

 <p>Agreement on the Conservation of Albatrosses and Petrels</p>	<p><b>Seventh Meeting of the Population and Conservation Status Working Group</b> <i>Edinburgh, United Kingdom, 18 - 19 May 2023</i></p> <p><b>Collaborative solutions for light pollution affecting seabirds</b></p> <p><b><i>Valentina Colodro Mailer, Héctor Gutiérrez Guzmán, Montserrat Lara Sutulov, Pedro Sanhueza, Rodrigo Silva Caballero, Ivo Tejeda Millet</i></b></p>
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## SUMMARY

Artificial light pollution in Chile has motivated joint work by diverse stakeholders to mitigate this threat. Actions include updating the Light Pollution Emission Standard , developing Recovery, Conservation and Management Plans (RECOGE) for ACAP listed Pink-footed Shearwater and storm petrels of northern Chile that are highly affected by light pollution, and improving design of lighting projects. Despite these advances many stakeholders agreed on the urgency of developing national light pollution mitigation guidelines for seabirds which did not exist.

## 1. INTRODUCTION

Light pollution affects seabirds in coastal areas and seas around the world, involving more than 60 species and representing a significant threat to their conservation. Most affected species are petrels and shearwaters from the Oceanitidae, Hydrobatidae and Procellariidae families, that have nocturnal reproductive activity and are more sensitive to wavelength emissions widely used by humans for illumination (less than 500 nm).

When birds move from, to or within breeding areas, they are attracted to sources of artificial light causing grounding or collision with natural or human made structures. Once grounded, they are often unable to become airborne again and frequently succumb to predation or starvation.

The causes of seabird attraction to artificial light are not completely clear. Hypotheses include relationships with feeding (through attraction towards bioluminescent prey or to light as a food source in species that thrive in darkness) or with altered patterns used for night sky navigation.

Vulnerability to artificial lighting varies between different species and age classes and according to the influence of season, lunar phase and weather conditions. In general, young birds are more likely to become disorientated by human-made light sources.

In Chile, every year thousands of seabirds are impacted by light pollution, causing death and injury to at least 17 species, mostly shearwaters and petrels (Silva et al., 2020) including the ACAP listed Pink-footed Shearwater (*Ardenna creatopus*). These impacts affect seabirds on islands and on the mainland, including coastal and areas tens or even a hundred kilometers inland.

## 2. COLLABORATIVE SOLUTIONS

Artificial light pollution in Chile has motivated joint work by diverse stakeholders to mitigate this threat. Actions include updating the Light Pollution Emission Standard<sup>1</sup>, developing Recovery, Conservation and Management Plans (RECOGE) for ACAP listed [Pink-footed Shearwater](#) and [storm petrels of northern Chile](#) that are highly affected by light pollution, and improving design of lighting projects. Despite these advances many stakeholders agreed on the urgency of developing national light pollution mitigation guidelines for seabirds which did not exist.

In 2021 Oikonomos, Red de Observadores de Aves y Vida Silvestre de Chile (ROC) and the Oficina de Protección de la Calidad del Cielo del Norte de Chile (OPCC) started developing these guidelines with support from the Ministry of the Environment, National Fish and Wildlife Foundation (NFWF) y American Bird Conservancy (ABC). This work resulted in the publication of the “Guidelines for Environmentally Friendly Lighting for Seabirds in Chile”<sup>2</sup>.

This publication presents guidelines to assess whether a project or activity will generate impacts on seabirds from light pollution and offers a framework of solutions to avoid or mitigate these impacts. These guidelines are applicable to all types of projects that have exterior lighting, regardless of their scale or type, including public lighting, industrial facilities or sports fields, among others.

The initial sections address the characteristics and impacts of light pollution, international efforts to address light pollution, and national regulations. The following sections present best practice lighting principles, detailed recommendations for lighting projects, and a six-step procedure to assess impacts of lighting projects on seabirds. The final section includes four case studies, where the problems, impacts and possible solutions to light pollution are put into practice.

## 3. FUTURE PERSPECTIVES

We hope these guidelines are used by private and public project developers, professionals who evaluate or are counterparts of these projects, local and regional land planners. We expect these guidelines contribute to improved knowledge and awareness about light pollution, develop capacities to assess light pollution impacts on seabirds, and improve exterior lighting design to minimize light pollution impacts.

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<sup>1</sup>

[https://planesynormas.mma.gob.cl/normas/expediente/index.php?tipo=busqueda&id\\_expediente=935533](https://planesynormas.mma.gob.cl/normas/expediente/index.php?tipo=busqueda&id_expediente=935533)

<sup>2</sup> [https://www.oikonomos.org/wp-content/uploads/Guia\\_iluminacion\\_amigable.pdf](https://www.oikonomos.org/wp-content/uploads/Guia_iluminacion_amigable.pdf)