PROTECTED AREAS AND SALMON FARMING

Position Paper — August 2022

Forum for the Conservation of the Patagonian Sea and Areas of Influence

BACKGROUND

What is aquaculture?

The term aquaculture refers to the cultivation and farming of a variety of marine and freshwater species. Worldwide, aquaculture is the fastest expanding food-related activity, responsible for a significant share of global fish and shellfish production, contributing about 44.1% of total fish production in 2018 (Fao, 2018). While it is promoted as a food security strategy, in view of the fact that an additional 37.4 million tons of aquaculture feed will be required by 2025 and there is a quest to find alternative and cost-effective sources of protein (Hua *et al.* 2019), its dependence on marine and terrestrial natural resources detracts from its benefits and may conspire with the ultimate goal of achieving stability in the global food supply (Troell *et al.* 2014).

Salmon farming in Chile

The aquaculture industry in Chile has grown exponentially since the late 1980s, mainly due to the sustained production of salmon and in particular Atlantic salmon (*Salmo salar*), rainbow trout (*Oncorhynchus mykiss*) and coho salmon (*Oncorhynchus kisutch*) (Avendaño, 2019). Thanks to the growth of salmon farming, Chile has become the world's second largest producer of farmed salmon and trout, after Norway with 995,158 tons produced in 2021 (Sernapesca, 2021). According to figures provided by the industry, it is estimated that salmon farming provides more than 20,000 direct jobs, and more than 50,000 indirect jobs[1]. However, after the ISA virus crisis at the end of the 2010, which caused massive layoffs, the new provisions for relocation of concessions changed the working conditions dramatically, to hire more qualified personnel,

[1] https://abc-salmonicultura.cl/2021/06/15/cuantos-puestos-de-trabajo-ofrece-la-salmonicultura-en-las-zonas-donde-opera/ (August 2022).

leaving many unemployed local workers. In addition, many of these jobs have low wages, no health insurance, minimal safety conditions, and long working hours (Chávez *et al.* 2019).

Salmon farming activity has increased its production by 3.454% between 1990 and 2021, occupying the fjords of Chilean Patagonia sequentially, starting in the North, in the Los Lagos Region, and then advancing to the Aysén Region and, finally, to the Magallanes Region. The farming centers have been located in areas of high ecological value and great ecosystemic fragility, including in national parks and reserves belonging to Chile's National System of Protected Wildlife Areas, and in "maritorios' (marine territories) that have been used since ancestral times by indigenous peoples (Forum for the Conservation of the Patagonian Sea and Areas of Influence, 2018).

IMPACTS OF SALMON FARMING ON PATAGONIAN ECOSYSTEMS

The rapid expansion of the salmon industry in Patagonia has led to significant environmental problems that call into question its sustainability. The most common problems are those related to unsustainable practices, and negative impacts on ecosystems and biodiversity (Quiñones *et al.* 2019; Tacón *et al.* 2020). In Patagonian marine ecosystems, the following impacts have been identified:

1. The escape of salmonids, from culture cages to the natural environment which implies the introduction of exotic species that compete and prey on native species, resulting in a loss of biodiversity and affecting interactions in the trophic web (Svasand *et al.* 2007; Chevassus-au-Louis & Lazard 2009; Lazard & Lévêque 2009);
2. The excessive use of antibiotics, antiparasitics and other chemicals (antifouling), which are released into the marine environment of pristine and vulnerable ecosystems and turn Patagonia into a reservoir of antibiotic-resistant microbiota (Miranda *et al.* 2018);
3. The introduction and spread of salmon-specific diseases and their causative agents to native species (Soto *et al.* 2001; Quiñones *et al.* 2019);
4. The accumulation of solid and liquid waste on the seabed from uneaten food, feces and salmonid mortality, which generates an excess of nutrients that can favor microalgae blooms or lead to hypoxia and even anoxia in aquatic systems, profoundly affecting biodiversity (Buschmann *et al.* 2006);
5. Pollution from industrial waste that companies leave in the fjords, such as abandoned cages, plastics, buoys, ropes, etc. (Tett 2008);
6. Fishing pressure on wild species used for fishmeal and fish oil that end up as food for salmonids (Naylor *et al.* 2000; Tacon & Metian 2008);
7. Direct and indirect negative interactions with marine mammals and birds such as collisions resulting from increased vessel traffic from the industry and increased underwater noise that affects communication between species, some of which are in a critical state of conservation (Bedriñana-Romano *et al.* 2021).

POSITION

Based on the impacts and threats derived from the salmon farming industry to the ecosystems and biodiversity of Patagonia outlined above, we maintain and reinforce that:

- **Activities such as salmon farming should not operate inside protected areas and in vulnerable marine ecosystems.** It should be a national and regional priority to clear the areas protected by the State from salmon farming concessions, as this industry has proven to be unsustainable in the country. Protected areas, according to different conservation figures, are recognized as the best internationally proven tool for biodiversity conservation (Alvarez Malvido *et al.* 2021, Roberts *et al.* 2017, Spalding *et al.* 2013, Watson *et al.* 2014). For such areas to be effective, only compatible and sustainable activities that meet their conservation objectives can be carried out within them. Salmon farming in Chile causes serious damage (sometimes with deleterious effects) to the environment, and also functions as a sort of cross-subsidy for companies installed in pristine areas.
- **Further geographic expansion of salmon farming concessions to the South should not be allowed.** It is necessary to establish and/or maintain a moratorium on the granting of new concessions for the salmon industry in the different regions of the country where the activity is developed. There are no spaces available for the granting of new concessions. It is also necessary to consider that not all marine ecosystems are duly represented in the protected areas and that there is no complete information registry of these, therefore, under the precautionary principle, the industry cannot operate in vulnerable marine ecosystems (such as areas with cold water corals)[2], and in areas that have been identified as having high conservation value and/or priority sites for biodiversity conservation.
- **It is urgent to establish limits on production quantities, and greater technological requirements in concessions that are currently operational.** The expansion of the industry in the last 30 years has not only been geographic, but also has had a significant increase in production tonnage, without adopting substantive improvements in existing technology. These bad practices led to the ISA virus crisis, which has led to salmon farming in Chile being the industry that uses the most antibiotics (0.53 kg per ton of salmon; Miranda *et al.* 2018). Additionally, the synergistic impacts of the industry have not been taken into consideration, nor have strategic environmental assessments been conducted; resulting in significant negative environmental effects on Patagonian ecosystems, without adequate mitigation or compensation measures having been taken (Chávez *et al.* 2019).
- **A labor reconversion and/or diversification plan is needed, through the activation of other productive sectors that generate quality jobs (with good salaries and decent conditions) but with less impact on the environment.** It is necessary to promote economic sectors that can provide alternative employment for workers who currently depend on the salmon industry, thus advancing in the balance between employment generation and environmental care. This would also mean a significant improvement for workers and their families in terms of their income employability conditions (Chavez *et al.* 2019), in light of recent human rights reports (Schönsteiner *et al.* 2021).

[2] https://www.subpesca.cl/portal/616/w3-propertyvalue-50833.html / (August 2022).

For these reasons, we urge the government of Chile and the regional governments of the southern areas, **to establish a road map with short, medium and long term commitments to limit the growth of the salmon industry, to concretize its exit from protected areas, to improve environmental regulations, and to promote more sustainable productive alternatives, with lower environmental impacts and better employment conditions.** To this end, it will be essential to strengthen the protected areas of the Patagonian Sea through active spatial planning, ecosystem restoration, scientific research, updating of regulations and of the Areas Suitable for Aquaculture, good fishing practices (in the categories that allow the activity), nature tourism, integrating the participation and cooperation of the various actors and their knowledge. The Organizations that make up the Forum for the Conservation of the Patagonian Sea and Areas of Influence are at your disposal to collaborate in this challenge.

Forum for the Conservation of the Patagonian Sea and Areas of Influence

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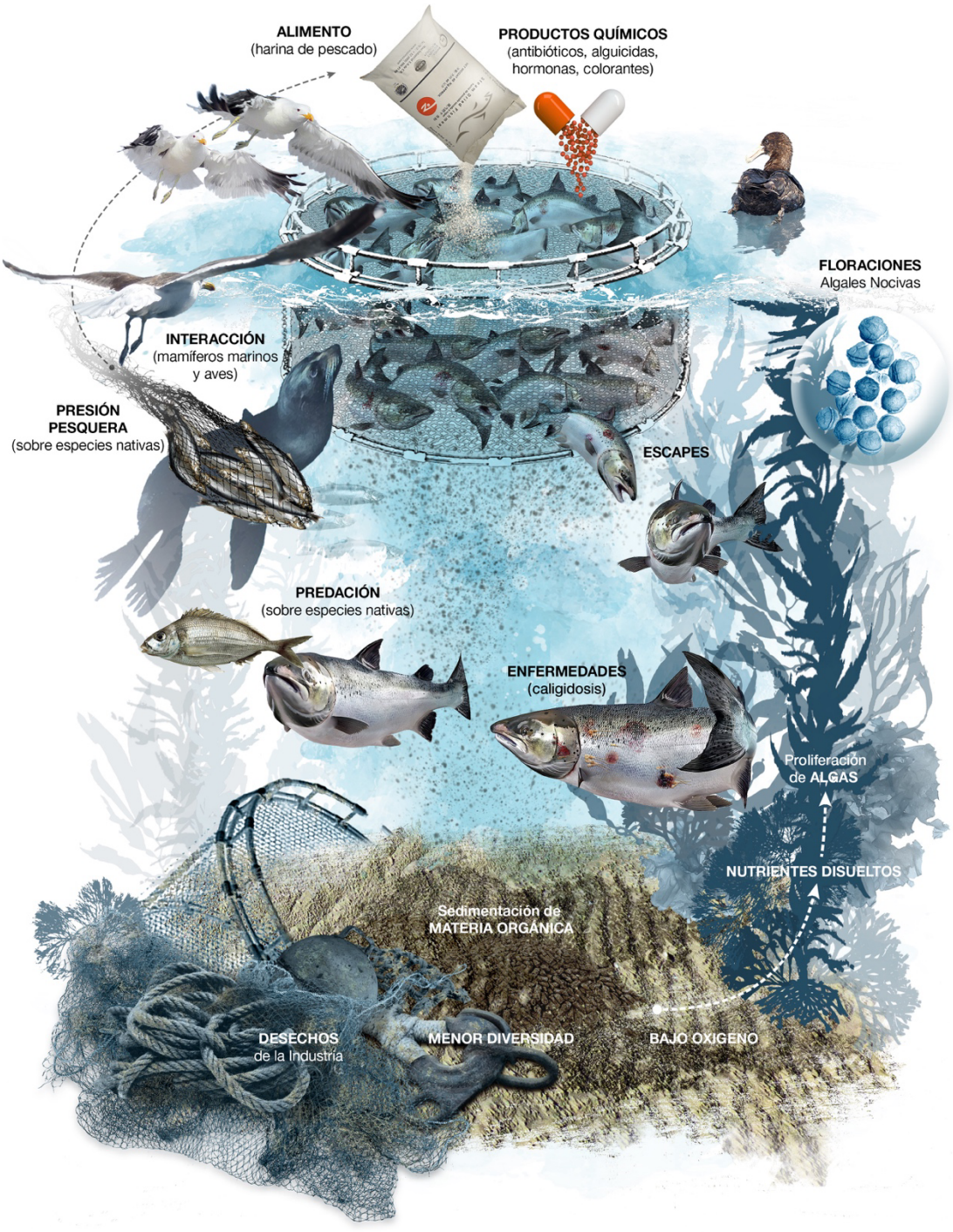

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