Received: 5 September 2019 | Revised: 11 June 2020 | Accepted: 10 August 2020

DOI: 10.1002/aqc.3469

WILEY

SPECIAL ISSUE ARTICLE

A country's response to tackling plastic pollution in aquatic ecosystems: The Chilean way

M.A. Urbina[1,2] | G. Luna-Jorquera[3,4,5] | M. Thiel[3,4,5] | T. Acuña-Ruz[6] | M.A. Amenábar Cristi[7] | C. Andrade[8] | C. Ahrendt[9] | C. Castillo[10] | A. Chevallier[3] | M. Cornejo-D'Ottone[2,11] | F. Correa-Araneda[12] | C. Duarte[13,14] | C. Fernández[10,15,16] | C. Galbán-Malagón[13,17,18,19] | C. Godoy[20] | M. González-Aravena[21] | I.A. Hinojosa[4,22] | A. Jorquera[1] | T. Kiessling[23] | M.A. Lardies[24] | J. Lenzi[25] | C. Mattar[6] | M. Munizaga[3,4] | N. Olguín-Campillay[11] | D.J. Perez-Venegas[26] | M. Portflitt-Toro[3,4] | K. Pozo[27] | J. Pulgar[13] | E. Vargas[28]

[1]Departamento de Zoología, Facultad de Ciencias Naturales y Oceanográficas, Universidad de Concepción, Concepción, Chile

[2]Instituto Milenio de Oceanografía, Universidad de Concepción, Concepción, Chile

[3]Facultad de Ciencias del Mar, Universidad Católica del Norte, Coquimbo, Chile

[4]Millennium Nucleus Ecology and Sustainable Management of Oceanic Island, Coquimbo, Chile

[5]Centro de Estudios Avanzados en Zonas Áridas, Coquimbo, Chile

[6]Laboratory for Analysis of the Biosphere, University of Chile, Santiago, Chile

[7]Facultad de Ciencias Agronómicas, Universidad de Chile, Santiago, Chile

[8]Laboratorio de Ecología Funcional, Instituto de la Patagonia, Universidad de Magallanes, Punta Arenas, Chile

[9]Plastic Oceans Chile, Santiago, Chile

[10]COPAS Sur-Austral, Departamento de Oceanografía, Universidad de Concepción, Concepción, Chile

[11]Escuela de Ciencias del Mar, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

[12]Unidad de Cambio Climático y Medio Ambiente, Instituto de Estudios del Hábitat, Facultad de Arquitectura y Construcción, Universidad Autónoma de Chile, Temuco, Chile

[13]Departamento de Ecología y Biodiversidad, Facultad de Ciencias de la Vida, Universidad Andrés Bello, Santiago, Chile

[14]Center for the Study of Multiple-Drivers on Marine Socio-Ecological Systems, Universidad de Concepción, Concepción, Chile

[15]CNRS, Laboratoire d'Océanographie Microbienne, Observatoire Océanologique, Sorbonne Université, Banyuls/mer, France

[16]Centro IDEAL, Universidad Austral de Chile, Valdivia, Chile

[17]Fundación MERI, Santiago, Chile

[18]Center for Bioinformatics and Integrative Biology, Facultad de Ciencias de la Vida, Universidad Andres Bello, Santiago, Chile

[19]GEMA, Center for Genomics, Ecology & Environment, Universidad Mayor, Santiago, Chile

[20]Biorigen SpA, Concepción, Chile

[21]Departamento Científico, Instituto Antártico Chileno, Punta Arenas, Chile

[22]Departamento de Ecología, Facultad de Ciencias y Centro de Investigación en Biodiversidad y Ambientes Sustentables, Universidad Católica de la Santísima Concepción, Concepción, Chile

[23]Kieler Forschungswerkstatt, University of Kiel and Leibniz Institute for Science and Mathematics Education (IPN), Kiel, Germany

[24]Departamento de Ciencias, Facultad de Artes Liberales, Universidad Adolfo Ibáñez, Santiago, Chile

[25]Centro de Investigación y Conservación Marina, Canelones, Uruguay

[26]Programa de Doctorado en Medicina de la Conservación, Universidad Andrés Bello, Santiago, Chile

[27]Facultad de Ingeniería y Technologia, Universidad San Sebastián, Concepción, Chile

[28]Departamento Preservación del Medioambiente Acuático, Combate a la Contaminación y Cambio Climático, Directemar, Valparaíso, Chile

Correspondence
Urbina MA, Departamento de Zoología, Facultad de Ciencias Naturales y Oceanográficas, Universidad de Concepción, Concepción, Chile.
Email: mauricio.urbina@imo-chile.cl

Abstract

1. Marine plastic pollution is worse than expected, and we are starting to realize its full extent and severity. Solving the plastic pollution problem is not easy, as it requires the action and commitment of all sectors of our society. With a coastline extending over 4,000 km (from 18°S to 56°S), Chile is a maritime country, and since plastics are potentially harmful for marine and coastal ecosystems, food security, and public health, plastic pollution is a real threat.
2. Chile is the sixth-largest exporter of seafood (fish, invertebrates, and algae) in the world, but the extent of plastic contamination of marine organisms, its potential effects on commercial species and aquaculture, and its subsequent effects on human health are mostly unknown.
3. Chile has recently introduced some legislation to prevent plastics from reaching the environment and the coastal ocean. Governmental and non-governmental organizations have joined an informal alliance to take action against plastic pollution, both at a national and regional level, but stronger involvement of producers and commerce is required for effective measures.
4. Chilean scientists working on plastic pollution have created the Scientific Plastic Pollution Alliance of Chile network, aiming to promote collaborative and coordinated research focused on this pollutant. The wide geographical extent of Chile, with researchers working in diverse ecosystems, provides a unique opportunity to better understand the consequences of one of the most recent and severe threats to biodiversity.
5. Rather than solely presenting the plastic pollution problem from the scientific perspective, this paper includes views from different sectors of society. Mitigating plastic pollution is exceptionally complex, with this study highlighting the importance of local engagement, media, solving social inequities, new legislation, and law enforcement in order to advance on decreasing plastic pollution from a country-wide perspective.

KEYWORDS

Chilean society, legal commitments, media and social perception, ocean, plastic pollution

1 | INTRODUCTION

It is widely recognized that plastic pollution has an ecological, social, and economic cost, and it is perceived as one of the most serious threats to aquatic conservation. In fact, plastic pollution has direct effects on organisms that could exacerbate biodiversity losses. It is also known that the sustained production of various types and sizes of plastics, associated with indiscriminate use and improper handling, poses a potentially severe risk for the functioning of aquatic ecosystems (Worm, Lotze, Jubinville, Wilcox, & Jambeck, 2017). The sources of the plastic items that enter freshwater, coastal, and oceanic habitats are diverse, including landfills, industrial production, urban litter, fisheries, and aquaculture. Plastic litter has been found in every ecosystem on Earth that has been searched for; and although oceanic islands are far away from the major pollution sources, plastic debris is found at levels comparable to that of industrialized areas (Barnes et al., 2018). Therefore, the idea of these remote and pristine oceanic islands being untouchable habitats does not hold true for plastic pollution (Luna-Jorquera, Thiel, Portflitt-Toro, & Dewitte, 2019). The risks that plastic debris poses for the conservation of these once 'pristine' oceanic islands needs to be properly evaluated.