November 19, 2024

Integrated Herring Harvest Planning Committee (IHHPC)
Att: Bryan Rusch
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Subject: Feedback on the 2023/2024 Integrated Fisheries Management Plan for Pacific herring

SUSPEND THE STRAIT OF GEORGIA HERRING FISHERIES

Dear the Integrated Herring Harvest Planning Committee (IHHPC),

The following comments are submitted jointly by Pacific Wild Alliance, Conservancy Hornby Island, Herring Conservation and Research Society, Saanich Inlet Protection Society, Bowen Island Conservancy, Association for Denman Island Marine Stewards, Friends of Shoal Harbour, BC Nature, Rocky Point Bird Observatory, Friends of Victoria Harbour Migratory Bird Sanctuary, and Nature Victoria in response to the 2024/2025 Integrated Fishery Management Plan (IFMP) for Pacific herring. We stand in solidarity with the WSANEC hereditary chiefs and also make reference to supporting the Q'ul-lhanumutsun Aquatic Resources Society banning the Food and Bait in their territories (Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe, Stz'uminus First Nation, and Ts'uubaa-asatx Nations) https://www.qars.ngo/pacific-herring.

Pacific herring are the foundation of the coastal food web in British Columbia (B.C.) and urgently need protection. We, the undersigned, advocate for a swift transition to an ecosystem approach to fisheries management of Pacific herring, alongside an immediate suspension of the commercial herring fishery in the Strait of Georgia (SoG) to allow the population to recover to historical abundance.

Please note, recommendations in this submission are not intended to apply to Food, Social and Ceremonial Fisheries conducted by Indigenous People or commercial Spawn on Kelp.

OUR REASONS TO SUSPEND THE FISHERY ARE AS FOLLOWS:

- **Herring feed the coast.** Herring are fundamental to the B.C. coast. Pacific herring sustain marine biodiversity and hold immense cultural and economic value for First Nations. Their seasonal spawning provides essential

food for ecologically, economically, and culturally significant species, such as Chinook and coho salmon, lingcod, Pacific halibut, and numerous marine mammals and seabirds.[1],[2],[3] A recovery of herring in the SoG would help support at-risk Chinook salmon populations, a key prey for endangered Southern Resident orcas (SRKW). Fisheries and Oceans (DFO) has already allocated millions of dollars to address threats to these orcas, including boosting Chinook salmon populations —a species whose diet is heavily reliant on herring. Protecting Pacific herring is a key missing part to the SRKW recovery strategy.[4]

- **Herring are disappearing from their historic range.** Herring stocks are declining across their historical range. For more than 50 years, spawning grounds in the SoG have shown a concerning trend of decline from south to north. This trend is now threatening the last significant spawning area north of Nanaimo. Additionally, a narrowing of timing of spawning activity, from five months historically to now only a few weeks, is a main concern and likely represents a loss of genetic diversity.[5] We have seen no evidence that DFO has identified the drivers of spawn loss in the SoG, indicating that the stock is being managed in the absence of this understanding.
- **DFO is using a decades-old population baseline.** The claim that herring are at historic high numbers in the SoG relies on population data from 1951 provides an inaccurate historical baseline that does not reflect pre-industrial abundance. Traditional First Nations knowledge and archaeological evidence indicate that herring were historically far more plentiful along the Pacific coast.[6] Some research estimates declines of forage fish populations, including herring, by up to 99 per cent in many areas.[7]

"[DFO] still does not have a complete picture about the amount of fish harvested and their biological characteristics to make informed decisions…[DFO] does not have the important information it needs to support the sustainable management of fisheries, and it runs the risk that fish stocks are overexploited" (Office of the Auditor General of Canada, 2023, pg iii, para 3-4).

- **Herring are worth more in the water & the commercial value of the herring fishery is in decline.** The species that eat herring support lucrative ocean-based tourism and commercial and sport fisheries that generate more revenue and employment than the herring fishery. Furthermore, the economic value of herring fisheries has been declining for decades, with the average landed value dropping from $1.78 per kilogram in 1990 to about $0.46 per kilogram in 2022 (unadjusted for inflation).[8]

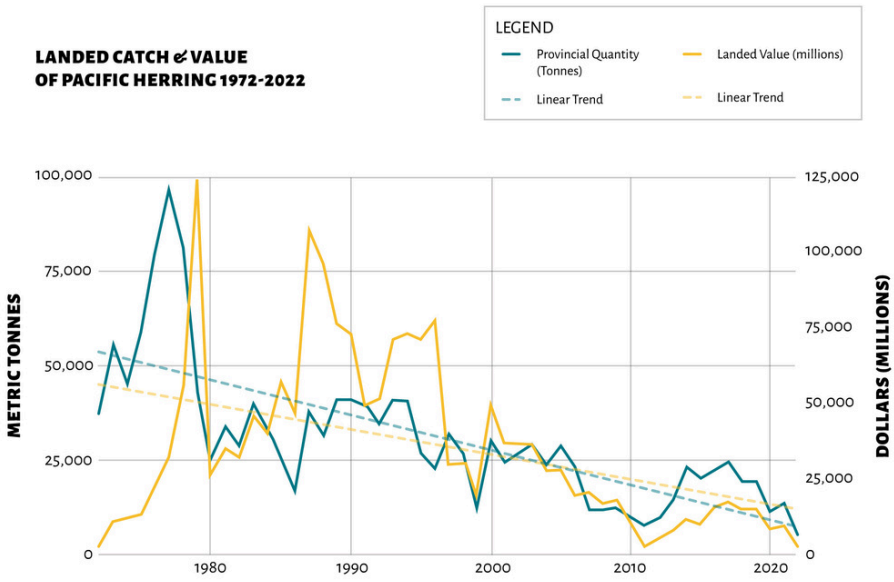

Figure 1. Data sourced from DFO Seafisheries Landings and Annual Commercial Statistics Reports (1951-1995) pages (DFO, 2024; DFO, 2022).

- **Climate change threatens herring survival.** Herring eggs and juveniles are highly sensitive to ocean temperatures, which have risen in B.C. between 0.6 to 1.4°C within the last hundred years, with some areas in the Strait of Georgia warming by up to 2.2°C per century. Research shows that elevated temperatures, especially chronic ones, are devastating for the survival of young herring.[9] On the Atlantic coast, where herring populations have critically declined, a moratorium has been in effect for two years. Atlantic fisheries experts caution that recovery may not be possible without substantial environmental improvements, highlighting the need for precautionary management in the Pacific.

OUR RECOMMENDATIONS ARE AS FOLLOWS:

- **Create a Recovery Plan for Herring in the SoG:** We recommend the development of a recovery plan for herring in the SoG, modeled on the Draft Haida Gwaii 'íináang | iinang Pacific Herring: An Ecosystem Overview and Ecosystem-based Rebuilding Plan. This should involve First Nations, independent scientists, governmental and non-governmental organizations, and other stakeholders to ensure a robust recovery framework.
- **Urgently incorporate an Ecosystem Approach to Fisheries Management (EAFM):** We strongly encourage fast-tracking the application of EAFM to Pacific herring management, incorporating Indigenous Knowledge Systems, climate adaptation, and the species' ecological role. This approach will ensure that management considers the herring's role in the broader ecosystem.[10]
- **Identify migratory and resident herring populations in the IFMP:** The IFMP assigns stocks to the area in which they are fished – however, there is sufficient evidence to suggest that the SoG is home to both local and migratory populations of herring, some of which have already been extirpated. As such, they cannot be managed as the same unit. This crucial information has remained under-researched and unmentioned in management plans despite the acknowledgement of the existence of local, non-migratory herring populations as early as 1934.[11]

Fisheries and Oceans holds a legal duty to sustain herring populations for First Nations, the coastal ecosystem, and all British Columbians, whose lives are closely interconnected with herring.

Public support for suspending the herring fishery is substantial. We urge you to suspend the commercial roe herring fishery in the Strait of Georgia to support herring, and all those that rely on them, into the future.

Sincerely,

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Melanda Schmid-Ochieng, Executive Director, Conservancy Hornby Island
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Nancy Flood, President, BC Nature
Rosa Munzer, President, Rocky Point Bird Observatory
Bob Peart, Chair, Friends of Shoal Harbour
Jacques Sirois, Chair, Friends of Victoria Harbour Migratory Bird Sanctuary
Andrew Harcombe, President, Nature Victoria

SUPPORTING INFORMATION

1. Pacific herring (*Clupea pallasii)* play a pivotal ecological role as a cornerstone and foundation species (Willson et al. 1998). Research indicates that herring depletion could have notable impacts on predator populations, particularly marine mammals, and food web structure and emphasizes the necessity of adopting precautionary and ecosystem-based management strategies for herring fisheries (Surma, et al. 2018).
2. Humpback whales continue to return to the Salish Sea, re-occupying areas they inhabited before they were harvested in large numbers by commercial whaling (Miller, 2020). The recovery of humpback whales represents one of the largest changes in trophic structure in the SoG over the last century, for which the impacts on Pacific herring are poorly understood (Doherty, 2024). Predation by humpback whales needs to be taken into account by DFO in management plans to accurately predict natural mortality levels of Pacific herring.
3. The IFMP for Pacific herring barely mentions birds and the connection between food availability for marine birds and herring is never mentioned. The K'ómoks Important Bird Area (IBA)—a merger of the former Comox Valley, Baynes Sound, and Lambert Channel/Hornby Island Waters IBAs—hosts annual gatherings of 30,000 to 60,000 waterbirds during the herring spawning season (IBA Canada, n.d.). Thousands of birds, including at-risk species such as the Marbled Murrelet, Horned Grebe, Western Grebe, Great Blue Heron, Ancient Murrelet, and Red Phalarope, rely on herring spawn and juvenile herring for survival during critical stages of their life cycles. However, intensive commercial fishing within this IBA for herring threatens these conservation-dependent bird populations, highlighting a conflict between fishing practices and ecological preservation in this vital habitat.
4. Increasing the availability of Chinook salmon, the preferred prey of the Southern Resident orcas, is one of priority recovery actions for DFO for protecting the whales (DFO, 2018). Research indicates that access to Pacific herring is important to the growth, survival and recruitment of juvenile Chinook salmon (Chamberlin et al., 2021). Juvenile Chinook are larger and faster growing in the Salish Sea where Pacific herring constitute a larger proportion of the diet. Overall, Pacific herring is the most important prey of juvenile Chinook Salmon (Duguid et al., 2021).
5. In the southern SoG, Area 19 has not hosted significant spawning since before 1950. Spawning in Area 18 collapsed in the 1980s, and has not recovered. In Area 17, spawning events have declined to their lowest recorded levels and this decline is now encroaching on the last remaining area of consistently high spawning activity in the SoG (MCC, 2023). Even the pockets within the Strait of Georgia that have seen consistently high spawning activity, are at risk of shrinking and growing fewer and farther between as resident sub-populations are overfished (Okamoto et al. 2020; Petrou et al. 2021; Stier et al. 2020).
6. Archaeological records from up to 10,700 years ago show that herring were more abundant and widespread than they are today. At 171 Indigenous village sites stretching from Puget Sound into southeastern Alaska, herring bones made up almost half of all fish bones, on average, and were found at 99 per cent of sites (McKechnie et al. 2014). In some parts of the B.C. coast, like southwestern Vancouver Island and the Gulf Islands, herring were likely a more important food source for First Nations than Pacific salmon.
7. The current management system for herring is based on an incomplete picture of B.C. herring populations, because it uses population estimates from the 1950's as their baseline for healthy stocks, even though these populations were already depleted by 60 years of industrial fishing at that time. New research indicates that forage fish populations, including herring, decreased by as much as 99 per cent since European colonization (Morin, et al., 2023).
8. In 2022, B.C. commercial fisheries for salmon, halibut, and hake were worth $32.7 million, $61.4 million, and $16 million in landed value, respectively ($110.2 million combined (DFO, 2022). The marine-based tourism and recreation industry, of which herring supports, generates over $5 billion every year (Government of British Columbia, 2022). In comparison, the 2022 landed value of the commercial herring fishery was just $2.2 million (DFO 2022).

9. Herring eggs and juvenile fish are highly sensitive to ocean temperatures, which have risen in B.C. between 0.6 to 1.4^{0}C within the last hundred years, with some areas like the Strait of Georgia warming by up to 2.2^{0}C per century (Whitney et al., 2020). As a single stressor, elevated temperature has been shown to generate greater embryo heart rates and mortality, lower hatching success, and shorter larval lengths (Villalobos et al. 2020). Increased temperatures can also result in the development of abnormalities in the pectoral fins and spinal cords. These abnormalities likely affect the growth and survival of later life stages through diminished swimming performance, leading to greater mortality from an inability to capture prey or avoid predators In a time of unprecedented natural threats threatening the recovery of Pacific herring, fisheries closures are a controlled, actionable item DFO can take to mitigate known threats.
10. An ecosystem approach to fisheries management (EAFM) expands on the single-stock method by integrating broader ecosystem variables, such as climate, ocean conditions, and predator-prey dynamics, into stock assessments. By considering these additional factors, EAFM enables more comprehensive decision-making, promoting resilience and adaptability in fisheries management. This approach supports the dual goals of ecological sustainability and economic prosperity by addressing the full range of influences on fish populations (Pepin et al., 2023).
11. There is sufficient evidence to suggest that many regions are home to both local and migratory populations of herring that are harvested as a homogenous unit. This crucial information has remained under-researched and unmentioned in management plans despite the acknowledgement of the existence of local, non-migratory herring populations as early as 1934 (Tester, 1934). Independent research indicates the potential conservation risks of ignoring sub-stock level dynamics in Pacific herring (Benson, et al., 2015; Okamoto, et al., 2020; Stier, et al., 2020; Rogers, et al., 2018; Pitcher, et al., 2017). When small local stocks are fished as part of a larger-scale quota, they may collapse. In B.C., many of these small local stocks have already been extirpated after the massive stock collapse in the 1960s, and now many coastal communities which historically had spawning activity, no longer do.

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