

## SEABIRD AND SHOREBIRD DIVERSITY AND ASSOCIATED CONSERVATION PROBLEMS IN PUERTO DESEADO, PATAGONIA, ARGENTINA

Patricia Alejandra Gandini<sup>1,2</sup> & Esteban Frere<sup>1,2</sup>

<sup>1,2</sup> Universidad Nacional de la Patagonia Austral, Almirante Brown y Colón s/n. (9050), Puerto Deseado, Santa Cruz, Argentina.

<sup>1,2</sup> Fundación Patagonia Natural, Almirante Zar 323, Puerto Deseado, Santa Cruz, Argentina.

**Resumen.** Durante las estaciones reproductivas de los años 1986 y 1987, y desde 1992 hasta 1995 se obtuvo información sobre la distribución y abundancia de aves marinas y costeras en el área de la Ría de Puerto Deseado y áreas aledañas. También se registró la abundancia relativa de las especies residentes no reproductivas, las migrantes y las que utilizan sus playas durante la dispersión invernal. Se identificaron dos áreas principales donde se localiza el mayor número de colonias reproductivas: 1) Las aguas interiores de la Ría Deseado, 2) Bahía Oso Marino. Un total de quince especies nidifican en este sector de costa: Pingüino de Magallanes (*Spheniscus magellanicus*), Pingüino de Penacho Amarillo (*Eudyptes chrysocome chrysocome*), Cormorán Imperial (*Phalacrocorax atriceps*), Cormorán de Cuello Negro (*P. magellanicus*), Bigua (*P. brasilianus*), Cromorán gris (*P. gaimardi*), Gaviota Cocinera (*Larus dominicanus*), Gaviota Austral (*L. scoresbii*), Gaviotines (*Sterna hirundinacea* and *S. eurynatha*), Skua Chileno (*Catbaracta chilensis*) y Skua Antártico (*C. antarctica*), Ostreros Negros (*Haematopus ater*), Garza Bruja (*Nycticorax nycticorax*), Pato Vapor Volador (*Tachyeres patachonicus*) y Pato Crestón (*Anas specularoides*). Los resultados mostraron que Puerto Deseado y zonas aledañas representan un área de gran importancia por su alta diversidad de aves marinas y costeras que interactúan directa o indirectamente con diversas actividades llevadas a cabo por el hombre como el turismo, la pesca y la contaminación.

**Abstract.** During the breeding seasons of 1986–1987, and from 1992 to 1995, we obtained information on the distribution and abundance of breeding seabirds and shorebirds of Puerto Deseado, Santa Cruz, Argentina, and the surrounding area. Also, we recorded relative abundance of resident species, migrant species, and birds using the beaches of Puerto Deseado during winter dispersion. We identified two main areas where seabird colonies were distributed: 1) interior waters of Ría Deseado, and 2) Bahía Oso Marino. We identified fifteen species breeding in both areas: Magellanic Penguin (*Spheniscus magellanicus*), Southern Rockhopper Penguin (*Eudyptes chrysocome chrysocome*), Imperial Shag (*Phalacrocorax atriceps*), Rock Shag (*P. magellanicus*), Neotropic Cormorant (*P. brasilianus*), Red-legged Cormorant (*P. gaimardi*), Kelp Gull (*Larus dominicanus*), Dolphin Gull (*L. scoresbii*), terns (*Sterna hirundinacea* and *S. eurynatha*), Chilean Skuas (*Catbaracta chilensis*), Antarctic Skua (*C. antarctica*), Blackish Oystercatcher (*Haematopus ater*), Black-crowned Night-Heron (*Nycticorax nycticorax*), Flying Steamer-Duck (*Tachyeres patachonicus*), and Crested Duck (*Anas specularoides*). Our results showed that Puerto Deseado and surrounding areas represent an important coastal zone with high bird diversity where seabirds and shorebirds interact directly or indirectly with diverse human activities such as tourism, fisheries and pollution. *Accepted 30 March 1998.*

**Key words:** Seabirds, shorebirds, biodiversity, conservation, Puerto Deseado, Patagonia, Argentina.

## INTRODUCTION

Santa Cruz Province in Argentina, Patagonia, has a long and varied coastline, measuring about 1300 km in length. Most of the sparse human population of the province lives along the coast in four main cities. The economy of the province is based on oil exploitation, sheep farming, fisheries and, lately, ecotourism.

Despite having the longest coastline of any Patagonian province, Santa Cruz has remained one of the least-studied provinces in terms of its coastal wildlife. Previous studies furnish information on the abundance of particular species such as Magellanic Penguin (*Spheniscus magellanicus*) (Scolaro *et al.* 1980, Gandini *et al.* 1996), Rockhopper Penguin (*Eudyptes chrysocome chrysocome*) (Frere *et al.* 1993), Red-legged Cormorant (*Phalacrocorax gaimardi*), (Gandini & Frere 1995) and Kelp Gull (*Larus dominicanus*) (Yorio *et al.* in press a), or provide lists of species for particular localities (e.g., Murphy 1936, Zapata 1967, Jehl & Rumboll 1976, Daciuk 1977a ,b).

Owing to an expansion of its fishing industry, Puerto Deseado experienced a 100% increase in its human population during the last decade, which, in turn, has increased pressures on the environment, including associated potential conflicts between wildlife and man. The fishing port, located near bird breeding areas, is one of the main sources of pollution. Chronic gasoline and other fuel spills, and garbage thrown overboard from ships, repeatedly affect wildlife. In addition, tourism has increased from less than 500 tourists/year to 9,000 tourists/year in a ten-year period (Gandini & Frere 1996).

Despite of belonging to a protected area, the lack of a management plan and active controls over economic development of the Puerto Deseado environment impedes efficient conservation of this site. The aims of this study were to provide information on the

distribution and abundance of seabirds and to characterize the threats they face in this portion of Patagonian coast.

## METHODS

The Ria at Deseado is a river bed abandoned by its former river and occupied by the sea. It is approximately 40 km long characterized by rocky shorelines, peninsulas, cliffs and islands some of which are connected to the mainland at low tide.

During the 1986, 1987, and 1992–1995 breeding seasons, we surveyed the entire Puerto Deseado area to detect breeding sites or to estimate abundance of birds in those places previously studied. We visited all islands and cliffs in the study area at least once a month from October to February.

Using direct counts of active nests, we estimated the breeding numbers of all avian species at their egg-laying peak. We also recorded those species present on the beaches during winter dispersion or on migration, and, distinguished these from the resident ones. Rock Shags (*P. magellanicus*), Black-crowned Night-Herons (*Nycticorax nycticorax*) and Red-legged Cormorants were surveyed during October and November by direct counts from a boat. Dolphin Gull (*L. scoresbii*), Blackish Oystercatcher (*Haematopus ater*), Flying Steamer-Duck (*Tachyeres patagonicus*) and Crested Duck (*Anas specularoides*) numbers were obtained by direct counts of nests during November-December whereas terns (*Sterna hirundinacea*, *S. eurygnatha*) numbers were obtained in the same manner in late December. Because of asynchronous (October and January) laying in the Neotropic Cormorant (*P. brasilianus*), once this species was detected at a breeding site, we followed its nests every month until egg laying. Skua (*Catharacta chilensis*, and *C. antarctica*) numbers were estimated by counting individuals or pairs showing territorial behaviour during

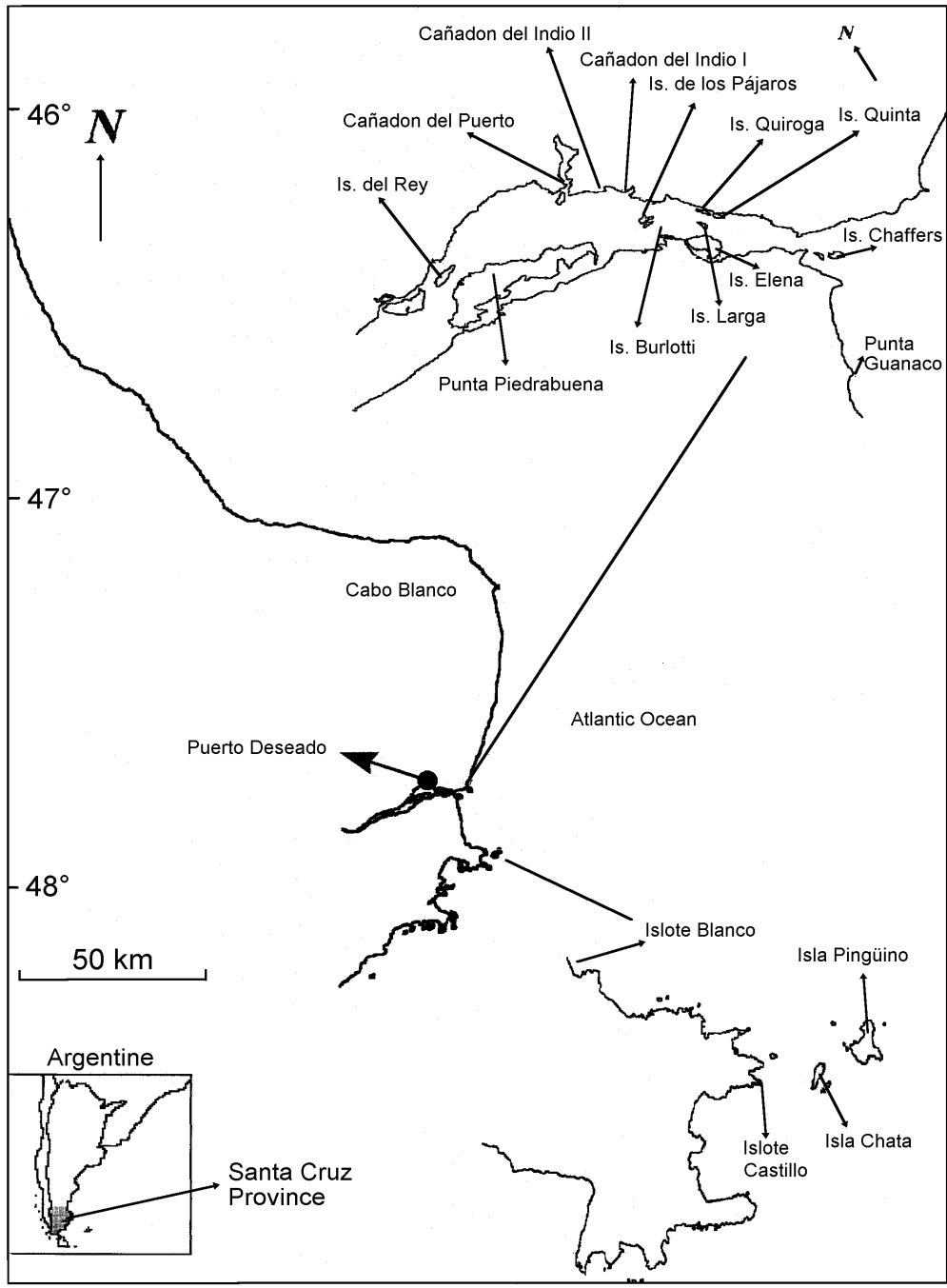


FIG. 1. Breeding sites for seabirds and shorebirds in Puerto Deseado and surrounding areas. Details of Ría Deseado (above) and Bahía Oso Marino (below) are shown.

TABLE 1. Location of nesting sites and abundance (breeding pairs) of seabirds and shorebirds in the vicinity of Puerto Deseado, Patagonia, Argentina, based on surveys made in 1986–1987 and 1992–1995.

Locality	Latitude & Longitude	<sup>1</sup> Species and number of breeding pairs														
		MP	RH	IS	RS	NC	RLC	KG	DG	CT	ST	SK	O	NH	CD	SD
Cabo Blanco	47°12'S 65°45'W			103	32		13	27	16				2			
Punta Guanaco	47°48'S 65°52'W							21		30	800					
Isla Chaffers	47°46'S 65°52'W	13,700						3,270					5			3
Isla Quiroga	47°45'S 65°56'W	760						700					5		1	3
Isla Quinta	47°45'S 65°56'W												3			
Isla Elena	47°45'S 65°56'W				124		130								6	
Isla Larga	47°45'S 65°56'W	50						208	22		61		8			
Islote Burlotti	47°46'S 65°57'W	225						297					5			
Cañadón del Indio I	47°45'S 65°58'W						29									
Cañadón del Indio II	47°45'S 65°59'W						22									
Isla de los Pájaros	47°45'S 65°58'W	5,500				127		110					1	4		1
Cañadón del Puerto	47°45'S 66°00'W	527				80	45	128			76		2	6		2
Punta Piedrabuena	47°46'S 66°02'W						14									
Isla del Rey	47°46'S 66°03'W	1,084					53	178								
Islote Blanco	47°53'S 65°50'W				250		37									
Isla Pingüino	47°54'S 65°43'W	15,000	180		10		40	200	58		145	100	5			
Isla Chata	47°55'S 65°44'W	120		5,817												
Islote Castillo	47°55'S 65°44'W				10		15									

<sup>1</sup>MP: Magellanic Penguin, RH: Southern Rockhooper Penguin, IS: Imperial Shag, RS: Rock Shag, NC: Netroptic Cormorant, RLC: Red-legged Cormorant, KP: Kelp Gull, DG: Dolphin Gull, CT: Cayenne Tern, ST: South American Tern, SK: Skuas (Antarctic and Chilean), O: Blackish Oystercatcher, NH: Black crowned Night-Heron, CD: Crested Duck, SD: Flying Steamer Duck.

December. Breeding numbers for Magellanic Penguins were obtained from Gandini *et al.* (1996). A direct count of all nests for Southern Rockhopper Penguins was performed during November, and population numbers of Kelp Gulls were obtained from Yorio *et al.* (in press a). Imperial Shag (*P. atriceps*) numbers were estimated by counting nests from aerial photographs taken in December, after the egg-laying peak. The taxonomic status of *P. atriceps* and *P. albiventer* is still unclear, in this study we followed Rasmussen (1991).

## RESULTS

We identified three areas where nesting sites are distributed: 1) interior waters of Ría Deseado, 2) Bahía Oso Marino, and 3) Cabo Blanco (Fig. 1).

We observed some 31 species of seabirds and shorebirds. Sixteen were found breeding (Table 1), and all of these species except the Rockhopper Penguin were found to forage in the interior waters of the Ría Deseado. The other 15 species were either non-breeding residents or occasional species; their relative abundance, places of foraging, and times of occurrence are shown in Table 2. Seventy-seven percent of the local avifauna was found to use the interior waters of the Ría for feeding.

*Magellanic Penguins.* There were nine breeding colonies in the area totalling approximately 37,000 breeding pairs (Table 1, Fig. 1; Gandini *et al.* 1996). This is a target species for tourism and tourist boats visit local penguin colonies during the spring and summer. Studies on physiological and behavioural aspects of human disturbance on Magellanic Penguins are being carried out in the area. Preliminary results showed that penguins are more sensitive to human presence during the chick stage (Gandini & Frere 1996). This species is also affected by chronic oil pollution

(Gandini *et al.* 1994): every year, many oiled penguins are found dead along the beaches of Puerto Deseado. Also, Magellanic Penguins are killed incidentally during shrimp (*Pleoticus muelleri*) and hake (*Merluccius hubbsi*) trawler operations, this is the most seriously affected species among the seabirds impacted by these fisheries (Gandini & Frere, unpubl. data).

*Southern Rockhopper Penguin.* Only one small colony was noted at Isla Pingüino (Fig. 1). Frere *et al.* (1993) monitored the colony during six breeding seasons. These authors found a 27% annual increase until 1990 (190 pairs), well exceeding the maximum endogenous rate of increase. A new survey carried out by Frere & Gandini during the 1994–1995 breeding season showed that the number of breeding pairs seems to be stable, totalling 180 pairs (Table 1).

Every year corpses of oiled penguins were seen on beaches. Also captains of jigging vessels report incidental catches of this species during squid (*Illex* sp.) fishing operations (Gandini & Frere unpubl. data).

*Imperial Shag.* Two breeding colonies totalling 5,920 breeding pairs were located in the area (Table 1, Fig. 1). Isla Chata is the main colony of this species in Argentina (Frere & Gandini unpubl. data). Both colonies are situated on islands; and only Cabo Blanco (Fig. 1) is visited by tourists. The latter colony is observed from the mainland and it is not possible to obtain access to it. This species was occasionally found oiled on beaches.

*Rock Shag.* We recorded five Rock Cormorant colonies, all located on cliffs, and counted 426 breeding pairs (Table 1, Fig. 1). During October the colonies were almost full. Egg-laying peaked during the first days of November, and fledging took place during the last week of January. One of the colonies, Isla Elena, was continuously monitored. Its breeding

TABLE 2. Foraging places and relative abundance of nonbreeding resident and migrant seabird and shorebird species in the Ría Deseado vicinity. O: Feeding outside the Ría; I: Feeding in the interior waters of the Ría; S: Scarce (< 100 individuals); A: Abundant (> 100).

Species	Common names	Foraging site	Abundance	Seasonal presence
<i>Diomedea melanopbris</i>	Black-browed Albatross	O	S	Spring-summer
<i>Macronectes giganteus</i>	Southern Giant Petrel	I	S	All year
<i>Podiceps major</i>	Great Grebe	I	S	Spring-summer
<i>Haematopus palliatus</i>	American Oystercatcher	I	S	Spring-summer
<i>Haematopus leucopodus</i>	Magellanic Oystercatcher	I	A	Spring-summer
<i>Charadrius falklandicus</i>	Two-banded Plover	I	A	Spring-summer
<i>Oreophobus ruficollis</i>	Tawny-throated Dotterel	O	A	Spring-summer
<i>Calidris fuscicollis</i>	White-rumped Sandpiper	O	A	Spring-summer
<i>Chionis alba</i>	Snowy Shearbill	I	A	All year
<i>Pluvialis dominica</i>	American Golden Plover	O	S	Spring-summer
<i>Larus maculipennis</i>	Brown-hooded Gull	I	S	Winter
<i>Sterna maxima</i>	Royal Tern	I	S	Spring-summer
<i>Puffinus griseus</i>	Sooty Shearwater	O	S	All year
<i>Fulmarus glacialisoides</i>	Southern Fulmar	I	S	Fall-winter
<i>Stercorarius parasiticus</i>	Parasitic Jaeger	O	S	Summer

ding population seems to be stable with a minimum of 104 breeding pairs in 1993 and a maximum of 124 breeding pairs in 1994. Tourist boats visit the colony often during spring and summer. Cormorants' reaction depend on the time of the breeding cycle. During settlement and courtship, birds were less tolerant of human presence than during incubation or brooding, when they stayed at the nest.

*Neotropic Cormorant.* We recorded two breeding colonies (Table 1, Fig.1) with 207 breeding pairs. In both colonies nests were located in the upper part of bushes (*Atriplex* sp.) shared with Magellanic Penguins. Egg-laying peak depended on the island and the breeding season. On Isla de los Pájaros in 1986–1987 we

found incubating birds in January whereas, during the 1993–1994 and 1994–1995 breeding seasons, fledglings were found, during the same month. In the other colony (Cañadón del Puerto) birds had eggs during November and fledglings at the end of January during the 1993–1994 breeding season.

In both places birds were very sensitive to human presence, abandoning the nest when humans were as little as 30 m away.

*Red-legged Cormorant.* Ten breeding colonies totalling 398 breeding pairs were located in the area (Gandini & Frere 1995). Eggs were found from the end of August to mid-October, and fledglings from January to early February (Gandini & Frere 1995). Isla Elena (Fig 1) was the main colony (Table 1, Fig.1), and it

is a target cliff for tourism. Individuals there seemed relatively tolerant of human presence, although less tolerant during settlement when males and females often flew out of the nest when a Zodiac arrived. In the other nine colonies individuals were less tolerant to human presence, flying out of the nest independently of the time of the breeding season. This species was occasionally found oiled on the beaches.

*Kelp Gulls.* Ten colonies totalling 5,139 breeding pairs were found in the area (Table 1, Fig. 1) (Yorio *et al.* in press a). This species has increased significantly in numbers at Puerto Deseado. Some of the colonies have increased ten times during the past decade (e.g., Isla Quiroga with 64 pairs in 1986 and 700 pairs in 1996) (Frere & Gandini unpubl. data). Human presence often makes adults fly away from nests when Zodiacs land on island beaches, with an associated chain reaction affecting other species. This species was found breeding in sympatry with other seabirds, at all sites. Egging is not very common at present, but is being carried out by local people on some islands including Isla Quiroga.

*Dolphin Gulls.* Three colonies were noted in the area (Table 1, Fig 1.). The breeding population comprised 96 breeding pairs. Egg-laying peaked during the last week of November. During winter, Dolphin Gulls remain in the area and often feed at sewage and garbage dumps with Kelp Gulls.

*Terns.* We found four South American tern colonies totalling 1,082 breeding pairs (Table 1, Fig.1). At Punta Guanaco 800 pairs of South American Terns and 30 pairs of Cayenne Terns were found breeding on the same beach (Fig.1, Table 1). Both species started to arrive in the Puerto Deseado area during November and laid eggs during

January, building their nests directly on the beach (upon substrates of rocks or pebbles). During January and February we observed feeding flocks (of more than 100 individuals) on the interior waters of the Ría. This species was very sensitive to human presence causing a chain reaction that resulted in nest abandonment. The biggest colony, Punta Guanaco, was located very close to an area commonly used for fishing and camping. In 1993–1994 breeding pairs were observed in this area, but due to disturbance during settlement they probably did not breed on this beach like they did during 1992–1993 and 1994–1995.

*Skuas.* Two species of skuas (Chilean Skua and Antarctic Skua) reportedly breed in this area (Devillers, 1978). The total population for both species was estimated at 101 breeding pairs nesting at two sites (Table 1). The Ría Deseado comprises a zone of overlap and limited hybridization between both species and some intermediate-plumaged birds have been collected (Devillers 1978), hence field identification of some birds may be difficult. We found both species nesting together in a colony at Isla Pingüino (Fig.1). At this island it was impossible to differentiate between the two species because of their extreme aggressiveness and sensitivity to human presence. Also, because of marine conditions we could not stay at the island for a long period of time. On Isla de los Pájaros (Fig.1) a solitary breeding pair of Antarctic Skua had eggs during November and fledglings in January.

*Blackish Oystercatcher.* We located at least nine sites with active oystercatcher nests, totalling 39 breeding pairs (Table 1, Fig. 1). Nest were placed on beaches on pebble substrates; eggs were found from October to December, and fledglings from January to February. In islands with tourism eggs can be crushed by people walking on beaches.

*Black-crowned Night-Heron.* Nests of this species were distributed along the cliffs near Isla Elena and Cañadón del Puerto (Fig.1). Breeding pairs totalled at least 12 (Table 1). Eggs were seen during October, and fledglings were found in January.

*Ducks.* We found only one active nest of Crested duck with eggs during November but because the nests of this species are typically dispersed and difficult to detect, their number was certainly underestimated.

Flying Steamer Duck's nests were also difficult to detect. We found active nests on four islands (Table 1, Fig. 1) which harbored at least 9 breeding pairs. Eggs were found during October to December. Both duck species remained in the area during winter, and groups of more than 300 individuals of the Crested duck and at least 15 pairs of the Flying Steamer Duck were often seen swimming and feeding in the intertidal zone.

## DISCUSSION

Puerto Deseado and surrounding areas concentrate a high diversity of seabirds and shorebirds. Some of the breeding species have restricted distributions and low numbers, and are especially in need of preservation. One of these species the Southern Rockhopper, is categorized as vulnerable by the IUCN (Collar *et al.* 1994). Sixteen species: two penguins, one petrel, five cormorants, three gulls, three terns and two skuas, breed along the coast from southern Buenos Aires (38°58'S) to Tierra del Fuego (54°50'S) (Yorio *et al.* in press b). Twelve seabird species breed in this area, representing some 75% of all the seabird species breeding along the Patagonian coast.

The previously mentioned conflicts between birds and humans do not seem likely to decrease in the near future. Puerto Deseado's fishing industry has grown during the last decade because of its proximity to one

of the main fishing grounds for Argentina, the Golfo San Jorge. The heavy vessel traffic represents potential threats to seabirds such as chronic pollution, big spills, waste, etc. Until now two major accidents associated with fishing vessels have occurred at Puerto Deseado, one in 1982 when 300,000 l of gasoline spilled when the vessel "Mar Brillante" sank and, another during 1995, when 180,000 l of gasoline were spilled after the vessel "Magallanes II" burned and sank in the mouth of the Ría Deseado. The major sources of chronic pollution come from accidents during tank refilling, the discharge of ballast water, and waste thrown overboard from ships, such as plastics, paper boxes, and cans. Seabirds covered in oil or gasoline, starving on the beaches or trying to breed at their nests were commonly seen in the course of this study. Twenty-four species that use the interior waters of the Ría for feeding are currently being exposed to this pollution. Pieces of plastic are commonly observed in cormorant and Kelp gull pellets, and are also used as nest material by many other species (unpubl. data). Incidental mortality during trawler or jigging operations is affecting some seabird species such as Magellanic and Southern Rockhopper penguins, shearwaters and cormorants, but additional data are needed to determine the real effect (Gandini & Frere unpubl. data). An indirect effect derived from resource competition between this fishery and certain seabirds (Frere *et al.* 1996). Further studies of foraging areas and dietary composition of all species would improve our understanding of this complex interaction. The fisheries industry also generates tons of waste annually. This artificial food source is used by Kelp Gulls, and may be the cause of a gull population expansion (Yorio *et al.* in press) such as was observed in the last decade in Puerto Deseado (Frere & Gandini 1991). This expansion may result in negative effects on other bird species (Furness & Monaghan 1987).



A management plan regulating visitation to the islands near Puerto Deseado was presented to the authorities (Gandini & Frere 1996), but because there is no warden, control is not effective. The plan includes provisions that regulate access by tourists and sport fishermen, but because of a lack of control, tourist and fisherman continue to leave garbage and break or burn the vegetation of some islands.

Pets and cattle are not common at the seabird colonies, but one of the islands (Isla Chaffers, Fig. 1) remains connected with the mainland at low tide. Sheep and dogs from a neighboring ranch cross over to this colony breaking nests and bushes (pers. observ.).

It is clear that the Puerto Deseado area supports a high diversity of seabirds and shorebirds whose populations are affected by human activities. Although the breeding colonies of the seabirds are nominally protected by law, more control over human activities has to be implemented in the near future if this diversity is to be maintained.

#### ACKNOWLEDGEMENTS

Field work was conducted as part of the Patagonian Coastal Zone Management Plan, GEF/UNDP, implemented by the Fundación Patagonia Natural and the Wildlife Conservation Society. Funds for this study were also provided by Universidad Nacional de la Patagonia Austral. We thank Javier Fernandez, Ricardo Perez, Marcos Oliva Day, and Malala Gaona for their help with field work. We also thank Club Nautico Capitán Oneto, Subsecretaría de Pesca y Actividades Portuarias, Dirección provincial de Fauna, Dirección de Turismo and Municipalidad de Puerto Deseado for their logistical support.

#### REFERENCES

- Collar, N. J., M. J. Crosby, & A. J. Stattersfield. 1994. Birds to watch II. The world list of threatened birds. Birdlife International, Cambridge, U.K.
- Daciuk, J. 1977a. Notas faunísticas y bioecológicas de Península Valdes y Patagonia. VI. Observaciones sobre áreas de nidificación de la avifauna del litoral marítimo patagónico (Provincia del Chubut y Santa Cruz, R.A.). Segunda Parte. *Hornero* 11: 361–376.
- Daciuk, J. 1977b. Notas faunísticas y bioecológicas de Península Valdes y Patagonia. V. Anillado de aves en el litoral marítimo patagónico para estudios del comportamiento migratorio (Provincias de Chubut y Santa Cruz, Rep. Argentina). *Hornero* 11: 349–360.
- Devillers, P. 1978. Distribution and relationships of south American skuas. *Gerfaut* 68: 374–417.
- Frere E. & P. Gandini. 1991. La expansión de la gaviota común *Larus dominicanus* y su influencia sobre la nidificación del pingüino de Magallanes *Spheniscus magellanicus*. IV Congr. Ornitol. Neotrop. 19: abstract.
- Frere, E., M. Gandini, P. Gandini, T. Holik, V. Litschtein, & M. Oliva Day. 1993. Variación en el número de adultos reproductivos de *Eudyptes crestatus* en la Isla Pingüino. *Hornero* 13: 293–294.
- Frere, E., P. Gandini & V. Lichtschein. 1996. Variación latitudinal en la dieta del pingüino de Magallanes (*Spheniscus magellanicus*) en la costa Patagónica, Argentina. *Ornitol. Neotrop.* 7: 35–41.
- Furness, R. W., & P. Monaghan. 1987. Seabird ecology. Blackie and Son, New York.
- Gandini, P.A., P. D. Boersma, E. Frere, M. Gandini, T. Holik, & V. Lichtschein. 1994. Magellanic Penguins (*Spheniscus magellanicus*) affected by chronic petroleum pollution along coast of Chubut, Argentina. *Auk* 11: 20–27.
- Gandini, P.A., & E. Frere 1995. Distribución, abundancia y ciclo reproductivo del Cormorán Gris (*Phalacrocorax gaimardi*) en la Costa Patagónica, Argentina. *Hornero* 14: 57–60.
- Gandini, P.A., & E. Frere 1996. Plan para el uso turístico y recreativo de la Ría Deseado e Isla Pingüino, Santa Cruz. Informes Técnicos del Plan de Manejo Integrado de la Zona Costera Patagónica. 18: 1–22.
- Gandini, P. A., E. Frere, & P. D. Boersma. 1996.

- Status and conservation of Magellanic Penguins (*Spheniscus magellanicus*) at Patagonia, Argentina. 1996. *Bird Conserv. Int.* 6: 307–316.
- Jehl, J. R., & M. A. E. Rumboll. 1976. Notes on the avifauna of Isla Grande and Patagonia, Argentina. *Trans. San Diego Soc, Nat. Hist.* 18: 145–154.
- Murphy, R. C. 1936. *Oceanic Birds of South America*. Am. Mus. Nat. Hist., New York.
- Rasmussen, P. C. 1991. Relationships between coastal South American King and Blue-eyed shags. *Condor* 93: 825–839.
- Scolaro, J. A., E. N. Rodriguez, & A. A. Monochio. 1980. El Pingüino de Magallanes (*Spheniscus magellanicus*). V Distribución de las colonias de reproducción en el territorio continental Argentino. *Contrib. Centr. Nac. Pat.* 33: 1–18.
- Yorio, P., M. Bertellotti, P. A. Gandini, & E. Frere in press a. Kelp Gulls (*Larus dominicanus*) breeding on the Argentine coast: population status and relationship with coastal management and conservation. *Mar. Ornithol.*
- Yorio, P. M., E. Frere, P. Gandini, & G. Harris in press b. Atlas de la distribución reproductiva de aves marinas en el litoral patagónico Argentino. Plan de Manejo Integrado de la Zona Costera Patagónica, FPN & WCS, Buenos Aires.
- Zapata, A. 1967. Observaciones sobre aves de Puerto Deseado, Provincia de Santa Cruz. *Hornero* 10: 351–378.