reflecting the inshore habits of this species.

Common Tern

A visitor to the Dorset coast in the summer and during spring and autumn migration; breeds at three sites in the county, one of which is in the survey area.

Several birds were seen around the Portland Harbour breakwaters in June and July, where breeding has occurred in the past. One pair bred in 1994 within the Portland naval base, successfully rearing a chick. The colony at Abbotsbury on the Fleet continues to increase with 35 pairs in 1994 (D. Moxom pers. comm.). The largest colony in Dorset is on Brownsea Island in Poole Harbour, where 126 pairs bred in 1993 (Dorset Bird Report 1993). Unlike the Sandwich tern, common terns do not appear to fly to feed in the survey area from Poole Harbour.

During the land-based survey, the only records of common terns away from Portland Harbour and Weymouth Bay were of single birds at Ringstead and Worbarrow Bay in September. In Portland Harbour and Weymouth Bay up to eleven birds were seen between April and August. During boat-based surveys three small groups of one to four common terns were recorded in September, perhaps these were birds migrating through the survey area at this time.

Little tern

A summer visitor to the Dorset coast, breeds at one site in the county outside the survey area.

The colony on Chesil Beach reached a new peak of 77 pairs in 1994 (D. Moxom pers. comm.); these birds feed in Lyme Bay off Chesil Beach, in the Fleet and in Weymouth Bay and Portland Harbour. The colony on Chesil Beach represents about 3% of the British breeding population (Lloyd, Tasker & Partridge 1991), and is therefore nationally important for the species.

Little terns were only recorded during land-based counts in Weymouth Bay and Portland Harbour in May, June and July, with a peak total count of 41 at these sites in June. There were no records of little terns during boat-based surveys, reflecting the inshore habits of the species and its scarcity in Dorset away from Portland Harbour and Weymouth Bay.

Guillemot

The guillemot is the commonest auk in the coastal waters of Dorset, breeding at two colonies in the county.

The cliffs between Durlston and St. Alban's Heads support the easternmost colony of guillemots on the mainland south coast of Britain, with about 570 individuals in 1994 (Table 3). The numbers at this colony have remained relatively stable since 1969, prior to which there was a large decline from an estimated 2500 to 3500 in 1932 (Dorset Bird Report 1932). Additionally, there was a colony at Bat's Head until it became extinct in 1982. This colony had declined from 37 in 1964 (Dorset Bird Report 1964). Two other colonies are found nearby; on the west cliffs of Portland where there were 173 individuals in 1994 (D. Chown pers. comm.) and on the Isle of Wight at Main Bench where there were 200 birds in 1989 (Aspinall and Tasker 1990).

In winter, birds were distributed widely throughout the inshore and offshore survey areas. Away from colonies, land-based counts of birds on the water rarely exceeded two at any one site; the highest single counts were of eight at Portland Bill in November and December. Peak numbers were present in all offshore areas from late November through to early February, with the largest concentrations around The Shambles in January. From mid February onwards fewer birds were recorded offshore; locally breeding birds spend more time on the cliffs and winter visitors leave the area to return to colonies at this time. Guillemots were recorded on the sea around the colonies from December until early July with a peak of 230 at Anvil Point in April. Guillemots were not recorded in either land-based or boat-based surveys after mid-July when they presumably left the area to moult. They did not return to the area until early November (Table 2). Birds returned to their colonies from early December, with 170 birds on the cliffs at Durlston on 7 December.

Razorbill

A regular visitor to the Dorset coast although present in lower numbers than guillemot.

Razorbills breed in the survey area between Durlston and St. Alban's Heads. Like the guillemot, razorbill numbers have undergone a large decline from 100-250 pairs in 1948 to 35 pairs in 1964 and fifteen pairs in 1974 (Haysom 1980) and have remained relatively stable since then with 23 individuals in 1994 (Table 3). Small colonies to the east at Main Bench (Isle of Wight) and west at Bat's Head have become extinct. A few birds

(eleven in 1994) still breed on the west cliffs of Portland.

Peak numbers of razorbills were recorded during the boat-based surveys in January and early February. Razorbills were not as numerous nor as widespread as guillemots, but similarly a concentration was noted around The Shambles. Small numbers were present at this time during land-based counts. In March, records of razorbills offshore declined sharply whilst numbers near the colonies increased, with a high count of twenty at Dancing Ledge in March. As with the guillemot, there were no records of this species between mid July and early November (Table 2), after which there was a marked influx to inshore areas, peaking at fifteen in Portland Harbour in November. However, this increase was not reflected in the offshore surveys.

Puffin

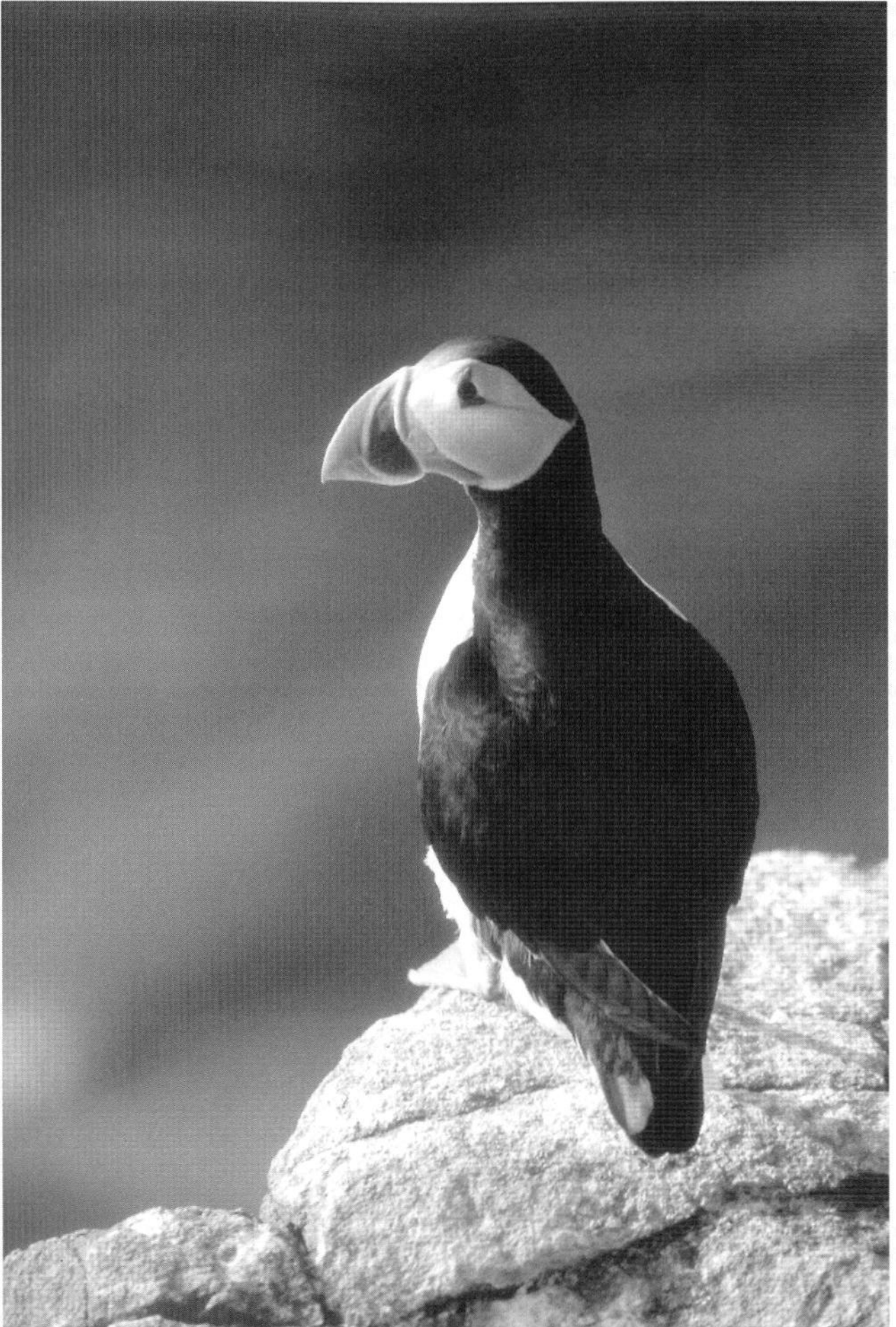
The least common of the auk species occurring regularly in Dorset. Puffins breed between St. Alban's and Durlston Heads, but unlike guillemots and razorbills, puffins are absent from the area in winter.

The largest puffin colony on the south coast of mainland Britain is at Dancing Ledge. Like the guillemot and razorbill, numbers of puffins have declined from 85 birds in 1958 to nineteen pairs in 1974 and more gradually since then to the current level of eight pairs in 1994 (Table 3). The only other south coast colony is on the west cliffs of Portland, where numbers declined from 20 pairs in 1948 to between two and five pairs by 1974 (Dorset Bird Report 1974). The colony remains at this level to 1994. The colony on the Isle of Wight is now extinct. The only record during offshore surveys was one seen in April. Several were recorded during land-based counts between St. Alban's and Durlston Heads from March until June with a maximum single of eight in April. The only other record during land-based counts was of a single bird flying west past Durlston Head in October.

Other species

The following seabirds, shorebirds and wildfowl were recorded during surveys on fewer than five occasions:

Mediterranean shearwater, grey heron, little egret, mute swan, shelduck, teal, velvet scoter, goldeneye, grey plover, Pomarine skua, great skua, little gull, Sabine's gull, Iceland gull, arctic tern and black tern.



F. Rush

The larger of the two puffin colonies in Dorset is between St. Alban's and Durlston Heads.

Beached bird surveys

Beached bird surveys

Since 1991 the RSPB, sponsored by British Gas, has organised national Beached Birds Surveys in February each year in order to assess the number of dead birds on British beaches and the proportions of those birds contaminated with oil.

Volunteer surveyors walk along a length of beach, record the numbers of dead birds found and the state of their plumage (clean, moderately or heavily oiled). In most cases, moderately or heavily oiled birds will have died from ingesting oil or from hypothermia.

The abundance of oiled seabirds in mid Dorset was about four times higher than in east Dorset during the same period (Table 5), but only half the number per km found in west Dorset. The 1992-94 average

for mid Dorset is comparable to the average for 1972-81 in southern England, when 0.20 oiled birds per km of coast were found (Aspinall and Tasker, 1990). This could be interpreted as little change in the levels of chronic oil pollution in the English Channel between the 1970s and the early 1990s. However, over a comparable period in east Dorset there was a decrease from 0.11 birds per km to 0.06 birds per km.

The results must be interpreted with care, as only a small proportion of all the birds affected by pollution will arrive on the shore, dependent on local factors such as wind direction and tides. Despite this, the results give a useful indication of existing levels of oil pollution in the area and the associated seabird mortality before any offshore development occurs.

Table 5 Numbers of auks and other seabirds found by the Beached Bird Survey in Dorset, 1992-94

	West Dorset	Mid Dorset	East Dorset
	Lyme Regis to Portland Bill	Portland Bill to Durlston Head	Durlston Head to Barton-on-Sea
Number of auks	45	20	2
% oiled	82	45	50
Number of other seabirds	24	9	3
% oiled	63	11	67
Distance surveyed (km)	120.1	41.2	47.5
Oiled birds per km	0.43	0.24	0.06

Marine mammal species accounts

Nine species of cetacean have been recorded off the Dorset coast since 1980 (M. Rogers pers. comm.), although of these only bottlenose dolphin, harbour porpoise, common dolphin and long-finned pilot whale occur regularly. Risso's, white-beaked and white-sided dolphins and humpback whale have also been recorded, but only rarely. Striped dolphins are known only from strandings. Of the four species that occur regularly off the Dorset coast, only the bottlenose dolphin is recorded annually from land. Bottlenose dolphins often occur close to land and are more likely to be seen by land-based observers, whereas common dolphin, harbour porpoise and pilot whale all have an offshore distribution. For this reason, it is difficult to interpret the difference in frequency of sightings of these species. Regular watches for cetaceans are carried out at Durlston Country Park, with an emphasis on recording bottlenose dolphins. There are no other systematic cetacean watches in Dorset, and away from Durlston reporting of casual records is poor and difficult to interpret.

Bottlenose dolphin

Previous systematic cetacean surveys in the English

Channel have recorded no bottlenose dolphins (SAST unpublished data). This is a reflection of both the scarcity of bottlenose dolphins and their mainly inshore habit in the English Channel. Bottlenose dolphins are recorded annually from a number of points along the mid Dorset coast. The majority of records are from Durlston Head, due in part to the systematic watches there, but this also reflects the importance of the waters off Durlston Head for this species. Bottlenose dolphins are also recorded annually at Portland Bill and intermittently at other sites between the headlands. The occurrence of bottlenose dolphins in Dorset has a distinctly seasonal pattern; very few are recorded in winter and in mid-summer and the numbers of sightings increase in spring and autumn. This pattern is noted at both Durlston Head and Portland Bill. It is thought that the dolphins may move eastwards in the English Channel in spring and return westwards in autumn. Nearby in Sussex, peak numbers occur in summer (S. Savage pers. comm.), but there is no seasonal pattern in sighting frequency in Cornwall (N. Tregenza pers. comm.). Timing of occurrence suggests that the bottlenose dolphins around Durlston Head and Sussex may relate to the same individuals.



Malcolm Turnbull (Durlston Coastwatch)

A semi-resident group of bottlenose dolphins occurs off Durlston Head. Photographs allow individuals to be recognised by nicks in their dorsal fins and skin blemishes.

During the year there was a total of 124 hours of land-based survey. There were no sightings of bottlenose dolphins during the land-based survey. There were approximately 2450 km of boat-based cetacean survey. The only cetacean encounter in this time was a single bottlenose dolphin about 3 km south of St. Alban's Head in December, close to the known inshore distribution of the species at the eastern end of the survey area.

The photo-identification programme started in April 1994, with several sets of photographs obtained in spring and early summer. These allowed five individuals to be identified, although all five animals were not always present on each occasion. In the autumn, the first returning animal in August was identified as one of the animals seen in spring, and subsequent animals in September through to November were also matched with those seen in spring. All five animals identified in spring were seen in the autumn, and no new individuals were found. The photo-identification programme continues and in March 1995 the bottlenose dolphins which returned to the waters off Durlston Head were photographed and identified as the same five animals present in 1994. Again, no new animals were found. Additionally, photographs of dolphins taken in Swanage Bay in 1990 have recently come to light that show at least two of the five dolphins identified in 1994 and 1995.

The results of photo-identification show that five individual bottlenose dolphins were present in spring and autumn 1994 and again in spring 1995, with at least two animals present also in 1990. There were no apparent changes in the group size in 1994 and until April 1995. In conclusion, photo-identification has confirmed the presence of a small, semi-resident group of bottlenose dolphins around Durlston Head.

Common dolphin

Sightings of common dolphins from systematic surveys have shown a distribution centred in the western approaches to the English Channel. In the western English Channel, abundance was lowest between May and September (SAST unpublished data). The common dolphin is the most regularly stranded dolphin on the Dorset coast (Table 6). Post-mortems of some of these animals have shown evidence of entanglement in fishing gear (by-catch), in common with animals stranded elsewhere

on the south-west coast of England (Kuiken *et al.* 1994).

There were no sightings of common dolphins during land-based or boat-based surveys during the year, reflecting the scarcity of this species in the area.

Long-finned pilot whale

Systematic surveys in the English Channel found pilot whales to be scarce and restricted to the area west of Start Point (SAST unpublished data) with records between September and February. Records from Portland Bill have also been made at this time of year (Rogers 1993).

There were no records of pilot whale during land-based or boat-based surveys during the year, reflecting the scarcity of the species in the area.

Harbour porpoise

The species is scarce in the English Channel (Evans 1992). There are few records from Portland Bill in spring and late summer (Rogers 1993). Harbour porpoises are rarely recorded around Durlston Head. There have been no harbour porpoise records east of Start Point in the English Channel from surveys conducted by SAST (unpublished data). However, systematic observations in Lyme Bay in 1994 have shown the species to be the most frequently observed cetacean on offshore surveys. Sightings were made in January, March, June and November (Leaper & Papastavrou 1995).

There were no sightings of harbour porpoise from either land-based or boat-based surveys, reflecting the rarity of harbour porpoise in mid Dorset waters. There have been no definite strandings of porpoises in Dorset in the past ten years (Table 6).

Grey seal

The grey seal is the only seal species to occur regularly in Dorset. There are records annually from all areas of the coast, usually of single animals. These records probably refer to a small number (less than five in total) of animals, which occasionally become semi-resident in an area. There are no regular haul-out sites for seals in Dorset.

One grey seal was recorded during land-based surveys, in the sea at Ringstead in May.

Table 6 Cetacean strandings in Dorset, 1986 -1994. Records provided by the National History Museum, London, from the British cetacean strandings database.

Species	Date	Location
Unidentified dolphin	1/1/86	Osmington*
Unidentified dolphin	early 1986	Lyme Regis
Common/stripped dolphin	19/11/86	Hengistbury Head
Pilot whale	9/12/86	Lyme Regis
Pilot whale	11/1/87	Weymouth Bay*
Pilot whale	21/1/87	Chapman's Pool*
Unidentified dolphin	10/3/87	Osmington*
Common/stripped dolphin	6/2/88	Chesil Cove
Common dolphin	4/3/88	Poole Harbour
Bottlenose dolphin	29/6/88	Bournemouth
Unidentified dolphin/porpoise	15/10/88	Weymouth*
Pilot whale	9/2/89	Weymouth*
Harbour porpoise	24/12/91	Chesil Cove
Unidentified dolphin/porpoise	8/5/89	Bridport
Common/stripped dolphin	6/2/90	Osmington*
Pilot whale	-/3/90	Portland (east side)*
Common dolphin**	1/1/91	Swanage
Unidentified cetacean**	28/7/91	Charmouth
Striped dolphin	29/7/91	Bournemouth
Common dolphin	27/10/91	Swanage
Pilot whale	3/12/91	Portland
Common dolphin	18/1/93	Bournemouth
Common dolphin	1/2/93	Chesil Beach
Unidentified dolphin	13/4/93	Lyme Regis
Striped dolphin**	8/8/93	Christchurch Harbour
Unidentified cetacean	15/11/93	Portland (west side)
Common dolphin	17/1/94	Portland (west side)
Common dolphin	23/1/94	Osmington*
Common dolphin	7/3/94	Lulworth*
Striped dolphin**	9/3/94	Bridport
Common dolphin	7/4/94	Kimmeridge*

* : in mid Dorset

** : live stranding

Discussion

Vulnerability of seabird concentrations

The relative vulnerability of seabirds to oil pollution varies between species. Those that spend the greater proportion of their time on the surface of the sea (such as divers, grebes, shags, ducks and auks) are at greatest risk, while species that feed from the air and spend less time on the surface of the sea (such as terns and gulls) are at least risk. Other factors such as the size of the biogeographical population, the age at first breeding and the clutch size can also be taken into account to calculate an Offshore Vulnerability Index (OVI) value for each species. An indication of the vulnerability of bird concentrations in an area can be produced by multiplying the densities of all bird species with their respective OVI values (Williams *et al.* 1995).

Within the study area it is clear that there is variation in the spatial and temporal distribution of seabirds. In order to assess the spatial variation in vulnerability of seabird concentrations to the effects of a pollution incident, the survey area has been divided into sections of broadly similar habitat (Figure 2). In inshore areas, where marine habitats are more variable, the area covered by land-based surveys has been divided according to the depth of the inshore waters. Generally, those areas where the inshore waters are shallow, such as Weymouth Bay and Portland Harbour and the Kimmeridge ledges have been separated from the coastal areas with deeper waters, such as between Durlston and St. Alban's Heads. In offshore areas where there is generally less variation in bathymetry, divisions have been made around features such as The Shambles and Lulworth Banks, where bathymetric features might affect seabird distribution.

The scores generated from OVI values in each area were divided into four categories, each containing equal numbers of records, to highlight the relative vulnerability of the seabird concentrations. This was carried out in offshore and inshore areas. In offshore areas, the scores were also compared to those calculated for all north-west European waters (Webb *et al.* 1995) and the vulnerability of the

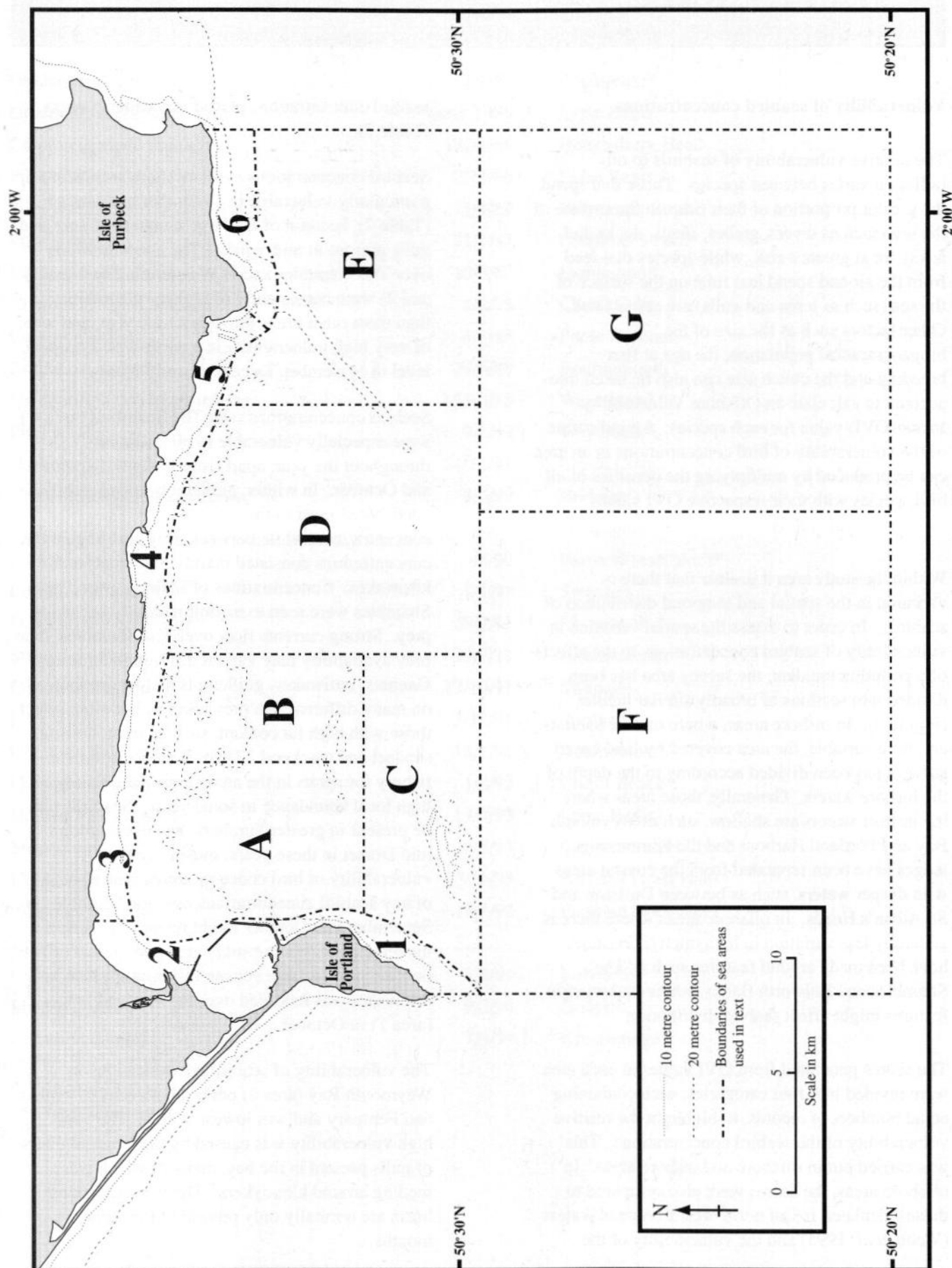
seabird concentrations placed in a wider context (Table 7).

Seabird concentrations in all offshore areas were particularly vulnerable in December and January (Table 7), because of the large numbers of auks and gulls present in mid-winter. The concentrations over The Shambles and in Weymouth Bay (areas C and 2) were consistently of higher vulnerability than most other areas throughout the year, and were of very high vulnerability at a north-west European level in November, December and January.

Seabird concentrations over The Shambles (area C) were especially vulnerable to oil pollution throughout the year, apart from in April, September and October. In winter, guillemots and razorbills contributed most to these vulnerable concentrations, while between May and August the concentrations consisted mainly of gannets and kittiwakes. Concentrations of seabirds over The Shambles were seen to exploit naturally occurring prey. Strong currents flow over The Shambles, thus prey availability may vary at different tidal states. Gannets, kittiwakes, guillemots and razorbills feed on many different fish prey species, but often select those with high fat content, such as sprat, herring, sandeel and mackerel. There is an opportunistic fishery for sprats in the area, dependent mainly on high local abundance in some years. Seabirds may be present in greater numbers than usual around mid Dorset in these years, increasing the vulnerability of bird concentrations. The absence of any seabird concentrations over the Shambles in September and October might relate to localised movements within the study area due to tidal effects on their prey; a large concentration of gannets and kittiwakes was recorded over the Portland ledges (area 1) in October.

The vulnerability of seabird concentrations in Weymouth Bay (area 2) peaked between November and February and was lowest in July. The very high vulnerability was caused by the large numbers of gulls present in the bay, many of which were feeding around klondykers. The fish processing boats are normally only present in the winter months.

Figure 2 Areas used for assessing the vulnerability of seabird concentrations to oil pollution in the inshore (areas 1 - 6) and offshore (areas A - G) waters of mid Dorset.



	Seabird vulnerability in offshore areas using local criteria							Seabird vulnerability in offshore areas using north-west European criteria							Seabird vulnerability in inshore areas using local criteria					
	A	B	C	D	E	F	G	A	B	C	D	E	F	G	1	2	3	4	5	6
Jan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Feb	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mar	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Apr	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
May	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
June	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
July	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aug	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sept	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Oct	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Nov	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Dec	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table 7 Vulnerability of seabird concentrations to oil pollution in offshore and inshore areas.
 Key to symbols: ● = Low vulnerability; ○ = Moderate vulnerability; ● = High vulnerability; ● = Very high vulnerability.

A change in the seasonal presence of the klondykers might affect the vulnerability of seabird concentrations in the area.

Seabird concentrations off Kimmeridge and over the St. Alban's Ledges (areas D and E) showed a general pattern in relation to local criteria of very high vulnerability in winter and moderate to low vulnerability throughout summer and autumn. Using similar criteria, the seabird concentrations were very highly vulnerable in mid-winter in the outer east (area G) and outer west (area F) areas and over the Lulworth Banks (area B). They were of consistently low vulnerability from July to October and moderate vulnerability in spring and early summer, due to small concentrations of guillemots and kittiwakes, presumably breeding at nearby colonies.

Seabird densities were very low in all offshore areas (areas A - G) in September and October, hence offshore seabird concentrations are least vulnerable at this time. Birds nesting locally probably disperse out of the area once they have finished breeding; for the auks this occurs in June and July, and for the gulls in July and August.

Seabirds return to spend the winter in offshore waters of mid Dorset, and their numbers are augmented by visitors from seabird colonies outside the study area.

The seasonal variation in the vulnerability of seabird concentrations in inshore waters (areas 1 - 6) was less clearly defined than offshore. The period of lowest overall vulnerability was from May to September, but during this time there were some areas of high vulnerability. The highest vulnerabilities were between October and April; a broader time period than in offshore waters.

Between St. Alban's and Durlston Heads (area 6) the highest vulnerability of seabird concentrations occurs from January to July, corresponding with the periods when seabirds attend their colonies. In contrast, the coast between Houn's Tout and Kimmeridge (area 5) has its highest vulnerable seabird concentrations between September and February, reflecting the more extensive use of the shallower waters here by wintering seabirds. The absence of breeding seabirds here gives rise to low vulnerability between March and August. A similar pattern of seabird vulnerability occurred between



Malcolm Turnbull (Durlston Coastwatch)

The presence of klondykers in Weymouth Bay in recent winters has led to large concentrations of gulls scavenging on discards.

Brandy Bay and White Nothe (area 4) and between Ringstead Bay and Redcliff Point (area 3), although vulnerability scores were generally lower in the latter section. Numbers of breeding seabirds were low between Brandy Bay and White Nothe, except for cormorants breeding at Gad Cliff and White Nothe (area 4); they flew to feed in Poole Harbour and made little use of the sea adjacent to the colonies, and consequently did not give rise to high concentrations of vulnerable seabirds in this area.

Portland Harbour (area 2), supported highly vulnerable seabird concentrations throughout the year. Concentrations of divers, grebes and ducks in winter were replaced in summer by concentrations of feeding terns. Portland Harbour is an easily contained unit and it should be possible to exclude oil pollution from an offshore source. However, the impact of any pollution within the harbour would be potentially very high, particularly if allowed to contaminate the Fleet. The open sea is more difficult to protect from the impact of an oil pollution incident, and therefore the birds here are potentially at greater risk.

Vulnerability of marine mammals

Bottlenose dolphins in Dorset are recorded primarily within 3 km of the coast between Ballard Down and St. Alban's Head. Typically they occur between March and late May and from late August until late November, perhaps linked to seasonal movements within the animals' home range. The impact of oil pollution on bottlenose dolphins and other cetacean species is not clear but they would be harmed directly by ingesting or inhaling oil.

Potentially more damaging, as with all marine wildlife, might be the effects of habitat degradation. The impacts of other forms of pollution on small cetaceans are even less clearly understood. In particular, they might be disturbed or otherwise harmed by noise pollution from seismic surveys or other sources of marine noise in the area, for example, military sources such as sonar or live firing exercises. Any effect, if at all, would be greatest at close range to the noise source.

Vulnerability of birds and marine mammals in intertidal areas

The intertidal areas of coastal mid Dorset are only of limited importance for birds, and there are no haul-out sites for seals. As a result, the beaches and intertidal rocks of the mid Dorset coast are considered of low vulnerability for seabirds and marine mammals to the impact of oil pollution. In contrast, the mudflats and open water areas of the Fleet and Poole Harbour are of international importance for birds and highly vulnerable to the effects of an oil pollution incident.

Sources of oil pollution

This publication focuses on the potential impact on birds and marine mammals of oil pollution from oil and gas exploration and production in the study area. However, oil pollution may originate from a number of sources, such as from tanker traffic, general shipping and land run-off. Levels of chronic oil pollution in the English Channel are generally high compared to the rest of the waters around the United Kingdom.

Recommendations

The following recommendations assume that a full anti-pollution response team is available, in line with good industry practice contained in the latest guidelines from the Department of Trade and Industry and the United Kingdom Offshore Operators Association on oil and gas operations in environmentally sensitive nearshore areas.

1. Any oil spill contingency plan should draw attention to and elaborate strategies to protect the most important areas identified by this project. These are the internationally important waterfowl populations in the Fleet; the nationally important flock of red-breasted mergansers in Portland Harbour in the winter; the concentrations of offshore seabirds over The Shambles throughout the year and the seabird colonies between Durlston and St. Alban's Heads. The presence of bottlenose dolphins between Durlston and St. Alban's Heads in spring and autumn is also of importance.
2. Seabird and cetacean experts (from JNCC/ English Nature) should advise on all oil spill responses, whether real or exercise. In the event of an oil spill, birds should be actively discouraged from using contaminated areas. If possible, gulls should be discouraged from roosting in Weymouth Bay if this area became contaminated in winter.
3. Seabird numbers and distribution should continue to be monitored to establish whether the numbers of seabirds encountered in 1994 were typical. Observers should be encouraged to monitor inshore waters and numbers of breeding seabirds in the area. If offshore areas are also to be monitored, surveys must be carried out from a dedicated survey vessel using standard SAST methods. Fewer offshore surveys might be needed than in 1994; perhaps two mid-winter surveys, concentrating on assessing the numbers of auks wintering in the survey area and, if possible, linking auk numbers with food availability, *e.g.* the abundance of sprat shoals.
4. Beached bird surveys should continue to be organised in winter. These surveys record the proportion of birds oiled and, at present, the source of oil is assumed to be from shipping and oil tankers. At some stage, samples of oil should be taken from victims of oil pollution to establish the origins of the contamination.
5. Activities that carry an increased risk of oil spillage should preferably occur from mid July to late October rather than at other times of the year. Seabird vulnerability to surface oil pollution in the survey area is lowest during this period. Any activity that carries an increased risk of harm to cetaceans should be carried out between mid July and the end of August when bottlenose dolphin occurrence is likely to be low.

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Appendices

Appendix I Peak counts of seabirds in inshore survey areas

The total is given for each species in each area (see Figure 2) for the month in which the peak occurred. The time of year is indicated after the count:

w: winter (December-February), sp: spring (March-May), su: summer (June-August), a: autumn (September-November).

	1	2	3	4	5	6
Red-throated diver	0	1w	1w	0	1w	0
Black-throated diver	0	9w	2su	0	0	1w/sp
Great northern diver	0	6w	2sp	1a	0	0
Great crested grebe	0	16w	4sp	0	0	0
Red-necked grebe	2w/sp/a	0	0	0	0	0
Slavonian grebe	0	2w	2sp	0	2sp	0
Black-necked grebe	0	5w	0	0	0	0
Fulmar	5sp	1sp	3sp/su	21sp	0	16w
Manx shearwater	60sp	0	0	0	0	0
Storm petrel	5su	0	0	0	0	0
Gannet	60a	1su/a	1sp/a	1su	2su	16su
Cormorant	5sp/su/a	26a	19sp	31sp	33sp	5su
Shag	15a	26w	20w	41su	22w	29su
Cormorant/shag	0	32w	18a	37w	7w	11a
Brent goose	0	40w	9a	0	1a	0
Teal	0	6w	0	0	0	0
Mallard	0	1a	0	0	38su	0
Eider	5a/w	17sp	0	0	0	1sp
Common scoter	100a	17sp	3w/sp	1a	0	1a/w
Velvet scoter	1w	0	0	0	0	0
Goldeneye	0	8w	0	0	0	0
Red-breasted merganser	0	223w	0	0	1sp	0
Great skua	0	0	0	0	0	1sp
Mediterranean gull	0	1w	0	0	1w	0
Little gull	0	1w	0	0	0	1a
Black-headed gull	0	471w	80a	237a	756a	35a
Common gull	20a/w	142w	23w	10a	73w	12w
Lesser black-backed gull	2sp/su/a	14su	2sp	4w	2a	4sp
Herring gull	201s	408w	72w	166w	62w	134w
Great black-backed gull	75sp	73w	7w	14a/w	36sp	38sp
Kittiwake	200a	1sp/su/w	1w	0	1su	125su
Sandwich tern	2sp	63sp	10su	6su	1sp	0
Common tern	0	18sp	0	0	0	0
Little tern	0	41su	0	0	0	0
Guillemot	8a/w	3w	3w	4w	2w	277sp
Razorbill	8sp	18a	5a	7w	8w	24sp
Guillemot/razorbill	0	3sp	1a/w	6w	3a	9w
Puffin	0	0	0	0	0	8sp

Appendix II Scientific names of species mentioned in the text

Birds

Red-throated diver	<i>Gavia stellata</i>	Redshank	<i>Tringa totanus</i>
Black-throated diver	<i>G. arctica</i>	Common sandpiper	<i>Actitis hypoleucos</i>
Great northern diver	<i>G. immer</i>	Turnstone	<i>Arenaria interpres</i>
Little grebe	<i>Tachybaptus ruficollis</i>	Pomarine skua	<i>Stercorarius pomarinus</i>
Great crested grebe	<i>Podiceps cristatus</i>	Arctic skua	<i>S. parasiticus</i>
Red-necked grebe	<i>P. grisegena</i>	Great skua	<i>Catharacta skua</i>
Slavonian grebe	<i>P. auritus</i>	Mediterranean gull	<i>Larus melanocephalus</i>
Black-necked grebe	<i>P. nigricollis</i>	Little gull	<i>L. minutus</i>
Fulmar	<i>Fulmarus glacialis</i>	Sabine's gull	<i>L. sabini</i>
Manx shearwater	<i>Puffinus puffinus</i>	Black-headed gull	<i>L. ridibundus</i>
Mediterranean shearwater	<i>P. mauretanicus</i>	Common gull	<i>L. canus</i>
Storm petrel	<i>Hydrobates pelagicus</i>	Lesser black-backed gull	<i>L. fuscus</i>
Gannet	<i>Morus bassanus</i>	Herring gull	<i>L. argentatus</i>
Cormorant	<i>Phalacrocorax carbo</i>	Iceland gull	<i>L. glaucoides</i>
Shag	<i>P. aristotelis</i>	Great black-backed gull	<i>L. marinus</i>
Little egret	<i>Egretta garzetta</i>	Kittiwake	<i>Rissa tridactyla</i>
Grey heron	<i>Ardea cinerea</i>	Sandwich tern	<i>Sterna sandvicensis</i>
Mute swan	<i>Cygnus olor</i>	Roseate tern	<i>S. dougallii</i>
Brent goose	<i>Branta bernicla</i>	Common tern	<i>S. hirundo</i>
Shelduck	<i>Tadorna tadorna</i>	Arctic tern	<i>S. paradisaea</i>
Wigeon	<i>Anas penelope</i>	Little tern	<i>S. albifrons</i>
Gadwall	<i>A. strepera</i>	Black tern	<i>Chlidonias niger</i>
Teal	<i>A. crecca</i>	Guillemot	<i>Uria aalge</i>
Mallard	<i>A. platyrhynchos</i>	Razorbill	<i>Alca torda</i>
Pintail	<i>A. acuta</i>	Black guillemot	<i>Cephus grylle</i>
Shoveler	<i>A. clypeata</i>	Puffin	<i>Fratercula arctica</i>
Pochard	<i>Aythya ferina</i>		
Tufted duck	<i>A. fuligula</i>	Marine mammals	
Scaup	<i>A. marila</i>	Humpback whale	<i>Megaptera novaeangliae</i>
Eider	<i>Somateria mollissima</i>	Harbour porpoise	<i>Phocoena phocoena</i>
Common scoter	<i>Melanitta nigra</i>	Long-finned pilot whale	<i>Globicephala melas</i>
Velvet scoter	<i>M. fusca</i>	Risso's dolphin	<i>Grampus griseus</i>
Goldeneye	<i>Bucephala clangula</i>	Bottlenose dolphin	<i>Tursiops truncatus</i>
Red-breasted merganser	<i>Mergus serrator</i>	White-beaked dolphin	<i>Lagenorhynchus albirostris</i>
Coot	<i>Fulica atra</i>	Atlantic white-sided dolphin	<i>L. acutus</i>
Oystercatcher	<i>Haematopus ostralegus</i>	Common dolphin	<i>Delphinus delphis</i>
Avocet	<i>Recurvirostra avosetta</i>	Striped dolphin	<i>Stenella coeruleoalba</i>
Ringed plover	<i>Charadrius hiaticula</i>		
Grey plover	<i>Pluvialis squatarola</i>	Grey seal	<i>Halichoerus grypus</i>
Lapwing	<i>Vanellus vanellus</i>		
Knot	<i>Calidris canutus</i>	Fish	
Sanderling	<i>C. alba</i>	Sprat	<i>Sprattus sprattus</i>
Purple sandpiper	<i>C. maritima</i>	Herring	<i>Clupea harengus</i>
Dunlin	<i>C. alpina</i>	Mackerel	<i>Scomber scombrus</i>
Black-tailed godwit	<i>Limosa limosa</i>	Sandeel sp.	<i>Ammodytes sp.</i>
Bar-tailed godwit	<i>L. lapponica</i>		
Curlew	<i>Numenius arquata</i>		
Whimbrel	<i>N. phaeopus</i>		