



# PACIFIC SALMON FOUNDATION



Hatchery Effectiveness Review

## COMMUNITY HATCHERY INTERVIEW REPORT: A REVIEW OF THE COMMUNITY INVOLVEMENT PROGRAM

Marine Science Program Newsletter

VOL.4 | 2023



Photos by Benjamin Fortini. Cover photos by Nicole Christiansen (top and centre) and Benjamin Fortini (left and right).

The Pacific Salmon Foundation was awarded BC Salmon Restoration and Innovation Funding (BCSRIF; Project Number BCSRIF-2019-136) to undertake a comprehensive review of BC’s hatchery program known as the Salmon Enhancement Program or SEP. As the first formal review in 30 years of the SEP, the PSF Hatchery Effectiveness Review comes at a critical time when many salmon stocks are struggling despite major investments in enhancement.

The goal of the broad and comprehensive review is to provide an independent assessment to support science-based decision-making and lay the foundation for future enhancement programs that support healthy salmon populations. As the review wraps up, [14 reports](#) focusing on a number of aspects from hatchery production and its impacts to technology and strategies for improved outcomes have been published on the [PSF Marine Science website](#). Here, we summarize one of the major reports of the Hatchery Effectiveness Review, [The Community Hatchery Interview Report](#), which is a review of SEP’s Community Involvement Program based on a series of interviews.

## SEP’S COMMUNITY INVOLVEMENT PROGRAM

In parallel with large production hatcheries, SEP also manages a Community Involvement Program (CIP) that operates smaller community-based hatcheries. These community projects are supported by a staff of Community Advisors (CAs) within DFO who provide advice on fish culture, data management, and planning. Community hatchery operations are guided by a set of Best Management Practices and annual Production Plans. The **Production Plans** outline targets for the numbers and types of juvenile salmon that are to be produced and specifies what are the SEP objectives of those fish – Conservation, Rebuilding, Assessment, Harvest, Stewardship, and Education. The **Best Management Practices** advises on each step of rearing from broodstock collection to release.

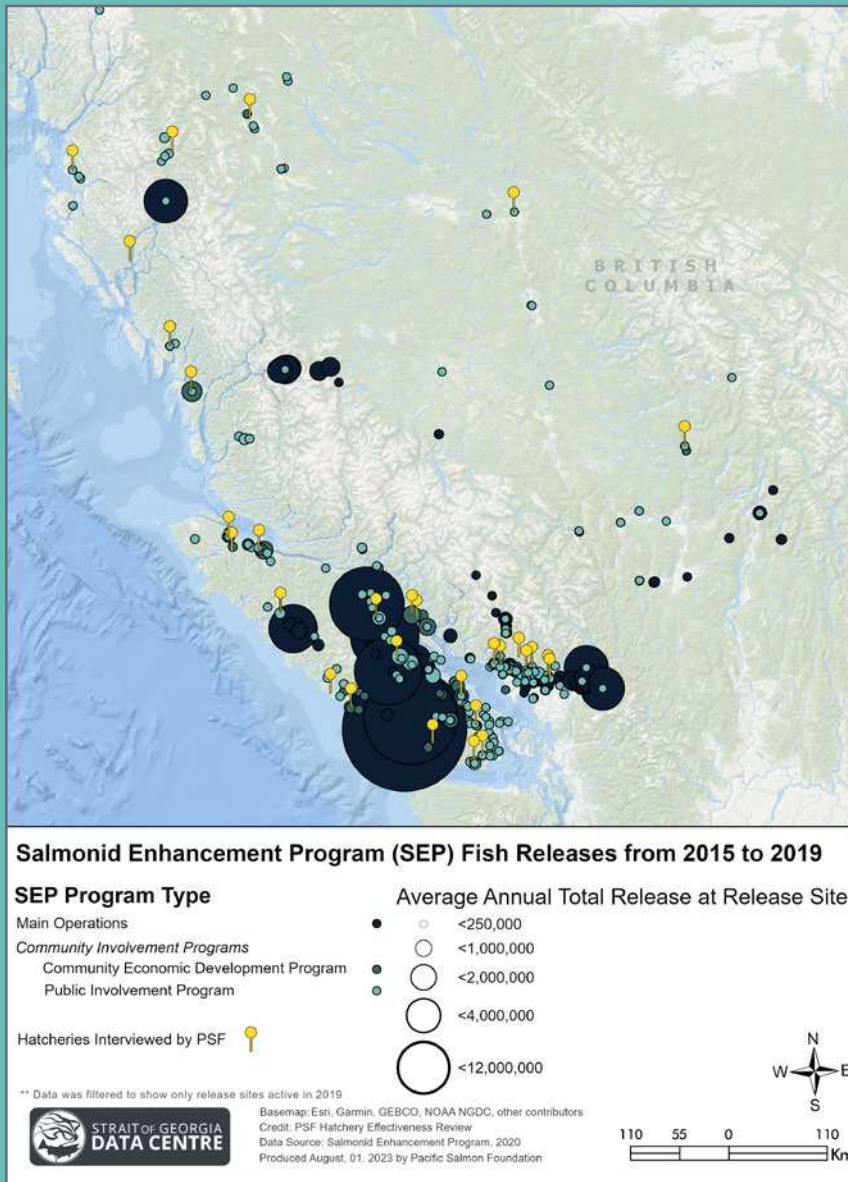


An important aspect of the CIP is that it provides community engagement through volunteer-led environmental stewardship, education, and economic development via its hatcheries. This is an invaluable benefit as it leads to engagement and public understanding, and builds local support for the conservation and future sustainability of salmon. However, the CIP’s dependence on community support can also put some of these programs at risk.

The Community Hatchery Interview Report highlights the value and needs of the CIP, as well as how best to support these hatcheries into the future to continue to create stewardship and education opportunities, and contribute to conservation and salmon enhancement.

## HOW DOES THE COMMUNITY INVOLVEMENT PROGRAM FIT IN WITH BC'S SALMON ENHANCEMENT PROGRAM?

The Community Involvement Program (CIP) includes hatchery projects designed to foster community engagement and stewardship which are centered around small-scale hatcheries. Community hatcheries were developed when SEP was first established in 1977 with the expectation that they would lead to increased awareness and appreciation by the public for salmon. This then would help to ensure that the public would be part of safeguarding a viable future for salmon. The CIP provides funding, equipment, expertise, and support to these hatcheries.



*As focal points for stewardship, education, engagement, habitat restoration, and monitoring, the community hatcheries are important in their local communities for their many contributions including and beyond fish production.*

There are two primary CIP hatchery program streams: the Community Economic Development Program (CEDP), and the Public Involvement Program (PIP). CEDP hatcheries tend to be larger and have more production than the PIP hatcheries. Many CEDP programs involve and are operated by First Nations, but this is not always the case. As objectives for the CIP range from stewardship to education to enhancement, these projects are more diversified in their objectives than the larger SEP production hatcheries (referred to as 'Operations Projects') but have a lower contribution to the overall number of salmon released into BC waters. The CIP programs (CEDP, PIP) account for a majority of projects but only 17.4% of salmon releases (Table 1 and Figure 1).

Program Level	# of Projects	% of Total Release
Operations	221	82.6%
CEDP	155	15.2%
PIP	135	2.2%

**Figure 1:** Map showing the location and scale of releases by SEP program. The largest releases are by the SEP Operations Hatcheries shown in dark blue. Releases by CIP are shown in light teal (PIP hatcheries) and dark teal (CEDP hatcheries). Those hatcheries that participated in interviews for the Community Involvement Program Review are marked with yellow pins.

*Interviews for this review included 79% of individual CEDP projects contributing to releases during 2021, and 36% of the PIP projects (Figure 1).*



Photo by Nicole Christiansen

## METHODS

Interviews formed the basis of the Community Hatchery Review. The first interviews were with DFO's CIP Community Advisors (CAs) to gather information on their hatcheries and seek advice on which community hatcheries to include in the review. The next phase involved interviews with community hatchery operators, typically facility managers. In all, 14 out of 15 CAs and a total of 32 community hatcheries were involved. Each interview covered the practices, priorities, and needs of each of the facilities. The interviews took place mainly in 2021 and were done over Zoom video calls, with a few being carried out by phone or in person. Care was taken to avoid any biases with standardized sets of questions presented consistently to the participants. The discussions were recorded to ensure all information was captured accurately. In addition to these interviews, eight hatcheries were visited in person in November 2021 to gain an additional layer of perspective on the role and scale of CIP projects.

The interview responses were summarized and categorized across a number of topics to provide a snapshot of facility practices and opinions at the time of the interviews. Comparisons were made between CA and hatchery manager responses as well as between reported practices and site Production Plans and SEP's Best Management Practices to look for any disconnects. These were rolled up into results and key findings including a 'needs summary' for each participating hatchery. The collective analysis from the interviews informed nine recommendations to improve the effectiveness of community hatcheries.

*In total, there were over  
80 hours of interviews!*



Photos by Benjamin Fortini



Egg take from adult salmon.

## KEY FINDINGS

### ► Staff and community partners are committed to their CIP programs

The commitment of staff and community partners was apparent throughout the interviews. Their dedication and ongoing passion for the projects was a common theme despite natural, social, and funding-related challenges. The interviewees often discussed ambitious goals linked with a desire to see their salmon and programs be successful. For example, several hatcheries were interested in expanding their programs (enhancing new areas, including additional species, or increasing restoration efforts). Others were motivated to improve outcomes through trialing different husbandry methods, working with researchers and students, as well as, monitoring their fish returns and outcomes of their restoration projects.

### ► There are opportunities for experimentation at CIP hatcheries

While some of the hatcheries felt they were at capacity, most of the participating hatcheries were interested in working with scientists and conducting experiments. Already there are some facilities participating in PIT tag studies, such as Mossom Hatchery. Goldstream Hatchery has been hosting local student researchers from the University of Victoria on projects and has interest in expanding their research capacity. Many hatchery operators have specific ideas in mind such as testing the efficacy of fish salvage, selective breeding, alternative feeding, and sea pen rearing. Others were open to suggestions. Testing hypotheses of ways to improve enhancement in these facilities is a tremendous opportunity. With appropriate support, funding, and partnerships, CIP hatcheries could be an important part of an informed and effective science-based hatchery program.

### ► Projects followed the Best Management Practices and Program Plans, for the most part

Overall, the projects were conducted consistently with the Best Management Practices and Program Plans provided by SEP. There were, however, some individual deviations where practices strayed from the guidelines. These are listed in the full report, and appear to be attempts to adapt to challenging environmental conditions or are a result of a perceived benefit for the fish/production. In these few cases, ongoing training and communication with DFO would help ensure staff were well acquainted with and adhering to the Best Management Practices, and fully understand the logic behind the practices.



Photos by Benjamin Fortini

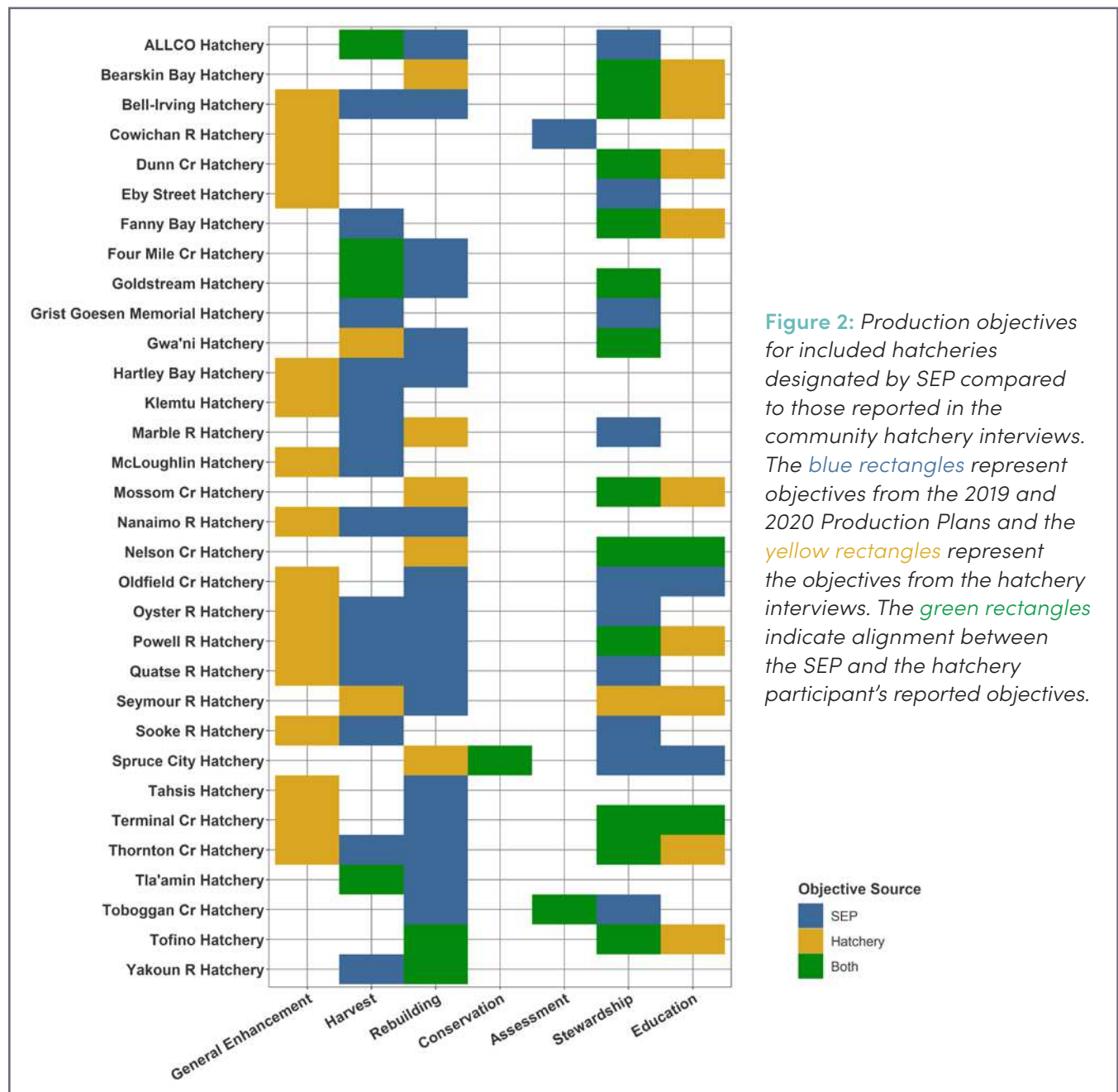


► **Hatchery operator perceptions did not always align with Program Plan objectives and CAs**

Misalignment of objectives and the role of the hatcheries can lead to misunderstanding and mismatches of expectations. It also has the potential to lead to unintended consequences. Ensuring regular support and communication from CAs and technical experts within DFO would help keep everyone on the same page.

*Comparing objectives as stated by the hatchery with the Production Plans*

When asked about the hatchery’s objectives, the hatchery operators commonly listed the goal of ‘Enhancement’, but did not specify the purpose of the enhancement, e.g. ‘Harvest’ or ‘Rebuilding’ objectives, that would be included in their Production Plans. Although this may be a nomenclature issue, awareness of the true production objectives is important and provides clarity for hatcheries, staff, and volunteers. Greater awareness of these specific objectives may enhance cooperation and commitment. This was not the only discrepancy, Education was more commonly listed as among the primary objectives by hatchery operators than in the Plans. This, perhaps also shows slightly different views on the role of the hatchery in the community. A full comparison of responses and Program Plan objectives can be seen in Figure 2.



**Figure 2:** Production objectives for included hatcheries designated by SEP compared to those reported in the community hatchery interviews. The blue rectangles represent objectives from the 2019 and 2020 Production Plans and the yellow rectangles represent the objectives from the hatchery interviews. The green rectangles indicate alignment between the SEP and the hatchery participant’s reported objectives.

## Comparing CAs and operators view of the hatchery contributions

As part of the interviews, both CAs and hatchery operators were asked what was the ‘most significant contribution’ of each community hatchery program to their local community and watershed. This question was posed more out of interest than specific criteria for assessment. These responses also did not always align and they provide insights into perceptions of the relative value or benefit of the hatchery between DFO CAs and the hatcheries. The top answers of the CAs tended to emphasize the community aspects of the CIP; their top answers were Education (34%), Community Involvement (31%), and Stewardship (31%). The hatchery operators, on the other hand, put greater emphasis on their role in enhancement with 56% stating Salmon Enhancement as their top contribution. Operators also recognized their hatcheries contributions to Education (43%), and Public Awareness (34%). Education was the category mentioned with the most consistency between CAs and operators.

### ► **Determining whether a community hatchery is effectively meeting its objectives is not straightforward, and not always possible due to lack of marking**

Each line of production at a CIP hatchery is associated with an objective in the SEP Production Framework (2018). These production activities are ‘Stewardship’, ‘Assessment’, ‘Harvest’, ‘Rebuilding’, or ‘Conservation’. Some facilities may have multiple lines of production with different objectives, sometimes even for the same species. For the purposes of this review, the Production Plan was the only comprehensive resource available that provided objectives for all CIP hatcheries and release groups and was therefore used as a reference to understand whether a hatchery was meeting its stated objectives.

The most straightforward objective to assess would be ‘Stewardship’. There were 22 hatcheries with a Stewardship objective specified in the Project Plan, and indeed, each of these hatcheries did some form of stewardship activity. The type and scope of stewardship projects varied across the hatcheries and the broader goal of any stewardship activity is to achieve a net benefit to the system such as improved salmon returns or greater community engagement. To assess these factors, follow-up monitoring would be required.

As for the salmon production-based objectives, monitoring of the harvest and/or returns would be needed to evaluate whether these objectives are being met. However, in many cases, this is not fully achievable due to a lack of marking or tagging. Marking or tagging, (whether fin clipping, Coded Wire Tag (CWT), Parentage Based Tagging (PBT), or thermal marking), is used to identify hatchery-origin fish, and would be necessary for this evaluation. Comparing the stated production objectives to whether or not fish are marked provides a measure of where assessment would be possible.

Participating CIP hatcheries with specific enhancement production objectives included:

- Two hatcheries had a ‘Stock Assessment’ objective, and both hatcheries adipose fin clipped and implanted Coded Wire Tags, enabling this objective to be achieved.
- 18 hatcheries had a ‘Harvest’ objective, however, six of those did not mark or tag any of their production.
- 19 facilities had a ‘Rebuilding’ objective, however, seven of those did not mark any of their production.

For the scope of the Community Hatchery Interview report, we did not investigate beyond this as to whether hatcheries are indeed meeting their objective (i.e. contributing to the harvest or rebuilding), but do see our report, [‘Review and assessment of enhancement for harvest and rebuilding’](#), where this is investigated more broadly across the SEP. However, these results show that there are gaps even in the potential ability to assess production objectives.

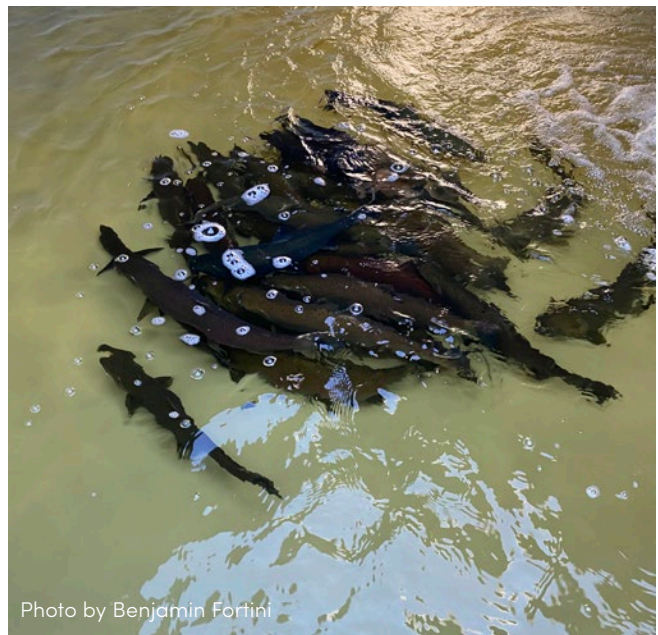


Photo by Benjamin Fortini

► **There is a desire among many CIP hatcheries to increase the marking of fish**

As discussed in the previous point, marking and tagging the salmon produced is fundamental to being able to assess how well a program achieves its production objectives, but the importance of marking and tagging also extends beyond this. For example, external marking (i.e. adipose fin clipping) is used for fishery management and protecting wild populations. In the case of southern coastal coho, all releases are mandated to be marked and tagged genetically with parentage-based tagging (PBT) (SEP 2019), but this was not always the case in the CIP hatcheries. External marking is also vital for broodstock management practices aimed at protecting the genetic integrity of the population. Only with consistent fin clipping can returning spawners be identified as hatchery or natural-origin fish during broodstock collection, which is necessary information to manage genetic consequences.

Facilities are aware of the importance of marking their fish and many facilities that were not marking expressed a desire to do so but cited a lack of resources as holding them back. There is a need and desire to increase the level of marking and tagging, though this will require funding and support.



Photo by Benjamin Fortini

**Hatchery fish being marked.**



Photo by Nicole Christiansen

► **Each CIP hatchery has unique needs, but funding was a commonly cited challenge**

An important component of this review was to take inventory of the needs and challenges the community hatcheries face from the perspective of those managing the facilities. For each participating hatchery, a summary of needs was outlined and recorded in the [full report](#). Each hatchery had specific unique needs, but there were common themes:

- > 72% of facilities stated that the level of funding was a significant problem,
- > 44% felt there was a lack of feedback following data submitted to DFO,
- > 31% reported difficulty with water (temperature, amount, etc.), and
- > 22% would like improved communication with DFO.

Funding was the most commonly cited challenge. Many of the hatchery operators relayed that funding has stayed at the same level for decades and that they are feeling the pressures of inflation. Common worries included not being able to offer competitive wages and attract quality staff, and increasing costs associated with basic necessities like feed, electricity and replacement of dated or failing infrastructure.

Together, the stagnant funding, inconsistent communication and feedback, and insufficient technical support from DFO have, in some cases, led to a sense of under-appreciation for the work that is done in these community hatcheries. There were many comments that the hatcheries had good relations with their CA but felt that more senior DFO people may not understand or appreciate their work leading them to feel that DFO overall was not recognizing, supporting and valuing their volunteer work.



## RECOMMENDATIONS

The report concludes with nine recommendations based on common issues mentioned by hatchery contacts during the interviews as well as areas for improvement noted during our review of the collected data. They are intended to broadly address common concerns and suggest opportunities for reform and improvement.

- 1. There is a need for a new common vision and purpose for community hatcheries.** As the operating context for community hatcheries has changed a lot over the years, there is a need for clarity on the role of community hatcheries. Their priorities and objectives should be defined to ensure these are shared and commonly understood between DFO and the hatcheries.
- 2. All salmon enhancement conducted at community hatcheries needs to have clear production objectives that are commonly understood by DFO and the hatchery.** In addition to objectives for the production of salmon, these community-based hatcheries also have many other benefits such as education, stewardship, public engagement, etc. and these should be clearly outlined in the operating objectives for each hatchery.
- 3. Community hatcheries must follow Production Plan targets and Best Management Practices.** While our review indicates that there is high compliance with the Production Plan and Best Management Practices, there were deviations. Increased interactions between DFO and the hatcheries could go a long way to ensuring that these are being followed.
- 4. Improved assessment is necessary.** Unless there is a strong reason to the contrary, hatchery fish need to be identifiable via appropriate marking or tagging to enable assessment of the hatchery objectives and evaluation of hatchery-wild interactions.
- 5. DFO should consider additional funding for community hatcheries.** Inadequate funding leads to issues including reduced staffing, poor infrastructure, operational shortcuts, etc. The value in terms of stewardship, education, and public awareness is very high.
- 6. Technical support for community hatcheries should be reviewed to ensure it is adequate and consistent across the province.** Support from SEP technical staff was noted as being lower than the hatcheries feel they need.
- 7. We suggest training for community hatchery operators be prioritized.** Training for community hatchery staff is not meeting the current needs.
- 8. Completing an annual review** with DFO to assess how operations and outcomes aligned with objectives would be beneficial.
- 9. Additional support for data management would benefit DFO, the hatcheries, and other stakeholders and interests.** As the central entity, DFO could develop data tools and data systems to facilitate efficient and effective data transfer and management. Many hatcheries expressed they were unsure as to what happens with the data they submit, leading to concerns that efforts to collect data were unappreciated and/or not used effectively. Therefore, there appears to be a need for DFO to improve communication with hatcheries on which data are required, how they are used, and to provide any feedback on the data that the hatcheries are providing.

These projects have tremendous support in their communities, and they have provided many benefits to salmon and the people of BC over the last 40 years. In the future, with proper support, CIP hatcheries hold great potential. The interviews demonstrated a strong dedication to the programs and projects and enthusiasm for applying science to improve practices and outcomes. We hope to see the care, attention and hard work of these community hatcheries continue into the future.

[Sign up](#) for our Marine Science quarterly eNews and never miss a newsletter!



**PACIFIC SALMON  
FOUNDATION**

1385 West 8th Ave,  
Vancouver, BC, V6H 3V9  
Tel: 604-664-7664  
Email: salmon@psf.ca



Fisheries and Oceans  
Canada  
Pêches et Océans  
Canada



Funding for this project is provided by the BC Salmon Restoration and Innovation Fund, a contribution program funded jointly between Fisheries and Oceans Canada and the Province of BC