



## Original investigation

# Status of the population of South American sea lion (*Otaria flavescens* Shaw, 1800) in southern Argentina

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## Abstract

The population status of southern sea lions (*Otaria flavescens*) in southern Argentina (provinces of Santa Cruz and Tierra del Fuego) was last assessed between 1946 and 1949, when there were 49 colonies with 84,714 individuals and a production of 12,658 pups recorded. To update the population size and pup production a new series of surveys was carried out during 1992 and 1997, either from land, airplane or boat, using direct counts in the field or pictures. The number of pups was corrected using data from land-based counts. Overall, we recorded 53 colonies, with a minimum number of 12,310 animals present on land, including 2925 pups. This estimate represents a decrease to only 14.5% of the population size reported in the late 1940's. Applying a correction factor for animals in the water, the estimated total population was 22,157 individuals. The sealing activities performed mainly at northern Patagonia and at Tierra del Fuego are likely to be responsible for the depletion. We also detected changes in the location of the colonies. However, seasonal movements of animals were difficult to assess due to the scarce data available. Only four breeding colonies may be considered permanent. Seasonal movements would take place between the islets close to Ushuaia city and Islas Becasses. Southern Argentina does not hold large breeding colonies like those found, for example, in northern Patagonia. Juveniles predominate in the social structure of colonies. This suggests a likely increase in the coming years.

**Key words:** *Otaria flavescens*, population, southern Argentina

## Introduction

The extensive work of CARRARA (1952) represents the last large-scale effort done by the National Government to assess the population status of pinnipeds and seabirds along the coasts of Argentina. One of the target species was the South American sea lion (*Otaria flavescens* Shaw, 1800). The surveys were performed between 1946 and 1949, cov-

ering most of the 3,500 km of the Patagonian coastline, from 38°30' S to 55° S. They were carried out throughout the South American sea lion breeding season (January to March 1946; March to April and December 1947; February and March 1949). By that time sealing operations on sea lions were declining till they finally ceased in the mid 60's.

After CARRARA's surveys, most of the studies on the population status and trends of South American sea lions in Argentina, were carried out in northern Patagonia (CRESPO 1988; CRESPO and PEDRAZA 1991). Sea lion settlements in Central Patagonia were surveyed with detail in the mid 90's (REYES et al. 1999). During November 1990, the Fundación Patagonia Natural carried out a survey along all the Patagonian coast (excluding Tierra del Fuego), allowing the location of all sea lion settlements and the preliminary estimation of the total population size (data not published). However, the pup production could not be assessed because most of the survey was done in November, out of the breeding season.

The coasts of Santa Cruz and Tierra del Fuego provinces, located in southern Patagonia between 46° S and 55° S, includes 2,000 km of coastline. The area is influenced by the cold-temperate shelf waters of the Falklands (Malvinas) current. South American sea lions breed or haul-out in several locations either on the mainland or islands. This study presents the results of surveys carried out between 1992 and 1997 in the coasts of southern Patagonia (Santa Cruz and Tierra del Fuego), in order to estimate the total population size and pup production for this area. It also reviews the previous information available and the possible trend of the population in the coming years.

## Material and methods

Sea lion colonies were surveyed by means of aerial, terrestrial and boat surveys depending on the particular site and the logistic conditions. Most of the locations where South American sea lions breed or haul out, are located in coastal areas, islands and islets, inaccessible by road. The rough weather typical of the south western South Atlantic prevents approaching by boat and disembarkation. The breeding season occurs from the second half of December to mid February, and whenever possible, the surveys were carried out during the fourth week of January, when most of the pups had been born (CAMPAGNA 1985; CRESPO 1988;

CRESPO and PEDRAZA 1991; REYES et al. 1999). Aerial surveys were conducted in order to document the animals ashore in all areas simultaneously.

**Aerial surveys:** With the exception of the rookeries at Monte Loayza and Cabo Blanco, the whole coast of Santa Cruz Province between Puerto Deseado and Cabo Vírgenes was surveyed by air on 24 January, 1995, at the end of the breeding season. The aerial survey was performed with a Piper Lance single-engine low wing aircraft, at an altitude of 100–150 m. We photographed each rookery using 35 mm photographs and slides, with cameras equipped with 80–200 mm and 300 mm telephoto lenses. In Tierra del Fuego, our main aerial surveys were performed March 23<sup>rd</sup> 1994 and February 27<sup>th</sup> 1997, using high wing twin-engine airplanes ARAVA and CASA-212. Flight altitude was maintained at 150–200 meters whenever the topographic conditions and wind allowed it. Only the last survey covered the later portions of the breeding season.

The number of pups is usually underestimated in aerial surveys. In view of this the number of pups in breeding rookeries was obtained from a linear regression between the number of pups (P) and the number of animals other than pups. The regression was developed from a set of 68 land surveys carried out on five rookeries of northern Patagonia, as part of a monitoring program developed from 1983 to 2001 (DANS, personal communication). Only rookeries with a very well defined breeding structure were used for the regression. The estimated equation was  $Pups = 48.05 + 0.83 * Non\ Pups$  ( $n = 68$ ;  $F_{1,66} = 237$ ;  $P < 0.001$ ). The corrected number of pups is presented only for the global counts and thus values presented in tabs. 1 and 2 are not corrected.

**Terrestrial surveys:** Two rookeries in northern Santa Cruz Province were surveyed and studied extensively by land in 1994 (Monte Loayza and Cabo Blanco). In addition we carried out a land based count at the colony at Cerro Bayo on January 24th, 1996. One more haul-out site not detected at the time of the aerial survey (Cañadón Gapp) was discovered and censused by land on November 15th, 1999.

**Boat based surveys:** We surveyed the colonies at the islands of the Beagle Channel from a tourist catamarán or a rubber boat, using direct counts or photographs, from July 1991 to March 1994. Surveys at Staten Island and the south eastern coast of Tierra del Fuego were performed with a 30 ft. sailing boat during November 1995 and January 1997.

Counts on land were made using hand tally counters and 8×30 binoculars. The sea lions were counted from elevated points or while walking slowly around the animals or from a boat sailing at less than 50 m from the coast. In the aerial censuses, the animals were counted from projected slides or black and white or colour photographs also using a tally counter. In every census made, we counted the number of animals at least twice and calculated the mean with the error not exceeding a previously fixed margin of 10% between extreme values (CRESPO 1988).

For land or boat based counts performed during the breeding season, we classified the animals into the following age and sex categories: Adult males, subadult males, females and juveniles in the breeding area, juveniles of unknown sex and pups (CRESPO 1988; REYES et al. 1999). For counts on photographs obtained in aerial surveys only the total number of individuals and pups was obtained.

## Results and discussion

### Distribution and abundance

Santa Cruz province: Twenty-eight colonies were surveyed along the coasts of Santa Cruz in the 1990 and 1995 aerial surveys (Tab. 1). Most of the rookeries (82%) were occupied only by juvenile age classes, with the exception of Cerro Bayo and Islote Lobos, which represent typical breeding rookeries and are the most important ones in the province. Pups were seen in other locations like Monte Loayza, and few others. However 90% of the Monte Loayza colony is composed by juveniles. It is remarkable that the coast of Santa Cruz province does not present large breeding groups like those located at northern and central Patagonia (REYES et al. 1999).

The total number of sea lions recorded for Santa Cruz (excepting pups, including the 1995 survey and the terrestrial survey of Monte Loayza) was 7,651 individuals. The pup production estimated by direct count from pictures was 611, but this figure is clearly underestimated. Estimating pup numbers from non-pup numbers only for rookeries with a breeding structure like Isla Lobos and Cerro Bayo (Tab. 1), rises the pup production to 2,188 pups and gives a

total number of 9,839 sea lions. This figure is clearly below CARRARA's numbers. One year after the aerial census, Cerro Bayo was surveyed by land, giving a number of 536 pups, a very similar figure to that estimated with the correction factor derived from non-pups (565 pups).

Based on the total numbers (9,839 animals, including the estimated figure for pups) and considering the individuals that could be at sea at the time of the surveys (1.8 \* censused population, following CRESPO 1988), the total population for Santa Cruz Province could be estimated in 17,710, roughly 18,000 individuals.

Tierra del Fuego province: We recorded 25 colonies (Tab. 2), with a total number of 1,734 individuals recorded, on 12 breeding colonies and eight haul-out areas. We recorded pups in 11 colonies and for five other locations we could not verify breeding (Tab. 2). Only Las Piedras, Las Chapas and Bahía Flinders presented a typical breeding social structure of harems. Consequently, we applied the correction factor for pup estimation only for these colonies (Tab. 2), estimating a minimum pup production of 737 pups. Thus, the total number of sea lions estimated for Tierra del Fuego reaches 2,471 animals during the breeding season. This estimation excludes those colonies in which pups were detected but could not be surveyed. Among the five colonies where breeding could not be verified, only Isla Observatorio exceeded 20 animals in numbers and would contribute substantially to the pup production of the region if breeding occurs. Considering, in addition, a correction factor for individuals at sea, the total population for Tierra del Fuego and Staten Island would be around 4,447, roughly 4,500 individuals. However, it should be taken into account that the surveys at Tierra del Fuego were widely spread in time. We do not have enough information to test the trend of the population during the surveying period. It is known that the population in northern and central Patagonia is under a rate of increase close to 3% since the last 12 years (DANS unpublished information).

**Table 1.** Southern sea lion colonies and rookeries of Santa Cruz province, comparing data from CARRARA (1952) with our data. Raw data without correction factors are presented. [\*] Name originally given by CARRARA but changed later. [NR] not reported by CARRARA. No pups: animals other than pups. [+] colony or rookery not found during the survey. [-] colony or rookery not visited during the survey. [WS] colony or rookery without sea lions at the moment of survey. [#] The grand total excludes Cañadón Gapp because it was surveyed out of the breeding season.

Location	Coordinates	CARRARA (1952)		SZAPKIEVICH/CRESPO (unpublished)	This study		Survey date
		Total	Pups	Total	No pups	Pups	
Punta Casamayor	46°55.0' S 66°53.2' W	375	45	+	+		24/01/95
Monte Loayza	47°5.3' S 65°16.3' W	2,940	400	1,112	1,727	245	Jan 94
Cabo Blanco	47°13.0' S 65°44.0' W	450	60	+	36	0	Jan 94
Islote Cabo Blanco	47°13.0' S 65°44.0' W	NR		+	-		24/01/95
Roca Foca	47°45.0' S 65°50.3' W	NR		152	+		24/01/95
Islote Lobos	47°46.0' S 65°55.0' W	NR		+	25		24/01/95
Isla Blanca	47°54.4' S 65°44.2' W	4,500	300	+	521		24/01/95
Isla Pingüino	47°54.6' S 65°43.3' W	2,900	300	190	207		24/01/95
Islas Gemelas	47°55.2' S 65°44.2' W	4,500	1,500	+	+		24/01/95
Punta Pozos (Lobería Oso Marino*)	47°56.6' S 65°46.0' W	850	50	40	+		24/01/95
Islet in front to Punta Médano Negro	48°0.5' S 66°55.1' W	NR		+	30	4	24/01/95
Isla Lobos	47°57.6' S 65°52.4' W	6,000	2,000	+	769	175	24/01/95
Islote Liebres	48°5.9' S 65°54.3' W	1,000	50	+	+		24/01/95
Islote Burgos (Islote Sud Punta Medanosa*)	48°6.4' S 65°57.3' W	3,500	300	+	+		24/01/95
Isla Shag	48°6.9' S 65°53.9' W	NR		312	744		24/01/95
Islote Puntudo	48°7.6' S 66°2.2' W	5,000	800	426 ± 31	302		24/01/95
Islote Cabo	48°15.2' S 66°13.3' W	400	20	586 ± 5	52		24/01/95
Punta Mercedes	48°25.0' S 66°29.6' W	115		+	+		24/01/95
Cerro Amette	48°27.6' S 66°41.6' W	NR		+	WS		24/01/95
Islet in front of to Cerro Ordoñez	48°29.9' S 66°45.1' W	NR		156 ± 2	622	51	24/01/95

Table 1. (continued)

Location		CARRARA (1952)		SZAPKIEVICH/CRESPO (unpublished)	This study		Survey date
		Total	Pups	Total	No pups	Pups	
Cerro Ordoñez	48°29.5' S 66°47.3' W	NR		220	+		24/01/95
Islet in front to Cabo Vigía	48°35.4' S 66°49.2' W	3,000	400	+	+		24/01/95
Islet N to Islote Chato	48°41.2' S 67°5.0' W	NR		+	31		24/01/95
Islote Chato	48°44.6' S 67°2.0' W	7,000	2,000	50	509		24/01/95
Cabo Dañoso	48°50.4' S 67°12.5' W	NR		600	+		24/01/95
Islet S of Cabo Dañoso	48°51.5' S 67°14.9' W	NR		+	147		24/01/95
La Mina	49°9.3' S 67°36.5' W	NR		+	72	1	24/01/95
Cabo Curioso	49°10.4' S 67°36.0' W	95	15	50	+		24/01/95
Maquenque	49°50.7' S 67°45.0' W	NR		+	626		24/01/95
San Francisco de Paula	49°44.3' S 67°43.3' W	NR		90	+		24/01/95
Cerro Bayo (Pico Quebrado*)	50°15.0' S 68°37.7' W	1,600	200	57	763	135	24/01/95
South to Rincón del Buque	50°17.1' S 68°44.0' W	NR		28	WS		24/01/95
Cerro Monte León	50°21.5' S 68°52.9' W	725	100	45	7		24/01/95
Punta Observación	50°21.1' S 68°53.0' W	NR		270	+		24/01/95
Punta Cuevas or North of Cerro Observatorio	50°31.6' S 69°2.6' W	NR		90	461		24/01/95
Cañadón Gapp	52°8.3' S 68°33.0' W	1,140	120	+	60		15/11/99
Grand Total		46,090	8,660		7,651 [#]	611	

**Table 2.** Southern sea lion colonies and rookeries of Tierra del Fuego and Staten Island, comparing data from CARRARA (1952) with our data. Raw data without correction factors are presented. [NR] not reported by CARRARA. [+] colony or rookery not found during the survey. Pups: [Pr] present but not counted. [#] Not included in the grand total because were surveyed out of the breeding season. Islets from Canal Beagle were not included in the grand total because was reported as occasional.

Location		CARRARA (1952)		This study		Survey date
		Total	Pups	No pups	Pups	
Isla Grande de Tierra del Fuego						
Punta de Arenas	53°9.7' S 68°12.4' W	1,940	140	+		
Cabo Santa Inés	54°8.0' S 67°5.0' W	NR		221		23/03/94
Caleta Policarpo (west) (Rancho Donata)	54°39.3' S 65°45.5' W	4,875	600	223	17	27/02/97
Caleta Policarpo (east)	54°39.0' S 65°30.3' W	2,625	300	116	Pr	27/02/97
Sin nombre	54°39.5' S 65°29.1' W	400 [#]		+		
Caleta Falsa	54°38.6' S 65°23.9' W	1,800		+		
Las Piedras (Lago Centenario)	54°38.3' S 65°20.2' W	2,366	100	217	85	27/02/97
Las Chapas (Tres Amigos)	54°36.5' S 65°18.0' W	2,933	400	178	111	27/02/97
Tres Amigos	54°36.3' S 65°17.0' W	2,500	350	+		
Cabo San Vicente	54°37.2' S 65°14.3' W	1,600	250	+		
La Laguna	54°38.9' S 65°12.2' W	2,333	300	+		
Caleta Chica (west)	54°38.9' S 65°11.2' W	3,000	500	127	3	27/02/97
Caleta Chica (east)	54°38.9' S 65°11.0' W	160 [#]		+		
Cabo San Diego	54°39.3' S 65°7.7' W	1,575	150	114	19	27/02/97
Caleta Le Maire	54°40.0' S 65°7.9' W	630 [#]		+		
Sin Nombre	54°40.1' S 65°7.8' W	2,166	100	+		
Caleta San Mauricio	54°44.5' S 65°12.6' W	1,266	70	+		
Bahía Buen Suceso (north)	54°48.7' S 65°15.0' W	2,500	200	+		
(south)	54°49.2' S 65°13.6' W	1,500	90	+		
Ensenada Patagones (north)	54°50.8' S 66°16.3' W	166	15	+		
(south)	54°54.4' S 65°18.7' W	43 [#]		+		
Cabo Buen Suceso	54°56.6' S 65°22.7' W	66	6	+		
Bahía Valentín	54°56.8' S 65°24.8' W	266	40	+		

Table 2. (continued)

Location		CARRARA (1952)		This study		Survey date
		Total	Pups	No pups	Pups	
Islotes Margarita	54°56.9' S 65°34.3' W	NR		P		23/03/94
Islets S of Cabo Hall	54°58.8' S 65°41.6' W	NR		3		23/03/94
Cabo Hall	54°58.0' S 65°42.5' W	133	50	+		
Islote San Martín de Tours	55°0.8' S 66°18.2' W	90	17	50	Pr.	29 /01/97
Rocas Soberanía	54°56.0' S 66°59.6' W	NR		P		23/03/94
Islas Becasses	54°57.3' S 67°2.8' W	126	20	59	179	29/01/97
Islote Belgrano	54°53.8' S 67°12.8' W	NR		P		23/03/94
Isla Yunque	54°53.5' S 67°21.0' W	55		+		
Islets from Canal Beagle	Not specified	600		+		
Islet NE of Isla Despard	54°52.1' S 68°9.9' W	NR		32		Summer 92/93
Islet W of Islotes Les Eclaireurs	54°52.3' S 68°6.6' W	NR		105	5	Summer 91/92
Islet E of Islotes Les Eclaireurs	54°52.4' S 68°6.0' W	NR		4		Summer 91/92
Isla Alicia	54°51.3' S 68°13.4' W	NR		17		Summer 91/92
Rock SE of Pta. Entrada	54°52.4' S 68°30.3' W	NR		20		Summer 91/92
Staten Island (Isla de los Estados) and Islas Año Nuevo						
Bahía San Antonio	54°43.5' S 64°32.1' W	300				
Bahía Flinders	54°43.2' S 64°32.8' W	1,500	200	51	20	27/01/97
Bahía Crossley	54°47.4' S 64°43.0' W	500	50	+		
Isla Observatorio	54°39.3' S 64°08.0' W	NR		100+		28/11/95
Isla Goffré	54°52.0' S 64°14.0' W	NR		50	Pr.	27/11/95
Caleta Ojeda	54°43.2' S 64°32.8' W	NR		17		20/11/95
Cabo San Juan	54°43.0' S 63°49.2' W	NR		20		20/11/95
Punta Fallows	54°47.0' S 65°51.0' W	NR		10		18/01/97
Grand Total		38,624	3,998	1,734+	439+	

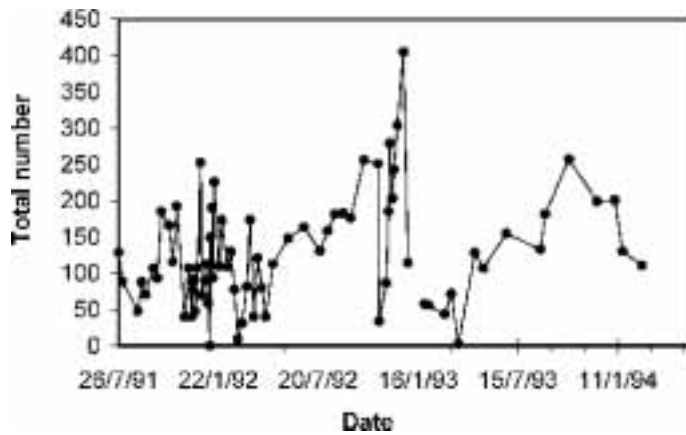
We identified three main breeding areas: Islas Becasses, the eastern tip of Isla Grande de Tierra del Fuego (Caleta Policarpo to Caleta Chica) and Staten Island (Tab. 2). Other two minor breeding groups are located at Bahía Ushuaia (Islote Les Eclair-eurs Este, Oeste and Islote NE of Isla Des-pard) and at Islote San Martín de Tours, which in total present few births (less than 20). The total number of pups counted at Islas Becasses was 138 (14 February 1994, direct count), 71 (11 February 1995, based on pictures), and 179 (28 January 1997, direct count). From the scarce data available it is not possible to assess if the difference relates to methodology or to intrinsic variation in the population. The photographs taken from the eastern tip of Isla Grande of Tierra del Fuego and from where the estimation was made were of low quality. Then, the assessment of the number of pups for this area must be considered as an underestimation.

**Seasonal movements**

Santa Cruz province: As we mentioned previously, only five rookeries showed breeding activity (Monte Loayza, Isla Lobos, the islet in front of Punta Médano Negro, the islet in front of Cerro Ordoñez and Cerro

Bayo). Based on the 1990 survey which was done in November and December (Tab. 1), there seems to be permanent colonies only in Monte Loayza, the islet in front of Cerro Ordoñez and Cerro Bayo. On the other hand, Isla Lobos and the islet in front of Punta Médano Negro seem to be occupied only during the breeding season. From the 1990 survey it is not possible to conclude anything about movements of females and pups between rookeries. Breeding colonies are separated by approximately 140 km (Monte Loayza-Isla Lobos and Punta Médano Negro), 90 km (Isla Lobos – Cerro Ordoñez) and 225 km (Cerro Ordoñez – Cerro Bayo).

Tierra del Fuego province: The different quality and character of the information recorded at Tierra del Fuego out of the breeding season, makes it difficult to analyse seasonal movements. The islets close to Ushuaia city (Islets of Islotes Les Eclair-eurs, Tab. 2), received juveniles and females with pups after the breeding seasons of 92' and 93'. Also, the total number of animals follows a cyclic trajectory with a minimum during the breeding season and a maximum the rest of the year (Fig. 1). In turn, Islas Becasses hold a temporary colony between November and May (Fig. 2). When comparing Figs. 1 and 2 it seems that Islas Becasses



**Fig. 1.** Total number of southern sea lions counted at the islets close to Ushuaia city, between July 1991 and March 1994.



and the Bahía Ushuaia islets present an opposite pattern, suggesting that South American sea lions would be using Becasses Islands during the pupping season and moving to the waters of the Beagle Channel during fall and winter. We do not discard movements to colonies located on the adjacent Chilean fuegian archipelago (SIELFELD et al. 1978).

Based on the few available data, Islote San Martín de Tours and the colonies at Staten Island would also be qualified as temporary breeding colonies. Las Chapas colony (now called Tres Amigos) seems to be the only permanent one confirmed by us. On the base of the scarce observations in the area, we can only suggest that animals of the closer breeding rookeries (Cabo San Diego, Laguna Centenario and Rancho Donata) would join after the breeding season in two colonies near the area of Tres Amigos.

**Changes in distribution and numbers between the 1940's and the 1990's**

Santa Cruz province: CARRARA (1952) recorded for the coast of Santa Cruz Province 19 settlements (18 breeding colonies and one rookery), with an abundance of 46,090 individuals and a production of 8,660 pups. Only 11 of the colonies reported then were recorded again in the 1990's surveys, mean-

while eight colonies disappeared and 17 re-presented new locations. It is likely that the information provided by CARRARA underestimated the numbers because this author reported averages of surveys carried out at different seasons of the year as totals. The total number of animals, as well as the pup production reported for us, represents 20% of the numbers reported during the late 1940's.

Tierra del Fuego province: CARRARA (1952) reported for the late 1940's an abundance of 38,624 individuals in 30 locations (23 breeding colonies and seven rookeries), with a production of 3,998 pups. When comparing with our data, eight colonies reported are coincident in location, 16 colonies were not mentioned by CARRARA and 22 colonies disappeared. As it was mentioned above, it is likely that figures reported by CARRARA underestimated the numbers. By the late 1940's, the colonies located at the eastern tip of Isla Grande of Tierra del Fuego (Caleta Policarpo to Bahía Valentín, Tab. 2) accounted for the 87% of the abundance of sea lions. At present, this area accounts for the 64% of the total population, representing still an important area for South American sea lions in Argentinean Tierra del Fuego. The present abundance of sea lions in Tierra del Fuego represents 8% of the abundance reported

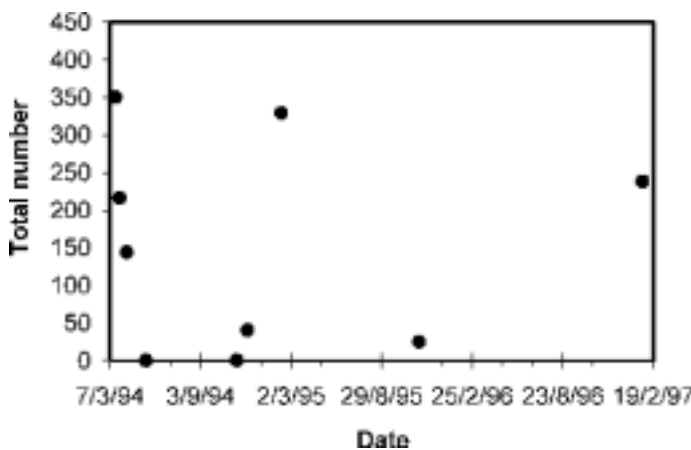


Fig. 2. Total number of southern sea lions counted at Islas Becasses, between March 1994 and June 1997.

by CARRARA (1952) and the present pup production represents about 28% of the pup production by the times of CARRARA's survey. The total number of animals and the pup production reported by us represent 8% and 28% respectively, of the levels reported during the late 1940's.

### Remarks

The general decrease reported for both Santa Cruz and Tierra del Fuego is similar to that observed in northern and central Patagonia during the second half of the XX century (CRESPO and PEDRAZA 1991; REYES et al. 1999). In the late 1940's several rookeries at Santa Cruz showed a large number of births, as Isla Gemela (1,500 pups), Isla Lobos (2,000 pups) and Islote Chato (2,000 pups) (Tab. 1), whereas at Tierra del Fuego the maximum number of births reported for a colony was 600 (Tab. 2). According to CARRARA (1952), the total number of pups born at Santa Cruz and Tierra del Fuego was no less than 12,500 individuals per year. Today this figure is reduced to about 2,800 pups, 22% of the pup production reported by the late 1940's. The population trend is at present unknown. Nevertheless, it should be remarked that the northern and central Patagonian stocks are increasing at rates close to 3.5% (REYES et al. 1999).

Our survey of the whole coast of Patagonia represents the first one performed after a long period of 50 years. As expected, we observed a decrease of the total population of Santa Cruz and Tierra del Fuego to 14% of the levels reported for the late 1940's. Considering that the figures of Carrara may be underestimated, the actual decrease may be more important. The sealing operations, performed mainly at Península Valdés (northern Patagonia) and at Tierra del Fuego are the most likely explanation for the depletion reported.

Some data available support an increase in population levels for the species in the coasts of Patagonia. For northern Patagonia, where the rookeries were surveyed for long periods, the increase is noteworthy (3.5% per year) (DANS, unpublished). For

central Patagonia, where much less data exists, there also seems to be an increase and with a similar pattern (REYES et al. 1999). For Santa Cruz and Tierra del Fuego, data are insufficient to assess a trend. Southern Patagonia does not seem to present large breeding concentrations and juveniles seem to predominate in the social structure of the rookeries. This probably means that an increase is likely to be recorded in the next few years.

Nevertheless, the information presented in this study is within the order of magnitude both in population levels and in the degree of decline of recent reports for northern and central Patagonia. Trends and changes in social structure are the focus for future research.

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## Zusammenfassung

### Status der Population von Südlichen Seelöwen (*Otaria flavescens* Shaw, 1800) im südlichen Argentinien

Der Bestand an Südamerikanischen Seelöwen (*Otaria flavescens*) im südlichen Argentinien (in den Provinzen Santa Cruz und Feuerland) wurde zuletzt in den Jahren zwischen 1946 und 1949 bestimmt. Diese Zählungen ergaben einen Bestand von 84 714 Individuen und eine Produktion von 12 658 Jungtieren in insgesamt 49 Kolonien. Neuere Zählungen wurden in den Jahren 1992 und 1997 an Land, von Flugzeugen und Schiffen aus mittels direkter Zählungen oder anhand von Bildern durchgeführt, wobei die Anzahl der Jungtiere durch direkte Zählungen an Land korrigiert wurde. Insgesamt wurde ein minimaler Bestand von 12 310 Tieren, darunter 2 925 Jungtieren, in 53 Kolonien bestimmt. Dies entspricht einem Rückgang auf lediglich 14,5% des ursprünglich vorhandenen Bestandes. Eine Korrektur für im Wasser befindliche Tiere ergab einen Gesamtbestand von 22 157 Individuen. Das Robbenschlagen, hauptsächlich in Nord-Patagonien und Feuerland durchgeführt, wird in erster Linie für die negative Entwicklung verantwortlich gemacht. Es konnten auch Unterschiede in der Position einzelner Kolonien festgestellt werden, allerdings sind aufgrund der geringen Datenmenge saisonale Wanderungen schwierig zu erfassen. Lediglich 4 Kolonien können als permanent angesehen werden. Saisonale Wanderungen finden vermutlich zwischen den kleineren Inseln in der Nähe von Ushuaia, Feuerland, und den Islas Becasses statt. Das südliche Argentinien weist somit keine größeren Kolonien, wie sie z. B. in Nord-Patagonien vorhanden sind, auf. Juvenile Tiere dominieren die soziale Struktur der Kolonien, was auf einen Anstieg des Bestandes in den nächsten Jahren hoffen läßt.

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