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](#_3._Analysis_of)). 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 vessels and nets, which are considerably more expensive than gillnet and tanglenet 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](#_4._Additional_Considerations)) 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](https://wdfw.wa.gov/about/commission/policies/columbia-river-salmon-fishery-management)), 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](#_3._Analysis_of)). 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](#_4._Additional_Considerations). 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]](#footnote-2)

## 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]](#footnote-3) 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]](#footnote-4)

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 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]](#footnote-5)

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) has 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 WDFW.[[5]](#footnote-6) 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 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; however, there are a significant number of license holders that currently or historically fish both areas with the same license. The majority of those who fish on the 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.”[[6]](#footnote-7)

While new licenses will not be issued, licenses are transferrable by the license holder to a new licensee. 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. This provides fishermen with flexibility in response to fishing opportunity and helps to distribute risk. Fishing a portfolio if 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.

## 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 cooperate 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.[[7]](#footnote-8) 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.

# 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 cots 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, tanglenet 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 lender[[8]](#endnote-2), the purpose of the loan, and particular borrower’s situation. The allowable debt – service ratio (typically 25-30%[[9]](#endnote-3)) 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 - $5,000[[10]](#endnote-4). 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.[[11]](#endnote-5)

Business administration costs: These costs include general administrative equipment (e.g., computer, software, internet, estimated at $2,000 - $3,000[[12]](#endnote-6)) and services (e.g., bookkeeping, tax preparation, estimated at $500 - $1,000[[13]](#endnote-7)) related to the administration of small businesses. Fishing businesses also pay an Enhanced Food Fish Excise Tax (0.0669)[[14]](#endnote-8) 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[[15]](#endnote-9). 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[[16]](#endnote-10). A truck would likely cost somewhere in the range of $50,000 - $100,000[[17]](#endnote-11). 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.[[18]](#endnote-12)

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 tanglenet vessels, and up to $7,000 per year for larger vessels like purse seiners[[19]](#endnote-13). 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.[[20]](#endnote-14)

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 two-hull intake).[[21]](#endnote-15)

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[[22]](#endnote-16)) and expenses associated with net mending and other equipment repair (approx. $4,000 - $6,000 annually[[23]](#endnote-17)). Commercial fishermen may also employ snag divers (approximately $700 per day[[24]](#endnote-18)) 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[[25]](#endnote-19)). Additional costs could also include scales and insulated fish totes ($750 - $1,000 each[[26]](#endnote-20)), 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 and 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.[[27]](#endnote-21) While there is more infrastructure for tanglent and gillnet fisheries, there may still be significant transportation and marketing costs (estimated at $12,000 - $25,000)[[28]](#endnote-22). 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 Cost[[29]](#footnote-9)** **ranges for traditional commercial fishing gear, and gear Considered in the Emerging Commercial Fishery rulemaking. NA = not applicable**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gear Type** | **Vessel(s)[[30]](#footnote-10)** | **Netting** | **Pilings/Anchors and installation[[31]](#footnote-11)** | **Rigging and other Equipment / Hardware[[32]](#footnote-12)** |
| Commercial Pound Net/trap (fixed) | $30,000 (used/skiff) - 100,000 (new)[[33]](#endnote-23) | $5,000-12,000[[34]](#endnote-24) | $65,000 - $107,000[[35]](#endnote-25) | $15,000-34,000[[36]](#endnote-26) |
| Research Pound Net/trap (fixed)[[37]](#footnote-13) | $25,000[[38]](#endnote-27) | $16,264 - $20,240[[39]](#endnote-28) | $74,466 - $118,430[[40]](#endnote-29) | $3,814 - $4,185[[41]](#endnote-30) |
| Purse Seine | $100,000 – $400,000 for main vessel and$25,000 – $50,000 for skiff[[42]](#endnote-31) | $30k -$50,000 (includes purse lines and installation)[[43]](#endnote-32) | NA | $9,000 - $13,000[[44]](#endnote-33) |
| Beach Seine | $35,000 – $100,000[[45]](#endnote-34) | $15,000 – $25,000[[46]](#endnote-35) | NA | $6,000 - $13,000[[47]](#endnote-36) |
| Tangle Net | $35,000 – $100,000[[48]](#endnote-37) | $2,000 (web only), $4,600 (full net, hung) (will last 1-2 seasons)[[49]](#endnote-38) | NA | $1,000 - $3,000[[50]](#endnote-39) |
| Gill Net | $35,000 – $100,000[[51]](#endnote-40) | $2,000 (web only), $6,000 - $9,000[[52]](#footnote-14) (full net, hung)[[53]](#endnote-41) | NA | $1,000 - $3,000[[54]](#endnote-42) |

**Table 2. Operations and maintenance cost ranges[[55]](#footnote-15) for traditional commercial fishing gear, and gear considered in the Emerging Commercial Fishery rulemaking. NA = not applicable**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gear Type** | **Vessel Fuel (daily)[[56]](#footnote-16)** | **Crew (number and daily total wage)** | **Utilities (electricity or batteries for lighting)[[57]](#footnote-17)** | **Removal costs (pilings/infrastructure and derelict gear)**  |
| Commercial Pound Net/trap (fixed) | $20 - 200[[58]](#endnote-43) | 1-3 crew[[59]](#footnote-18) per net[[60]](#endnote-44) | $1,000 - $2,300[[61]](#endnote-45) | $50,000 for piling removal[[62]](#endnote-46) |
| Research Pound Net/trap (fixed) | $12.50[[63]](#endnote-47) | 1-3 crew[[64]](#footnote-19) per net[[65]](#endnote-48) | $455 - $910 (for solar)[[66]](#endnote-49) | $50,000 for piling removal[[67]](#endnote-50) |
| Purse Seine | $400 - $450[[68]](#endnote-51) | 3 crew per vessel (approx. 10% ($300/day) each)[[69]](#endnote-52) | NA | NA |
| Beach Seine | $75 - $300[[70]](#endnote-53) | 2-3 crew per vessel (approx. 15% ($300/day) each)[[71]](#endnote-54) | NA | NA |
| Tangle Net | $75 - $400[[72]](#endnote-55) | 1 crew per vessel (approx. 15%, $300/day)[[73]](#endnote-56) | NA | NA |
| Gill Net | $75 - $400[[74]](#endnote-57) | 1 crew per vessel (approx. 15%, $300/day)[[75]](#endnote-58) | NA | NA |

**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[[76]](#endnote-59) [[77]](#footnote-20)** | **Wholesale fish buyer[[78]](#endnote-60)**  | **Dealer’s License[[79]](#endnote-61)** | **Crew Licenses[[80]](#endnote-62)** |
| 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 | $585 (resident)$ 970 (non-resident) |
| Gill Net |

**Table 3b. Regulatory Costs[[81]](#footnote-21) ranges for traditional commercial fishing gear, and gear considered in the Emerging Commercial Fishery rulemaking. NA = not applicable**

| **Gear Type** | **DNR Site survey[[82]](#endnote-63)** | **DNR Site Lease[[83]](#endnote-64)** | **DNR Site Bond[[84]](#endnote-65)** | **Site Selection Research[[85]](#footnote-22)** | **WDFW HPA**  | **ACOE Section 10 permit[[86]](#endnote-66)** | **DOE Permit** | **USCG PATON permit[[87]](#endnote-67)** | **County Shoreline permit[[88]](#footnote-23)** | **Consultant Costs for Analysis and Permitting[[89]](#footnote-24)**  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Commercial Pound Net/trap (fixed) | ~$2,000 | Application: $25Rent: Variable/year | $10,000- $20,000 | Unknown | No fee | $100 | No fee | No fee | $1,075 -$9,250[[90]](#endnote-68)  | 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 Costs 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[[91]](#endnote-69) | $ 500[[92]](#endnote-70) | $7,000[[93]](#endnote-71) |

# 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 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, and what opportunity remains in other commercial fisheries. Legalizing new commercial fishing gears has the potential to significantly change the structure and economic viability of commercial fisheries on the Columbia River.

There are also several equity considerations with how the costs and benefits of alternative gears, as an ECF and potentially a permanent fishery, are distributed among the fleet. The purpose of an ECF is to gather additional information with alternative gears and explore the questions that will inform further deliberation on alternative gear fisheries.

Working with small businesses, WDFW will explore the questions and considerations outlined below, and present findings in a report to the legislature at the conclusion of the ECF. Additionally, there has been considerable research conducted on alternative commercial fishing gears in the Columbia River over the past two decades, and there is a need to compile and evaluate this research to help inform the following questions and focus experimentation with these fishing gears through 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 tanglenet); 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:

* **How many and what kinds of fish will be allowed to be caught and sold?** To cover the cost of alternative gear, fishermen will need to be able to catch high value species (e.g., spring/summer chinook and upriver bright fall chinook) and/or consistently catch enough volume of other species to provide a stable source of income.
* **What specific regulations will be associated with alternative gears?** It will be important to understand the specific regulations that will be associated with each gear (e.g., size and depth restrictions for nets), and the specific fishing zones in which these gears will be authorized. Other regulations, such as license structure and eligibility criteria will factor into profitability and raise questions around equity and fairness.
* **What amount of ESA impacts will be allocated for alternative gears?** The allocation that can be expected for each type of alternative gear will significantly influence the risk calculation for fishermen in choosing whether to invest in new gears.
* **Will alternative gears be viable for harvesting non-salmon species?** In addition to targeted salmon species, commercial gillnet fishermen also harvest sturgeon and other high value, non-salmon species. The ability to harvest these species with alternative gear will influence economic viability.
* **What expectations can be provided for long-term opportunity with alternative gears?** For fishermen to change their business model and invest in alternative gears, there will need to be a reasonable expectation for sufficient and consistent opportunity to cover costs, pay off capital investments, and make a reasonable profit. If opportunity cannot be guaranteed, and financial risks are too high with alternative gear, fishermen will choose to pursue other options. Politics and the potential for future policy changes introduce another important risk factor for the long-term viability of alternative commercial fishing gears on the Columbia River.
* **How do alternative gear fisheries compare with other West Coast fisheries?** Alternative gear fisheries will need to perform consistently with other fisheries that have similar investment costs. The return on investment will need to be on par with other West Coast and Alaska fisheries for fishermen to invest in new Columbia River fisheries. These alternative gear fisheries may not have the potential to produce adequate profits and allow license holders to pay comparable crew shares. For alternative gear fisheries that require substantial capital investment, other non-fishing opportunities may provide a better return on investment.
* **Are the business models needed for alternative gears viable?** Some alternative gears may require that fishermen take a completely different approach to their businesses, such as a co-op model for pound nets. For a co-op to fish a single pound net, the threshold for profitability will be even higher to cover capital and operational costs and provide a reasonable profit for all fishermen in the co-op. A co-op structure for commercial fishing with a pound net may not be financially viable. Traditionally, co-ops in the Columbia River have focused entirely on processing and marketing; harvesting co-ops may not be of interest to commercial fishermen.

**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 risks associated with financing will also need to be explored, such as the inability to repay loans due to lack of fishing opportunity, and whether the fishing gear and equipment purchased under the loan are viewed as an asset or liability by the lender.

The potential for grants to support gear transitions also needs to be explored. For example, who would provide funding for grants, who would be eligible, and what requirements are associated with the funds? It also needs to be explored if grants can be provided to small businesses or if new business structures would need to be formed to accept grant funds. There are also equity considerations in how grants would be awarded.

**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 tanglenet fishery. There are opportunities to sell fish directly to wholesalers given the number of fishermen participating in these fisheries. Gillnet and tanglenet 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.

* **Are niche markets realistic for alternative gear?** While niche markets may be able to produce higher prices and potentially offset higher operating costs, the realistic potential of niche markets needs to be explored. It will take time to develop new markets, establish contacts and develop strategies to produce the desired product. The size and durability of markets for high value fish will also need to be explored, particularly given the potential for significant fluctuations in harvest. The lack of infrastructure in the Columbia River can increase the costs of accessing markets, particularly for fishermen looking to bring fish to market themselves.
* **How will high volume gears influence prices?** If alternative gears produce significant a significant volume of harvest in a short period of time, prices may be impacted due to a flooded market. This has the potential to impact prices for other commercial fisheries operating in the Columbia River as well. It will be helpful to explore the limits of high and low value fish to predict the potential for profitability.

**4. Where will the impact allocations for alternative gear fisheries come from?** For any new commercial fishery to operate on the Columbia River, it will need an allocation of ESA impacts. Since there are a limited number of impacts, the allowable impacts for any new fishery will need to come from reapportioning the existing allowable impact from other fisheries.

* What will be the specific reductions and/or subdivisions of impact allocations to accommodate new commercial gears? Should ESA impacts for alternative gear come from the commercial or recreational sector’s allocation?
* If impacts for alternative gear fisheries are apportioned from the commercial allocation, will the commercial gillnet fishery still be able to operate under a further reduced level of impacts? What are the small business and economic impacts to the fishing businesses that will lose opportunity based on a reallocation of impacts?
* If commercial fisheries using alternative gears do use fewer ESA impacts, what happens to those impacts? Are they reallocated to other commercial fisheries?
* If there is an overage in ESA impacts from the recreational sector triggering a reduction in the available ESA impacts for the commercial fishery, will that reduction be distributed among all commercial fisheries equally?
* If there are not enough fish or ESA impacts each year for all commercial fisheries to operate, which fisheries will get priority?

**5. What is the licensing structure for alternative gear fisheries?** Several questions will need to be explored to determine how alternative gear fisheries will be licensed, and how the new fisheries will interact with existing limited entry fisheries.

* **How will new licenses be issued given that commercial salmon fisheries are limited entry?** Will there be new license for alternative gear, or will existing commercial gillnet licenses be converted to alternative gear licenses? What are the impacts to the existing commercial fishery from converting or issuing new licenses? How can the objectives of a limited entry fisheries be maintained while adding new licenses?
* **How many licenses will be issued for each alternative gear fishery?** The size ofalternative gear fisheries, and the ESA impacts allocated to each will have a direct effect on the profitability of new and existing fisheries.
* **Who is eligible for new commercial licenses**? There are many equity considerations with issuing new licenses when there is already an established commercial fishery. Will there be landing requirements for alternative gear licenses? Will licenses be issued as a lottery or based on certain criteria? Can small businesses hold multiple licenses (e.g., gillnet and seine license)? Can licenses be transferred?
* **How will multiple commercial fishing licenses be fished?** Are existing and alternative gears meant to provide additional options to fish new runs/seasons, or will new gears replace some existing fisheries? How will the management strategy influence the desirability and value of each type of license?
* **What is the relationship between licensing and permitting for fixed gear?** Fixed gears like pound nets will require an involved permitting process. Will fishermen seeking to use fixed gear purchase a license prior to, or following, the permitting process? How can permitting and licensing processes be aligned?

**6. 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 (pHOS goals)
* ESA salmon and steelhead impact rates
* Other sources of morality (e.g., juvenile mortality in pound net lead nets)

**7. How will alternative gear fisheries on the Columbia River affect other fisheries (commercial, recreational, tribal), including SAFE area fisheries and along the coast?**

* **How will fixed gear fisheries interact with fishing grounds that have traditionally been fished with gillnets or tanglenets?** The placement and operation of pound nets may interfere, either in the placement of, or ability to harvest from, gillnets. There are also equity considerations with granting exclusive fishing rights to pound nets when drift gillnet rights or other exclusive rights are not offered for other commercial gear types.
* **How will catches of non-salmon stocks be affected**? If gillnets are the only commercial gear that can catch sturgeon and other high value non-salmon species, reductions on allowable impacts for the commercial gillnet fishery to allow for alternative gears will reduce catches and fishing profits for gillnet fishing operations.
* **What is the relationship between alternative gears and the license reduction program for Columbia River commercial gillnet licenses?** There are inherent interplays between alternative gear and license reduction. For example, the economic viability of alternative gear fisheries will play into the determination of whether to participate in a license reduction program. The reduction in commercial gillnet licenses will also influence the size of the existing fleet and the potential economic viability of gillnets compared to alternative gears.
* **What will be the economic impacts to Grays Harbor and Willapa Bay fisheries?** While the Emerging Commercial Fishery explores alternative gears for the Columbia River only, the structure of licenses is likely to affect participation in coastal fisheries.
* **Will the commercial gillnet fishery remain a viable option for commercial fishermen?** If opportunity for participating in the gillnet fishery declines, either through regulation or the reallocation of ESA impact to alternative gears, there will be significant economic impacts to commercial fishermen. If alternative gears can prove to be a viable commercial enterprise, there may not be enough opportunity in those fisheries for all gillnet fishermen to transition to alternative gear fisheries. In particular, pound nets may consolidate the industry into the hands of a small subset of fishermen who can afford the capital investment of and navigate the regulatory and permitting process.
* **How will the implementation of alternative gears impact new entrants into the commercial fishery?** Fishing gears that require a significant capital investment would likely be financially out of reach for young fishermen. Additionally, contraction of the commercial gillnet fishery as the result of new alternative gear fisheries would make it more difficult for new entrants to enter the gillnet fishery.

**8. How will alternative fishing gears impact the broader communities and fishing related small businesses along the Columbia River?** Commercial fishing businesses on the Columbia River operate in a community and broader small business environment, and the potential economic impacts from alternative gear will extend well beyond fishermen. Fishing businesses are critical for small communities, providing job opportunities and anchoring income earned from other fisheries in the Columbia River. Commercial fishing businesses also support many other small businesses in the Columbia River region, such as processors, buyers, and other dockside services (e.g., ice, nets, vessel repair, fuel).

* **What are the potential impacts to fishing communities?** If alternative gears result in a significant change to fishing operations, those impacts will be felt by local communities. For example, consolidation or shifts in fishing effort could result in the loss of local fishing jobs, the loss of local support businesses, and the loss of key fishing revenue which can prop up local economies.
* **How will alternative gears impact the dynamics of family fishing businesses**? Fishing operations with alternative gears may change the structure of family businesses (e.g., the role of women and children).
* **How will alternative gear impact the economic viability of seafood processors and buyers?** There may be economic impacts to processors and buyers because of changes in the geographic distribution of landings and changes to fishing practices. For example, if alternative gears catch smaller fish, processing costs may be higher because the processor will need to butcher more fish to obtain an equivalent poundage of marketable fish. This introduces more waste and may also impact profitability for fish buyers.

**9. What would a commercial pound net fishery look like, and what is the permitting process?** There are many remaining questions that will inform the potential economic viability of a commercial pound net fishery, and the process and costs for permitting.

* **What are the specific locations for pound net sites?** How many pound net sites could or should be permitted? How do those sites compare in potential profitability and how will it be determined who gets to fish which sites? There will likely be sites that are higher or lower performing, which will result in different economic viability for each pound net operation. There are also equity considerations who gets which site.
* **Will the permitting process be undertaken collectively or individually?** WDFW will need to assess whether all allowable pound net sites should be permitted as a unit or permitted on an individual basis. There may be additional requirements from local, state and federal agencies to examine the environmental and cumulative impacts of a pound net fishery on the Columbia River.
* **How will commercial pound net operation costs differ from the costs associated with pound nets fished experimentally?** For example, there is a different business and staffing structure that would be used in a commercial fishing business than during research experimentation.
* **What additional costs might be involved with permitting and operating a pound net operation?** Additional costs may include site selection research (i.e., finding a viable location), leasing property from an adjacent landowner to gain shoreline access, preparing trap design schematics, maps and legal descriptions property for permitting and potential leasing, and hiring consultants to assist with the permitting process. The duration of the permitting process also needs to be determined to evaluate investment costs. Operational costs will also need to be further explored, including the legal and administrative costs associated with forming a co-op.
* **What specific regulations would be associated with a commercial pound net fishery?** Managers will need to identify the specific requirements for pound nets including maximum length of lead nets, in-season modification of gear, catch reporting requirements, closed season gear removal, and requirements for on-site watchmen.
* **How might a pound net fishery be different in Oregon?** If pound nets became a legal commercial fishing gear in Oregon, there would be an additional licensing process and there may be additional permitting requirements (e.g., water quality permits).

**10. How will alternative gears impact the bi-state nature of Columbia River fisheries?** Given that Columbia River commercial fisheries are jointly managed and prosecuted by Washington and Oregon, it will be important to examine the implications to participants in both states.

* Will the alternative commercial fishing gears being tested by Washington under the Emerging Commercial Fishery be allowed in Oregon waters?
* Can fishermen who hold Oregon permits fish with alternative fishing gears?
* How will deliveries to Oregon and Washington be impacted by alternative gears? Will fish caught with alternative gears by Washington fishermen be allowed to be landed in Oregon?

**11. How will alternative gears impact costs to WDFW and ODFW?** The exploration of and potential transition to alternative commercial fishing gears will come with costs to management agencies. These include the costs of establishing new planning and management structures, issuing and tracking new licenses, and the ongoing management and monitoring of even more complex fisheries on the Columbia River. It will also need to be explored how WDFW and ODFW revenue will be impacted from alternative gear, such as changes in licensing fees and landings taxes/surcharges. Alternative gears may also change the distribution of licenses and landings revenues between Washington and Oregon.

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29. 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. [↑](#footnote-ref-9)
30. 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. [↑](#footnote-ref-10)
31. 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. [↑](#footnote-ref-11)
32. 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. [↑](#footnote-ref-12)
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44. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-33)
45. Salmon For all, Inc. Analysis of Economic Viability Issus re a Columbia River Fish Trap/Pound Net Fishery. Astoria, Or., Salmon For All, Inc., Feb. 2021. And personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-34)
46. Personal communication with commercial fishermen (2/24/2022) [↑](#endnote-ref-35)
47. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-36)
48. Salmon For all, Inc. Analysis of Economic Viability Issus re a Columbia River Fish Trap/Pound Net Fishery. Astoria, Or., Salmon For All, Inc., Feb. 2021. And personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-37)
49. Salmon For all, Inc. Analysis of Economic Viability Issus re a Columbia River Fish Trap/Pound Net Fishery. Astoria, Or., Salmon For All, Inc., Feb. 2021. And personal communication with commercial fishermen (12/9/2021, 2/28/2022) [↑](#endnote-ref-38)
50. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-39)
51. Salmon For all, Inc. Analysis of Economic Viability Issus re a Columbia River Fish Trap/Pound Net Fishery. Astoria, Or., Salmon For All, Inc., Feb. 2021. And personal communication with commercial fishermen (12/10/2021, 2/24/2022, 2/28/2022) [↑](#endnote-ref-40)
52. 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. [↑](#footnote-ref-14)
53. Salmon For all, Inc. Analysis of Economic Viability Issus re a Columbia River Fish Trap/Pound Net Fishery. Astoria, Or., Salmon For All, Inc., Feb. 2021. And personal communication with commercial fishermen (2/28/2022) [↑](#endnote-ref-41)
54. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-42)
55. 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). [↑](#footnote-ref-15)
56. 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) [↑](#footnote-ref-16)
57. This refers to fishing related utilities (e.g., lighting required for pound net instillations), not lighting on vessels or utilities for general business operations. [↑](#footnote-ref-17)
58. Personal communication with commercial fishermen (11/3/2021, 2/24/2022, 2/28/2022) [↑](#endnote-ref-43)
59. Crew estimates for commercial operations are based on existing research operations. Commercial operations may require additional crew. [↑](#footnote-ref-18)
60. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021); Salmon For all, Inc. Analysis of Economic Viability Issus re a Columbia River Fish Trap/Pound Net Fishery. Astoria, Or., Salmon For All, Inc., Feb. 2021; WDFW staff judgement [↑](#endnote-ref-44)
61. WDFW staff estimate, based on a solar and 12 volt battery configuration [↑](#endnote-ref-45)
62. Personal communication with commercial fishermen (2/24/2022) [↑](#endnote-ref-46)
63. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021) [↑](#endnote-ref-47)
64. 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. [↑](#footnote-ref-19)
65. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021) [↑](#endnote-ref-48)
66. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021) [↑](#endnote-ref-49)
67. Personal communication with commercial fishermen (2/24/2022) [↑](#endnote-ref-50)
68. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-51)
69. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-52)
70. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-53)
71. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-54)
72. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-55)
73. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-56)
74. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-57)
75. Personal communication with commercial fishermen (2/24/2022, 2/28/2022) [↑](#endnote-ref-58)
76. RCW 77.65.160 and [Commercial and specialized license fees | Washington Department of Fish & Wildlife](https://wdfw.wa.gov/licenses/commercial/fees#limited-entry) [↑](#endnote-ref-59)
77. 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. [↑](#footnote-ref-20)
78. RCW 77.65.340 [↑](#endnote-ref-60)
79. RCW 77.65.280 [↑](#endnote-ref-61)
80. RCW 77.65.610 [↑](#endnote-ref-62)
81. 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>) [↑](#footnote-ref-21)
82. Personal communication with DNR staff [↑](#endnote-ref-63)
83. Personal communication with DNR staff [↑](#endnote-ref-64)
84. Personal communication with DNR staff [↑](#endnote-ref-65)
85. 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. [↑](#footnote-ref-22)
86. Army Corps of Engineers website (<https://www.nwp.usace.army.mil/Missions/Regulatory/FAQ.aspx>) Visited 12.17.2021 [↑](#endnote-ref-66)
87. United States Coast Guard Private Aids to Navigation (PATON) (<https://www.pacificarea.uscg.mil/Portals/8/District_13/dpw/docs/patonguide.pdf?ver=2018-10-15-154537-490>) Visited April 12, 2022 [↑](#endnote-ref-67)
88. 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. [↑](#footnote-ref-23)
89. 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. [↑](#footnote-ref-24)
90. Clark County, Washington Shoreline Review, revised 5/22/2019 (<https://clark.wa.gov/sites/default/files/media/document/2022-01/shorelines.pdf>, visited 4-12-22); Wahkiakum County Building Section Permit Fee Schedule, Land use/shoreline, updated 2008; provided to WDFW staff 4-12-22 [↑](#endnote-ref-68)
91. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021) [↑](#endnote-ref-69)
92. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021) [↑](#endnote-ref-70)
93. Wild Fish Conservancy, Northwest. Draft Analysis of Fish Trap Capital and Annual Costs in the Lower Columbia River, undated (received by WDFW staff March 23, 2021) [↑](#endnote-ref-71)