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Informing a Program to Increase Lifejacket Use with Pacific Northwest Fishermen

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ABSTRACT

Objective: Fatalities continue to plague the US commercial fishing industry and have broad impacts on coastal communities and families. The success of the Lifejackets for Lobstermen program in the US Northeast led to the development of a Pacific Northwest regional Fishermen Led Injury Prevention Program (FLIPP) for Lifejackets. To be effective in a different region with distinct fisheries, adaptations must be based on regional community input. The goal of this research was to collect and apply the perspectives of commercial fishermen and community partners to improve vessel safety and in particular, lifejacket use, to guide the development of the FLIPP for Lifejackets program.

Methods: Four approaches were used in Washington and Oregon: (1) structured interviews with commercial fishing community partners, (2) surveys with fishermen, (3) lifejacket ranking by fishermen, and (4) brief surveys of regional fish observers.

Results: Commercial fishing community partners ($n = 54$) confirmed that: a variety of brands/designs with good potential for commercial fishermen exist; there is interest in education around advances in materials and design; and the style depends on fishery, fishermen, and season. There is not a perfect model for all commercial fishing situations. From 98 fishermen interviewed, 15% always reported wearing a lifejacket on deck, 16% most, 40% some, and 25% none of the time. Most fishermen agreed it was important to wear a lifejacket/personal flotation device (PFD) (75%) and indicated interest in learning about new types of lifejackets (71%). Fishermen completed a ranking ($n = 56$), which showed the Mustang Inflatable Work Vest and Kent Rogue Work Vest stood out as the most preferred lifejackets. The majority of regional fish observers ($n = 22$) shared the frequency of vessels with at least one crew wearing a lifejacket was below 50%. Most reported fishermen's use of lifejackets was situational and agreed that attitudes regarding lifejacket use among fishermen had become more positive since they began observing.

Conclusion: Conversations and connections established through our efforts created collaborative opportunities and directly informed the design of the FLIPP for Lifejackets Program. These approaches can be used in other regions to establish commercial fishing as a safer industry.

KEYWORDS

Commercial fishing safety; intervention; lifejackets

Introduction

Commercial fishing in the United States (US) remains a dangerous occupation with a sustained, high fatality rate compared to all US workers.¹ Commercial fishing fatalities due to falling overboard or following a vessel disaster occurred when those lost were not wearing a personal flotation device (PFD) or lifejacket. According to the most recent nationally published data from 2000–2019, there were 866 US commercial fishermen who died while fishing. Vessel disasters and falls overboard account for the majority of fatalities nationally, with substantial variation by region: Alaska

(37% and 25%), West Coast (54% and 19%), Gulf Coast (49% and 30%), East Coast (37% and 30%), respectively.¹ Vessel disasters are commonly initiated by flooding, a large wave, or vessel instability (in descending order of prevalence), and severe weather contributes to over half of the disasters. Of the fishermen who died due to a fall overboard, none were wearing a lifejacket.² To effectively reduce the risk of both fatal and non-fatal injuries, a multipronged approach addressing the varied and complex contributors to injury must be undertaken. Proper weather decision-making, navigation, and vessel stability, as well as

other primary prevention strategies must be prioritized to reduce vessel disaster events. Secondary prevention strategies, such as well-maintained and functional safety equipment, including a properly worn lifejacket, are also essential to reduce the burden of injury and death. The results of an analysis of cold-water immersion survival factors for commercial fishing crewmembers in Alaska show having access to well-maintained, serviceable lifesaving equipment along with the knowledge and skill to use them properly were critical to survival.³

From 2000 to 2018 there were 93 fatalities in Washington and Oregon. Five of the victims, which were a result of a vessel disaster, were wearing a lifejacket, but three were not wearing it properly. Among US Pacific Northwest (PNW) commercial fishermen, non-fatal injuries that occur on-board vessels are also common,^{4,5} yet preventable. Critical times for injury prevention and use of lifejacket include when fishermen are working on deck, unfavorable tide movement, and/or the vessel is crossing the bar (the area where the deep waters of the Pacific Ocean meet shallower waters near the mouth of the river when there is a high risk of capsizing).

Commercial fishermen deaths and injuries have broad impacts on coastal communities and family, and markers of these impacts are provided by numerous fishermen's memorials often found in coastal communities. Along the Oregon coast, there are at least five memorials in Astoria, Newport, Depoe Bay, Charleston, and Gold Beach to honor commercial fishermen lost at sea with plaques, gardens, and annual traditions like the Blessing of the Fleet. In Washington, there are at least six memorials with statues or granite walls in Ilwaco, Westport, Seattle, Bellingham, Gig Harbor, and Anacortes. These memorials and traditions serve as gathering places for communities to remember the sacrifices of local fishing families and to connect generations by capturing fishermen's work, loss, and community resilience.

These tributes underscore the importance of prevention efforts. An unpublished small study of Oregon Dungeness crab fishermen in one port in 2010 assessed safety and lifejacket use.⁶ The dock-side survey results indicated PFD use among the survey participants was relatively low. Based on

the weighted average score, fishermen reported PFDs were worn on average about 30% of the time crossing river bars, and about 20% of the time during transit and while working on deck. When queried as to the conditions in which the participants would wear a PFD, 50% and 60% indicated they would wear a PFD under emergency and storm/high sea situations, respectively. The fishermen identified a need for increased use, policies, opportunities for trying before buying, and a campaign to encourage use, but no such effort in the region had been made to date.

Objectives

The Fishermen Led Injury Prevention Program (FLIPP) has engaged PNW commercial fishermen in a variety of injury prevention efforts over the past decade.^{7–10} To address this need in the PNW, our FLIPP study team initiated a translational research project in 2023, FLIPP for Lifejackets, focused on the adaptation and implementation of a successful lifejacket intervention from the Northeast Center for Occupational Health and Safety (NEC) called the Lifejackets for Lobstermen Program.¹¹ The Lifejackets for Lobstermen program utilized social marketing principles. This included offering a variety of fishermen-approved PFDs with easy and affordable access by bringing them to ports and offering 50% discounts. The Lifejackets for Lobstermen program was promoted regionally using slogans and pictures that connected PFD use to fishermen's values and interests.¹¹ Similar social marketing efforts had not previously been attempted in the PNW, and this research aimed to increase lifejacket use among PNW fishermen. Given advancement in lifejacket designs, as well as an evidence-based program model and access to ports, there is the potential to significantly shift the current culture of lifejacket use in commercial fishing.

A key aspect of the success of the Lifejackets for Lobstermen program was incorporating fishermen and stakeholder preferences and needs into the design of the program. The specific coastal conditions in the PNW, with ports being at the mouths of rivers in Oregon and the Puget Sound in Washington, create hazardous conditions crossing

into the Pacific Ocean. This, combined with weather and tide conditions, fishery management practices, and inter-state agreements for the sustainable fisheries, creates unique hazards. Each fishery in the PNW has different gear, equipment, work practices, vessel conditions, and fishing timing. We sought to collect needs, experience, and perception data from fishermen to identify where common designs of lifejackets may be applicable and when fishery-specific designs are preferred. This paper focuses on the research conducted to collect PNW fishermen's and commercial fishing partners' views and experiences related to vessel safety, including use of lifejackets to inform the development of a regional lifejacket program, FLIPP for Lifejackets.

Methods

Study region, sampling, and survey instruments

This study engaged commercial fishermen, their families, and regional partners – coastal community organizations, government agencies, lifejacket manufacturers and distributors, and marine suppliers – across Oregon and Washington to inform the development of a tailored lifejacket program for the PNW. Four data collection methods were used: (1) structured interviews with commercial fishing community partners, (2) surveys with commercial fishermen, (3) simple lifejacket ranking exercises completed by commercial fishermen, and (4) brief surveys of regional fish observers regarding lifejacket use and general experiences aboard commercial vessels. This study protocol was reviewed by the university human research

protection program and institutional review board and determined exempt.

Structured interview of commercial fishing community partners

Relevant commercial fishing community partners were identified through several pathways: (1) existing contacts from the research team and Sea Grant collaborators, including ports and commodities, media, and community organizations; (2) introductions from our NEC partners, particularly lifejacket manufacturers and distributors involved in the Lifejackets for Lobstermen program; and (3) snowball sampling in which interviewed partners recommended additional interviewees. Interviews were collected from March 2023 to December 2023. The target sample was 50 interviews and was based on obtaining representation across the various partner groups and saturation of themes identified in multiple interviews.

Open-ended questions focused on perceptions of lifejackets and were guided by the “Four Ps” of social marketing theory: Price, Product, Place, and Promotion, and adapted from Lifejackets for Lobstermen project materials. The interview guide is summarized in Table 1. Interviewers recorded responses in Qualtrics, and responses were grouped by topic and analyzed inductively to identify themes. Key domains included lifejacket perceptions, emergency gear, and social marketing categories.

Survey of commercial fishermen

Commercial fishermen were recruited to participate in the survey. Participants were contacted by phone and randomized using fishing licensing lists

Table 1. Main topics and sample prompts from structured interviews with commercial fishing community partners, focusing on lifejacket perceptions and the Four Ps of social marketing theory (Price, Product, Place, Promotion).

Question/Context	Prompts for Discussion
Lifejacket perceptions	What brands or designs do you think have potential? What would prevent or encourage use? Would there be any difference by fishery because of the season or gear?
Price	What price is reasonable? Would discounts or rebates help?
Product	What features do you look for in lifejackets? Are several designs necessary for different fisheries?
Place (events)	Where should outreach events take place? Which ports or fishing community events are most relevant?
Place (distribution)	How should lifejackets be distributed? Through which partners or supply chains?
Promotion (media strategy)	What communication strategies reach commercial fishermen most effectively?
Promotion (marketing materials)	What messages, visuals, or approaches would resonate with fishermen and their communities?

in Oregon and Washington. When participation was low through phone recruitment efforts, a convenience sample was collected in person at events held for commercial fishermen in various regional ports. The target sample size was 100 based on the NEC experience, and surveys were collected from May 2023 to March 2024.

Surveys collected basic demographics (age, sex), fishery type, years of fishing experience, and attitudes and behaviors related to lifejacket use: importance, reasons for wearing, crew's experience, interest in new types, awareness of new models, ideal models, price point, and other health and safety topics of interest. Descriptive statistics were used to characterize the experience, demographics, and lifejacket perceptions of the survey participants.

Ranking of lifejackets by commercial fishermen

To increase familiarity with lifejacket options, we engaged commercial fishermen attending five safety events from February 2024 to July 2024 in Oregon and Washington and asked them to rank seven different lifejacket designs. This was a convenience sample focused on the fishermen at the events to better collect input from fishermen about the lifejacket designs and perceptions. Physical samples were available for hands-on evaluation. The ranking sheet was one page and included images and product names: Mustang Inflatable Vest, Mustang Floatcoat, Kent Rogue Vest, Kent Classic Vest, Hero Inflatable T-shirt, Stormline Bib Overalls, and Spinlock Inflatable Belt Pack. The lifejacket designs included were based on the structured interviews and commercial fishermen survey results. Appendix A is an information sheet entitled "What Gear Works" showing the different lifejacket designs and features.

Fishermen ranked each design from 1 (most preferred) to -7 (least preferred) and noted whether they would wear the design while fishing. The data were summarized by average rank and the percentage of fishermen who indicated they had worn the design (wear proportion). A Friedman's test was applied to evaluate significant differences in the

median rankings across the lifejacket designs. Participants also provided short, open-ended feedback about why they would or would not wear each lifejacket design, which was then thematically coded. A proportional odds model was applied to provide the relative likelihood of each lifejacket design being ranked higher or lower based on the fishermen's preferences.

Survey of fish observers

We collaborated with the National Ocean and Atmospheric Administration (NOAA) Western Region Fish Observer program to survey fish observers about their experience on commercial fishing vessels and lifejacket use by commercial fishermen. The fish observers are in a unique position to provide reports of at-sea lifejacket use on commercial fishing vessels. At the time of this survey, fish observers in the Western Region cover vessels fishing out of Oregon and Washington for nearshore and offshore groundfish and pink shrimp. Fish observers completed an emailed electronic survey. The opportunity to support the FLIPP for lifejacket program was presented at multiple trainings for the West Coast fish observers. The plan was to repeat the survey throughout the FLIPP program to see if an increase in lifejacket use is observed. The baseline survey of fish observers, collected from January 2025 to March 2025, is reported here.

The fish observer surveys included the date, location of commercial fishing vessels they had been on, and what they observed in the past month. This included the number of vessels observed, an estimate of the percentage of lifejacket use of at least one crew member, the types of lifejackets seen worn, and if the lifejacket use was situational and if so, description of the situation. The observers were then asked to provide their opinion about the trend of lifejacket usage in the commercial fishing industry (decreasing, increasing or same). We also asked if they received any push back from fishermen when the observer wore their lifejacket. Descriptive statistics were used to characterize the experience of the observers.

Results

Community partner interviews

Key commercial fishing community partners were interviewed between March and December 2023. Structured interviews were completed with 46 partners that included: fishing community/family members ($n=2$), port managers/harbor masters ($n=10$), tribal fishery representatives ($n=4$), Vessel and safety training organizations ($n=5$), regional marine suppliers ($n=3$), governmental agencies (US Coast Guard, state fishery management, state marine board, NIOSH commercial fishing safety researchers) ($n=8$), Media that serves commercial fishing audiences ($n=2$), fishery associations ($n=3$), a lifejacket association ($n=1$), and lifejacket manufacturers ($n=8$). The distribution across partners and resulting themes satisfied our target sample goal.

Lifejacket perceptions regarding the brand and design features confirmed that a variety of brands/designs with good potential for commercial fishermen exist or have existed. Additionally, the following key themes emerged: (1) Kent Rogue vests are popular; the foam helps with cushioning, the design is warm so good for cold months but can get too hot otherwise; (2) inflatables appeal to many fishermen since they have a lower profile and do not impede work; (3) there is interest in learning about more models and brands with advances in materials and design; (4) the preferred style depends on fishery, fishermen, and season; and (5) there is not a perfect PFD for all commercial fishing situations. Common responses from the community partners about what prevents fishermen from wearing a lifejacket included entanglement concern, encumbering work, diminished dexterity, bulk, fishermen's attitude of invincibility, and the cost. On the other side of the spectrum, the response about what would make a fisherman consider wearing a lifejacket included: wearability/fit, knowledge about the lifejackets, need in stormy/rough conditions and nighttime, if a captain enacts a policy, if the fishermen have witnessed someone going overboard, if they have lost someone they know at sea, if they are fishing alone, if their wife says to wear a lifejacket, and if they are working on deck.

We sought to collect insight from our partners for the 4P's of social marketing - *Price, Product, Place, and Promotion*. We identified that a reasonable *Price* for a fisherman is in the range of \$50–\$150 and would be dependent on being a passive (foam) or active (inflatable) lifejacket. Feedback on the *Product* indicated having several lifejacket styles to choose from is important for increasing interest in the program. Respondents reported the importance of placing the program in a location where fishermen already gather (*Place*). For specific events or places, the following ideas were shared: gear yards, fishermen appreciation days, Oregon and Washington Department of Fish and Wildlife events, USCG drill conductor training or examinations, Columbia River Fisher Exposition, tribal fishery meetings, Pacific Marine Exposition, at the processors in the port where fishermen wait to get paid, blessing of the fleet events, NOAA events, coffee and donuts at marine supplier stores. The partners shared that a variety of *Promotion* approaches would be most effective, such as print copies to post in common gathering spots in ports, radio, word of mouth and social media. A wide variety of ideas were collected to inform the marketing materials. For example, some indicated using a fear-based approach is motivating, while others said to use humor. One common theme was having a trusted spokesperson (fishermen) with testimonials.

Fishermen surveys

A total of 98 completed surveys captured fishermen experiences with lifejackets. There were 17 completed over the phone, with an 11% response rate (17 completed with 152 attempts). Due to the low phone response rate, fishermen were approached in person at various events with 100% response rate and 81 completed surveys in 5 ports. Captains (44%) and males (79%) were the largest portion of responders. The age of the fishermen surveyed ranged from 21 to 67 years, and 52% reported starting to commercial fish before the age of 18. When asked if they wore a lifejacket on deck, 15% reported all of the time, 16% most of the time, 40% some of the time, and 25% none of the time. Most fishermen agreed it was important to wear a lifejacket/PFD (75%) and indicated

Table 2. Frequency of lifejacket use by reported primary fishery and gender.

Fishery Type	All of time	Most of time	Some of time	None of time
Salmon (<i>n</i> = 41)	6 (14.6%)	4 (9.8%)	9 (22%)	22 (53.7%)
Crab (<i>n</i> = 35)	7 (20%)	4 (11.4%)	18 (51.4%)	6 (17.1%)
Other fisheries (<i>n</i> = 22)	2 (9.1%)	7 (31.8%)	5 (22.7%)	8 (36.4%)
Gender				
Male (<i>n</i> = 76)	10 (13.2%)	13 (17.1%)	33 (43.4%)	19 (25%)
Female (<i>n</i> = 19)	5 (26.3%)	2 (10.5%)	6 (31.6%)	5 (26.3%)
not recorded (<i>n</i> = 3)		1 (33.3%)	1 (33.3%)	1 (33.3%)

Table 3. Ranking of lifejacket designs from highest to lowest with average (1 as most preferred; 7 as least preferred), wear proportion (yes), and positive and negative feedback themes identified.

Design	Average Rank	Wear Proportion (Yes)	Positive Feedback Themes	Negative Feedback Themes
Mustang Vest	2.53	82.9%	Comfort, low profile, freedom of movement	Durability concerns
Kent Rogue Vest	2.85	83.3%	Comfortable for long wear, good cushioning	Snag potential
Kent Classic Vest	3.37	65.2%	Warm, good flotation	Bulkiness
Mustang Floatcoat	4.00	73.9%	Good safety features	Bulk and weight
Hero T-Shirt	4.30	54.8%	Very low profile, easy wear	Durability questions
Stormline Bib Overalls	4.38	67.4%	Integrated protection	Too bulky
Spinlock Beltpack	4.84	47.8%	Minimal profile when worn	Snag risk, reliability concerns

interest in learning about new types of lifejackets (71%). Fishery-specific differences in lifejacket use were observed (Table 2). Crab fishermen showed higher rates of situational use (51% “some of the time”) and consistent use rates (all/most of the time combined – 31%). Notably, 54% of salmon fishermen reporting never wearing lifejackets/PFDs on deck. Gender differences were observed; in total there were 19 female fishers who completed the survey out of 95 respondents with recorded gender data. When combining consistent use (all/most of the time), 37% of female respondents wore lifejackets/PFDs regularly compared to 30% of male respondents. Female fishermen also demonstrated greater interest in safety innovations (not shown in table), with 84% expressing interest in learning about new lifejacket/PFD types compared to 71% of male respondents.

The common responses about ideal lifejacket features included: not too bulky, ability to be worn over or under layers, no entanglement hazards, “*movability*”, seaworthy zipper, on and off with ease, and waterproof. Different design specifics were reported for the different Pacific Northwest Fisheries, such as a preference for self-inflating PFDs like the belt type for halibut and black cod, and the collar type for salmon and lingcod. For crabs, fishermen preferred “*something warm and easy to move in*”. Inspiring quotes about using a lifejacket when

fishing included, “*Want to wear [a lifejacket] to be a better example to my daughter and grand-child*” and “*Even if you have [fished] your entire life and its nice [weather], if a line gets around your arm and the crab pot either comes out of the block or is launched, you will go over with it*”.

Ranking of lifejackets results

Table 3 provides a comprehensive summary of 56 commercial fishermen’s preferences for different lifejacket designs, highlighting key aspects like rank order, wear proportions, and feedback themes. Mustang Vest and Kent Rogue Vest stood out as the most preferred lifejackets, with high rankings and wear rates, reportedly largely due to their comfort and low bulkiness. The Kent Classic Vest and Mustang Floatcoat are also positively regarded and described by the rankers as having slightly more bulkiness or snag potential. The Friedman’s test (42.99, $p < .001$) was highly significant, suggesting strong evidence that fishermen preferences varied across the designs. The Proportional Odds Model results showed the Mustang Vest and Kent Rogue Vest had significantly negative coefficients (−2.047 and −2.620, respectively), suggesting they are generally more preferred than other options. Negative coefficients indicate a higher likelihood of favorable rankings.

Survey of fish observers

A total of 32 fish observers were contacted, and 22 observers responded to the survey for a 68.8% response rate. They had a range of experience with 10 having 1–2 years while 7 had more than 10 years of experience as a fishery observer. The majority (73%) had observed in Oregon, and many observed in multiple states including Alaska, Washington, and California, observing from 5 to 25 vessels per year. The responses regarding the frequency of vessels with at least one crew using a lifejacket ranged from 0% use to 80%, with the majority (90%) being below 50% use. When asked about the types of lifejackets observed, respondents did not mention specific models but reported seeing both inflatable and foam vests. Most (87%) reported the use of PFDs is situational, including nasty weather, setting or hauling gear, and rough waters. Of the observers, 39% said the trend of lifejacket use was increasing. While many observers (61%) said lifejacket use was not changing, 61% agreed that attitudes regarding lifejackets among fishermen have become more positive since they began observing. Most observers (83%) said they did not receive pushback from fishermen when they wore their own lifejacket on the vessels.

Discussion

By soliciting feedback on the various aspects of a lifejacket program from a variety of commercial fishing partners, we were able to tailor the FLIPP for Lifejacket program for the Pacific Northwest region. Feedback was collected systematically but distinctly in different settings and with different groups, which supported the success of obtaining relevant feedback.

Structured interviews with community partners connected us with key organizations capable of supporting lifejacket try-ons, education, and reduced-price distribution. We learned regional marine suppliers and lifejacket manufacturers were open to collaboration, eliminating the need to travel from port to port as with the Lifejacket for Lobstermen Program in Maine and Massachusetts. Instead, we could incorporate the FLIPP for Lifejacket program in port-based

training opportunities and community events. Since the marine suppliers and training opportunities are located in ports where fishermen already gather, the program can participate in events and use supply stores to distribute lifejackets after the event, once orders are placed. We also found strong interest and willingness to partner from fishermen advocacy and support organizations, which will support sustainability of the program and effort moving forward.

From the fishermen interviews and rankings, we learned there are a variety of lifejackets that would work with the fisheries in the Pacific Northwest. Fit, comfort, and ease of use were consistently emphasized, as were opportunities to put on lifejackets before purchasing. We also learned that commercial fishermen are considering wearing lifejackets more when they are fishing, and there is an opportunity for education about different and new models. From the results with the fish observers in the Pacific Northwest we learned while some fishermen wear lifejackets, not all do. Observers also noted a perceived increase in acceptability of lifejacket use over time, which is positive for the program.

The higher rates of both lifejacket use and interest in new safety equipment among female commercial fishermen who participated in our survey may indicate greater safety-conscious behaviors in this high-risk industry. Given that female participation in commercial fishing has been increasing in the Pacific Northwest, these findings suggest gender-specific messaging and outreach approaches may enhance the program effectiveness and engagement to learn more about the attitudes and behavior of the female fishers.

Our efforts with the PNW partner interviews, fishermen surveys, and lifejacket rankings build upon the previous efforts and research conducted by the Lifejackets for Lobstermen program,¹¹ but also other foundational research. A survey and analyses of predictors of lifejacket use conducted in 2013 in Alaska¹² showed difference by fishery in use and beliefs similar to the finding reported here. A social marketing intervention¹³ featuring Angus and the campaign, “Live to be salty”, demonstrated positive opinions and reported change in behavior of fishermen related to use of lifejackets. The FLIPP for Lifejackets Program has a regional

multi-media social marketing approach and was developed with authentic input and feedback from the fishermen and partners and will be evaluated as the program moves forward.

The conversations and connections established through these efforts were essential in creating opportunities for the program. Insights from this research directly informed the design of the FLIPP for Lifejackets Program. We made the appropriate connections with lifejacket manufacturers and distributors to ensure lifejackets could be made available at community and training events. The program provides education, a variety of lifejacket selections, and the opportunity for fishermen to try on the lifejackets during training events – such as drill conducting and first aid courses – as well as at community events like fishermen's appreciation days in various ports. In addition, the program collaborates with local marine supply stores, community-based organizations, and safety training organizations to provide lifejackets and support ongoing safety efforts.

While the multi-pronged approach (interviews, surveys and rankings) to inform the program was effective, a limitation to this research included convenience samples that may not represent all commercial fishermen in the region and across all fisheries, nor all fishery observers. In the co-creation of the approach to engage fishermen and pilot test the program with community partners, we refined our study materials which may limit the information we obtained but made the information relevant to the community.

We pilot tested the first FLIPP for Lifejackets Program in Newport, OR in November 2023. Partnering with the Newport Fishermen's Wives (Newport, Oregon), Englund Marine, and Kent, we distributed the popular Kent Rogue lifejackets at the Newport Fishermen's Appreciation Day and a USCG Drill Conductor course. There were 71 vessels and 175 fishermen that received a free Kent Rogue lifejacket, with an optional \$25 donation. The successful collaboration and interest from fishermen support our plans for continuing the program. The plans to implement the FLIPP for Lifejackets program are to (1) collaborate with fishing community partners and regional commercial fishing training opportunities to have program at events in Oregon and Washington where

fishermen gather, (2) cooperate with local community partners to identify funding sources, marine suppliers to have the product, and lifejacket manufacturers to have lifejacket at no cost to fishermen, (3) educate and have fishermen try on the lifejackets before selecting and receiving the lifejacket, and (4) market the program using strategic and relevant posters, social media and texting campaigns to promote lifejacket use.

Conclusion

Tailoring an evidence-based intervention requires active engagement and varied methods of feedback. The process should involve multiple methods to obtain feedback and sample a wide range of partners who interact or are part of the target population. These methods and results can support other regions in identifying their regional opportunities to increase lifejacket use and improve commercial fishing safety across the United States and beyond. Creating a safer commercial fishing industry can support regional workforce development and food supply.

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Author contributions

Dr. Laurel Kincl led efforts on the development of the research design in the Pacific Northwest of the US, data collection, data analysis, interpretation and drafted the

manuscript. Ms. Vaughan supported the participant recruitment, data collection, database management and review of manuscript. Ms. Chang supported the database management, data analysis, and review of the manuscript. Dr. Kasner supported data collection and critical review of manuscript. Dr. Milkovich supported the approach and tracking of the translation of the Lifejackets of Lobstermen program to the Pacific Northwest, and the critical review of the manuscript. Dr. Sorensen led the development of the research design at the Northeast Center for Occupational Health and Safety and critical review of the manuscript.

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