Skin lesions in Southern right whales (*Eubalaena australis*) off the coast of Valdes Peninsula, Argentina.

Dr. Marcelo Bertellotti1,2, Alejandra Varisco2 , Gabriel Aguado3 , Eduardo Francisco3.
1 Centro Nacional Patagónico (CONICET), Bvard Brown 2825 (9120) Puerto Madryn, Chubut, Argentina. 2 Fundación Tierra Salvaje (WEF). 3 Fundación Temaikén.

Abstract
Adults and calves of Southern Right Whale (*Eubalaena australis*) show different type of lesions on their skin, including large injuries produced by kelp gull's attacks (*Larus dominicanus*), and other non specific wounds of unknown origin. Kelp gulls usually aggravate the lesions by taking pieces of skin and bubbler, increasing the size of the injuries. Lesions of unknown origin are observed in adults and juveniles, while in calves the skin appears abnormally scattered and wrinkly but without the patterns observed in adults. We classified non specific lesions by gross examination, that can appear in the same whale at the same time. Lesions were categorized as: stippled pattern; pox-like pattern; ulcerative pattern; regular depression pattern, and rounded elevation pattern. Some of the gulls peck wounds have the aspect of a volcanic-lesion, with epithelial hyperplasia and large inflammation, possibly caused by the presence of opportunistic bacterial infection. We are studying the origin of these lesions by taking samples of dead and live animals, in order to analyze the epidemiology of this type of disease.

Introduction
Southern right whale, *Eubalaena australis,* is one of the most highly endangered large whale. They make seasonal migrations between warm water breeding areas and cold water feeding areas (Payne 1986). Waters around Peninsula Valdes are considered of vital importance for the Southern Right whale, as it is one of the major breeding and reproduction grounds for this species.
The abundance and predictability of whales in the area produced an important development of tourism. Peninsula Valdes is visited annually by more than 150.000 tourists that come attracted to whale-watching tours, making it a sustainable resource.
Kelp gull, *Larus dominicanus,* is the most abundant sea bird species that can feed not only in urban garbage dumps but also on fish discard in many localities of the Patagonic coast (Giaccardi *et al.* 1997, Bertellotti 1998, Bertellotti & Yorio 2000, Bertellotti *et al.* 2001). In Chubut coast, this opportunistic sea gulls also feed on blubber and skin of Southern Right whales (Thomas 1988, Rowntree *et al.* 1998) causing different type of injuries on their backs. During the study of this interaction, the presence of another type of lesions was found that were not related to the kelp gulls attacks. In 1990, 39% of whales of Peninsula Valdes showed lesions (Rowntree *et al*, 1993).while at present, more than half of observed whales has skin lesions of different etiology
The aims of this investigation are to determine the primary pathogens of the skin that act on these lesions, evaluate the importance in the population of *Eubalaena australis* of these pathologies, and determine if the affected animals are more predisposed to the attacks than the whales that are not infected.

Materials, methods and results
In 680 hours aboard whale-watching boats in 2007, we observed 4587 whales and took photographs of the skin of 626 individuals (many whales were observed and sampled more than one time) We classified the lesions in five different patterns.
- Stippled pattern (SP)
- Pox-like pattern: multifocal to coaliscing round to oval-shaped raised plaques, color light gray with darkened center (PLP)
- Ulcerative pattern: Ulcerative dermatitis with epithelial proliferation, it seems to be chronic, with an irregular perimeter, usually located behind the blowholes (UP)
- Depression pattern: Focal light gray depressions or ulcerations with irregular perimeter (DP)

- Rounded elevation pattern: Different round shaped elevations, without changes in color and aspect of the epidermis (RP)
In this preliminary analysis, the stippled pattern wasn't considered, and pox-like pattern and regular depression pattern were considered together.

We also took tissue samples from live and dead whales.

Live Animals
Tissue samples of the lesions were taken from a boat with a crossbow with a stainless steel surgical tip sterilized with heat. The samples collection was completed with photo-identification of the whale, (registered with photographs and video to obtain a full evaluation of the animal's general condition), including quantity and distribution of the lesions. Samples were divided in two with a sterile scalpel within two hours of being obtained, and were refrigerated until its processing in the lab: one piece was used for histopathology - tissue fixed using a ratio of at least 10:1 neutralbuffered-formaline - , and the other piece was processed within 6 hours of being obtained, stored in a sterile bag on ice to be submitted to the lab for processing in the following way:
(A) Bacteriology: cultivated in blood agar previous to taking a sample from the center of the lesion with a sterile swab and kept it in a bacteriological medium
(B) Determination of pathogens: samples for PCR test (polymerase chain reaction testing) were stored at -80º C
(C) Cytology study: placement in the slide to stain with - T15
(D) Sample for electronic microscope in corresponding medium

Dead Animals
Samples of skin were taken from stranded animals that were found within code 2 and 3 (Geraci codes). Samples taken from code-4-animals were used only to determine pathogens by PCR test.

In 2007 season we analyzed a total of 626 whale photographs. The major percentage (55.91%) of the whales (N=350) presented non-specific lesions, while 44.09% whales (N=276) didn't.
Then we analyzed how many of those whales presented gull pecks:
77.54% (N=214) of the 276 whales without non-specific lesions, presented gull peck wounds, while 75.71% (N=265) of the 350 whales with non-specific lesions, presented gull peck wounds.

Whales with non specif wounds	350
Whales with RP	77
Whales with PLP	212
Whales with UP	10
Whales with combination patterns	51

Acknowledgment
We thanks to Ana Fazio and Inés Arhex by their data work and photography. Laboratory of Genetic of the School of Veterinarian Medicine of University Complutense of Madrid, Spain. This work was supported by a grant of PNUD ARG 02/018 "Conservación de la Diversidad Biológica y Prevención de la Contaminación Marina en Patagonia" Secretaría de Ambiente y Desarrollo Sustentable of Argentina, Fundación Vida Silvestre Argentina, Dirección General de Conservación de Áreas Protegidas, Subsecretaría de Turismo, Ministerio de Comercio Exterior, Turismo e Inversiones de Chubut, Administración del Área Natural Protegida Península Valdés, Dirección de Fauna y Flora Silvestre de Chubut, Fundación Tierra Salvaje, Fundación Temaikén, Hydrosport S.R.L., Whales Argentina, Tito Bottazzi S.R.L. and Municipalidad de Puerto Pirámides.