

WDFW – Lower Columbia River Emerging Commercial Fishery

Costs of Potential Alternative and Traditional Commercial Gear



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Executive Summary

The following document summarizes information gathered under a Small Business Economic Impact Statement (SBEIS) pilot program to support the rulemaking process for designating an Emerging Commercial Fishery (ECF) in the Columbia River non-treaty commercial fishery. The purpose of the SBEIS requirement under the Administrative Procedures Act (APA) is to identify the direct costs to small businesses of complying with new rules and explore ways to reduce those costs. The designation of an ECF allows for the voluntary, experimental use of new gears but will not change any other regulations or policies associated with the fishery. While this designation does not impose additional requirements on small businesses, or result in any direct costs of compliance, this SBEIS analysis is undertaken to support continued dialogue with small businesses and inform further consideration of costs through the implementation of the ECF.

Working with small businesses who participate in the Columbia River commercial gillnet fishery, cost estimates have been compiled for voluntarily participating in alternative and traditional commercial fisheries on the Columbia River (see [Section 3](#)). The costs associated with these fisheries are extensive. Some costs exist regardless of the specific gear type used (e.g., insurance, safety equipment, transportation costs); however, many of these costs will be influenced by specific gear types and the business model employed by each fisherman. When comparing the costs of alternative and traditional fishing gears, the costs associated with pound nets and purse seines are expected to be significantly higher. For pound nets, the major costs include the construction and installation of the trap, trap removal, and regulatory costs associated with siting and permitting the pound net operation. For purse seine gear, the major costs include crew, vessels, and nets, which are considerably more expensive than gillnet and tangle net operations. The costs provided in this SBEIS are an initial estimate, which will be revised as additional information is gained through experimenting with alternative gears in the ECF.

While the scope of this SBEIS relates only to the direct costs of fishing with alternative gears under the ECF, the question of costs and economic viability, as it pertains to the establishment of permanent fisheries, is much more complicated. Given higher capital and operating costs with some alternative gears, there are questions around the economic viability of these gears as a sustainable, commercial operation. There could be considerable economic impacts to small businesses depending on how alternative gear fisheries are structured and what opportunity remains in other commercial fisheries. There are also several equity considerations with how the costs and benefits of alternative gears are distributed among the fleet, and potential impacts to associated small businesses and communities. The final section of this report ([Section 4](#)) outlines a range of questions and considerations to be explored through the ECF to inform future deliberation on alternative gear fisheries.



1. Purpose

The Washington Department of Fish and Wildlife (WDFW) has initiated a rulemaking process to designate an Emerging Commercial Fishery (ECF) in the Columbia River non-treaty commercial fishery (see Box 1). This designation supports the Washington Fish and Wildlife Commission’s Columbia River Policy ([C-3630](#)), which calls for the exploration of alternative commercial fishing gears (see Box 2). The goal of this designation is to investigate the feasibility and commercial viability of new mobile and fixed fishing gears (e.g., beach seines, purse seines, pound nets). The following Small Business Economic Impact Statement (SBEIS) document is one aspect of the public rulemaking process for the Emerging Commercial Fishery designation. The purpose of the SBEIS provision is to identify the direct costs to small businesses of complying with new rules and explore ways to reduce those costs. This SBEIS is not a decision-making document; it is meant to compile relevant information to support the rulemaking process and provide a framework for further investigation of costs through the implementation of the ECF.

Box 1. Emerging Commercial Fishery Designation and Evaluation

Pursuant to RCW 77.65.400, the WDFW Director may designate an Emerging Commercial Fishery authorizing trial and/or experimental fishing with gears that are otherwise disallowed for commercial fishing. This designation allows information to be gathered for approximately five years, at which point findings will be presented to the Washington Legislature to determine whether or not to establish permanent fisheries using these additional gears (RCW 77.70.180). If the legislature decides to establish permanent fisheries, a rulemaking process will be undertaken (including additional SBEIS analysis) to legalize these new commercial gears.

Once the Emerging Commercial Fishery designation is effective, the required fishing licenses and permits will be issued on an annual basis (RCW 77.65.400). WDFW staff will then utilize these experimental gears within the existing Columbia River fisheries management framework. Columbia River salmon fisheries are managed through a Compact process with Oregon where regulations are established annually to specify the time, place and manner for commercial fishing. The experimental gears will essentially “plug into” this process and be utilized when, where and how they are appropriate (i.e., as run sizes and fishery conditions allow).



1.1 SBEIS Pilot Program

Given the limited economic information available at this time, WDFW has decided to pursue a statutory exception (RCW 19.85.030(1)(a)) to the Small Business Economic Impact Statement (SBEIS) requirement by conducting a “pilot program” rulemaking under the Administrative Procedures Act (APA). This pilot program (RCW 34.05.313) will allow WDFW to obtain real-time small business information and suggestions as provided by the industry before the adoption of a final rule. WDFW has engaged with small business volunteers to develop this draft SBEIS document and will continue to solicit input from additional small fishing business and other stakeholders during the rulemaking process.

Box 2. Alternative Gear in Commission Policy C-3630

The goal of Policy C-3630 regarding alternative commercial gear is to promote conservation goals and enhance and optimize economic benefits to commercial and recreational fisheries. Implemented alternative gears will need to increase the selectivity of fishing gear compared to current capabilities, be economically viable for commercial harvesters, and promote state conservation objectives. In theory, gears with greater selectivity for hatchery fish will be able to harvest more hatchery-origin salmon utilizing the same number of allowable impacts to wild salmon and steelhead that are currently used. This would extend commercial fishing seasons, as more opportunity would be allowed before harvest constraints are reached and could potentially increase economic benefits to commercial fishers and their communities.

1.2 Scope of SBEIS analysis

The scope of the SBEIS pilot program relates directly to the ECF designation and aims to identify direct costs to commercial fishermen for fishing with the specified gears ([Section 3](#)). The ECF designation allows for the voluntary, experimental use of new gears but will not change any other regulations or policies associated with Columbia River non-treaty commercial fisheries. Thus, there are no additional requirements placed on the industry for which they would incur additional costs.

While this SBEIS analysis is narrowly focused on the direct costs of fishing with experimental gears, WDFW recognizes the complexity of the lower Columbia River non-treaty commercial fishery and the potential economic impacts to small businesses that may result from establishing, or not establishing, permanent fisheries with these gears at the conclusion of the ECF. Given that the purpose of an ECF is to explore the feasibility and commercial viability of alternative fishing gears, a list of economic questions, concerns, and considerations are outlined in [Section 4](#). The questions outlined in section 4 will be explored in consultation with the small business community through operating the ECF and addressed in a comprehensive report to the Legislature after sufficient experience with these new gears is obtained.



Section 2 of this document provides background on the Columbia River non-treaty commercial fishery, intended to provide context for assessing the direct costs associated with participating in an Emerging Commercial Fishery (Section 3) and begin framing the context for the questions and considerations outlined in Section 4.

2. Background

2.1 Columbia River fisheries management framework

Because Columbia River salmon and steelhead stocks migrate throughout the ocean and Columbia River waters, the management of fisheries in the Columbia River include a variety of management organizations and guidelines, including; the Pacific Salmon Treaty with Canada, the Pacific Fishery Management Council, the Federal Endangered Species Act, the *U.S v Oregon* Management Agreement, Washington and Oregon Fish and Wildlife Commission policies, and state legislative mandates to provide for sport and commercial fishing opportunity as well as optimizing the use of the public resource.

Regulations for Columbia River fisheries are established through the Columbia River Compact, a public, joint-state process. The Columbia River Compact (ratified by Congress in 1918) is charged by congressional and statutory authority to adopt rules for fisheries within Oregon/Washington concurrent state waters of the Columbia River. In recent years, Compact authority has been delegated to the directors of Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife, or their designees, acting on behalf of their respective fish and wildlife commissions. In addition, the Columbia River *U.S. v. Oregon* treaty tribes have authority to regulate treaty Indian fisheries.

When addressing seasons for salmon, steelhead, sturgeon, and smelt, the Compact must consider the effect on escapement, treaty rights, and other fisheries, as well as the impact on species listed under the Endangered Species Act. Compact hearings are used for season setting, in-season management, and to authorize the purchase of commercially caught fish in treaty fisheries. The hearings are open to the public and allow for public testimony. In addition, the states develop pre-season plans in cooperation with constituent advisory groups, that provide guidance for Compact hearings based upon meeting conservation objectives, fishery allocations, and public input for commercial and recreational fisheries.

2.2 History of commercial fishing gears on the Columbia River

Europeans began using Columbia River salmon around 1830 and by 1861 the commercial fishery started to expand. In 1866 salmon canning began, and the commercial fishery grew rapidly. The early commercial fishery used gill nets, seines hauled from beaches, traps, and fishwheels. Later, purse seines and trolling boats using hook and lines entered the fishery. Sturgeon set lines (mostly un-baited snagging lines) were used when sturgeon became commercially valuable in the early 1880s. Lower Columbia River commercial salmon landings exceeded 40 million pounds in several years between 1883 and 1925.



Development of the Columbia River commercial fishery was rapid since the 1860s. The number of canneries increased to a peak of 39 in 1886. The amounts and types of gear employed also increased. Known peak amounts of gear licensed were 2,856 gillnet boats in 1915, 104 haul seines in 1928, 506 traps in 1926, and 76 fish wheels in 1899.

In fisheries where the amount of fishing gear is excessive and the fish stocks are declining, conflicts within the industry may develop. This was true of the Columbia River salmon fishery. Many attempts to eliminate one or more gear types occurred using the political system.

- In 1917 purse seines were prohibited in the Columbia River
- In 1923 whip seines were prohibited in the Columbia River
- In 1927 fish wheels were prohibited in Oregon (followed by the Washington prohibition in 1935). Oregon prohibited seines and traps east of Cascade Locks and gill nets >250 fathoms throughout the river.
- In 1935 haul (drag) seines, traps, and set nets were prohibited in Washington (followed by the Oregon prohibition in 1950). Fish wheels were also prohibited in Washington.

By 1949, the only allowable commercial gear types remaining were gill, dip, and hoop nets plus baited set lines for sturgeon.¹

2.3 History of alternative gear in the Columbia River commercial fishery

A variety of alternative gears have been researched and tested within the past two decades, including tangle nets, beach seines, purse seines and pound nets. During 2009 – 2016, WDFW and ODFW evaluated thirteen combinations of alternative commercial fishing gears and seasons to determine feasibility for implementation in live-capture mark-selective fisheries in the mainstem Columbia River. Most of this research has focused on beach seines and purse seines, as well as tangle nets for coho.² Overall, this research has illustrated the difficulty with identifying a gear that can provide additional conservation benefits while producing an economic value equivalent to gillnet fisheries.³

As described in the 2018 WDFW Columbia River Policy C-3620 evaluation report, beach and purse seines have a low chance of success as a complete replacement gear in the commercial fishery because of the high bycatch of steelhead, the high release mortality rate

¹ Washington Department of Fish and Wildlife and Oregon Department of Fish and Wildlife, 2002. Status Report Columbia River Fish Runs and Fisheries, 1938-2000. Clackamas Oregon

² Tweit, Bill, Ryan Lothrop, and Cindy LeFleur. Comprehensive Evaluation of the Columbia River Basin Salmon Management Policy C-3620, 2013-2017. Olympia, Washington, Washington Fish and Wildlife Dept., Nov. 2018. FPA 18-11.

³ Oregon Department of Fish and Wildlife. Summary and Analysis of Columbia River Harvest Reform Activities 2009-2017, including Transition Period 2013-2016 and 2017 Policy Review by Oregon Fish and Wildlife Commission (2018 mainstem commercial fishery data included), January 2019. Draft.



for Chinook and the low mark rates (adipose fin-clip rates) for Chinook. ODFW conducted a post-release mortality study for coho tangle nets during 2013-2015. Coho tangle nets had lower catch rates of hatchery fish, but had favorable ratings for mark rates, handle of non-target species and economic factors. Low gear investment cost was a particularly important consideration in the favorable determination. The coho tangle net was implemented in the late fall commercial fisheries during 2013-2015. Tangle nets for spring Chinook were implemented in 2003 and have been used successfully since.⁴

Beginning in 2013, one of WA's commercial fishers began experimenting with the design and installation of a pound net in the Cathlamet Channel, WA. In 2016, the Wild Fish Conservancy (WFC) worked with that Columbia River commercial fisher to refine the design and test the feasibility of the pound net under a Scientific Collection Permit issued by WDFW⁴. In 2021, the WFC installed a second pound net in the Clifton Channel, OR to further explore catch rate and mortality rates of target and non-target catch.

While there has been considerable research conducted on alternative commercial fishing gears, there is a need to compile and comprehensively evaluate this research to help focus experimentation through the ECF. WDFW requested, but did not receive, funding to conduct an analysis of past research for fiscal year 2023. An implementation model for the ECF, currently under development, may serve as a useful tool to focus further experimentation.

2.4 Licensing and fishery structure

Both Washington and Oregon issue commercial fishing licenses and residents of both states participate in the fishery. Washington residents may fish with an Oregon license, and Oregon residents may fish with a Washington License. Fishermen can deliver their catch in either state, though there are different taxation structures in Oregon and Washington.

2.4.1 Washington Licensing Structure

There are two types of Washington Columbia River commercial gillnet fishing licenses: Columbia River/Willapa Bay and Columbia River/Grays Harbor. Each license authorizes commercial fishing in the Columbia River and either Willapa Bay or Grays Harbor. The Emerging Commercial Fishery designation applies only to the Columbia River.

As of 2022 there were 240 Columbia River licenses. Of those, 181 were CR/WB licenses (~75%) and 59 CR/GH licenses (~25%). The majority of license holders fish in either the Columbia River or associated coastal area, and the majority of those who fish on the

⁴ Tweit, Bill, Ryan Lothrop, and Cindy LeFleur. Comprehensive Evaluation of the Columbia River Basin Salmon Management Policy. C-3620, 2013-2017. Olympia, Washington, Washington Fish and Wildlife Dept., Nov. 2018. FPA 18-11.



Columbia River hold a CR/WB license. A small portion of license holders (less than 15%) have two or more commercial gillnet fishing licenses.

As of 1974, both license types became limited entry, which means that existing licenses can be renewed but no new licenses will be issued (RCW 77.70.090). The legislature enacted limited entry for all salmon fisheries in response to the increased efficiency of salmon fishing gear and an “overabundance of commercial salmon fishing gear” in state waters. This overcapacity was deemed detrimental to the welfare and economic good of the commercial salmon fishing industry, and a barrier to achieving salmon conservation goals. The legislature’s intent in establishing limited entry fisheries was “to preserve this valuable natural resource so that our food supplies from such resource can continue to meet the ever-increasing demands placed on it by the people of this state.”⁵

While new licenses will not be issued, licenses are transferrable by the license holder to a new licensee. Licenses are treated as property, and if the license fees are paid annually, can be inherited or accounted for in a person’s estate. Licenses can be bought and sold through online marketplaces (e.g., Dock Street Brokers), however local advertising and word of mouth are also used. The purchase price for Columbia River licenses is influenced by value and economic potential of the fishery and has declined since the adoption of the Columbia River policy. Licenses may be leased, which allows an individual other than the license holder to fish the license.

Licenses must be renewed each year to remain active and there is also the option to put a license on “waiver” which means the license is renewed at a reduced price, but it cannot be fished that year. Fishing businesses in the Columbia River are built around a portfolio of fishing permits including other Washington state and West Coast fisheries, as well as other fisheries around the country. This provides fishermen with flexibility in response to fishing opportunity and helps to distribute risk. Fishing a portfolio of licenses is a common business strategy for US fisheries; while diversified, each fishing license is an important part of a successful portfolio.

2.4.2 Oregon Licensing Structure

In Oregon there is a single Columbia River gillnet permit (which also includes the SAFE area in Youngs Bay). Like Washington licenses, these permits are limited entry. Uniquely, there is a floor of 200 permits – meaning that if the number of Oregon CR gillnet permits drops below 200, the department will issue new permits up to a total of 200 permits. As of fall 2019, there were 281 Columbia River gillnet permits in Oregon.

⁵ RCW 77.70.090



2.5 Commercial fishing businesses

2.5.1 Overview of business models

In the United States, there are three main business models used by small commercial fishing businesses. The first is where commercial fishing licenses are fished individually by the license holder, either directly and/or by employing a small crew. Crew are generally not formal employees of the small business and are paid a share of the value of the catch (e.g., a portion of gross value), typically 10 – 25%. Crew are typically expected to pay for their own raingear, transportation, and any necessary licenses.

The second is a partnership model, where two or more individuals operate their small business in partnership. These partnerships are often among people with familial relation (e.g., father and adult child) or longtime business partners, and may be formal or informal business relationships.

The third is a cooperative model (i.e., co-op), where a group of individuals work collectively. This can take many different forms and involve several aspects of fishing and related businesses and services. Cooperatives can be formal, long-term business arrangements or more informal, shorter-term collaborations. Fishermen may form a cooperative for fishing activities, such as fishing two licenses from a single vessel to minimize expenses, or pooling allocation or quota for constraining stocks to minimize risk (e.g., risk pool). A cooperative structure may also be used to support business activities related to fishing (e.g., compliance and catch accounting). The way in which profits are distributed would depend on the specific arrangement (e.g., based on each member's relative catch, contribution or capital investment, or the allocation associated with each member's licenses in a quota fishery).

Cooperatives can also be formed for processing and marketing purposes. Under this type of model, fishermen fish their own licenses individually, but share the costs and effort associated with other value-added activities. For example, catch for each license holder is weighed separately and reported on individual fish tickets and then fishermen are paid a proportional amount once processing, shipping and marketing is complete. The value of this type of co-op lies in the ability to conduct value add services (e.g., bleeding, icing and dressing fish), the ability to share the cost of business assets (e.g., ice machines), and access larger or niche markets. Processors and fish buyers may also be part of these cooperative structures.

2.5.2 Business models in the Columbia River

In recent times (the last 50-60 years), small fishing businesses on the Columbia River have operated under the individual business model. Prior to the mid-1900s, canneries played a large role in the business structure for commercial fishermen on the Columbia River. In the early days fishermen would lease boats (and at one point fishing gear) from the cannery.



Over time, most fishermen came to own their own vessels and the relationship between canneries and fishermen weakened in that regard, though some canneries still leased vessels and/or provided credit for fishermen to purchase or upgrade their vessels.

Many canneries were corporate endeavors; however, some canneries were cooperative ventures. One notable canning co-op on the Columbia River was the Union Fishermen's Cooperative Packing Company which was formed by 200 fishermen in Astoria in 1896. It should be noted that these large co-op canneries are much different than what a small business co-op might look like for today's commercial fishermen. As dams were constructed and salmon runs declined, canneries gradually left the Columbia River and commercial fishermen began to operate as the small businesses we see today. Fishermen began selling fish to buyers (rather than canneries) and building portfolios of fishing permits to build a viable business and balance risk and opportunity.⁶ Some of the gear types being explored through the Emerging Commercial Fishery may be more conducive to this same individual model, while others (e.g., pound nets) may require a new business model to compensate for high capital and operating costs. Regardless of the business model, all alternative gear fisheries will need to produce positive economic returns to be viable as a commercial fishery.

2.5.3 Social and economic importance of Columbia River commercial fishing businesses

Information obtained from working with the public as well as Small Businesses shows WDFW that:

The Columbia River commercial fishery is economically important to individual fishermen, their families and local communities, as well as a wide range of businesses that support, and are supported by this fishery (e.g., docks, processors, mechanics, maritime suppliers). The seafood harvested by the commercial fishery enters the seafood supply chain, making additional economic contributions to distributors, retailers and restaurants, and ultimately providing the public with access to fresh, local, sustainable seafood.

The Columbia River commercial fishery provides jobs and important economic opportunity in a region with few employment opportunities. The majority of Washington Columbia River commercial fishermen live in Wahkiakum, Pacific and Grays Harbor counties, all of which are ranked in the lowest per capita income field and are below the state poverty level.⁷ For communities that are struggling socially and economically, the commercial fishery is a bright spot, providing critical job opportunities, halting further community decline and providing opportunity for

⁶ Martin, Irene. [The Incoming Tide of Memory: Salmon Canneries and Communities of the Columbia River](#). Dec. 10, 2021. Excerpts pages 86, 87, 88, 126 and 127 with permission from the author.

⁷ Martin, Irene. [White Paper on Columbia River Salmon Gillnet Communities](#). May 10, 2022.



improved social and economic conditions. In addition to the direct economic benefits, there is a long history of commercial fishing in the communities along the Columbia River. Fishing is a way of life and is woven into the cultural fabric of these communities. Commercial fishing has historically been a generational vocation and identity, being passed down from generation to generation among fishing families.

In addition to direct social and economic benefits, the fishery facilitates participation in other fisheries and local seasonal jobs, and anchors income in the region. Because the Columbia River is “home” for fishermen, income is brought back to the region where it is spent on local goods and services, bolstering these economies. Thus, the fishery not only anchors fishing-related businesses in the region, but it anchors other businesses and social programs. The Columbia River commercial fishery has historically been one of the few fisheries in the state where young fishermen can gain experience, thus providing a pathway for employment and business opportunities for new generations of fishermen in Columbia River communities.

3. Analysis of Costs

This section outlines the estimated costs for participating in alternative and traditional commercial fisheries on the Columbia River. The first subsection identifies and describes general costs relevant to all commercial fishing operations in the Columbia River. The extent of these costs may vary depending on gear type and the specific business model employed. The second subsection examines costs associated with specific gear types, organized into three tables: capital costs, operations and maintenance costs, and regulatory costs. Costs are estimated for fixed pound nets/traps, purse seine, beach seine, tangle net and gillnet fishing gears. Traditional gears are included for context, but they are not the subject of the Emerging Commercial Fishery rulemaking. There has also been discussion about the potential for floating pound nets and fish wheels; should there be interest in exploring these gears through the Emerging Commercial Fishery, costs will be explored at that time.

The ballpark estimates outlined in this section were developed using the limited economic information available, including cost information for similar gear used in other fisheries, and the experience and judgement of industry advisors. Fishing costs are also included for research operations conducted using pound nets. While costs for research operations provide valuable data points, costs for commercial operations will differ from research operations. Where possible, estimates are presented as a range to reflect the variability in potential costs and the uncertainty with projecting costs associated with alternative gear. Commercial fishing businesses are diverse and operate differently than many other small businesses, which can make it challenging to project costs. For example, crew are often paid a portion of the value of the catch (i.e., crew share), rather than an hourly rate or set wage. Commercial fishing businesses can also employ several different business and



marketing strategies, which have different costs. Therefore, costs are highly variable and can vary even among individual fishing businesses operating in the same fishery.

3.1 General costs for commercial fisheries on the Columbia River

Interest and/or loan repayment for capital costs: Fishing businesses may need to take out loans to cover capital and operating costs. In general, financing commercial fishing operations can be challenging given the lack of “industry standards” and the need to provide adequate collateral and/or down payment for the loan. It’s estimated that interest rates would be no lower than 3.5-5% but could also be 8% or higher depending on the lenderⁱ, the purpose of the loan, and particular borrower’s situation. The allowable debt – service ratio (typically 25-30%ⁱⁱ) also limits the amount of money that can be borrowed relevant to the applicant’s income.

Government programs, such as Small Business Administration (SBA) loans may provide a lower interest rate but are highly competitive and require the applicant to have a business plan. Hiring a consultant to develop a business plan is an additional cost, estimated at \$2,000 - \$5,000ⁱⁱⁱ. Another option for capital funding is the NOAA Fisheries Capital Construction Fund, however this is limited to assisting with the purchase, repair or upgrading of vessels (not netting or other equipment), and there are depreciation considerations with this type of financing.

The funding options available to invest in new fishing gear will vary depending on the business strategy and personal situation (e.g., credit score, collateral, relationship with lenders) of each fishing business. However, the ability to secure funding for capital investments, and the relative financial return from those investments will be a critical part of the decision when deciding to switch to new fishing gears.

Insurance: Commercial fishing businesses carry insurance policies to protect their businesses. The business model being used by each fishing business informs which types of insurance are needed. Many commercial fishing businesses carry insurance for their vessels and vehicles as well as a general liability insurance policy to cover their crew and any accidents or injuries. If a fishing business employs staff, they may also need to carry labor and industries (L&I) and unemployment insurance. The cost of insurance for fishing businesses can be quite high (around \$10,000 per year or higher); insurance costs may be even more expensive for complex operations such as fish traps.^{iv}

Business administration costs: These costs include general administrative equipment (e.g., computer, software, internet, estimated at \$2,000 - \$3,000^v) and services (e.g., bookkeeping, tax preparation, estimated at \$500 - \$1,000^{vi}) related to the administration of small businesses. Fishing businesses also pay an Enhanced Food Fish Excise Tax (0.0669)^{vii} in addition to other state and federal taxes (e.g., income tax, self-employment tax). Depending on the type of business and county of residency, business licenses may also be required for small commercial fishing businesses.



Basic equipment: All fishing businesses need to purchase and maintain basic equipment, such as vehicles, life jackets, dip nets, ice shovels and fish totes. Basic equipment is an estimated cost of \$5,000 - \$7,500^{viii}. Additional equipment costs are captured in the gear specific tables below.

Vehicle and boat trailer: All fishing businesses will need a boat trailer and a truck to pull the trailer and transport fish and fishing related equipment. It is estimated that a trailer for a smaller vessel or skiff would cost \$3,000 - \$10,000^{ix}. A truck would likely cost somewhere in the range of \$50,000 - \$100,000^x. Ground transportation costs (e.g., driving to and from fishing areas, picking up ice, transporting catch to market) are estimated as \$200 - \$300 per day.^{xi}

Vessel and equipment storage: Depending on the size of the vessel and the fishing operation, fishing businesses will need to purchase moorage for their vessel or have a place to store the vessel on land. Moorage costs are estimated as \$3,500 - \$5,000 per year for gillnet and tangle net vessels, and up to \$7,000 per year for larger vessels like purse seiners^{xii}. Fishing businesses also need storage space for equipment (e.g., gear shed, forklift, additional equipment) and vessels. Some may construct a storage shed on their property (likely an \$80,000 investment), or rent a space to store their equipment, estimated as \$500 - \$1,000/month.^{xiii}

Live box: Using a live box with any of the listed gears is another expense that may be incurred. It is estimated that the cost for a two-chamber live box would be a minimum of \$2,500 (including pump, instillation, and through-hull intake).^{xiv}

Annual repairs and snag divers: Commercial fishing business can expect to pay regular maintenance and repair costs for fishing vessels (approx. \$3,000 - \$5,000 annually in basic maintenance^{xv}) and expenses associated with net mending and other equipment repair (approx. \$4,000 - \$6,000 annually^{xvi}). Commercial fishermen may also employ snag divers (approximately \$700 per day^{xvii}) to clear logs and other debris from fishing grounds.

Transport and Marketing: Some fishing businesses participate in aspects of processing, transport and marketing for their catch. This can add additional value to the landed fish, but also comes with additional costs. For example, many fishermen who sell their catch directly to buyers receive ice from the buyer at no cost. Participating in additional value-add services may require purchasing ice from a supplier or purchasing an ice machine (\$13,000 - \$25,000^{xviii}). Additional costs could also include scales and insulated fish totes (\$750 - \$1,000 each^{xix}), processor facilities and equipment, and a vehicle or vessel for transportation. These costs are highly variable and would depend on the business model chosen. For example, for purse seine and beach seine operations it can take an additional \$30,000 - \$50,000 of equipment to get fish from the boat to market because infrastructure is lacking along the Columbia River to support larger vessels.^{xx} While there is more



infrastructure for tangle net and gillnet fisheries, there may still be significant transportation and marketing costs (estimated at \$12,000 - \$25,000)^{xxi}. Alternative gears with high capital and/or operating costs may necessitate additional investment in marketing to offset gear-related expenses.

Time and opportunity costs: To represent their interests and investments, fishermen need to participate in the management process. This can include serving on advisory boards, attending meetings, providing public comment, drafting letters, and generally staying abreast of a very complex and fast paced management process. This can take a significant amount of time and comes at the expense of participating in other fisheries or job opportunities. Fishermen may also join a trade organization, supported by membership dues, to represent their interests in the process.

3.2 Gear-specific costs for commercial fisheries on the Columbia River

See tables 1-3, below.



Table 1. Capital costs⁸ for traditional and alternative commercial gear included in the Emerging Commercial Fishery. NA = not applicable.

Gear Type	Vessel(s)⁹	Netting	Pilings/Anchors and installation¹⁰	Rigging & Equipment / Hardware¹¹	Total Capital Costs
Commercial Pound Net/trap (fixed)	\$30,000 (used/skiff) - 100,000 (new) ^{xxii}	\$5,000 - 12,000 ^{xxiii}	\$65,000 - \$107,000 ^{xxiv}	\$15,000-34,000 ^{xxv}	\$115,000 - \$253,000
Research Pound Net/trap (fixed) ¹²	\$25,000 ^{xxvi}	\$16,264 - \$20,240 ^{xxvii}	\$74,466 - \$118,430 ^{xxviii}	\$3,814 - \$4,185 ^{xxix}	\$119,544 - \$167,855
Purse Seine	\$100,000 - \$400,000 for main vessel; \$25,000 – \$50,000 for skiff ^{xxx}	\$30,000 - \$50,000 (includes purse lines and installation) ^{xxxi}	NA	\$9,000 - \$13,000 ^{xxxii}	\$164,000 - \$513,000
Beach Seine	\$35,000 - \$100,000 ^{xxxiii}	\$15,000 – \$25,000 ^{xxxiv}	NA	\$6,000 - \$13,000 ^{xxxv}	\$56,000 - \$138,000
Tangle Net	\$35,000 - \$100,000 ^{xxxvi}	\$2,000 (web only), \$4,600 (full net, hung) (will last 1-2 seasons) ^{xxxvii}	NA	\$1,000 - \$3,000 ^{xxxviii}	\$38,000 - \$107,000
Gill Net	\$35,000 - \$100,000 ^{xxxix}	\$2,000 (web only), \$6,000 - \$9,000 ¹³ (full net, hung) ^{xl}	NA	\$1,000 - \$3,000 ^{xli}	\$38,000 - \$112,000

⁸ The capital costs involved with commercial fishing are not one-time costs. New nets will need to be purchased and vessels will need to be replaced or upgraded over time. There may also be significant capital costs associated with transport and marketing of catch. These costs will vary by gear type and the business strategy used by each individual fisherman. These costs are discussed in the section above.

⁹ Vessel costs will be highly variable, depending on several factors. For example, vessel cost for pound nets (fixed and mobile) may be lower than \$30,000 if a used, non-commercial skiff were used. For purse seine vessels, costs will be informed by whether you're retrofitting and rigging a non-seine vessel, buying a vessel designed for seining or purchasing a seine vessel that can also be used in other purse seine fisheries. There will also be significant transportation costs if purchasing a vessel from Alaska. Fishermen also noted that there can be significant repair and upgrade costs when purchasing a used vessel, that needs to be factored in.

¹⁰ Pound net construction costs include pile driving, docks/catwalk/platforms, navigation lights and professional diver. Note that there may not be a straight delineation between construction costs and rigging/equipment/hardware.

¹¹ This category includes all the rigging, equipment and hardware necessary for each fishing operation (e.g., pulleys, ropes, lines, anchors, standpipes, winches, clamps, poles, marine mammal exclusion gates, etc.). Note that for purse seine gear, most hardware costs are accounted for in the cost of the vessel.

¹² Cost estimates for research operations are included for reference; costs for commercial operations are anticipated to differ from research operations.

¹³ The cost for gillnet netting depends on the mesh size (e.g., 6 or 9 inch). There is also a cost different between purchasing the netting and hanging the net.



Table 2. Operations and maintenance cost ranges¹⁴ for traditional commercial fishing gear, and gear considered in the Emerging Commercial Fishery rulemaking. NA = not applicable

Gear Type	Vessel Fuel (daily)¹⁵	Crew (number and daily total wage)	Utilities (electricity or batteries for lighting)¹⁶	Removal costs (pilings/infrastructure and derelict gear)
Commercial Pound Net/trap (fixed)	\$20 - 200 ^{xlii}	1-3 crew ¹⁷ per net ^{xliii}	\$1,000 - \$2,300 ^{xliv}	\$50,000 for piling removal ^{xlv}
Research Pound Net/trap (fixed)	\$12.50 ^{xlvi}	1-3 crew ¹⁸ per net ^{xlvii}	\$455 - \$910 (for solar) ^{xlviii}	\$50,000 for piling removal ^{xlix}
Purse Seine	\$400 - \$450 ^l	3 crew per vessel (approx. 10% (\$300/day) each) ^{li}	NA	NA
Beach Seine	\$75 - \$300 ^{lii}	2-3 crew per vessel (approx. 15% (\$300/day) each) ^{liii}	NA	NA
Tangle Net	\$75 - \$400 ^{liv}	1 crew per vessel (approx. 15%, \$300/day) ^{lv}	NA	NA
Gill Net	\$75 - \$400 ^{lvi}	1 crew per vessel (approx. 15%, \$300/day) ^{lvii}	NA	NA

¹⁴ Annual operating costs can be significant. Given the difficulty of providing gear-specific estimates, most of these costs are discussed in the general cost section above (e.g., insurance, moorage, boat and gear maintenance).

¹⁵ The commercial fishermen consulted provided a wide range of cost estimates for vessel fuel, indicating that there are several variables that would influence this cost (e.g., distance from dock to fishing grounds, currents, offload and delivery sites)

¹⁶ This refers to fishing related utilities (e.g., lighting required for pound net installations), not lighting on vessels or utilities for general business operations.

¹⁷ Crew estimates for commercial operations are based on existing research operations. Commercial operations are likely to require 2 or more crew.

¹⁸ Based on research operations, pound nets will require 1-3 crew for net operation, as well as an additional 30 crew days for net deployment and deconstruction each fishing season.



Table 3a. Licensing cost ranges for traditional commercial fishing gear, and gear considered in the Emerging Commercial Fishery rulemaking. NA = not applicable.

Gear Type	Commercial fishing permit^{lviii 19}	Wholesale fish buyer^{lix}	Dealer's License^{lx}	Crew Licenses^{lxi}
Commercial Pound Net/trap (fixed)	\$440 (resident) \$825 non-resident	\$ 155 (resident, one buyer); \$ 350 (resident, 2+ employees); \$ 735 (non-resident)	\$505 (resident); \$ 890 (non-resident)	\$35 (resident) \$110 (non-resident)
Purse Seine				
Beach Seine				
Tangle Net	\$585 (resident)			
Gill Net	\$ 970 (non-resident)			

¹⁹ In addition to commercial fishing permits, fishing operations may also need a snag permit to drag the bottom of the river to clear debris from fishing sites. Snag permits are issued by ODFW at no cost.



Table 3b. Regulatory Costs²⁰ ranges for traditional commercial fishing gear, and gear considered in the Emerging Commercial Fishery rulemaking. NA = not applicable.

Gear Type	DNR Site survey ^{lxii}	DNR Site Lease ^{lxiii}	DNR Site Bond ^{lxiv}	Site Selection Research ²¹	WDFW HPA	ACOE Section 10 permit ^{lxv}	DOE Permit	USCG PATON permit ^{lxvi}	County Shoreline permit ²²	Consultant Costs for Analysis and Permitting ²³
Commercial Pound Net/trap (fixed)	~\$2,000	Application: \$25 Rent: Variable/year	\$10,000-\$20,000	Unknown	No fee	\$100	No fee	No fee	\$1,075 - \$9,250 ^{lxvii}	Unknown
Purse Seine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beach Seine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tangle Net	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gill Net	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3c. Licensing and regulatory cost ranges for experimental pound net operations (2018 – 2020).

Gear Type	Annual permits and licenses	Annual land use fee	Consulting, Engineering and Permitting for trap construction
Research Pound Net/trap (fixed)	\$750 ^{lxviii}	\$ 500 ^{lxix}	\$7,000 ^{lxx}

²⁰ Most of the regulatory requirements included in this table would be coordinated through the Joint Aquatic Resources Permit Application (JARPA) process (https://www.epermitting.wa.gov/site/alias_resourcecenter/9978/default.aspx)

²¹ To site a pound net, considerable research would need to be conducted to identify available sites, assess suitability and accessibility, the ownership of adjacent lands, leasing requirements and associated costs. Unless a site proves profitable, these research costs would be “sunk costs” to the permit holder.

²² The costs of shoreline use permitting will vary by county and the specific operation and location proposed. Preliminary research indicates that costs for Clark County would range from \$8,077 - \$9,250 and costs for Wahkiakum County would range from \$1,075 and \$2,075.

²³ Depending upon how the regulatory process is coordinated, consultants may be needed to assist with the permitting steps listed above. There could also be the need for the individual fisher, a consultant, or WDFW to develop SEPA and biological assessment documents to support USFWS, MMPA consultation, and other permitting steps.



4. Additional Considerations

The purpose of this SBEIS is to support rulemaking for the designation of an ECF and is therefore focused on the direct costs of voluntarily participating in this fishery. However, there may be indirect economic impacts associated with the ECF (e.g., revenue reductions to existing commercial fisheries), and a significant number of economic impacts to local fishing communities could result from the establishment of permanent fisheries for alternative gear.

The magnitude of small business economic impacts will depend on several factors, including how alternative gear fisheries are structured, what opportunity remains in other commercial fisheries, and the impacts to other small businesses that support, and are supported by, this fishery. Working with small businesses and through the ECF, WDFW will explore the questions and considerations outlined below, and present findings in a report to the legislature at the conclusion of the ECF.

1. Are alternative gears commercially viable for small fishing businesses?

Alternative gears for the commercial fishery will need to be economically viable, meaning that they need to provide a reasonable profit relative to the costs and risks involved. The alternative gears listed in the ECF designation have higher capital and operating costs than existing gears (gillnet and tangle net); therefore, they will need to provide economic returns sufficient to cover costs and still produce a profit. If alternative gears are not economically viable, they cannot be considered commercial fishing gear.

Despite the prediction of economic gains for the commercial fishery with Columbia River Policy C-3620, the policy resulted in economic losses rather than gains. The small businesses consulted for this SBEIS emphasized the importance of giving serious consideration to the economic health of the commercial fishery, and the impacts of alternative gear fisheries on fishing businesses and communities. Some of the factors that will influence the economic viability of alternative gear fisheries include:

- What fish species will be allowed to be caught and sold
- Comparison of alternative gear fisheries with other West Coast fisheries, including other fisheries in the Columbia River
- Considering the viability of the business models for alternative gears

2. What financing options are available for fishermen who wish to use alternative gears?

Some of the alternative gears being explored may require significant capital investments and operational costs. Traditional financing options for small businesses may be challenging (particularly for fixed gear) and viable financing options need to be identified. The financing options for alternative gears could also influence the extent of consolidation in the fishery. As has been seen in other limited entry fisheries, high entry and operational

costs can concentrate a fishery in the hands of few large companies who can afford the upfront financial investment and associated risks.

3. How will markets and marketing influence the economic viability of alternative gears?

Marketing and access to markets is a key factor in determining the profitability and viability of any commercial fishing gear. Markets are well established for the gillnet and tangle net fishery. There are opportunities to sell fish directly to wholesalers given the number of fishermen participating in these fisheries. Gillnet and tangle net fisheries are also more versatile to get their fish to market. Establishing markets and assessing the marketing costs for alternative gear fisheries will be an important part of evaluating if these gears are economically viable.

4. How well do alternative gears perform relative to existing gears? As alternative gears are tested under the Emerging Commercial Fishery, it will be important to assess their performance across several metrics:

- Economic performance
- Marine mammal encounters
- Marine mammal predation on ESA listed salmon
- Landings and hatchery removals
- ESA salmon and steelhead impact rates
- Other sources of mortality (e.g., juvenile mortality in pound net lead nets)

5. How will alternative fishing gears impact the broader communities and fishing related small businesses along the Columbia River? As described in Section 2.5.3, Commercial fishing businesses on the Columbia River operate in a community and broader small business environment. The potential economic impacts from alternative gear will extend beyond fishermen to other small businesses in the Columbia River region, such as processors, buyers, and other dockside services (e.g., ice, nets, vessel repair, fuel).

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