Wild Fish Conservancy
NORTHWEST
SCIENCE EDUCATION ADVOCACY

Comments on Washington Department of Fish and Wildlife State Environmental Protection Act Review of Cooke Aquaculture Proposal to Commercially Propagate and Harvest *Oncorhynchus mykiss* in Puget Sound net pens: SEPA #19056

Submitted 11/22/19

Drafted and Submitted by:

Wild Fish Conservancy

Kurt Beardslee, Executive Director

Overarching Comments:

In addition to and as explained by the detailed technical comments below, Wild Fish Conservancy provides these overarching comments to highlight that the State's mDNS and SEPA process is legally flawed in many respects, including but not limited the following:

- The State improperly relinquished its SEPA duties by delegating its primary responsibilities for evaluating the environmental impacts of Cooke's proposed net pens farms to Cooke. Cooke is clearly biased in favor of allowing its proposal, and all analysis and documents that Cooke or its consultants prepared are therefore unreliable.
- The net pens will have significant adverse impacts on the environment, and the State failed to prepare an environmental impact statement to fully consider and evaluate reasonably foreseeable consequences from these impacts. For example, and as detailed in these technical comments, escaped steelhead from the net pens will adversely affect wild salmonids by competing for food and forage space with native salmonids and by amplifying and transmitting diseases and parasites. The State did not fully consider this, instead relying on an outdated EIS and a paragraph from Cooke that incorrectly minimizes impacts on wild salmonids without citing any support for its assertion.
- A new EIS is required because there are significant adverse effects that are not addressed in the prior EIS and because there is substantial new information and changed circumstances. For example, the outdated EIS relied upon by the State addressed rearing of a different species—Atlantic salmon—and not the steelhead currently proposed for Puget Sound net pens and was prepared before the listing of various species in Puget Sound under the Endangered Species Act, including Puget Sound steelhead, Puget Sound Chinook, and the Southern Resident Killer Whale. Further, there is an abundance of new science informing the risks net pens pose to the environment since the 1990 EIS. The cursory additional information and analysis

is insufficient to update an entirely stale EIS. These comments detail some of the many ways the EIS and checklist fail to consider best available science that has come out in the last 30 years.

- The SEPA documents are neither complete nor accurate, failing to disclose many risks and harms associated with the net pens. Relatedly, the State failed to gather necessary additional information and failed to consider reasonably foreseeable consequences. For example, the State has not supplemented the decision documents with information from the recent Orchard Rocks incident. Regardless of whether the State considers the incident, the State has not provided the public with an evaluation of this incident and an opportunity to comment on the reasonably foreseeable risks posed by pen sinking.
- The State failed to disclose and consider all direct, indirect, and cumulative impacts of the net pens, and accordingly failed to provide an accurate and complete analysis.
- The State narrowed the project scope, improperly limiting its effects analysis and failing to consider many impacts posed by net pen farming in the State of Washington.
- The State failed to articulate and analyze updated objectives or purposes, making it impossible to consider and evaluate reasonable alternatives. The 1990 EIS articulates an objection/purpose of assisting in resolution of conflict by evaluating the environmental impacts of fish farms on the biological and build (human) impacts. This objective/purpose is clearly outdated and based on the political climate at the time. The update in Attachment D does not provide any updated objectives/purposes, but simply states a "proposed action" of permitting steelhead/rainbow farming. This failure to articulate objectives or a purpose makes it impossible for the public to understand what reasonable alternatives are available that the State failed to consider.
- The State failed to consider and evaluate reasonable, safer alternatives to raising the rainbow trout/steelhead at existing marine net pen sites in Puget Sound. For

example, the State should have considered an alternative requiring all salmon farms to be self-contained land-based facilities. As another example, the State should have considered an alternative regulation that restricts the number of steelhead/rainbow that may be farmed in the pens. These alternatives would significantly lessen the risks and impacts of salmon farming on the environment while still allowing Cooke to run a profitable salmon farming business.

- The no action alternative in the 1990 EIS is outdated and does not make sense because the "existing regulations and guidelines," as well as the laws of the State of Washington related to net pens, that would form the basis for a no action alternative have changed in the last 30 years.
- The State must prepare an EIS because of the significant negative environmental and health impacts from the net pens, examples of which are detailed in these comments.
- The mitigation measures included in the decision documents are unenforceable; fail to address all significant adverse impacts on the environment; will not reduce impacts to a nonsignificant level; and otherwise do not comply with SEPA.
- The regulatory agencies lack sufficient regulatory controls to allow the proposed action to go forward. As demonstrated by disease outbreaks—like the 2012 outbreak of IHNv and the PRV outbreaks—as well as equipment failure—like the 2019 Orchard Rocks incident and the collapse of Cypress Site 2 and its aftermath—the regulatory agencies are ill-equipped to mitigate any adverse impacts.

Under the State Environmental Protection Act (SEPA), this review requires a threshold determination of whether an action is likely to have a "significant adverse environmental impact." The State's current threshold determination of Mitigated Determination of Non-Significance (mDNS) is inadequate as an environmental review and fails to address many well-documented risks associated with farming salmonids in these exact pens. Industrial-scale, open-water finfish aquaculture poses significant environmental risks, and the transition from Atlantic salmon aquaculture to rainbow/steelhead trout aquaculture adds significant risks that cannot be adequately mitigated. The State has violated SEPA by not preparing a new Environmental Impact Statement (EIS). Below, we detail some but not all of the significant environmental impacts that compel a determination that this proposal poses significant adverse environmental impacts, and reasons why the mitigations proposed are not reasonably certain to address those risks. In evaluating the proposed actions, the State failed to properly consider all available alternatives, or the cumulative impacts of the many risks posed by this proposed action.

The State should withdraw the Mitigated Determination of Non-Significance (mDNS), issue a Determination of Significance, and draft an EIS to assess the full impacts of this transition. Furthermore, that EIS should incorporate into its no-action alternative the cessation of operation of the pens (and cessation of any environmental risk) after the legislative non-native aquaculture phaseout takes effect in 2022.

The public comment period was flawed

The initial 21-day comment period was too short to allow adequate public comment. That period was first extended by 10 days, and again by 21 days. These extensions were announced near the end of each comment period, meaning that commenters could not budget their time to conduct the depth of analysis and consideration that might have been possible had the comment period been announced at full length to begin with.

When first announced, the comment period ended before the deadline for a legislatively-mandated report from state agencies to the legislature regarding best practices on aquaculture licensing and practices. That report was mandated by HB 2957, the law which also phased out Atlantic salmon aquaculture and mandated stricter regulations of marine net pen aquaculture in general, and was supposed to be filed on November 1. The first extension of this comment period ended on that same day. Unfortunately, that report has still not been filed as we complete these comments, meaning the public has not been able to draw on the guidance of State agencies on how “to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife." Proceeding with review of this proposal before completing the mandated report to the legislature puts the cart before the horse, and makes it likely that the clear will of the legislature and voters will not be reflected in the State's response to Cooke's request.

Even with the extensions the State has granted, there is a great deal for the public to evaluate. The filing covers over 400 pages, including a lengthy bibliography that requires review and in some cases rebuttal, as well has hundreds of references within the text to review. In addition, it references and discusses material developed by two sources who are expert witnesses for Cooke Aquaculture currently preparing to testify in ongoing litigation regarding these net pens. Understanding their statements here requires consideration of expert testimony rebutting their claims from that ongoing litigation. Furthermore, the 1990 EIS (Environmental Impact Statement) on which the State is relying is woefully outdated, and addressing the environmental effects of this policy requires the public to integrate decades of new information regarding Puget Sound, wild salmonids and other native fish in the Sound, its endangered marine mammals, the physics of tides and currents and tsunamis in the Sound, and the effects of net pens and industrial finfish aquaculture on the Sound.

The submission includes a 76-page document authored by Cooke Aquaculture staff and contractors, which purports to serve as a supplement to the 1990 Programmatic EIS. This self-interested document cannot stand on its own as a supplement to the state's EIS, and the document largely omits discussion of the specific environmental impacts of the net pens on the threatened and endangered species under discussion, including effects on the conspecific Puget Sound steelhead which are listed as threatened under the Endangered Species Act.

That there is so much additional information accumulated in those intervening decades—including multiple new federal and state listings of endangered and threatened species, newly-designated critical habitat, and substantial new evidence of the effects and risks posed by open-water salmonid aquaculture in Puget Sound—is a strong argument of the need for the appropriate state agencies to conduct a full EIS. Washington Department of Fish and Wildlife (WDFW) is the appropriate agency that should write such a supplement, and in view of Cooke's active defense in litigation over its ESA and CWA violations and the considerable controversy surrounding Cooke Aquaculture in general, the proposal at issue in particular, and the widespread public consensus supporting the complete elimination of open net pen finfish aquaculture in Puget Sound, WDFW should provide a period for public comment on that EIS once it is issued. Allowing the petitioner to write its own supplement to the 1990 Programmatic EIS rather than having the state to perform its own due diligence and impartial analysis, and offer the public the statutory amount of time for comment, represents a dangerous end run around key environmental protections.

During the comment period, new information became available that the public deserves an opportunity to understand and comment on. This includes the partial sinking of a net pen at the Orchard Rocks site, and Cooke Aquaculture's efforts to intimidate Wild Fish Conservancy and prevent us, our members, and our partners in the Our Sound, Our Salmon coalition from exercising First Amendment rights to comment on this matter of public interest.

Orchard Rocks, 2019

In the 2019 Orchard Rocks incident, neighbors on shore observed the pen sinking as early as October 15, and reported their concerns to Cooke. Initially, Cooke staff told these neighbors that the apparent sinking was simply a result of normal tidal movement, and neighbors observed no repairs and it appeared that the pen was operating as if nothing was wrong. On October 18, the corner of the pen was fully under water, and emails obtained through public records requests indicate that the initial emergency alert came not from Cooke's personnel, but from state employees visiting family near the pens during their off-hours. In response to these calls from WDFW staff, coordinating with staff at the Department of Natural Resources, the US Coast Guard mounted an emergency response and created a security cordon, while Cooke and DNR divers surveyed the damage and began repairs. According to a DNR spokesperson, fish could have escaped had the sinking pen been stocked at the time.

Emails obtained through public records requests show that state regulators did not feel Cooke followed the emergency protocols that they had agreed to through previous permits. It is unclear why it took several days to begin repairs, or whether Cooke staff intentionally misled concerned members of the public during that delay. It appears that the public and agency staff initiated the emergency response, not Cooke or its staff. The public and state agencies cannot adequately evaluate Cooke's emergency response—a central component of the risk mitigation proposed in the mDNS—without clarity on those matters, and a clearer understanding of Cooke's monitoring and preventative maintenance. In emails obtained through public records requests, state agencies appear to be planning an internal investigation of this incident, and our records request remains open. Estimated times to complete the records search extend beyond the end of this comment period. As we complete these comments, no results have been announced from the agencies' investigation of this incident.

Silencing public comment

On October 3, 2019, less than two full days after the public comment period began and the day after Wild Fish Conservancy issued a press release informing the press and public about this comment period, Cooke Aquaculture issued a "cease and desist" notice to WFC. This letter instructed WFC (a group that convened and coordinates the Our Sound, Our Salmon coalition) to "cease and desist" from expressing opinions about the risks posed by Cooke's net pens in Puget Sound, opinions derived in part from and citing an engineering report prepared and submitted as part of ongoing litigation. Cooke's letter warned "If these statements result in delay in issuance of those permits…Cooke will seek recovery of damages against WFC and [WFC executive director] Mr. Beardslee personally, in addition to injunctive relief."

Describing evidence and opinions derived from that evidence, especially as part of a petition to a government agency for redress of grievances, is the epitome of First Amendment-protected free speech. The First Amendment protects the rights of citizens to make such fair comment on matters of public interest and public controversy. Washington State is one of the first states to legislatively shield reports like this from threats like Cooke's, declaring in 1989:

"The legislature finds that the threat of a civil action for damages can act as a deterrent to citizens who wish to report information to federal, state, or local agencies" (RCW 4.24.500).

Cooke's letter to WFC, and any similar letters sent to members of Our Sound, Our Salmon and other individuals or advocacy groups, may have chilled or otherwise limited the public's participation in this important process. To correct any such chilling effect, the State should take measures to ensure that the public should feel no barrier to making their opinions heard. This might include asking the Attorney General to review existing laws and regulations to ensure that the State's anti-SLAPP laws are sufficient to protect the integrity of the public comment process, and to investigate this incident and its harm to the integrity of the State's public comment process.

Effects of escaped steelhead on wild steelhead genetics

The mitigated Determination of Non-Significance (mDNS) rightly treats the possibility of escape, both small- and large-scale, as a real and serious threat that must be addressed before planting fish in the net pens. Escaped fish pose a range of risks to endangered wild salmonids, and to the ecology of Puget Sound and its watersheds. The recovery efforts following the 2017 collapse demonstrated inadequacies of the existing escape plan even for non-native species (see comments below regarding inadequacies of the escape plan in the mDNS).

As DFW notes in the mDNS and their exchanges with Cooke in Attachment B, under this proposal, an escape on the scale of 2017 would have released a number of fertile female steelhead that "would have exceeded the number of wild steelhead returning to spawn in many rivers in Puget Sound." DFW's exchange with Cooke states that the use of eggs treated to induce triploid sterility "would reduce, but not eliminate the risk."

We note in the section on failure of triploidy-induction below that monitoring of escapes of farmed Atlantic salmon in Norway (where the salmon are farmed in regions with wild conspecifics) demonstrates that escaped farmed salmonids do survive and feed and grow in marine feeding areas at rates similar to wild Atlantic salmon, and survive to mature and return to Norwegian rivers to interbreed in significant numbers with wild Atlantic salmon, with known adverse population level impacts to the affected wild populations (Disreud et al. 2019, Glover et al. 2019, Karlsson et al. 2016, Skilbrei et al. 2015). Importantly, Cooke's existing net pen sites are less than 20 kilometers (12.5 miles) by water from important wild steelhead rivers, including: the Elwha, Dungeness, Samish, Skagit, Stillaguamish, Cedar, and Green rivers (Map).

Table 1 shows the average wild steelhead population abundances in rivers nearest to the existing net pen facilities. State guidelines generally regard the risk of genetic harm as too high when wild fish are less than 95% of the spawners in a stream (5% hatchery-origin). Science would argue for a much lower threshold than 5% when the hatchery fish are as significantly domesticated as those proposed to be used by Cooke. Simulations of escape and survival scenarios (Appendix) indicate high likelihood that an escape on the scale of Cypress 2017 could cause the proportion of fertile farmed rainbow/steelhead trout spawning in streams to exceed 5%, or in some scenarios could exceed the entire wild population in streams.

A full understanding of the genetic risks posed would require more detailed information on the genotypes of the broodstock for the farmed salmon, and reportedly the egg supplier will not supply those data. While WDFW officials have offered assurances that they would require such information before authorizing a finfish transfer permit, the mDNS does not specify what standards would be applied in such a review. WAC 197-11-080 requires a worst case analysis and a discussion of the likelihood of that worst case. Rather a worst case scenario, the mDNS discussion adds a scenario that is less of a worst case than the proposal offered by Cooke.

In 2018, WDFW's fish health specialist—Dr. Ken Warheit—testified before the state legislature that raising native fish in these pens would actually represent "a greater risk to the state's native wild and hatchery salmonid populations, than is Atlantic salmon marine aquaculture." That risk should be considered through a full EIS.

Effects of escaped steelhead on wild salmonids' prey and habitat

The escape of rainbow/steelhead from any of the Puget Sound aquaculture facilities, whether from small scale leakage or catastrophic facility failure, will pose risks to native salmonids rearing in nearshore marine habitats and rivers due to competition for food and foraging space.

This will be particularly true in the case of triploid individuals because, as noted in the SEPA checklist, they will have appetites that are likely to be considerably greater than rearing wild juvenile salmon and steelhead due to the faster inherent growth rate of these triploid fish.

Diploid individuals that result from the failure of triploid induction will pose a significant risk of becoming sexually mature and interbreeding and/or competing with native rainbow and steelhead on the spawning grounds of native fish. The effects of recurrent, annual low level escapes on wild Atlantic salmon Norway is well documented, and similar impacts on native rainbow and steelhead in Puget Sound are to be expected (Diserud et al. 2019, Glover et al. 2019). Research in escapes of farmed Norwegian Atlantic salmon has also shown that escaped salmon survive to rear in the ocean for one or two years and return as mature fish to spawn in rivers of wild salmon (Olsen et al 2013, Karlson et al. 2016). Further, analysis of monitoring of escapes of farmed Atlantic salmon in Norway has shown that the actual number of escaped farmed salmon is two to four times greater than the officially reported annual number of escapes (Diserud et al. 2019, Skilbei et al. 2015). Of course, these potential risks will be greater the greater the magnitude of an escape and the greater the frequency of small-scale leakage events. But, as is the case for wild Atlantic salmon in Norway and the north Atlantic in general, the risks posed by low level escapes can not be discounted.

A full EIS would allow for updated analyses that incorporate this and other new research on the effects of salmonid aquaculture, rather than relying on the prospective analysis conducted nearly 30 years ago, in 1990.

Effects of escaped steelhead on wild salmonids' predators

Various operations at the net pens can attract threatened, endangered, and otherwise protected predator species to the vicinity, creating risks that those birds and mammals would be harassed, experience ship strikes, or become dangerously accustomed to human proximity. The process of feeding farmed rainbow/steelhead trout attracts juvenile and adult wild fish (including ESA-listed salmonids), which in turn aggregates predator species. Predators will also be attracted by the outflow of shed skin and other parts from the penned rainbow/steelhead, and could be exposed to diseases and parasites through that proximity. The harvest process results in the release of bycatch fish, blood, and other fish parts from harvested fish, which has been shown to attract marine mammals to close proximity to the pens and boats (as in this video: https://drive.google.com/file/d/1TWXLMTcdG4s4QEvd3BM65-GpD1IEdaRJ/view?usp=sharing). A comprehensive EIS should examine the risks to these protected species from raising steelhead/rainbow trout in these net pens, and develop appropriate mitigation measures in consultation with federal, tribal, and international co-managers.

Farmed steelhead diseases could harm wild salmonids

Raising native salmonid species, and rainbow/steelhead trout in particular, in open Puget Sound net pens likely increases the risk of disease transmission from farmed to wild native salmonids and other fish species. Rainbow/steelhead trout are susceptible to native, endemic, Pacific salmon viruses, bacteria and parasites as well as non-native, introduced pathogens including piscene orthoreovirus (PRV). Rainbow/steelhead trout are vulnerable to a deadly form of infectious hematopoietic necrosis virus that can spread to and kill wild steelhead. While vaccination and state monitoring can limit this risk, it remains a greater risk than existed with Atlantic salmon.

The experience from a 2012 outbreak of the Atlantic salmon-specific strain of IHN indicates the danger of an outbreak in farmed rainbow/steelhead trout. While response plans call for rapid culling of infected fish to prevent the spread of disease, in 2012 the culling dragged on for months, with the Northwest Indian Fisheries Commission's fish health specialist noting the pen owner "reported increased mortalities starting in April. We now are at end of May and infected fish are still in those pens shedding virus." (https://nwifc.org/ihn-virus-detected-in-atlantic-salmon-farm-near-bainbridge-island/) The effect of such a delay if farmed rainbow/steelhead trout were infected with the strain shared with wild steelhead would be catastrophic.

Concentrated populations raised in what are effectively aquatic animal feedlots, face greater risk of disease, parasitic, and viral amplification than free-ranging, especially wild, populations. When viral, bacterial, fungal, or parasitic diseases break out in net pens, the disease-causing organisms are rapidly amplified in number and leaked to the surrounding aquatic environment in large numbers. Because their conspecifics (and other salmonids of concern, including coho salmon, ESA-listed Chinook salmon and bull trout and as required by WAC 197-11-080) will be swimming in close proximity to the pens, there is likely to be a spread of disease to endangered wild steelhead and other salmonids. In 2017, a B.C. study documented a strong correlational connection between disease prevalence in net pens and disease transfer to wild fish populations (Morton et al., 2017). Recent research in British Columbia found novel viruses in endangered salmon, and found evidence that these novel viral infections may originate from farmed salmonids (Mordecai et al., 2019).

As with terrestrial feedlots, the diseases that spread in and from net pens are likely to include the spread of antibiotic- and fungicide-resistant pathogens to wild steelhead and hatchery steelhead, which poses additional risk to hatcheries and the humans and wild species that feed on steelhead and other Puget Sound salmonids (discussed further below, along with other risks of pollution from net pens). As the *Seattle Times* reported in October: "The risk is low, but consequences could be severe." (https://www.seattletimes.com/seattle-news/environment/cooke-aquaculture-seeks-to-farm-native-steelhead-in-puget-sound-after-2017-atlantic-salmon-escape/)

A comprehensive EIS should examine the risks to these protected species from raising biologically-engineered steelhead/rainbow trout in these net pens, and develop appropriate mitigation measures in consultation with federal, tribal, and international co-managers. That analysis should include an assessment of disease transmission to predator species, as well as the effects of these diseases on wild fish, and the potential for transmission of resistant strains to hatcheries.

Fertility of steelhead eggs treated for triploid sterility

The mDNS Summary (and Attachment A to Cooke's SEPA checklist) notes that the induction of triploidy in fertilized eggs at Cooke's hatcheries is imperfect. The likely adverse effects on native rainbow and steelhead from the escape of fertile aquaculture rainbow highlights the importance of providing firm risk-averse quantitative criteria and associated procedures regarding the estimation of the rate of triploid failure in each lot of eggs intended for production of smolts for outplanting to Cooke's marine net pen facilities. WDFW's Summary notes some concerns with the procedure Cooke employs to estimate the triploidy failure rate ("failure rate", Cf. Attachment B, Cooke's response to WDFW question C2, pp. B-25,26). We believe WDFW's concerns are valid but that their recommendations do not go far enough to adequately reduce the risk posed by the presence of diploid (fertile) rainbow/steelhead in net pens in Puget Sound.

First, we note that the assertion by Cooke on page B-25 that the results of sampling to test triploid induction presented in Attachment A "are additive" is erroneous. The data in Appendix A show results from samples of 60 to 100 fertilized eggs from 36 separate lots sampled between 2013 and 2018. These samples can legitimately be pooled only if all 36 samples were obtained from a single lot (cohort) of eggs. This is clearly not the case. Further, Attachment A contains no data on the total number of eggs in each lot from which each sample was obtained. This missing information is critical to determining the adequacy of the sample sizes for estimating the triploid failure rate of each lot.

A Bayesian assessment of the data in Attachment A (modeling 36 separate draws of the same sizes observed, drawn from a hypergeometric distribution with unknown rate of diploidy) provides a 95% Highest Posterior Density Interval for the rate of diploidy of 0.06%-0.35%, and an 80% HPDI of 0.09%-0.28%. A worst case assessment as required by WAC 197-11-080 should consider not just the average triploidy rate in these samples, but the likely range of scenarios, and should attempt to cap the risk.

We recommend an alternative approach described in the following. The details in the approach we suggest also illustrate a robust general approach to risk assessment, particular in contexts of endangered species.

There are two basic issues in regard to the risk posed by the failure of triploid induction:

1. the failure rate itself (i.e., how many diploids will be reared and released into each net pen per batch of fertilized eggs in the hatchery that have been subjected to the triploid-induction treatment)?
2. The total number of diploids in a pen that would escape either via low level leakage or catastrophic failure.

The first (failure rate) in conjunction with the size (number) of fertile eggs subjected to the triploidy-induction procedure is relevant to determining the minimum sample size of eggs from each lot that should be tested for triploid failure in order to assure an appropriate low risk of diploids being released into the pens. The second determines the probability or likelihood that escapes – especially under conditions of a catastrophic failure – would survive in sufficient numbers to pose a significant threat to wild rainbow or steelhead. Here, we assume that 'significant threat' is one that would amount to a take of a threatened or endangered salmon, steelhead, and bull trout under the ESA. Determination of this number, therefore, requires an appropriate determination by National Marine Fisheries Service (NMFS) and issuance from NMFS of an appropriate Endangered Species Act (ESA) Incidental Take Statement (ITS).

Determining a risk-averse failure rate (issue 1) is dependent on determining the risk-averse probability that escapes under a catastrophic failure of a net pen would pose a 'significant threat' to ESA-listed salmonids from surviving escaped diploid rainbow/steelhead. This, in turn, requires, a determination of the maximum allowable number of diploids per total number of individuals out-planted to each farm facility. We follow WDFW in expressing this number per-million eggs tested.

On page 6 of the Summary, WDFW conducts a rough illustrative exercise estimating the numbers of diploids surviving to potentially interact with wild rainbow or steelhead on the spawning grounds. WDFW provides a lower estimate of 63 mature diploid fertile fish from a catastrophic escape from a pen initially planted with 1,000,000 smolts, given a variety of assumptions about intermediate rates leading from the initial escape to the presence of surviving diploids on the spawning grounds. WDFW calculates that there would be a total of 63 such fertile escaped rainbow/steelhead, under a presumed "low survival" scenario and 316 under a "high survival" scenario.

In order to be very risk-averse (in keeping with the high priority placed on protecting ESA-listed salmon, steelhead, and bull trout), suppose we adopt a maximum of 50 fertile diploid escapees from a total net pen failure of 1,000,000 rainbow/steelhead. Under the assumptions of the WDFW "low survival" scenario 1,000,000 rainbow/steelhead net pen rearing primarily sterile triploid fish would have to consist of a maximum of 1560 fish in which triploid-induction had failed (Table 2). 1560 escaped diploids would result in no more than 50 surviving with the potential to reach the spawning grounds of wild steelhead or rainbow, given the assumptions used in WDFW's low-estimate scenario, which we adopt here for the sake of illustration.

In a total population of 1,000,000, 1560 diploids yields a point estimate of the triploid-induction failure rate of 0.00156. To be risk-averse with respect to ESA-listed fish, we argue that the number of fertilized eggs post-triploidy induction sampled and tested for triploid failure should be large enough to assure a probability of 0.95 (95%) or greater that the total number of diploids in the lot of 1,000,000 eggs is no greater than 1560. This requires a sample of approximately 3000 randomly selected eggs (per million eggs). The standard would require a random sample of at least 3000 be tested from each lot of one million fertilized eggs (or hatched fry) and result in no more than 1 triploid failure (figures 1 & 2). A lower-cost alternative protocol with the same effect would be to test consecutive lots of 100 eggs from each batch of 1,000,000 fertilized eggs, and to continue testing lots until either one or more diploids is detected from the current lot or until a total of 3500 eggs has been tested and no more than one diploid has been found. The occurrence of one (or more) diploid eggs in a total number of eggs fewer than 3500 would result in a distribution of the total number of diploids in the one million egg lot being tested in which the 95th percentile of the cumulative probability distribution exceeds the critical value of 1560.

It is also of interest that if the total of 2950 samples tested for failure of triploid induction (diploidy) listed in Attachment A of Cooke's SEPA Checklist, of which 5 diploids were found, were obtained from a single lot of 1,000,000 fertile eggs, the mean number of diploid in the entire lot of 1,000,000 eggs would be more than 2000, the median number would be 1900, and there would be a probability of just over 5% that the true number was greater than 3500 (Figure 2). Each of these quantities is clearly greater than the hypothetical maximum of 1560 described above.

In summary, the risk standard should be stated as a high probability that the outcome of a specified quantitative sampling protocol not exceed a specified quantitative upper bound judged sufficient to assure that an adverse outcome of management concern will not occur. Here, the quantitative upper bound is the number of triploid failures per 3000 random samples tested (here 1), which corresponds to a corresponding high probability that no more than some total number of triploid failures (here 1560) occur per batch of million fertile eggs or fry sampled. The latter maximum number (1560) is in turn derived from an appropriate estimation of the distributions of the quantities (parameters) required to estimate (with appropriately high probability) the total number of fertile escaped diploid farmed rainbow/steelhead that would survive following a catastrophic net pen failure, where the total number of surviving fertile escaped diploids is itself determined on the basis a similar assessment of the risk posed to ESA-listed steelhead by the presence of escaped diploid farmed rainbow/steelhead on the spawning grounds of wild steelhead. The determination of such a risk standard requires that full probability distributions of the relevant quantities of interest be calculated (estimated) so that risk-averse probabilities of attainment of a risk-averse standard can be specified as a probability from the relevant tails of the distributions. Picking a point estimate, such as the mean of a sample, as in the WDFW summary (picking the mean triploidy-failure rate of 0.0017 (0.17%) from Cooke's sampling data (Attachment A to Cooke's SEPA checklist) is inappropriate and very likely to be insufficiently risk averse.

This analysis is necessarily limited given the short comment window. The State must develop and "document…its worst case analysis and the likelihood of occurrence" as required by WAC 197-11-080. A fuller analysis of the genetic risks posed by escaped non-triploid rainbow/steelhead, and measures that might mitigate those risks, would be possible with a longer comment period, and should properly be undertaken as part of a comprehensive EIS.

The proposed escape recovery plan is clearly insufficient

It appears that Cooke's recovery plans are no different from the ones employed to address the catastrophic 2017 net pen failure and escape at Cypress Island. In Appendix B, they state:

> Upon receiving authorization from WDFW, the company will commence recovery of escaped fish through one or more of the following actions: (1) use of company skiffs and seine nets; (2) contacting the Northwest Indians Fishery Commission and nearby tribal Natural Resource managers to help facilitate the recapture of escaped fish; (3) contacting and engaging the services of local commercial fishing boat operators to facilitate the recapture escaped fish.

This approach was inadequate in 2017, resulting in substantial unrecovered escapees. It is far less adequate for this proposal. Here, the escaped fish may school with threatened wild salmonids and conspecifics. While non-specialists might reasonably have been expected to make quick distinctions between a recovered Atlantic salmon and a wild salmonid, those distinctions will be much harder in this case. A captured steelhead might be a threatened wild steelhead that must be immediately released, or a hatchery-raised steelhead subject to catch limits, or a farm-raised steelhead that must be retained. This distinction may be difficult for non-specialists to make under emergency conditions. As a result, escapees are likely to be harder to recover than were Atlantic salmon.

A recent comprehensive review of efforts to recapture escaped fish from marine aquaculture (including open net pen farmed Atlantic salmon and rainbow trout) demonstrates that such efforts are largely unsuccessful (Dempster et al. 2018). This review casts considerable doubt that escaped farmed salmon and steelhead that escape during either persistent low-level "leakage" or less frequent catastrophic failures such as the one that occurred at Cypress Island in August 2017 cannot be recaptured in ecologically significant numbers.

In passing HB 2957, the state legislature tasked state agencies "to eliminate commercial marine net pen escapement." Using the same escape plan that failed dramatically in 2017 does not fulfill that statutory language, or the high standard that the legislature and the people of Washington demanded of the marine aquaculture industry. WAC 197-11-080 requires an analysis of the worst case scenario and its likelihood, which are not adequately discussed.

A full EIS would allow WDFW and other agencies and co-managers to consider a range of alternatives to better mitigate this risk.

The "no-recovery" option for escapes as an unmitigated environmental risk requiring SEPA review

SEPA review requires a threshold determination of whether an action is likely to have a "significant adverse environmental impact." As the Department of Ecology SEPA FAQ notes, "An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe." The FAQ explains further that an agency may issue a "mitigated DNS in lieu of preparing an EIS when there is assurance that specific enforceable mitigation will successfully reduce impacts to a nonsignificant level."

In this case, one of the forms of mitigation required by the DNS seems to acknowledge that there are risks that cannot reduce impacts to a nonsignificant level. Regarding escape recovery plans, including scenarios for recovery after a catastrophic failure of the pens, the mDNS states:

It is conceivable that an attempt to recover fish after an escape event may negatively affect native Pacific salmonids more than no attempt to recover fish. Cooke is required to work with WDFW, Ecology, and DNR to include a no-recovery option in the 2020 Fish Escape Prevention, Response, and Reporting Plan, to be finalized December 2019. This option should include when, where, and under what conditions a recovery effort should not be attempted. A no-recovery option would be triggered by the state, in consultation with co-managers and federal agencies for the purpose of protecting native Pacific salmonids. A no-recovery option can be triggered by Cooke if the attempted recovery would put the health and safety of its employees at risk.

This scenario exceeds the scope of an mDNS and demonstrates the need for a finding of significance and an environmental impact statement.

The mDNS rightly treats the possibility of escape as a real and serious threat that must be addressed before planting fish in the net pens. Escaped fish pose a range of risks to endangered wild salmonids, and to the ecology of Puget Sound and its watersheds. The recovery efforts following the 2017 collapse demonstrated inadequacies of the existing escape plan even for non-native species. As DFW notes in the mDNS and their exchanges with Cooke in Attachment B, an escape on the scale of 2017 would have released a number of fertile female steelhead that "would have exceeded the number of wild steelhead returning to spawn in many rivers in Puget Sound." DFW's exchange with Cooke states that the use of eggs treated to induce triploid sterility "would reduce, but not eliminate the risk."

To mitigate that risk, DFW requires Cooke to prepare an escape recovery plan. That escape recover plan itself could pose environmental risks. DFW recognizes that significant risk and imposes a further mitigation, one in which no recovery is attempted. This option could be triggered by the state in consultation with federal and tribal partners, but also can be triggered by Cooke based on its assessment of risk to its crew.

This creates a risk that there would be no mitigating effort taken to address the adverse environmental impacts of an escape. DFW's own arguments in the mDNS lead to the conclusion that this impact cannot be mitigated, and that it is inappropriate to proceed with a mitigated Determination of Non-Significance. To assess the risks of this projects requires a full EIS.

The pens' structure is likely to be unsafe for prevailing conditions in Puget Sound

The joint DFW/DOE/DNR investigation of the Cypress Island net pen collapse of 2017 identified failures of maintenance and engineering which resulted in the collapse of that ten-cage net pen and the release of hundreds of thousands of farmed fish. In the course of ongoing litigation resulting from that collapse, Wild Fish Conservancy contracted an independent marine engineer to provide expert testimony evaluating the collapsed pen and assessing the risks posed by the surviving pens.

Like the state's own investigation, Dr. Tobias Dewhurst's assessment found evidence that the net pen had not been adequately cleaned, and that there had been a persistent failure to confirm the soundness of the pens and their anchoring systems, despite those cleanings and inspections being required by permits and industry best practices prevailing before 2017. In addition, Dr. Dewhurst compared manufacturers' ratings for the surviving pens with conditions at the sites where they are currently deployed, and found "conditions at each of its eight sites exceeded the maximum rated conditions specified by the net pen manufacturer. Based on Cooke's documentation that I have reviewed to date, these issues persist at many of the remaining net pen sites. Thus, the remaining net pen systems may be at risk of partial or catastrophic failure during instances of extreme environmental loading, which could result in fish escapement."

He concluded: "As a result of excessive loads on the net pen system created by:

- currents and net sizes exceeding those specified by the net pen manufacturer,
- biofouling levels potentially exceeding design values, and
- mooring system installations that deviate from manufacturer recommendations and were not approved by a marine engineer, pens and cages operated by Cooke were at risk of complete failure. One pen, Cypress Site 2, did experience a catastrophic failure."

DFW and its partner agencies should not regard it as sufficient mitigation of risk to permit these pens to transition to rainbow trout/steelhead without new engineering plans in place. The current mitigation proposal would allow these pens to operate without "engineered mooring and anchoring plans and site-specific engineered drawings stamped by a structural engineer" until 2021, and would allow them to operate without a third-party inspection for periods as long as two years.

Given the history of these net pens, the consequences of the mismatch between their manufacturers' ratings and conditions in Puget Sound, and the inadequate maintenance and inspection preceding the 2017 collapse, these pens should be required to have adequately-engineered structures before transitioning to rainbow trout/steelhead. The engineering plans should be incorporated into a full EIS, allowing independent engineers to review the plans and assess the risks posed by the re-engineered pens and anchoring systems. The analysis should incorporate worst case scenarios and their likelihood, as required by WAC 197-11-080. Without that information, how can DFW and its partner agencies, or the voting public and elected leaders who reacted with outrage to the 2017 collapse, assess the risk and sufficiency of this current proposal?

The pens' structure is unsafe for foreseeable conditions in Puget Sound

Puget Sound is a seismically active area, with structures facing threats of significant damage from shaking in an earthquake, and from tsunamis caused by local earthquakes and those traveling from more distant quakes up and down the coast. A substantial tsunami is likely to occur during the life of these pens, and much state policy has been directed in recent years to make high-risk structures safe from seismic risks. While the exact time of such a tsunami is not predictable, there is a substantial likelihood of such a tsunami in the foreseeable future, and much attention and policymaking effort has been dedicated to incorporating that risk into planning.

Unlikely as that risk might be, it is necessary to consider here because, as noted in the Depart of Ecology SEPA FAQ: “An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe.” Since there is evidence that the net pens are already operating at or past their engineered limits, and since the people of Washington State have seen the tremendous harm done when these pens fail, understanding low-probability/high-risk events that threaten further collapses is critical in addressing the pens’ full environmental impact.

Modeling by Washington’s Department of Natural Resources and NOAA recently examined consequences of tsunamis for Puget Sound. Tsunami waves in some ways simply amplify the existing concerns about the structural soundness of the net pens, and add to the likelihood of a partial or complete collapse of one or more pens already considered as part of Dr. Dewhurst’s engineering study. The forces generated by tsunami waves may differ in more than just intensity from routine tidal flow, in part due to the intense oscillation and the rebound of waves off of nearby shores. This risk deserves additional concern and scrutiny as part of a comprehensive EIS. A full-blown analysis of these forces is impractical given the limited time available for public comment.

To help understand the consequences of tsunamis, we requested simulated wave amplitudes and current velocities for the net pen sites. The DNR/NOAA simulations show significant added risk to all of the sites in the event of a tsunami within Puget Sound. The Fort Ward and Clam Bay sites see modeled wave heights nearly 20 feet high, as does the Port Angeles site, while the Cypress Island sites would face a wave over 10 feet high. The Skagit Bay site and Fort Ward site would face variable currents, with current speeds as high as 14 knots and rapid changes in direction and intensity. This oscillation in the course of a tsunami seems likely to generate forces outside those in normal engineering assumptions, and call for further consideration of anchoring systems and structural integrity.

There is no reason that a seismic catastrophe should be allowed to place Puget Sound's wildlife at needless risk due to inadequate planning and preparation. WAC 197-11-080 requires a consideration of worst case scenarios, and state law requires other facilities, such as hazardous waste storage sites, to be evaluated for seismic risks. These aquaculture net pens should be subjected to a full EIS that includes consideration of the seismic risks that they uniquely face as semi-permanent, in-water structures containing farmed fish whose escape would cause significant environmental risks.

Water withdrawal and discharge into Puget Sound

The SEPA checklist states "No surface water withdrawals or diversions are required to implement the species change proposal, or to continue operations at existing floating net pen facilities." This is incorrect, since routine operations—including harvest—entail drawing water out of the pens, extracting the fish on board the harvest ship, and then allowing the water to flow back into the Sound after sluicing across the ship. This process adds pollutants including fish blood, damaged fish parts, and injured bycatch fish to the water before it returns to the Sound. A full EIS would consider the environmental impacts of that removal and addition of water to the Sound.

Pollution from the pens would be harmful to the plants and animals in nearby waters, including to endangered and threatened species

Open water net pens raising salmonids routinely disperse large volumes of feed into public waters within the boundaries of the net pens as sustenance for their farmed fish. Some portion of the feed dispersed may not be consumed by fish in the pens, and thus makes its way into, and have an impact upon, the surrounding marine environment. The high-energy tidal zones in which these net pens are located may cause wide dispersal of unconsumed feed. This dispersal of feed into public waters represents a continuous and constant act of “chumming,” and attracts native fish species into or near the pens.

Physically small fish species, such as baitfish species and out-migrating and rearing salmonids (including ESA-listed Chinook and steelhead), may be attracted by net pen feed to the point where they physically enter a net pen facility and are vulnerable to predation from farmed rainbow trout/steelhead in the pens. The constant dispersal of feed may also cause disruptions in the natural migratory patterns of native salmonids, as the pens provide a constant and unnatural food source that may cause salmonids to occupy a single location for a longer period of time than is typical, and deter rearing or migrating salmonids from developing key feeding strategies which are critical to their early growth and development. This constant source of broadcast feeding, otherwise known as “chumming” is also likely to draw native species (including ESA-listed Chinook and steelhead) from their protective shallow nearshore habitats to net pen locations located in deep water, increasing their exposure to both avian and aquatic predators within and outside the pens.

Additionally, feed dispersed by these rainbow trout/steelhead net pens may have detrimental nutritional impacts on native fish species, as fish competing for survival in the wild may have distinct nutritional requirements from those being grown in an isolated facility.

In order to treat specific diseases or fungal occurrences, or to prevent infection, chemicals and pharmaceuticals are often applied by the industry to the fish, water, or feed in the net pens. Among the potential and likely harmful impacts to designated uses of surrounding water is the use of these chemical or pharmaceuticals for treating infections, parasites or diseases where the U.S. Food and Drug Administration (FDA) requires a waiting period before treated fish may be approved for human consumption. Native fishes in the immediate vicinity of the treated pens may also be exposed to or consume the very same chemicals and pharmaceutical treatments (including fish that may enter the pens attracted by the presence of feed and fish odors). These fish may then be caught in recreational or commercial fisheries and unknowingly be consumed by the public within FDA's required waiting period. A full EIS would assess the risks posed to wild fish and their human and non-human consumers by outflows of food or medicine, and from exposures of native fish entering the pens.

An additional concern with antibiotic-treated feed and treatments to fish or water is the facilitation of the development of antibacterial resistant bacteria in the sediments (Heuer et al 2009, Cabello et al. 2013, Hu 2019). This issue needs to be explicitly addressed, including the provision of data pertaining to any monitoring of the sediments below each of the extant net pens in Puget Sound that may be available, if any.

In the SEPA checklist, Cooke refers in passing to the use of unspecified probiotics in net pens. These unspecified introduced microbes are likely to colonize the microbiome of native fish and the environment near net pens. Given the growing scientific appreciation of the role of the microbiome in health and development of fish and other animals and plants, this practice deserves greater scrutiny than is practical in the limited comment period available.

The pens are also subject to, and possibly causes of, lethal algal blooms. On November 15, marine aquaculture net pens in Clayoquot Bay began seeing die-offs due to a bloom of diatomaceous algae (https://thetyee.ca/News/2019/11/20/Algal-Blooms-Tofino/). The concentration of fecal material, excess food, and fish flesh near pens may exacerbate these blooms, and the resulting fish deaths then produce additional pollution as they cannot be extracted from the nets quickly enough. Observers near the recent die-offs report that the waters near the pens turned "a dark brown muddy river-like colour," due to the rotting flesh.

These die-offs are likely to be more frequent in the future, since reporters observe these algae and their large blooms "have expanded their range and frequency as climate change has warmed, acidified and robbed coastal waters of normal oxygen levels." As discussed below, the inability to quickly empty the pens in the event of massive deaths or a disease outbreak poses significant risks to Puget Sound at large. One such risk is that the weight of the dead fish itself can add stresses to the pens' structure, making a collapse more likely during those emergency operations, and when the contents of the pens pose the greatest risk to the environment.

In passing HB 2957, the state legislature tasked state agencies "to eliminate negative impacts to water quality and native fish, shellfish, and wildlife." Allowing these pens to continue emitting this pollution fails to comply with that statutory language and the high standard that the legislature and the people of Washington demanded of the marine aquaculture industry.

A full EIS would assess all of these risks, including the risks posed by artificial probiotics to the microbial biodiversity of the Sound and its wild denizens, and benthic effects near pens.

Bycatch of fish entering pens or in harvesting and escape recovery efforts

Native fishes—including but not limited to forage fishes such as Pacific herring and potentially migrating or rearing juvenile salmon (including ESA-listed Chinook and chum salmon, steelhead, and bull trout)—may be attracted to the net pens due to the presence of feed and the presence of lower trophic taxa drawn to the feed and waste emanating from the pens.. Native fish that have entered the pens attracted by the large volumes of feed may then be entrained in the suction harvest machinery during the harvest of adult farmed rainbow trout/steelhead. There are (at least) two issues that DFW and its partner agencies must address with regard to this issue in the permits as part of a full EIS:

1. A comprehensive accounting of species composition as well as total numbers of non-target fishes entrained during each net pen harvest period in which adult farmed rainbow trout/steelhead harvest occurs. This is required, among other reasons, in order that any take of ESA-listed salmon and steelhead may be accounted. All harassment injuries and mortalities of all individuals entrained in the vacuum pump harvesting

equipment—including but not limited to direct mortalities of ESA-listed individuals—must be accurately determined and reported to state agencies and NOAA and available for public review.

2. As documented during Cooke harvesting operations in Puget Sound, all non-target fish entrained (sucked up) by the harvest operations are commonly disposed of by being thrown from the upper deck of the harvester ship back into the water on the outside of the nets. The volume of native fish is often so extensive it requires the harvester staff to use snow shovels to scoop them up from the landing area on board the harvest vessel. Pinnipeds and gulls are routinely observed adjacent to the net pens during the harvest, feeding on the native fish as they are being discarded in violation of state and federal laws prohibiting the feeding of pinnipeds.

It is not surprising that there would be such bycatch, and it is likely that it includes endangered and threatened species. British Columbia requires reporting of bycatch (or what they term "incidental catch") at aquaculture facilities. A complete record of the species captured since 2011 is available from the Canadian Department of Fisheries and Oceans (https://open.canada.ca/data/en/dataset/0bf04c4e-d2b0-4188-9053-08dc4a7a2b03). In that dataset, salmon species are recorded for every year on file. In some cases, hundreds of thousands of fish are recorded as incidental catch as part of a rapid depopulation of the pens to control a disease outbreak. Even excluding those incidents, an average of over 35,000 incidental catches in net pens per year are recorded in British Columbia. It is likely that a proportionate amount of bycatch occurs in Puget Sound, and could have serious effects on the Sound's sensitive ecology. Because Cooke does not report that bycatch, the state does not monitor their efforts, and independent observers are not able to view the harvest process in detail, we cannot fully measure the harm this bycatch causes.

Surveys of aquatic diversity at sites near these net pens indicate substantial numbers of threatened and endangered juvenile salmonids, and forage fish. State-funded surveys including "West Sound Nearshore Fish Utilization & Assessment (SRFB Grant: 07-1898)" (2010), "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011), "West Whidbey Nearshore Fish Use Assessment" (2007), and the ongoing "Hood Canal Nearshore Juvenile Fish Use Assessment" find substantial populations of threatened coho, Chinook, pink, and chum salmon in near-shore waters at sites near and similar to those where net pens operate. Those surveys also demonstrate substantial variation in total species diversity and population sizes from site to site (e.g. Figure 3), and between surveys at the same site over time. Salmonid populations could vary by orders of magnitude from month to month, and between years. This highlights the difficulty of monitoring and predicting the potential bycatch that might occur in these pens without active, independent monitoring.

There are three additional issues here that DFW and partner agencies must address as part of a full EIS:

- Indirect predation by net pen steelhead on ESA-listed juvenile Chinook salmon, steelhead, and bull trout (take).
- The illegal feeding of pinnipeds, which provides an additional attraction for the pinnipeds that increases the likelihood of their predating on ESA-listed Chinook salmon, steelhead, and bull trout in the vicinity of the pens.
- The harvester crew and/or net pen operator must obtain a fishing license or permit that would allow them to harvest native fish as described above.

Further, addressing this and other issues concerning potential adverse impacts to public resources from the operations of each net pen requires that WDFW as the primary regulatory agency have the authority to conduct regular and unannounced site visits and to conduct any biological sampling and testing deemed advisable to assure the public that no adverse impacts are occurring. At the very least, mitigation should require the presence of independent observers on-site during each harvest operation to quantify and describe the species and life stages of all by-caught species. A full EIS would allow analysis of the effects of bycatch on Puget Sound ecosystems and recovery plans for ESA-listed species, and the proper regulatory frameworks to apply for monitoring and limiting bycatch, and due consideration of various alternatives for mitigation.

Air and noise pollution impacts to adjacent lands

Net de-fouling and cleaning operations have been found to cause fouling of the air and significant noise. Residents on shoreline properties near the Fort Ward facility, for example, cannot conduct normal outdoor activities, particularly during warm months, during net cleaning operations due to the foul smell of the air that directly results from the operations and the loud noises associated with generators, pumps, and other industrial equipment. This air and noise pollution causes severe depression of local residential property values, apart from human respiratory impacts. A full EIS would allow DFW and partner agencies to determine appropriate maximum levels of airborne particulates, odor-causing chemicals, and noise levels, and require facility operations to monitor and maintain appropriate airborne pollutant and sound levels.

As part of a full EIS, DFW and partner agencies should commission an appropriate sociological survey of resident households within one-half mile of the shorelines of the locations of each net pen facility. The survey should interview residents to assess the degree and frequency (times of day, times of year) that normal and desired residential activities (e.g., outdoor family activities and social events such as dinner parties) are disrupted and/or prevented by air and noise pollution.

Fish flesh discharge

Open-air salmonid net pens chronically discharge particles of decaying fish flesh that are often consumed by native fish and birds. These particles may be contaminated with pathogens, parasites, pharmaceuticals or chemicals that may be ingested by native fishes, including conspecific steelhead and other salmonids. Studies have shown that these particles are potential vectors for pathogens.

This fish flesh also serves as an attractant for protected marine mammals and birds, and a full EIS should be undertaken to assess the harm this may do to those protected species.

A NMFS-approved Hatchery Genetic Management Plan (HGMP) is required

In view of the several issues of potential concern to public waters and ESA-listed native salmonids posed by the proposed open water net pen operations, a NMFS-approved Hatchery Genetic Management Plan (HGMP) for each of Cooke's freshwater hatcheries hatching rainbow/steelhead eggs, rearing fry and smolts, and outplanting smolts to open water net pens is required. This is the required ESA Section 4 Incidental Take Permit required of any artificial production facility producing any species of finfish that may have an adverse impact on ESA-listed salmonids. It is clear that open water marine salmonid net pen operations, including those currently operated by Cooke and those proposed to be operated using "triploid" rainbow/steelhead pose risks to native ESA-listed steelhead, Chinook salmon, and bull trout.

Further, since evaluation and approval of an HGMP is clearly a federal action, NEPA likely applies and a NMFS evaluation of any such HGMP would therefore require a full NEPA analysis, including preparation of an EIS.

Need for a thorough economic cost-benefit analysis of the proposed action and alternatives

Regardless of the biological concerns posed by the proposed action, no credible evaluation of the possible benefits of the proposed action can be considered complete without a full cost-benefit analysis of the proposed action and reasonable alternative uses of the locations currently leased by Washington Department of Natural Resources (WDNR) to Cooke Aquaculture. The public and the public servants charged with making the decision on the proposed action cannot adequately evaluate the possible benefits of the proposed action in the absence of an understanding of what the presumed benefits to the public from the proposed action are and what benefits from reasonable alternative uses of the locations are or may be. It bears reminding that the locations at which the current net pens are located, including the bottom lands and the water in and surrounding each net pen belong to the public. The public needs to be presented with a complete and clear analysis of the economic costs and benefits of the proposed action and alternative uses of these resources. This can only be achieved by a thorough economic cost-benefit analysis embedded in a bona fide alternatives analysis through a full EIS.

The proposed mitigations are inadequate and not reasonably certain to address the risks

While a full EIS would be a more appropriate way to identify and evaluate methods for mitigating the risks of introducing steelhead into net pens, there are several important mitigations that are absent from the current proposal, or that must be strengthened before the proposal moves forward. As it stands, these mitigations are not reasonably certain to address the risks that the state acknowledges, and thus do not satisfy the requirements of SEPA.

While not comprehensive, these are some suggested changes to the proposed mitigations:

- As discussed above, the harvest process must be monitored by independent observers to assess bycatch and to ensure that blood, fish parts, or other waste is not discharged into public waters.

- WDFW and other regulators must have clear authority to conduct unannounced visits and inspections of facilities. They must have authority to review maintenance logs and to examine the structures, fish, feed, medicine, mort tanks, and other regulated components of the facility to ensure that Cooke is fulfilling all obligations under its permits and the required mitigations here.
- Independent inspections of the facilities should be required on an annual basis, not biennially.
- Reports from the independent engineer, and all other reports required from Cooke as part of this mitigation, must be clearly recognized as public records and made available to the public immediately through a publicly-accessible website.
- As discussed above, the mitigation should not merely establish a consistent means of estimating triploidy error rate, but should set a maximum acceptable error rate, and a sampling regime sufficient to assure that the error rate is estimated probabilistically and with high precision. A minimum number of total random samples for a specific, fixed number of fertile eggs from each egg cohort should be specified to assure that the total number of diploids in a specific total number of eggs from each cohort does not exceed a specified maximum threshold number T with high probability P (95% or greater) The attainment standard would be a probability of less than (1-P) that the number of diploids is not greater than the threshold number T. This error rate cap should be derived based on maximum number of fertile females that might escape from a pen.
- All forms of PRV should be reportable. In addition to screening eggs and smolts, WDFW inspectors should inspect the tanks to assess the rate at which net pens are amplifying pathogens, and act to address pathogen levels that might pose significant risks to wild species attracted to the pens' vicinity.
- All farmed fish should be clearly identifiable in the event of an escape. There is no basis for allowing any of these biologically-altered domestic rainbow/steelhead trout to be introduced without a clear and approved plan in place for visually distinguishing them from any other fish in Puget Sound.

The proposal is deficient by the standards of the 1990 EIS

As stated above, we disagree with the choice to rely on the 1990 EIS for analysis of the current SEPA review. Substantial changes in the list of endangered and threatened species in Puget Sound, improved understanding of the risks posed by industrial net pens and industrial aquaculture, and changes in state law all make a compelling demand for a new EIS. But since the EIS relies on that dated document, any failure to implement its guidelines should be ground to refuse to allow the proposed action or to compel a full environmental review of the effects of that deviation.

The 1990 EIS recognizes that aquaculture with native fish (such as the rainbow/steelhead trout at issue here) pose different, and in some cases greater, risks than non-native fish like Atlantic salmon. As such there are some guidelines which were not applied in planning and approving the siting and construction of the existing net pens for use with Atlantic salmon which must now be applied in evaluating the pens' use for rainbow/steelhead trout.

On pages 69-70 of the 1990 EIS, section 5.7.2.2 reads in full:

> It is recommended that the following guidelines be used by WDF when reviewing fish farm proposals:
>
> - When Pacific salmon stocks are proposed for farms in areas where WDF determines there is a risk to indigenous species, WDF should only approve those stocks with the greatest similarity to local stocks near the farm site.
> - In areas where WDF determines there is a risk of significant interbreeding or establishment of harmful self-sustaining populations, WDF should only approve the farming of sterile or monosexual individuals, or genetically incompatible species.

- In areas where WDF determines that wild populations could be vulnerable to genetic degradation, WDF should establish a minimum distance of separation between farms and river mouths.

In the following section, "Mitigation Measures and Unavoidable Significant Adverse Impacts," the EIS states: "WDF and other local experts agree that the potential for significant genetic impacts resulting from farm escapees interbreeding with wild stocks is low. Existing regulations and the use of the guidelines indicated in the Preferred Alternative are adequate to avoid any significant adverse impacts and additional mitigation measures are not necessary."

Unfortunately, there is no evidence that the guidelines indicated in the Preferred Alternative have been applied. We can locate no record of any policy regulating the distance of net pens to the mouths of rivers, and WDFW staff confirmed that they are also unaware of any policies addressing the distance of net pens to river mouths. This guideline only applied to proposals for native fish aquaculture, so would have been unnecessary under the 1990 EIS until now. WDFW staff queried about this guideline cited the use of monosexual and partially sterile stock in this proposal as adequate mitigation, but the plain language of the 1990 EIS requires both, not one or the other.

This issue is crucial in considering the risks of a farmed domestic fish in waters populated with a threatened wild conspecific, as with wild steelhead and rainbow/steelhead trout. Farmed fish that escape near a river mouth could rapidly migrate upriver and interbreed with wild fish. As noted above, the wild steelhead populations in many rivers could be swamped by the number of fertile females if an escape on the scale of 2017 occurred. But the threatened state of the wild species is so dire that population estimates for some rivers—according to the National Marine Fisheries Service steelhead recovery plan (NMFS 2018)—are as low as 5 individuals in some rivers. Even a single fertile female breeding in such a river could destroy the wild genetics.

As shown in the attached map, the existing seven net pen farm sites are less than 20 kilometers (12.5 miles) by water from important wild steelhead rivers, including the Elwha, Dungeness, Samish, Skagit, Stillaguamish, Cedar, and Green rivers. Other nations restrict net pen farm sites from being as near as 10 km from river mouths, and distances of under 1 km clearly pose serious risk that escapees could breed before recovery.

It should be noted that even the discussion of risks from escapees on breeding grounds rely on dubious assumptions, discussed in detail above. The analysis ignores the loss of breeding opportunities when wild males attempt to mate with escapees (even if those matings are not successful), and the loss of mating opportunities if escapees are able to outcompete wild females for redd sites. Even if the reproductive fitness for escaped females was exactly zero, those effects mean there would still be harm to fragile wild populations. Furthermore, the analysis of reproductive success considers only a point estimate of reproductive success rate, and doesn't address the full distribution of this or other rates, and thus systematically under-estimates the number of offspring that might result from escapes and the long-term harm to wild steelhead genetics. There is no worst case analysis or discussion of that worst case's likelihood, as required by WAC 197-11-080.

In the absence of established guidelines, and with no discussion in the SEPA checklist or associated documents assessing the risk of releasing these potentially-fertile fish in proximity to river mouths, the conditions set by the 1990 EIS have not been fulfilled, and the proposed actions must be deemed to carry too high a risk of environmental harm. The mDNS should be withdrawn and a full EIS should be conducted assessing the risks associated with each of the existing net pen sites and its neighboring rivers.

The SEPA analysis failed to account for changes in risk assessment imposed by new law

After the 2017 collapse, the Washington Legislature acted deliberately and overwhelmingly to limit open-water marine net pen aquaculture, and the Governor signed the new law enthusiastically. In addition to phasing out Atlantic salmon farming by 2022, the new law imposed a series of other requirements, and established its clear intent that future marine net pen aquaculture be subjected to greater scrutiny. Section 1 of the legislation passed by both houses states:

> Recent developments have thrown into stark relief the threat that nonnative marine finfish aquaculture may pose to Washington's native salmon populations. But just as evidence has emerged that nonnative marine finfish aquaculture may endanger Washington's native salmon populations, so too has evidence emerged that marine finfish aquaculture in general may pose unacceptable risks not only to Washington's native salmon populations but also to the broader health of Washington's marine environment. Given this evidence, the legislature intends to phase out nonnative finfish aquaculture in Washington's marine waters. Because the state of the science and engineering with regard to marine finfish aquaculture may be evolving, the legislature further intends to study this issue in greater depth, and to revisit the issue of marine finfish aquaculture once additional research becomes available.

This language was vetoed as the Governor signed the law, but demonstrates the legislature's intent. That intent is also shown in Section 5 of the engrossed bill, which requires agencies to "continue the existing effort to update guidance and informational resources to industry and governments for planning and permitting commercial marine net pen aquaculture," and mandating: "The guidance must be designed to eliminate commercial marine net pen escapement and to eliminate negative impacts to water quality and native fish, shellfish, and wildlife."

In finding that "marine finfish aquaculture in general may pose unacceptable risks" and mandating guidance to "eliminate" those risks the legislature overturned the 1990 EIS's determination that Atlantic salmon aquaculture posed acceptable risks and imposed a stricter standard than existed previously. It is clear that the legislature intended to alter the risk assessment framework used for marine finfish aquaculture in general from the status quo. Relying on the 1990 EIS without acknowledging the significant shift in risk assessment mandated by this law is clearly unwarranted and contrary to the law passed in response to the 2017 catastrophe.

The legislature clearly understood that its actions would not only affect Atlantic salmon farming. In addition to the explicit statement to that effect in Section 1, they heard this testimony from Dr. Ken Warheit, supervisor of WDFW's fish health program:

> We suggest that if the State is going to restrict marine fish aquaculture, it removes authorization also for other nonnative fish. More importantly, it should also remove authorization for native salmonid marine commercial aquaculture which WDFW considers to be a greater risk to the State's native wild and hatchery salmonid populations, than is Atlantic salmon marine aquaculture.

The legislation did not forbid the use of biologically-altered rainbow/steelhead trout, but it did establish that the risks of Atlantic salmon aquaculture are too great, and express concern that the same might be true of all marine finfish aquaculture. It urged further study of that risk and raised the bar for future risk assessment.

Unfortunately, the guidance mandated to eliminate these risks has not been issued, even though a report to the legislature regarding its progress was due during this comment period.

In light of that change in state law, it is inappropriate to apply the same risk assessment used in 1990 to a proposal today. In evaluating the risk of marine finfish aquaculture proposals not forbidden under HB 2957, state agencies should conduct an EIS on any proposal that is riskier than the best-case scenario for marine Atlantic salmon aquaculture. Since this proposal does not clear even the guidelines laid out in the 1990 EIS (since no assessment of proximity to river mouths was conducted), and since the farmed fish in this proposal could directly interbreed with a federally-listed steelhead species and degrade its genetics, a new EIS is clearly warranted.

References cited

Cabello, F.C., H. P. Godfrey, A. Tomova, L. Ivanova, H. Dolz, A. Millanao, and A. H. Buschmann. 2013. Antimicrobial use inaquaculture re-examined: its relevance to antimicrobial resistance and to animal and human health. Environmental Microbiology 15(7): 1917 – 1942.

Dempster, T., P. Arechavala-Lopez, L. T. Barrett, I. A. Fleming, P. Snachez-Jerez, and I. Uglem. 2018. Recapturing escaped fish from marine aquaculture is largely unsuccessful: alternatives to reduce the number of escapees in the wild. Review in Aquaculture 10, 153 – 167.

Diserud, O. H., Fiske, P., Sægrov, H., Urdal, K., Aronsen, T., Lo, H., Barlaup, B. T., Niemelä, E., Orell, P., Erkinaro, J., Lund, R. A., Økland, F., Østborg, G. M., Hansen, L. P., and Hindar, K. 2019. Escaped farmed Atlantic salmon in Norwegian rivers during 1989–2013. ICES Journal of Marine Science, 76: 1140–1150.

Glover, K. A., Urdal, K., Næsje, T., Skoglund, H., Florø-arsen, B., Otterå, H., Fiske, P., Heino, M., Aronsen, T., Sægrov, H., Diserud, O., Barlaup, B. T., Hindar, K., Bakke, G., Solberg, I., Lo, H., Solberg, M. F., Karlsson, S., Skaala, Ø., Lamberg, A., Kanstad-anssen, Ø., Muladal, R., Skilbrei, O. T., and Wennevik, V. 2019. Domesticated escapees on the run: the second-generation monitoring programme reports the numbers and proportions of farmed Atlantic salmon in >200 Norwegian rivers annually. ICES Journal of Marine Science, 76: 1151–1161.

Heuer, O.E., Kruse, H., Grave, K., Collignon, P., Karunasagar, I., and Angulo, F.J. (2009) Human health consequences of use of antimicrobial agents in aquaculture. Clin Infect Dis 49: 1248–1253.

Hu, Jane. 2019 “Antibiotic resistance is spreading among marine mammals.” High Country News. https://www.hcn.org/issues/51.18/ocean-antibiotic-resistance-is-spreading-among-marine-mammals

Jensen, A.J., S. Karlsson, P. Fiske, L. P. Hansen, K. Hindar, G. M. Østborg. 2013. Escaped farmed Atlantic salmon grow, migrate and disperse throughout the Arctic Ocean like wild salmon. Marine Ecology Progress Series Vol. 3: 223–229. doi: 10.3354/aei00064.

Karlsson, S., Diserud, O. H., Fiske, P., and Hindar, K. 2016. Widespread genetic introgression of escaped farmed Atlantic salmon in wild salmon populations. ICES Journal of Marine Science, doi:10.1093/icesjms/fsw121.

Mordecai, G. J., Miller, K. M., Di Cicco, E. D., Schulze, A. D., Kaukinen, K. H., Ming, T. J., Li, S., Tabata, A., and Teffer, A. 2019. Endangered wild salmon infected by newly discovered viruses. eLife 2019;8:e47615.

NMFS (National Marine Fisheries Service). 2018. Proposed Recovery Plan for the Puget Sound Steelhead Distinct Population Segment (Oncorhynchus mykiss). National Marine Fisheries Service. Seattle, WA.
https://archive.fisheries.noaa.gov/wcr/publications/recovery_planning/salmon_steelhead/domains/puget_sound/proposed_puget_sound_steelhead_recovery_plan_12_13_18.pdf

Northwest Fisheries Science Center. 2015. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest. https://archive.fisheries.noaa.gov/wcr/publications/status_reviews/salmon_steelhead/2016/2016_nwfsc.pdf

Skilbrei, O. T., Heino, M., and Svåsand, T. 2015. Using simulated escape events to assess the annual numbers and destinies of escaped farmed Atlantic salmon of different life stages from farm sites in Norway. – ICES Journal of Marine Science, 72: 670–685.

Tables

River/River system	Population (five year geometric mean, 2010-2014)
Cedar	4
Green	552
Puyallup	277
White	531
Dungeness	141
East Hood Canal Tributaries	60
Sequim/Discovery Bay Tributaries	19
Samish/Bellingham Bay Tributaries	846
Skagit	5123

Stillaguamish	392

Table 1. Estimated wild adult steelhead populations (five year geometric mean, 2010-2014) in rivers within a 12 mile radius of the existing net pens. The highly domesticated fertile net-pen-origin females that are predicted to escape during a net pen failure comparable to that of 2017 would comprise a significant proportion of the spawning population in many Puget Sound rivers.

Number of Fish	1000000
Proportion Diploid	0.00156
Number Diploid Outplanted	1560
Probability of Escape	0.82
Number of Diploid Escapes	1279.2
Probability of Non-Recovery	0.77
Number Diploids Not Recovered	985
Proportion Sexually Mature_High Estimate	0.5
Number Mature Diploids_High Estimate	493
Proportion Sexually Mature_Low Estimate	0.1
Number Mature Diploids_LowEstimate	99

Proportion Fertile Surviving to Spawn	0.5
Number of Mature survivors_High Estimate	247
Number of Mature survivors_Low Estimate	50

Table 2. Estimate of number of the maximum number diploid individuals per million farmed rainbow/steelhead outplanted to a net pen that would result in no more than the number of mature escapees surviving to sexual maturity (bottom row) given the assumptions in WDFW's mDNS Summary, page 6.

Figures

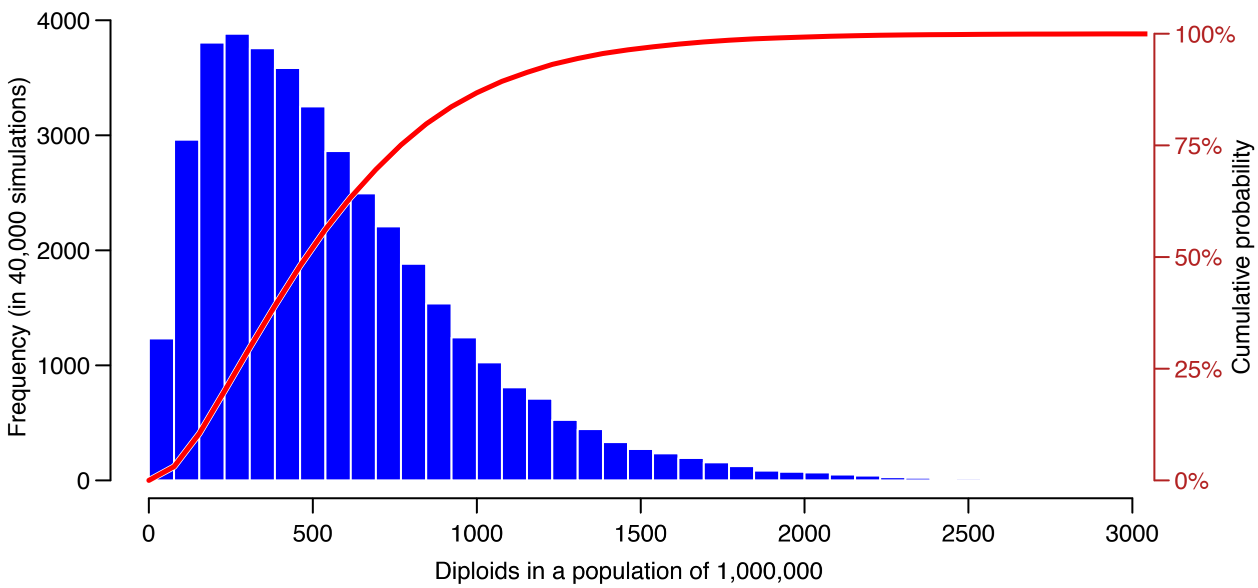


Figure 1. Distribution of the number of diploids (triploid-induction failures) in one million eggs when the number of diploids in a random sample without replacement of 3500 is one. The blue bars show the number of diploids in the interval on the horizontal x-axis (for example, 5000 in the interval between 3000 and 400 shown on the left y-axis). These numbers were computed through a Bayesian analysis that sampled 40,000 probable values (so the probability that the true number of diploids in the population of 1,000,000 is 5,000/40,000 = 0.125 or 12.5%). The

red curve is the cumulative probability distribution. The shows the probability that a given value on the x-axis is less than or equal to the corresponding value on the right y-axis. For example, 95% of the distribution is less than 1400 and 97.5% is less than 1600, satisfying a risk-averse criteria that 95% of the distribution of possible values be no greater than 1560 diploid per million eggs or fry. About half the distribution (50%) is less than 500.

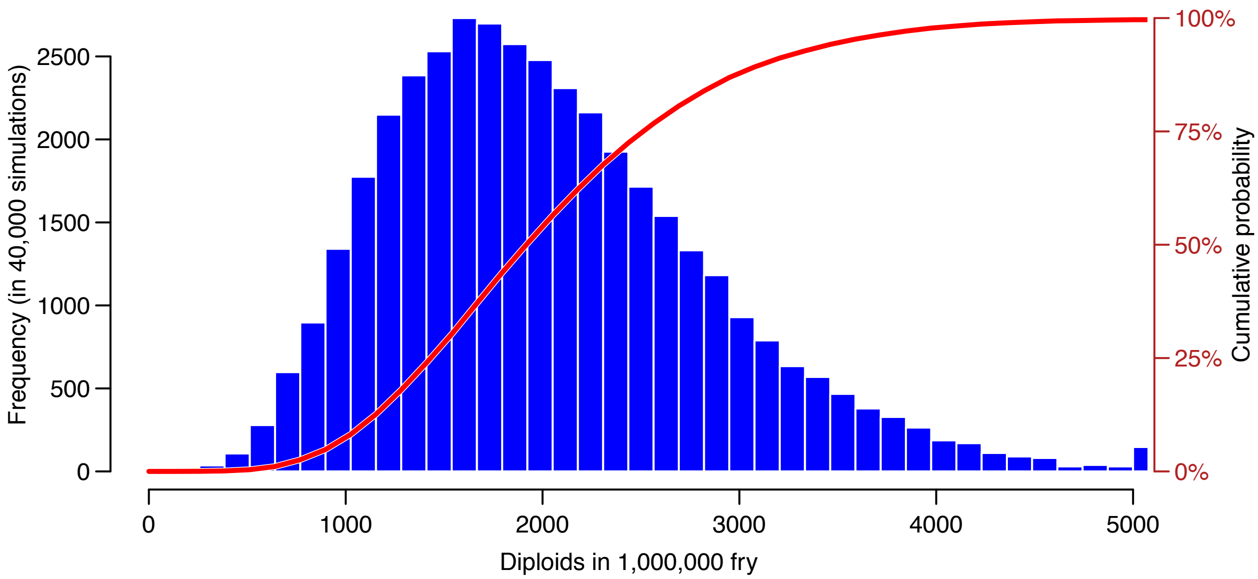


Figure 2. Distribution of the number of diploids (triploid-induction failures) in one million eggs when the number of diploids in a random sample without replacement of 2950 is five (per Attachment A of Cooke's SEPA Checklist). The mean is 2029, the median is 1900. 95% of the distribution is less than 3600. There is a 5% chance that the true number of diploids is between 3500 and 5000.

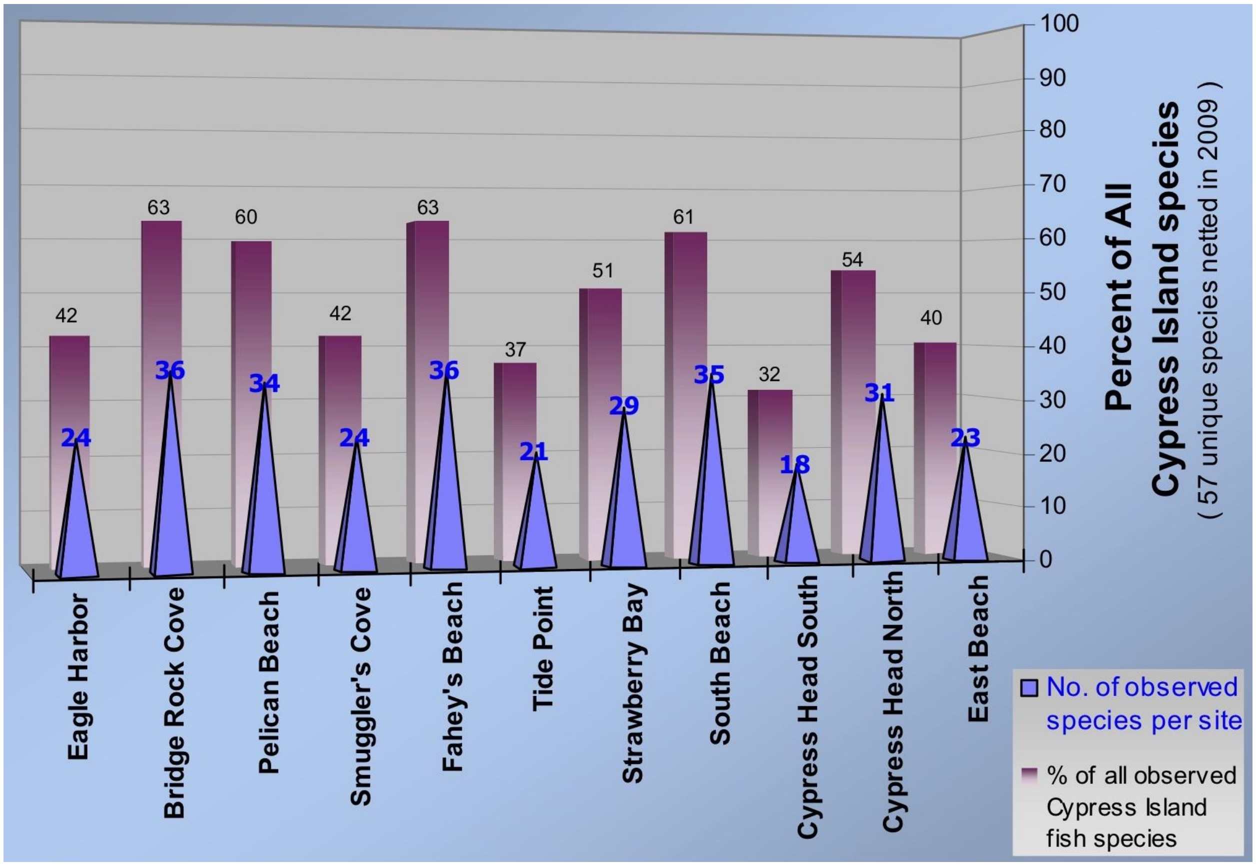
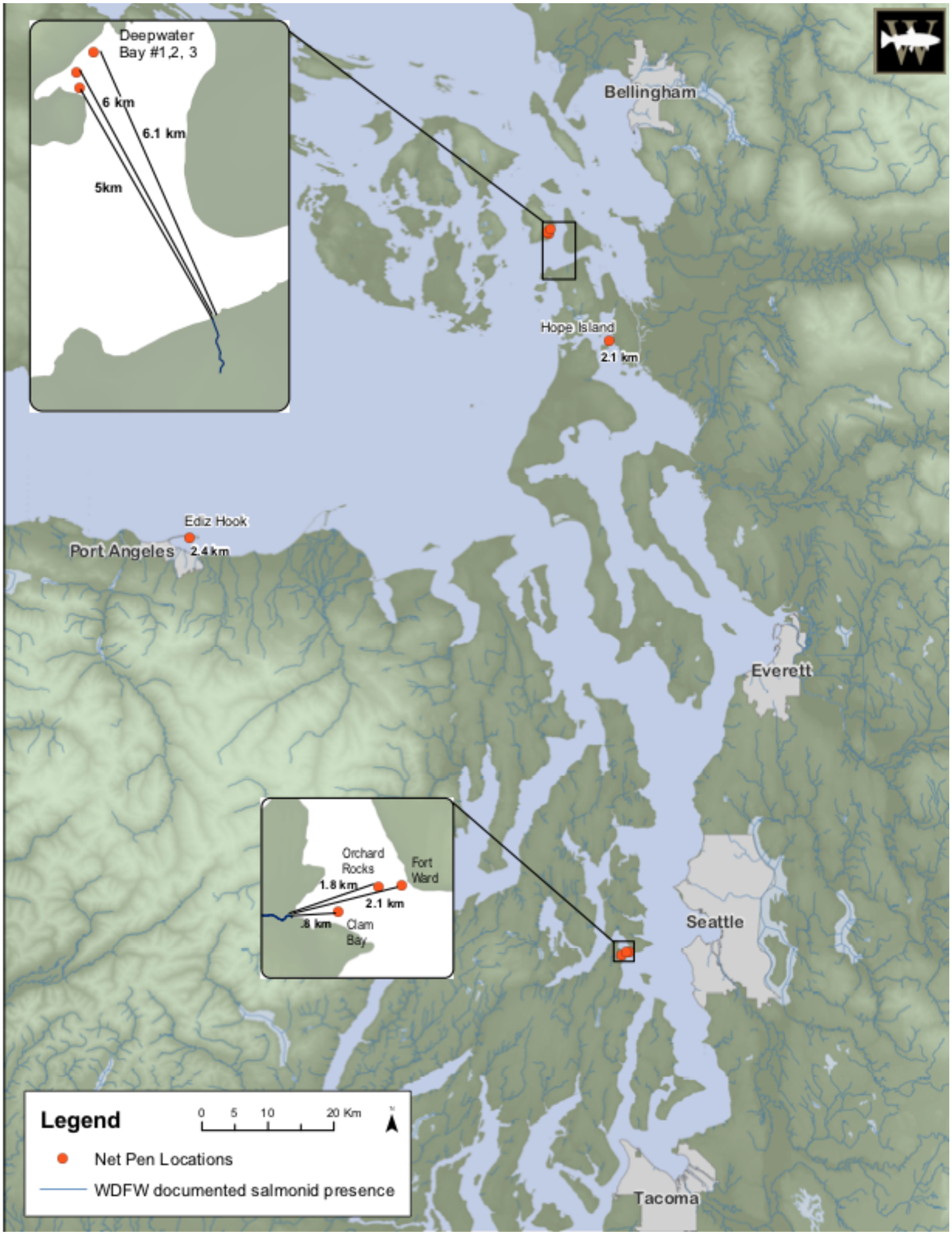


Figure 3. The total number of species encountered at each sample site in a survey of Cypress Island nearshore habitats, as well as the per-site percentage of all species netted from the Cypress nearshore. No single locale had greater than 65% of all species present across the 11 widely dispersed sites. From "Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment" (2011).

Map



Deepwater Bay #1,2, 3
6 km
6.1 km
5km
Bellingham
Hope Island
2.1 km
Ediz Hook
Port Angeles
2.4 km
Everett
Orchard Rocks
Fort Ward
1.8 km
2.1 km
.8 km
Clam Bay
Seattle
Tacoma
Legend
0 5 10 20 Km
Net Pen Locations
WDFW documented salmonid presence

Appendix

Section A

Extended illustration of the approach for determining a risk-averse standard for the maximum permissible number of diploids released into a new pen seeded with one million ostensibly triploid rainbow trout

We extend the illustrative analysis of the triploid failure rate provided in our comments and summarized in figure 2 to provide a probability distribution of the number of diploids that would survive to spawning grounds of wild steelhead.

Methods

We provide distributions for a) the proportion of fish that escape from a catastrophic failure of a net pen containing one million fish, b) the proportion of the escaped fish that elude recovery efforts, and c) the proportion of diploid fish sexually mature at or after the time of escape that survive to the spawning grounds of wild steelhead. We parameterize each of these three distributions using Beta probability distributions, with parameter values based on the point estimate values used by WDFW in its "Summary of Key issues", pp. 5-6. We then integrate these distributions with the Bayesian estimation of the number of diploids in a lot of 1,000,000 fertilized eggs subjected to triploid induction by extending the model used to generate the data shown in figure 2. All modeling was conducted in Stan running four chains of 20,000 iterations each with a burnin of 20,000 per chain and retaining a total of 40,000 samples from the joint posterior distribution.

We make the simplifying assumption that the total number of 1,000,000 fish growing in the net pen at the time of collapse resulted from plants of surviving fry from lots of 1,000,000 fertilized eggs from each of which 2950 random samples without replacement were obtained and tested for triploid induction of which a total of 5 individuals were diploid. Given this assumption the probability of the number of diploids in the net pen at the time of failure would follow the distribution shown in figure 2.

Each of the Beta distributions (a, b, and c1 – c3) was parameterized in terms of the mode and coefficient of variation (standard deviation/ mean). We evaluated three cases using different Beta distributions for (c), the proportion of diploid fish sexually mature at or after the time of escape that survive to the spawning grounds of wild steelhead. The parameterizations of the five Beta distributions together with the principal moments are listed in Table 1.

Parameter	Alpha	Beta	Mode	Mean	CV	Central 50%	Central 95%
Beta a	18.86	14.15	0.85	0.80	0.10	[0.77, 0.88]	[0.67, .0.96]
Beta b	22.83	6.46	0.78	0.80	0.10	[0.73, 0.83]	[0.63, 0.92]
Beta c1	90.0	802.1	0.10	0.10	0.10	[0.93, 0.11]	[0.08, 0.12]
Beta c2	70.13	162.3	0.30	0.30	0.10	[0.28, 0.32]	[0.24, 0.36]
Beta c3	50.5	50.5	0.50	0.50	0.10	[0.47, 0.53]	[0.40, 0.60]

Table 1. Parameters of principal moments of the five Beta distributions employed to estimate the number of escaped diploid rainbow/steelhead (RBT) surviving to reach the spawning grounds of wild steelhead.

RESULTS

Convergence of each of the four chains in the stan model run was rapid and the Rhat statistic for all parameters to three digits was 1.000 or 1.001.

Figure A1 (identical to figure 2 in Comments) shows the distribution of the number of diploid RBT in a net pen with a total population of 1,000,000 based on random sampling (without replacement) of 2950 fertile eggs tested for triploidy of which 5 were diploid (i.e., failed the test). This is the principal unknown parameter estimated by the stan model. Figure A2 show the distribution of the number of diploids in the net pen of 1,000,000 RBT (shown in figure A1) that escape from the net pen upon catastrophic failure. This is the result of integrating the distribution shown in figure A1 with the Beta distribution Beta a (Table 1). Figure A3 shows the distribution of the number of escaped diploid RBT that were not recaptured. This is the result of integrating the distribution shown in figure A2 with the Beta distribution Beta b (Table 1). Figures A4, A5, and A6, show the distribution of the number of uncaptured escaped diploid RBT that survive to mature and migrate to the spawning grounds of wild steelhead, given the distribution of survival probabilities Beta c1, Beta c2, and Beta c3, respectively.

Table 2 summarizes some key quantities from each of the distributions in figures A4, A5, and A6.

Parameter	Mean	Std. Dev.	Median	5th %-ile	95th %-ile
Probability of spawning: mode = 0.10 (Beta c1)	131.6	59.0	125	53	242
Probability of spawning: mode = 0.30 (Beta c2)	390.9	172.7	365	160	720
Probability of spawning: mode = 0.50 (Beta c3)	642.9	284.0	600	270	1170

Table 2. Principal moments of the distributions of the numbers of escaped diploids surviving to mature and migrate to the spawning grounds of wild steelhead shown in Figures A4, A5, A6.

We considered three survival scenarios for the survival to maturity and migration to the spawning grounds of wild steelhead in Puget Sound following the catastrophic failure of one of Cooke Aquaculture's net pens containing 1,000,000 RBT. The three scenarios bracket a reasonable range of probabilities, given the uncertainty due to lack of information regarding escaped farm-raised RBT, basic biology and life history of rainbow trout in their native environment, and concern regarding the risk that escaped diploid RBT on the spawning grounds of wild, ESA-listed Puget Sound steelhead may pose to wild steelhead.

The value that society places on protecting ESA-listed Puget Sound steelhead from harm due to escaped non-native (not members of the Puget Sound steelhead Distinct Population Segment) may appropriately be expressed (in part) by how many potential escaped diploids that may be permitted to survive to enter the spawning grounds of wild steelhead and with what probabilities. We argue that a risk-averse, precautionary, approach should be based upon the upper tail of probability distributions of adverse outcomes. In the case at hand, the 95th percentile of the probability distribution of the number of surviving escapes diploids should be the minimum of the upper tail of the distribution considered.

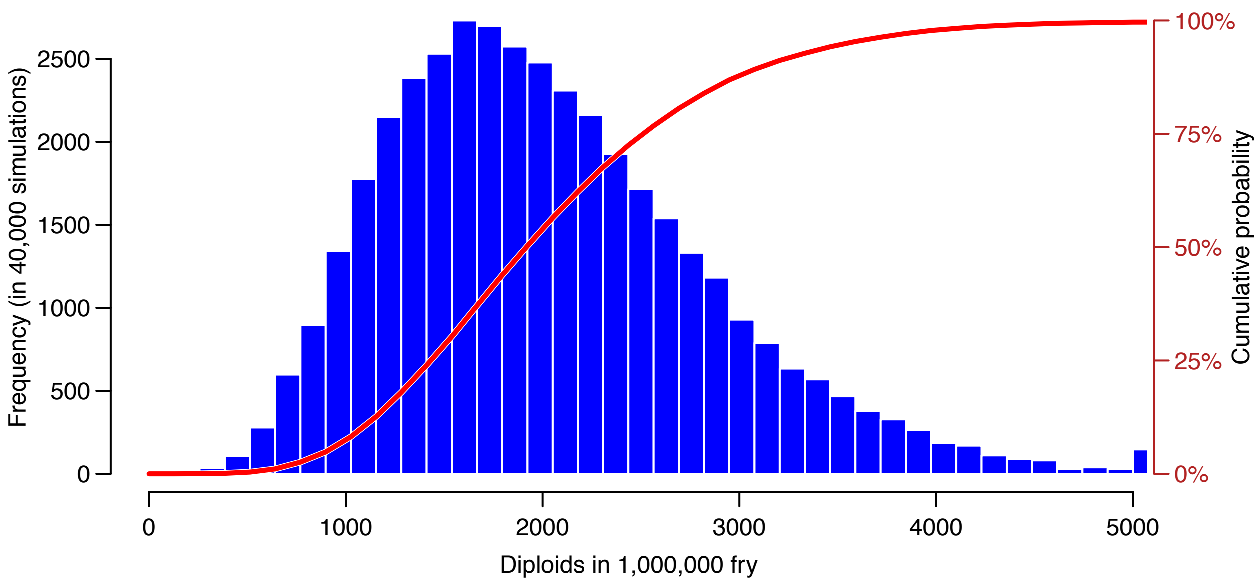
For the three scenarios evaluated the number of surviving escaped diploids at the 95th percentile is 242 for the lowest survival scenario, 720 for the intermediate scenario, and 1170 for the high (50% mean survival) scenario. This mean that there is probability of 0.05 (5%) that in the event of a catastrophic failure of a net pen containing 1,000,000 RBT that the number of surviving escaped diploids reaching the spawning grounds of wild steelhead is at least 242, 720, and 1170, respectively.

From a regulatory, ESA perspective, assuming that the appropriate risk-averse probability level to consider for an adverse outcome of an event such as a v pen is the 95th percentile (where the standard is to not allow an adverse outcome of magnitude X or greater to occur with a probability greater than 5 %), the maximum value of X (here, the number of escaped diploids surviving to the wild spawning grounds) needs to be determined. As discussed in the

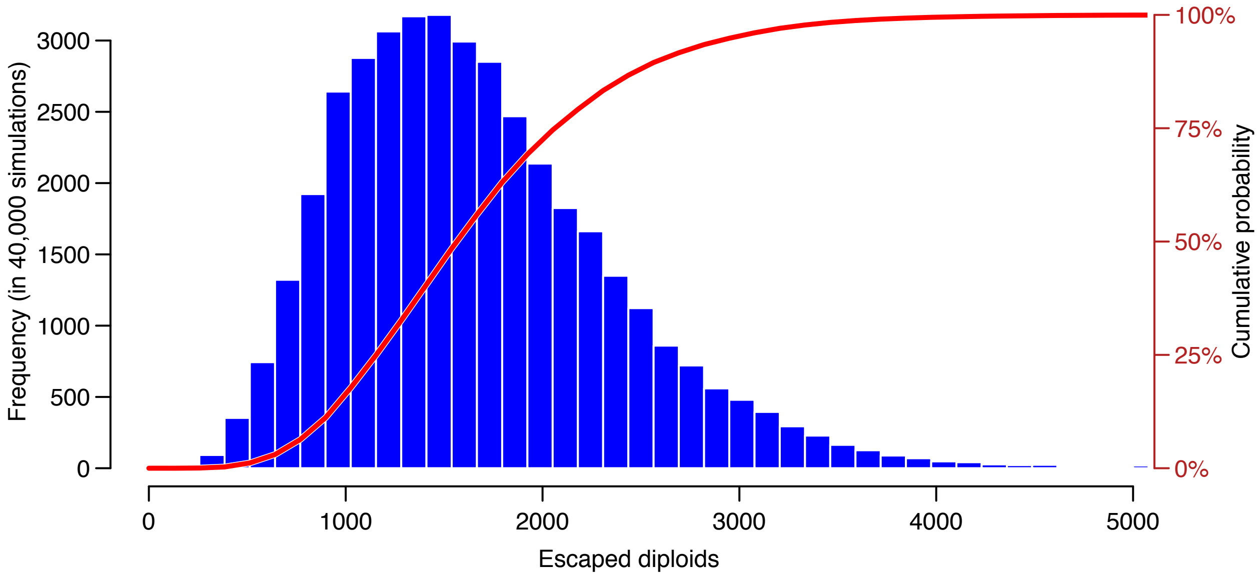
Comments, the choice of the specific maximum acceptable value of X and the maximum permissible probability of X occurring (conditional on a catastrophic failure of a net pen containing 1,000,000) will then determine the maximum allowable triploid-induction failure rate, as well as the appropriate minimum number of samples per million fertile eggs to be tested as well as the maximum number of failures in that number of samples.

We would argue, based on the scenarios described herein, 5 failures (diploids) in a random sample of 2950 from a lot of 1,000,000 fertile eggs yields a distribution with unacceptably high numbers of total diploids in the lot of progeny from those eggs released as molts into any of Cooke's Puget Sound net pens. An appropriate approach to identifying the minimum number of random samples per million eggs and the maximum permissible failures (diploids) in the sample is described in the main body of our Comments.

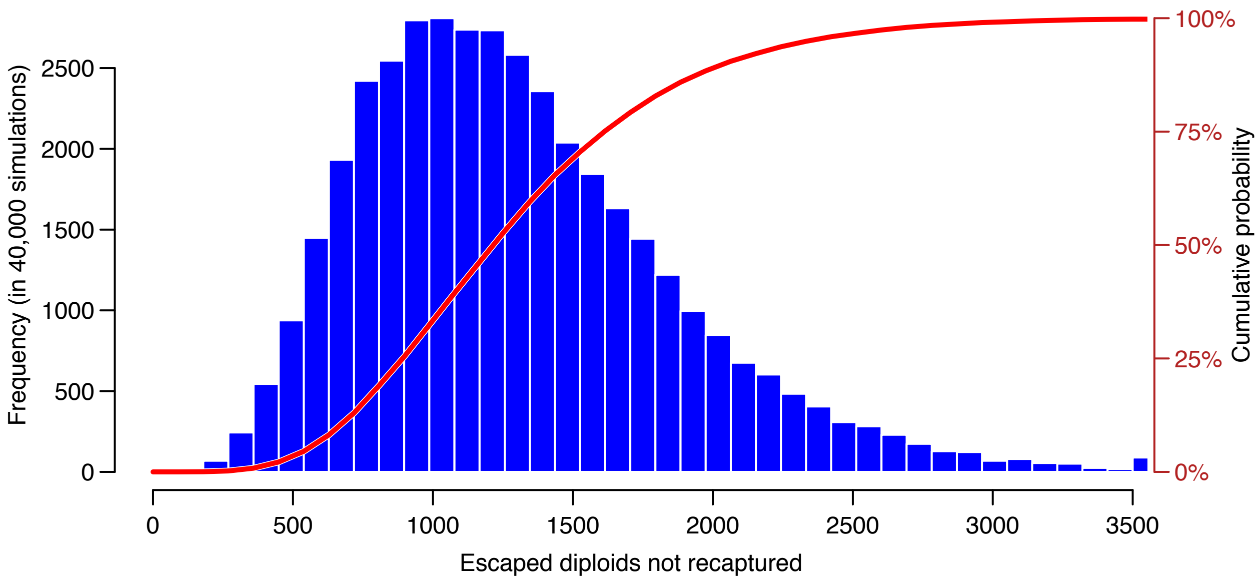
Appendix Figures



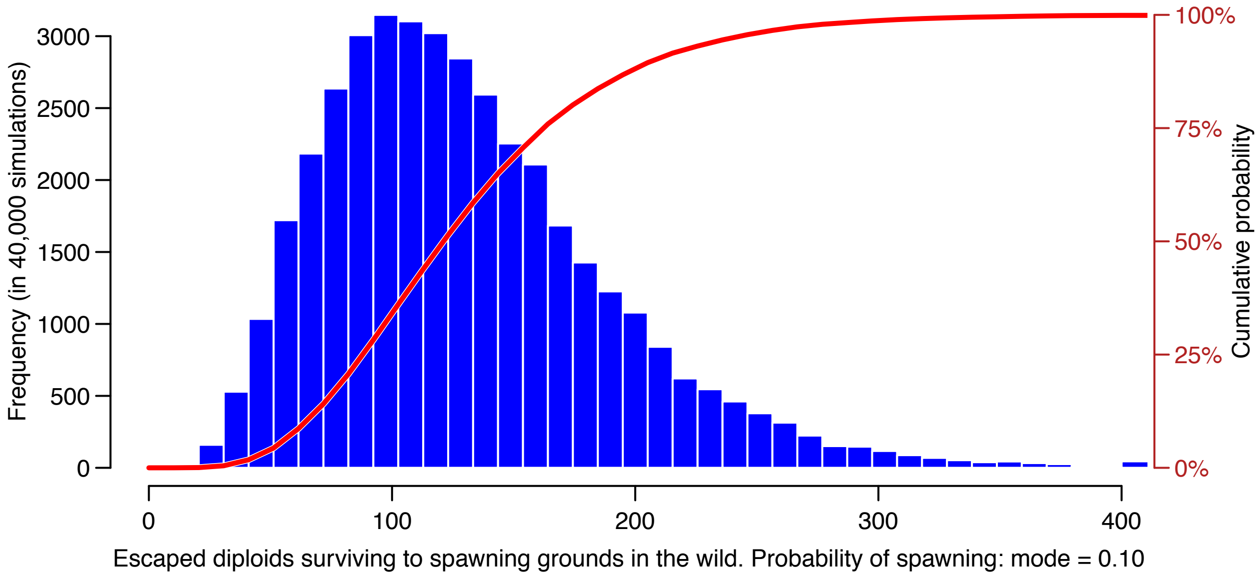
A1 Number of diploid RBT in a net pen of 1000000 RBT (identical to figure 2 above).



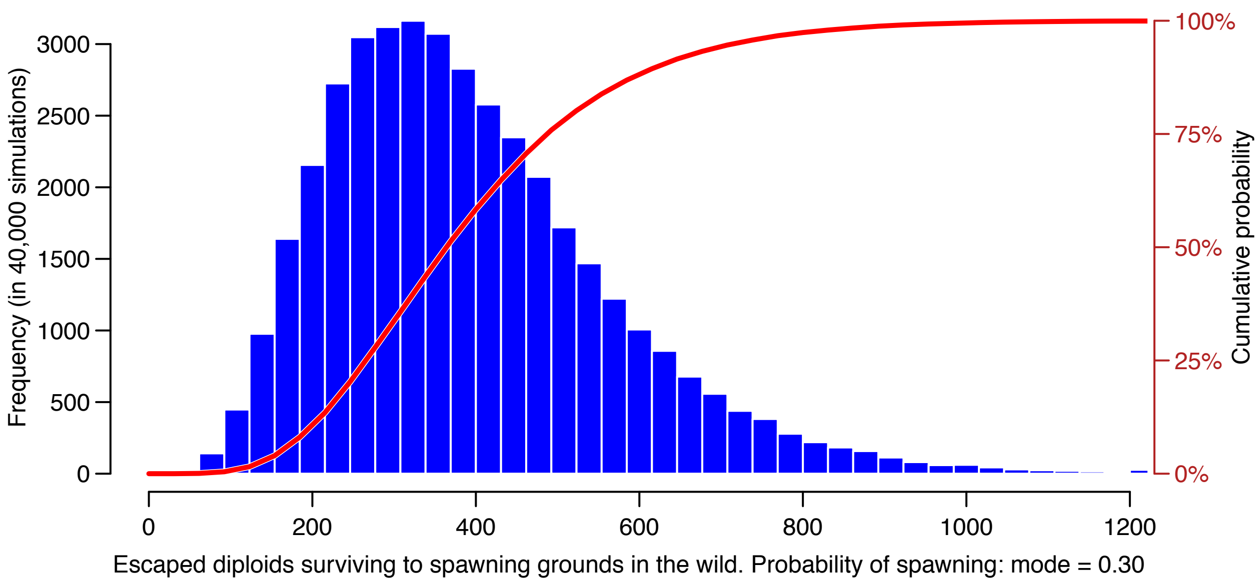
A2. Number of RBT that escape during a catastrophic failure of the net pen.



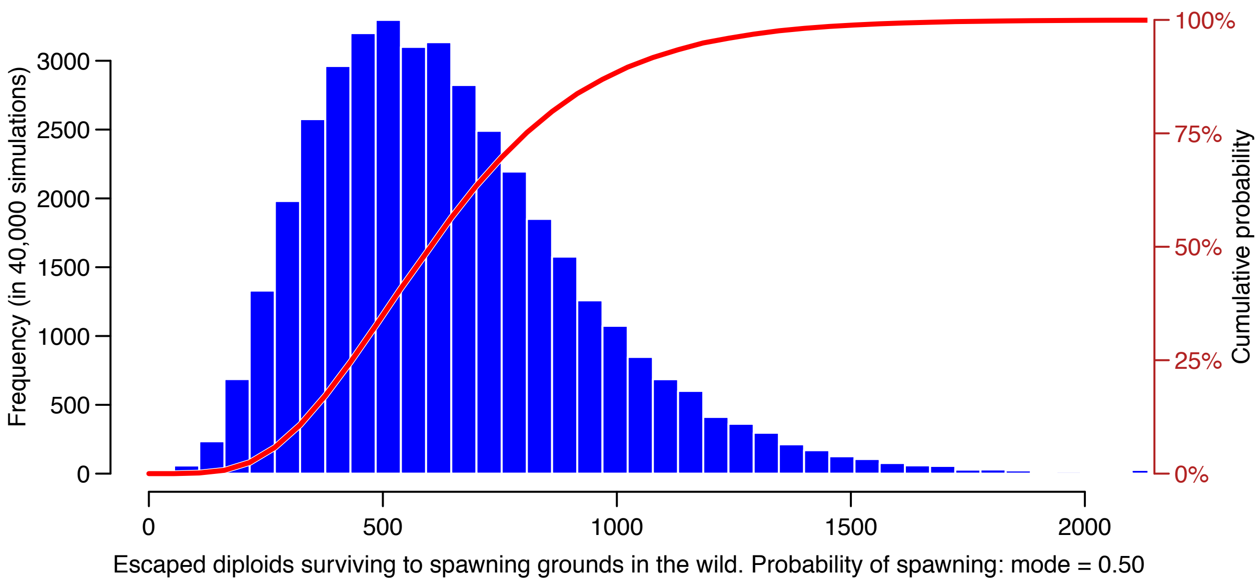
A3. Number of escaped RBT that are not immediately recaptured at the farm site



A4. Number of escaped diploid RBT surviving to spawning grounds in the wild when the modal probability of survival from escape to spawning grounds equals 0.10 (10%).



A5. Number of escaped diploid RBT surviving to spawning grounds in the wild when the modal probability of survival from escape to spawning grounds equals 0.30 (30%).



A6. Number of escaped diploid RBT surviving to spawning grounds in the wild when the modal probability of survival from escape to spawning grounds equals 0.50 (50%). Note the different scale on the X axis compared to figures 4 and 5.

Section B: Our Sound, Our Salmon* Petition and signatures

**Our Sound, Our Salmon is a campaign coordinated and overseen by the Wild Fish Conservancy.*

We, the undersigned, have serious concerns over Cooke Aquaculture's new proposal to transition their net pen leases and permits to allow for the commercial propagation and harvest of biologically altered steelhead / rainbow trout in the waters of Puget Sound (https://wdfw.wa.gov/licenses/environmental/sepa/open-comments). These concerns are described in detail in Our Sound, Our Salmon's technical comments (www.oursound-oursalmon.org/osos-sepa-comments).

This proposal is inconsistent with the public's will and seriously undermines the recovery of threatened and endangered wild salmon, steelhead, and Southern Resident killer whales.

We are further concerned at the pace this proposal is moving forward under the State Environmental Protection Act (SEPA) in the absence of a thorough and current environmental assessment.

The State's decision to rely on an outdated, 30 year old Environmental Impact Statement (EIS) completed in 1990, as well as a supplemental environmental review completed by Cooke Aquaculture themselves, erodes the public's trust in the process. Currently, this review fundamentally ignores three decades of well-established science and evidence demonstrating the serious and compounding ecological risks to native fish, water quality, and the overall health of Puget Sound.

This is the same evidence that moved the Washington State legislature to pass bipartisan legislation banning Puget Sound's industrial Atlantic salmon net pens by 2022, an action overwhelmingly supported and celebrated by the public at large.

Given that biologically altered steelhead / rainbow trout have never been reared at the proposed industrial scale in Puget Sound and therefore pose new and unknown risks, and given the public distrust in Cooke Aquaculture to act in the public's best interest, the State should uphold their responsibility to the public and approach this proposal with current, precautionary, and rigorous environmental review.

We, the undersigned, urge the Washington Department of Fish and Wildlife to withdraw the current SEPA threshold determination and draft a new, comprehensive Environmental Impact Statement that adequately reviews this issue of critical importance to the public.

This petition was signed and supported by the following 1,841 individuals on the following 35 pages.

Name	Email
Aaron Berreth	aberreth84@gmail.com
Aaron Jorgenson	aaronthairjorgenson@gmail.com
Aaron Steck	ansteck87@hotmail.com
Aaron Trampush	atrampush@gmail.com
Abagayle Shane	abagayleshane@gmail.com
Abbey Kaufman	gaialvs@yahoo.com
Adam Johnson	abassman1975@gmail.com
Adam Pett	adampett@hotmail.com
Adele Hollingsworth	adelineg@shaw.ca
Adrian Tuohy	adrian@wildfishconservancy.org
Aïda Oliver	myperfectstardust@gmail.com
Aileen Jeffries	aileenj@centurytel.net
Al Williams	alwilliams1875@gmail.com
Alan Yamashita	alanyama33@gmail.com
Albert Mauch	mauchskier@yahoo.com
Alec Corbett	aleccorbett@msn.com
Alecia Flanagan	alecia.flanagan@yahoo.com
Alex Park	parkale1@gmail.com
Alexa Mcnae	alexa.mcnae@surlatable.com
Alexander Olsen	aohorrigmoe@outlook.com
Alexandria Rossoff	oceanpearlgems@gmail.com
Alfredo Quarto	mangroveap@olympus.net
Alicia Carr	aliciacarr03@gmail.com
Alicia Mariscal	alicia.mariscal@gmail.com
Alicia Vradenburg	samandalicia@comcast.net
Alissa Ferrell	alissa_30@hotmail.com
Allan Brookstone	abrookst@gmail.com
Allison Brown	allie@octogroup.org
Allyson JonesW	rmonoxide@gmail.com
Alwyn Jones	kiwizone@rockisland.com
Amanda Brown	amandamckenzie777@gmail.com
Amanda Grondin	ajgrondin@gmail.com
Amanda Martin	amart005@mac.com
Amanda Muir	ellamuir@msn.com
Amber Miko	amber_miko@yahoo.com
Amelia Brower	ameliabrower@yahoo.com
Amelia Brown	abrown@surfrider.org
Amy Georgeson	geoamy19@yahoo.com
Amy Hansen	pittle.r.us@gmail.com
Amy Huang	meamtaz@yahoo.com
Amy Kramerhawks	fireweeddesign@gmail.com
Amy Mower	almower@earthlink.net
Amy Nesler	anesler3784@gmail.com
Amy Waterman	abw3@cornell.edu
Ana De Give	adegive@gmail.com
Ana Rebelo	anasalvadorrebelo@gmail.com
Anastasia Coleman	anastasiammcgeorge@gmail.com
Andre Estevez	aestevez04@gmail.com
Andrea Amdal	cloudman@whidbey.com
Andrea Davis	redowoodoma@gmail.com
Andrea Richey	andrea_richey@hotmail.com
Andrea San	andrea.marie26@rocketmail.com
Andrea Van Houten	bluecar72@gmail.com

Andrew Friedrich	ptdory@hotmail.com
Andrew Harpster	andrew.harpster@gmail.com
Andrew Lawrence	skykomishsunrise@gmail.com
Andrew Redell	andrewredell@gmail.com
Andrew Smalling	aasmalling@gmail.com
Andrew Stevenson	jandj@thestevensons.us
Andrew Walton	andrewbwalton@gmail.com
Andria Roth	annyroth@hotmail.com
Andy Brew	andykbrew@gmail.com
Andy Starr	arstarr91@gmail.com
Ang Hodgeboom	ahodgeboom@gmail.com
Angela Sheppard	amgshepp@hotmail.com
Angelina Mendez	nikitamendez@hotmail.ca
Anita Holladay	anitah@rockisland.com
Ann Allen	annallen17@yahoo.com
Ann Daniels	adaniels@satx.rr.com
Ann Kuhlman	ajwillbug@yahoo.com
Ann Lieseke	alieseke@yahoo.com
Ann Morcom	morcoms@shaw.ca
Ann Prezyna	houseboata@gmail.com
Ann Pryich	aprijich@yahoo.com
Ann Self	selfp@earthlink.net
Ann Ventic	annventic@gmail.com
Anna Dunford	awdunford@msn.com
Anna Gullickson	dearrieta@gmail.com
Anna Santo	annaruthsanto@gmail.com
Anna Windfeldt	anna.j.windfeldt@gmail.com
Anna-Kerissa Thorson	annakerissa@yahoo.com
Annabelle Herbert	annabelleh13@gmail.com
Annapoorne Colangelo	anapurna@whidbey.com
Anne Hayden	ahayden@whidbey.com
Anne Jimenez	jajimenez@impulse.net
Anne Kroeker	annek@36524.com
Anne Middleton	anne.jackm@gmail.com
Anne Shaffer	anne.shaffer@coastalwatershedinstitute.org
Anne Stoltz	annest@msn.com
Annette Tomeo	eetsatimes5@gmail.com
Anthony Britton	agb1411@btinternet.com
Anthony Mardesich	tonymardesich@yahoo.com
Anya Keen	sillipurplegirl@hotmail.com
Aoife Kearns	aoife.kearns84@gmail.com
April Atwood	hissrattlesnap@yahoo.com
April Azar	aprilinparadise@gmail.com
Apryle Craig	apryle@uw.edu
Ariel Linden	aporphy@gmail.com
Ariel Yseth	ariel.yseth@me.com
Arloa Taggart	ajeantaggart@gmail.com
Art Hanson	ahanson47@comcast.net
Art Huffine	rhrinc@comcast.net
Arthur Lynch	arthurnlynn@aol.com
Ashley Bonilla	aaurban87@gmail.com
Ashley Cothern	ashleycothern94@gmail.com
Ashley Smith	mtnkamp@gmail.com
Audrey Black	audrey789@icloud.com

Audrey Mannolini	audreyspuppy@aol.com
Audrey Thompson	saltysailboat@gmail.com
Audrey Wood	audj1244@gmail.com
August Julian	augustj@live.com
Augusta Mcmurray	gusmcmurray@me.com
Austin Bragg	austinbraggucsb@gmail.com
Austin Ferguson	austinrferguson@hotmail.com
Austin Nowka-Keane	austinnowkakeane@gmail.com
Austin Trigg	austin@austintrigg.com
Avery Kulek	avery.kulek@gmail.com
Avon Hansen	avon.hansen@gmail.com
Ayden Kennedy	aydenkennedy@gmail.com
Balucia Cook	pcook5531@gmail.com
Barb S	barbm@msn.com
Barbara Citko	barbaracitko@hotmail.com
Barbara Davenport	bcdaven@earthlink.net
Barbara Houshmand	barbarahoushmand@gmail.com
Barbara Mckee	barbaramckee@comcast.net
Barbara Metch	bmetch@q.com
Barbara Montgomery	2barbaramontgomery@gmail.com
Barbara Mueser	bmueser@protonmail.com
Barbara Orr	bjosplace@yahoo.com
Barbara Rosenkotter	skye@alumni.ucdavis.edu
Barbara Shane	bcshane@aol.com
Barbara Skotte	bskotte@yahoo.com
Barbara Vanderwerf	bnb@olypen.com
Barrett Mattison	barrett@farawayflyfishing.com
Barry Kemp	barryg.kemp@gmail.com
Bart De Cuyper	decuyperbart@yahoo.fr
Bea Wilson	beabeachwatcher@gmail.com
Becca Yucha	beccay@gmail.com
Becky Hardey	bhardey@gmail.com
Ben Fellows	btf@olypen.com
Ben Rall	bensrall@gmail.com
Benoit Dominique	dominique.benoit.girard@gmail.com
Beth Farley	bethfar@gmail.com
Beth Hom	bethhom@msn.com
Beth Hutmacher	hutmacherbeth@gmail.com
Bethany Maloney	bethany.maloney@gmail.com
Betsy Robins	brobins@wavecable.com
Bev Vink	vinkbev@gmail.com
Beverly Leyman	bevleyman@gmail.com
Beverly Setzer	beverlysetzer@gmail.com
Bianca Tarleton	bianca.tarleton@gmail.com
Bill Barron	nwliquidators9@gmail.com
Bill Boosman	piscobill@gmail.com
Bill Clogston	bill.clogston@gmail.com
Bill Mcmillan	monksend@fidalgo.net
Bill Touchette	billt@windermere.com
Blake Merwin	flyfishingblake@gmail.com
Blake Nicolazzo	blakenico@gmail.com
Bo Bricklemyer	bobrick@igc.org
Bob And Bonnie Jacobs	jacobsoly@aol.com
Bob Burr	burrresear@aol.com

Bob Deml	bdeml2@cox.net
Bob Grossman	bandk@whidbey.com
Bob Triggs	littlestoneflyfisher@mail.com
Bob Vadas Jr	bobesan@comcast.net
Bobby Righi	bobby.righi@gmail.com
Bonnie Gretz	bgwhaluv@comcast.net
Bonnie J Shimizu	bjs@rof.net
Borg Hendrickson	borghendrickson@gmail.com
Brandon Blakley	brandonblakley1982@gmail.com
Brandon Moberg	brandon.l.moberg@gmail.com
Brandon Orr	snobum5637@gmail.com
Brandt Willson	willson@whidbey.com
Breke Harnagel	bjharnagel@gmail.com
Brenda Bailey	salim3796@yahoo.com
Brenda Molloy	brendamolloy78@yahoo.co.uk
Brenda Padsham	brenda.padsham@gmail.com
Brenda Sue Thompson	oinkbst@msn.com
Brendan Moore	brendan.moorep@gmail.com
Brennan Helwig	brennan@wildfishconservancy.org
Brennen Rose	rosetime101@hotmail.com
Bret Kibele	bret.kibele@gmail.com
Bret Wirta	bretw@wirtahospitalityworldwide.com
Brett Baunton	bbaunton@gmail.com
Brett Ellenberger	brettellenberger11@gmail.com
Brett Soberg	bdsoberg@gmail.com
Brian Bennett	moldychum@gmail.com
Brian Benson	bk_benson@yahoo.com
Brian Cowan	briancowan3@gmail.com
Brian Francis	forsettij@gmail.com
Brian Grad	brians.way51@gmail.com
Brian Holl	bholl1972@gmail.com
Brian Jester	brian_jester@hotmail.com
Brian Odell	odellbp@yahoo.com
Brian Paige	rifflehitch69@gmail.com
Brian Strasbaugh	strasbertos@gmail.com
Brian Westlund	bcwestlund@yahoo.com
Brian Woodward	bwoodward1@gmail.com
Brianna Deemer	bdeemer@live.com
Bridget Mills	nicellmills@gmail.com
Brigitte Fortin	brigitteft@comcast.net
Brook Meinhardt	bmeinhardt@gmail.com
Brooke Idol	bei_02@hotmail.com
Brooke Stover	brooke_stover@yahoo.com
Bruce Dobson	hosho@whidbey.com
Bruce Harrison	bh2688@gmail.com
Bruce Mcnae	bruce@worldsalmonforum.org
Bruce Nesbitt	brucen20@gmail.com
Bruce York	bruceeyork@gmail.com
Bryan Lucore	lucobry@hotmail.com
Bryce Hansen	bryce.c.hansen@gmail.com
Bunny Schneider	bunschneid@hotmail.com
C. Blair Leckie	cblairl@yahoo.com
Caitlin Mcintyre	caitlmac@hotmail.com
Calie Rose	rosetime101@gmail.com

Callie Martin	littleswimmergirl@gmail.com
Cameron Derbyshire	derbyshc@hotmail.com
Cameron Ontkean	camontkean@gmail.com
Camile Sigler	siglerfish@gmail.com
Camille Kariya	akariya@comcast.net
Candace Beardslee	candace@candacebeardslee.com
Candace Bohonik	hamilton7@comcast.net
Candace Krick	candacekrick@gmail.com
Candace Laporte	candiphantom@aol.com
Candace Urquhart	candace@cacestudy.com
Candis E. Krummel	candisekrummel@gmail.com
Carl C.	cjc4269@hotmail.com
Carl Sander	carlsander7@gmail.com
Carl Siver	csiver666@gmail.com
Carla Torgerson	beckywild@aol.com
Carlann Copps	carlanncopps@gmail.com
Carleen Weebers	carleen_weebers@hotmail.com
Carlos Andersen	2carlosandersen@gmail.com
Carmela Micheli	carmela@harbornet.com
Carmen Wolflisberg	caermu@gmail.com
Carne Williams	cmwilliams13@msn.com
Carol Anderson	cja@windwalkermedia.com
Carol Cummins	ccummins@olypen.com
Carol Essick	carolessick@comcast.net
Carol Ferrera - Johnson	damselflycarol@outlook.com
Carol Goldberg	goldcarol@yahoo.com
Carol Jerome	ccjerome@whidbey.com
Carol Krez	krezzo@whidbey.com
Carol Lee Ragus	cleeryan@msn.com
Carol Malcolm	carolmalcolm1@gmail.com
Carol Whitfield	carwhit@hotmail.com
Carole L Burger	calybur@mac.com
Carole Tyson	murmur@whidbey.com
Caroline Armon	onboardtours@yahoo.com
Carolyn Town	c.k.town@live.iup.edu
Carrie Krickbaum	carrie.krickbaum@gmail.com
Carson Bowles	porschephile991@gmail.com
Casey Mcdonnell	c.j.mcdonn@gmail.com
Casson Trenor	trenor@gmail.com
Catherine Ferran	orcasmom@gmail.com
Catherine Hendy	ccgoingon@hotmail.com
Cathie Ernst	caternst@cox.net
Cathleen Burns	commcomm2@gmail.com
Cathleen Smith	nekomijo@yahoo.com
Cathy Bohlke	gobymore01@gmail.com
Cathy Kozial	ckozial@hotmail.com
Cathy Schaeffer	cathylschaeffer@comcast.net
Celeste Weller	celestialweller@gmail.com
Chad Price	chad985@hotmail.com
Chandira H	chandirah@gmail.com
Chardell Paine	cpaine13@comcast.net
Charlene Lauzon	oceanlvr1111@hotmail.com
Charles Cassagnol	cassagnol.charles@gmail.com
Charles Gilnick	cagilnick@comcast.net

Charles Hammerstad	chamerstad@aol.com
Charles Nafziger	canafziger@hotmail.com
Charles Rice	cncrice@olypen.com
Charles Vigil	cdvigil@gmail.com
Charles Wenig	charles.wenig@frontier.com
Charley Foxx	charleyefoxx@gmail.com
Charli Hamilton	crackerd@gmail.com
Charlie Henke	dominantbuck@gmail.com
Charlie Speno	chaspeno@gmail.com
Charlotte Burkard	cburkard@tangentis.com
Charlotte Canning	charart7@gmail.com
Charlotte Caskey	char.caskey@gmail.com
Charlotte Wells	baytime@mac.com
Charmian M Lander	charmain36@hotmail.com
Chase Holt	chaseholt1422@gmail.com
Chase Navratil	chasenavratil@live.com
Cherri Mann	cherrimann@aol.com
Cheryl Campbell	zapcheryl@gmail.com
Cheryl Harrison	cherylpharrison@gmail.com
Cheryl Henley	wildonionyoga@live.com
Cheryl Johnson	cj716021@comcast.net
Cheryl Loran	jvlcml@live.com
Cheryl Lotz	cheryl.l.lotz@gmail.com
Cheryl Moore	the_moores00@hotmail.com
Cheyenne Black	blackenne@gmail.com
Chris Abbott	christophercabbott@yahoo.com
Chris Andersen	candersen@sageflyfish.com
Chris Currie	chrislcurrie@gmail.com
Chris Eaton	eaton2184@gmail.com
Chris Matthews	chrismatthews126@gmail.com
Chris Mccaffity	freefish7@hotmail.com
Chris Prescott	curlyvictor@gmail.com
Chris Stanley	cgstanley57@gmail.com
Chris Stay	cstay@aol.com
Chris Tompkins	ctompkins84@hotmail.com
Chris Usami	1madura1200@gmail.com
Chris Vondrasek	chrisv@seanet.com
Christi Norman	christi.norman50@gmail.com
Christian Berg	christianfentonberg@gmail.com
Christian Crookes	chriscrookes_411@msn.com
Christian Farley	chriscfarley@yahoo.com
Christina Cunningham	ceclunningham2@gmail.com
Christina Doherty	christinad@islandwood.org
Christina Tychonick	christinatychonick@yahoo.ca
Christine Boswell-Still	rstill1@hotmail.com
Christine Ham	ham007@hotmail.co.uk
Christine Palmer	modernsprout@gmail.com
Christine Perkins	c2cperkins@gmail.com
Christine Rayburn	shmoosma@gmail.com
Christine Rust	christinerust2016@hotmail.com
Christine Woodward	cwoodward5893@gmail.com
Christopher Cannon	bicannons@gmail.com
Christopher Heincy	cheincy@verizon.net
Christopher Miller	chrusnn@gmail.com

Christopher Olsen	olsenca513@gmail.com
Christopher Taber	tabertiger@gmail.com
Christy Avery	cma319@gmail.com
Christy Panico	christy.panico@gmail.com
Cinda Weber	underthemaple@gmail.com
Cindy Hansen	ballenagris@live.com
Cinzia Caporali	cici4ever@hotmail.it
Claire Furtwangler	clairefurt@gmail.com
Claire Lawrence	ctlrnc2@gmail.com
Claire Lewis	clairelewis002@gmail.com
Claire M	clairemmcdougall@gmail.com
Claire Mcneilly	mcneillyclaire@gmail.com
Claire Page	cspage2911@gmail.com
Claire Vanpelt	vanpeltclaire@gmail.com
Clara Jean Carmean	stje.carmean@gmail.com
Clare Hansen	clareh@msn.com
Claudia Crosier	claudiacrosier66@gmail.com
Claudia Deibert	claudiadeibert@gmail.com
Claudia Learoyd	claudia.learoyd@yahoo.co.uk
Clay Finck	cfinck31@gmail.com
Clay Livingston	fatdaddyx@gmail.com
Clayton Smith	claytn8@gmail.com
Cliff Schultz	schultz.cliff@gmail.com
Clint Lougheed	clint@nwi.net
Cole Featherston	sok@finderskeepers.us
Coleman Byrnes	swampdog0001@gmail.com
Colin Durfee	cdurfe02@gmail.com
Colleen Cunningham	ccunningham@olypen.com
Colleen Curtis	colleenhcurtis@hotmail.com
Colleen Cushnie	c.a.cushnie@gmail.com
Colleen Feasel	feasel_colleen@yahoo.com
Colleen Parker	collparker56@gmail.com
Connie Lloyd	jerrytoy@whidbey.com
Conrad Gowell	driftc@gmail.com
Courtney Heitter	courtney.heitter@yahoo.com
Craig Kirkby	cbkirkby@comcast.net
Craig Moore	craigjmoore6@gmail.com
Craig Newbury	chicanesports@yahoo.com
Craig Stewart	craigw1959@gmail.com
Craig Tuohy	ctuohy56@gmail.com
Craig Zora	czor490@gmail.com
Cristina Grecchi	cristina.grecchi@gmail.com
Crystal Morris	crystalstyper@yahoo.com
Curtis Hezeau	drzeaus42@gmail.com
Cy Scammell	cyscammell@yahoo.com
Cynthia Bentley	cwithgod@yahoo.com
Cynthia Ceteras	cindyconnects@jeffnet.org
Cynthia Ferrucci	searundoc@icloud.com
Cynthia Kerr	frankiesfavorites@verizon.net
Cynthia Patereau	cynthiap@whidbey.com
Cynthia Zaferatos	czaferatos@gmail.com
D C	cdanistar@hotmail.com
D Faulkner	distefaulkner@yahoo.com
Dabney Rohrbach	dmrohrbach@gmail.com

Dagmar Schnader	dschnader@icloud.com
Dake Traphagen	dake@traphagenguitars.com
Dale Grooms	dale77g@gmail.com
Dalius Giluydis	daliusg@yahoo.com
Damon Johnston	damonjohnston1@yahoo.com
Dan And Jane Coombs	dwjmcoombs@gmail.com
Dan Brake	danbrake3@gmail.com
Dan Freeman	dan@elementalcorp.com
Dan Kegebein	kaveman@tds.net
Dan Marcus	dan_marcus@comcast.net
Dan Resetarits	dan.resetatiys@jsp.com
Dana Kovac	denko@broadstripe.net
Dana Wenig	dwenig@gmail.com
Daniel Allison	danallison@yahoo.com
Daniel Beck	fishinbum1@gmail.com
Daniel Brant	dnlbrant@gmail.com
Daniel Cur	dancur42@gmail.com
Daniel Eastman	daneastman6@gmail.com
Daniel Johnson	da1johnson@comcast.net
Daniele Halle	danielehalle2@hotmail.com
Danielle Clarneaux	danclar1@msn.com
Danielle Dorsch	dorschmountain@gmail.com
Danny Beatty	jdbeatty@wavecable.com
Danny Mansmith	dannymansmith@gmail.com
Daphne Brindle	dbrindle@hotmail.com
Darlene Allen	darsekella@hotmail.com
Darlene Schanfald	darlenes@olympus.net
Darrell Jones	d.d.jones@icloud.com
Darren Peterson	bugchkr@comcast.net
Darren Unrein	dagwwood23@gmail.com
Dave Anderson	dnasmithers@gmail.com
Dave Croonquist	dcroonquist@gmail.com
Dave Ericson	airliftpilot@icloud.com
Dave Felice	gelato321@aol.com
Dave Schlosser	dave.schlosser99@gmail.com
Dave Seabrook	dseabrook@nventure.com
Dave Shreffler	lostmtnloft@olympus.net
Dave Woodruff	ptdwoodruff@gmail.com
Dave Zor	david.zorii@gmail.com
Daviann Mcclurg	chevy_thunder_z@yahoo.com
David And Hohler	dbhohler@gmail.com
David Andruss	dkruzs@gmail.com
David Arntson	dchristiemusic@hotmail.com
David Bise	bikesd@olypen.com
David Conrad	mdconrad@gmail.com
David Davenport	daveyd6998275@yahoo.com
David Dunneback	david.dunneback@yahoo.com
David Engebretson	d.engebret@icloud.com
David Feingold	dfeingold@hotmail.com
David Harvey	david.harvey@smail.pencol.edu
David Hawkinson	dhawkinsonre@hotmail.com
David Heller	daheller@aol.com
David Johnson	squallicum49@msn.com
David Kearford	david@kearford.com

David Koopmans	koopdave@gmail.com
David Laws	davidmlaws@hotmail.com
David My Cxurdy	davidsailboat@msn.com
David Palmer	seapalmer@comcast.net
David Parks	crescentenvironmental@gmail.com
David Payne	kumapayne@yahoo.com
David Poling	dwpoling@gmail.com
David Pool	dave@xmlfund.com
David Quinn	dvquinn14@gmail.com
David Riffle	d.rif@comcast.net
David Shiah	charles81818181@yahoo.com
David Simon	cartermary69@googlemail.com
David Taber	dt@neimantaber.com
David Todnem	dormtodnem@gmail.com
David Turnoy	davidgeri@centurylink.net
David Vardy	davidvardy@gmail.com
Dayna Yalowicki	dlwicki@comcast.net
Dc Reid	dcreid@islandnet.com
Deanna Calef	deanna.lynntapleycalef@gmail.com
Deanna Dibene	soigne6@yahoo.com
Deb Vern Melin	debandvern@centurytel.net
Debbi Fincher	fincher@rockisland.com
Debbi Steele	deborahksteele@gmail.com
Debbie Bennett	beesweet42@yahoo.com
Deborah Carbery	deborahcarbery@gmail.com
Deborah Cherry	d.cherry@sympatico.ca
Deborah Dix	ddix@whidbey.com
Deborah Engebretson	debeng@comcast.net
Deborah Hansen	pv.dhansen@gmail.com
Deborah Heg	dheg@whidbey.net
Deborah Hite	debhite@ptd.net
Deborah Hurley	deborahhurley7@gmail.com
Deborah Lantz	lantzdd@msn.com
Deborah Milton	deborahmltn@gmail.com
Deborah Myers	deborah.myers@comcast.net
Deborah Parker	firstplanetarian@hotmail.com
Deborah Rudnik	debrudnick@gmail.com
Deborah Vann	debbievann@gmail.com
Debra Merz	debramerz@ymail.com
Delia Scholes	deliascholes@yahoo.com
Deloa Dalby	deloaparrish@hotmail.com
Delores Leber	leberda@hotmail.com
Denee Scribner	deneec@yahoo.com
Deniks Ransmeier	ransmeierd@centurylink.net
Denis Tuzinovic	denis.tuzinovic@patagonia.com
Denise Nutt	dnutt12@gmail.com
Denise Sharer	denisehinkey@hotmail.com
Denise Willey	dmail@snowcrest.net
Dennis Church	pandchurch68@gmail.com
Dennis Daneau	dennisdaneau@gmail.com
Dennis Dougherty	dmdfct@gmail.com
Dennis Schaef	dshifdy@aol.com
Denny Justis	dennyjustis@gmail.com
Denny Redman	dennythered@msn.com

Denyse Piper	denyse@whidbey.com
Desiree Panis	daisypanis@hotmail.com
Desiree Sauve	d.sauve@me.com
Dexter Brown	dexterb04@gmail.com
Diana Bublitz	dianab@whidbey.net
Diana Greenfield	digreenfield@comcast.net
Diana Moore	dimooreod@gmail.com
Diana Somerville	writer@olypen.com
Diane Jandreau	dmjma06@yahoo.com
Diane Jones	dianefrjones@gmail.com
Diane Kaufman	entropy@whidbey.com
Diane Landry	fallschurchbiker@yahoo.com
Diane Lombardo	diane.lombardo40@gmail.com
Diane Rose	ddrose@earthlink.net
Diane Stone	gregdi@whidbey.com
Diane White	dianewhite72@gmail.com
Dianna Macleod	dmacleod@msn.com
Dianne Dyer	woodsdyer5@gmail.com
Dianr White	diane.white2213@yahoo.com
Dick Burce	fskibum@olypen.com
Dirk Vermeeren	seattle.expresso@gmail.com
Dmitry Pristin	dpristin@gmail.com
Don Kneass	donkneass@gmail.com
Don Olliff	drolliff@gmail.com
Don Paton	don.paton19@gmail.com
Don Rahm	doncdc2451@msn.com
Don Tarbutton	don.tarbutton@gmail.com
Donald Harland	dharland@bellsouth.net
Donald J Miller	delicatelight@whidbey.com
Donald J Starkin	dstarkin@msn.com
Donald Richardson	dgrichardson@myfrontiermail.com
Donald Setzer	donald1147@gmail.com
Donna Davis	wildonmdavis@gmail.com
Donna Hall	djohall2000@yahoo.com
Donna Spence	janddspence@aol.com
Dorene Belisle	djbelisle@hotmail.com
Dori Mondon-Freeman	dori.mondon@gmail.com
Dorothy Bird	mail4dorothyb@gmail.com
Doug Jacobson	d.jacobson99@yahoo.com
Douglas Lapchis	dlapchis@gmail.com
Douglas Rohn	lymfatic@me.com
Dr Daniel Haldeman	bellsbleach1@whidbey.com
Dr Jessa Madosky	jessa.madosky@gmail.com
Dr Susan Caswell	jsusie23@hawaii.rr.com
Drew Bekins	drewbekins@gmail.com
Dusty Collings	dustycollings@gmail.com
Dusty Rowland	drowland478@outlook.com
Earlene Benefield	earleneb@comcast.net
Ed Andrews	ed@somelabdesign.com
Ed Heidel	heidel@c21nhr.com
Eden Zillioux	barberryhead@gmail.com
Eduardo Fuhrken	info@waterswest.com
Edward Beaty	etbeaty@earthlink.net
Edward Chadd	edchadd@olypen.com

Edward Gardner	singingbear@telus.net
Edward Gawne	egawne257@gmail.com
Edward Kaeufer	cpmielk@comcast.net
Edwin Shepherd	es3dc55@gmail.com
Elaine Becker	elainebecker@yahoo.com
Elaine Donovan	donovaneb@frontier.com
Elaine Goodrich	elainegoodrich1@gmail.com
Elaine Packard	espackard@msn.com
Elena Pomeroy	saltysalishwitch@gmail.com
Elissa Gonzalez	eagonza3@gmail.com
Elizabeth Abbott	abbottelizabetha@gmail.com
Elizabeth Crosby	eclairecrosby@gmail.com
Elizabeth Davidson	elizabethdavidson33@gmail.com
Elizabeth Gaines	elizabethgaines2@gmail.com
Elizabeth Kennedy	lizkennedy@seanet.com
Elizabeth Kruse	krusedrummond@gmail.com
Elizabeth Loudon	ejloudon@gmail.com
Ellen Bartsch	ellen.bartsch@web.de
Ellen Fetchiet	efetchiet@gmail.com
Ellen Hom	ekhom@whitman.edu
Ellen Prior	ellenrayprior@yahoo.com
Ellen Yoder	ellenyoder@yahoo.com
Elliott Menashe	elliott@greenbeltconsulting.com
Ellis Stock	ellisstockk@gmail.com
Eloise Sheldon	ellie@xmediacom.com
Elsie Wattson Lamb	elsievz1@gmail.com
Elspeth Werle	elspethwerle@msn.com
Emilie Roure	ecroure@gmail.com
Emily Doe	elmimp77@yahoo.com
Emily Orrson	eorrson@gmail.com
Emily Van Alyne	oceanminded09@gmail.com
Emily White	emilymwhite@hotmail.com
Emily Whitmire	emwhitmire2@gamil.com
Emily Wigley	wigleyemily@gmail.com
Emma Helverson	emma@wildfishconservancy.org
Emma Hiebert	emma.hiebert.01@icloud.com
Emma Song	soul17surfer@gmail.com
Enid Phreaner	eepslp@aol.com
Eric Edwards	eeguinness@hotmail.com
Eric Morris	eric@earthball.com
Erica Arnold	earnold@usc.edu
Erica Eden	ericae@whidbey.net
Erich Chavolla	myconid2112@yahoo.com
Erik Larue	pacific2626@gmail.com
Erik Marks	erik@egmrealestate.com
Erika Harlow	erock1010@gmail.com
Erika Lorrain	erikalorrain@gmail.com
Erin Braybrook	birdherder@gmail.com
Erin Phillips	erin.n.phillips@me.com
Ernie Williams	ewilliams2010@hotmail.com
Esmeralda Farias	e_farias16@yahoo.com
Estella Mixson	mixsoneg@gmail.com
Ethan Millard	ethanmillard3@icloud.com
Ethan Strahan	suijuris8@gmail.com

Eva Cooley	evvargreen@hotmail.com
Evan Stickles	sticklesejl@gmail.com
Evellyne Boehni	libardi1010@gmail.com
Eycke Strickland	eycke1@olypen.com
F H	geneophotos@hotmail.com
Fanny Vittoz	f.vittoz@yahoo.com
Fátima Menarelo	acm.nene@hotmail.com
Faye Kennedy	fdkennedy@live.com
Fayette Krause	fkrause@olympus.net
Florence Krummel	florence.c.k.quinilla@gmail.com
Floyd Carter	thefloydc@gmail.com
Forest Shomer	inspass@whidbey.net
Frances Blair	fblair39@centurylink.net
Francesca Zambon	sundandy@libero.it
Francie Rutherford	frutherford68@gmail.com
Francoise Vulpe	fvulpe@sympatico.ca
Frank Coccia	fdc83@yahoo.com
Frank Escalona	frank@wesselduval.com
Frank Halstead	fhalstead4@gmail.com
Frank Nance	frankehnance@comcast.net
Fred Hall	fhall2004@yahoo.com
Fred Johnson	rainbow13@mindspring.com
Fred Karlson	fkarlson@frontier.com
Fred Koontz	fwkoontz@gmail.com
Frederick Doden	rickdoden@gmail.com
Fritz Feiten	ffeiten@ameresco.com
Gabe Barnes	gfb42@uw.edu
Gail Dunavan	gail.dunavan@gmail.com
Gail Forsberg	tdforsberg@yahoo.com
Gail Smedley	gail.smedley@gmail.com
Garrett Mann	garrettlandon@gmail.com
Garth Mchattie	garths1@peoplepc.com
Gary Bruner	ghbruner@gmail.com
Gary Clark	gary_clark@fsafood.com
Gary Flagel	garygf@shaw.ca
Gary Gunder	gary@tinroofranch.org
Gary Lagerloef	gary.lagerloef@gmail.com
Gary Young	bcwish@yahoo.ca
Gaylynn Beighton	glbeighton@earthlink.net
Geanna Revell	geanna.revell@gmail.com
Gemma Barker	gemmab26@hotmail.com
Genae Kaltenbach	genaekaltenbach@outlook.com
Gene Smith	earlingtonsmith@gmail.com
Genevieve Graham	genevieve@genevievegrahamclothing.com
Genevieve Shank	genevieveshank@gmail.com
Geoff Mueller	geoff@drakemag.com
Geoff Murphy	rockndiver@gmail.com
Geoffrey Hamill	gshamill@gmail.com
George Sutherland	scgsland@gmail.com
Georgia Lyster	legalpeachy@aol.com
Gerald Stehura	seanfromnature@hotmail.com
Geraldine Walker	gfoss_98225@yahoo.com
Geri Vincent	gerrone@comcast.net
Gina Erskine	ginaerskine@me.com

Gina Johnson	ginabella1@gmail.com
Gina Meng	ginameng@cox.net
Gina Pantier	gsvesey@excite.com
Ginny Gensler	ginnymg@comcast.net
Ginny Shulman	shulmanlg@aol.com
Glen Anderson	glenanderson@integra.net
Glenn Branch	cumblecat@aol.com
Glenn Browning	gbrowning@pacbell.net
Glenn Franko	gfranko@aol.com
Glenn Herlihy	g.herlihy@beaconfoodforest.org
Glenys Lawton	glenntslawton@bigpond.com
Gordon Collins	gordon@whidbey.com
Gordon Yumibe	gyumibe@gmail.com
Grace Wright	gjwright@sonic.net
Graham Duncan	grahamduncan07@yahoo.ie
Graham Mackenzie	grammack@hotmail.com
Graham Read	grahamread_422@msn.com
Greg Armstrong	searun53@gmail.com
Greg Barnes	ptron@whidbey.com
Greg Espe	gregespe@msn.com
Greg Mcdonald	goldmcd@yahoo.com
Greg Wingard	gwingard@earthlink.net
Gregg Overman	ghoverman@comcast.net
Gregory Massa	gregor54@comcast.net
Gregory Mueller	gregmueller@centurylink.net
Gregory Wemhoff	gregorywemhoff@gmail.com
Gretchen Dewire	wabisabiman@centurylink.net
Gretta Kramer	gretta.harley8@gmail.com
Gudrun Dennis	gdennis2@cox.net
Guy Allen	upstream@peak.org
Gwen Goodbee	ggoodbee@gmail.com
Gwen Snyder	theobvioussuspct@aol.com
Halle Thompson	hallethompson8@gmail.com
Hallie Appel	hrivea@aol.com
Hamish Stevenson	hamishsvenson19@gmail.com
Harold Cooke Jr.	hcook5531@gmail.com
Harri Maki	vicarpeggio@gmail.com
Harrie Kessler	harrie@nwlink.com
Harry Bhagwandin	omroa1@gmail.com
Harry Goertz	wade_tull@comcast.net
Harry Reid	harry.r33@gmail.com
Harry Von Stark	vonstarkphotography@gmail.com
Heather Caputo	caputos321@gmail.com
Heather Farren	heatherfarren89@gmail.com
Heather Foster	heather.strassell76@gmail.com
Heather Nicholson	heatherfold@yahoo.com
Heidi Huber	drgnphly17@hotmail.com
Helen Bartuska	tbartuska@wsu.edu
Helene Harrison	helener24@yahoo.ca
Helene Smot	helenesmot@msn.com
Henry Sak	hsak@telus.net
Henry Thein	tseahunter@wavecable.com
Hilarie Ericson	hilariee@hotmail.com
Hilary Turner	haturner579@gmail.com

Hilda Wiens	hilda.wiens@gmail.com
Hilde Chichester	hilde.anderson@gmail.com
Holly Rasmussen	hollyrasmussen11@gmail.com
Holly Shill Vogel	frostflower2000@yahoo.com
Hope Fay	drhope@whidbey.com
Ian Hands	ianhands00@gmail.com
Ian Keith	ikeith@olympus.net
Ian Phelps	iangphelps@gmail.com
Ian Vermeeren	ian.vermeeren@gmail.com
Ik Icard	ikicard12@gmail.com
Inda Taylor	taylori723@gmail.com
Inger Hyatt	fringe@shaw.ca
Ingrid Carmean	icarmean2@gmail.com
Iona Park	ionapark@me.com
Irene Wikman	irenewikman@gmail.com
Irina Czyzewski	otheracctik@gmail.com
Irmgard Conley	irmorcas@rockisland.com
Isa Werny	isawerny@gmail.com
Isabel Vogt	percivaldvogt@gmail.com
J C	jancookphoto@hotmail.com
J Clifford Lasnetske Dds	jclasnetske@gmail.com
J H	kimgroom@hotmail.com
J Lamsek	redwood952@gmail.com
J W Gorodn	jwg98368@gmail.com
J Wayne	lwinolympia@comcast.net
Jack Berryman	cohojack@hotmail.com
Jack Burke	jburke102@comcast.net
Jack Stewart	jackstewart425@msn.com
Jack Williams	fishnspringers@gmail.com
Jackie Campbell	jactim@shaw.ca
Jackie Chow	jchow23708@yahoo.ca
Jacob Kaldor	streamandsky@gmail.com
Jacqueline Young	seamusin@hotmail.com
Jacquelyn Sidor	palupalu_makani@yahoo.com
Jacqui Strange	jjtbq@hotmail.com
Jai Boreen	jailoon@gmail.com
Jaimeson Keegan	jaimeson.keegan@gmail.com
James Anderson	jbosleya@yahoo.com
James Brennan	jsbrennan360@gmail.com
James Brooks	boyntonbrooks@yahoo.com
James Cornwall	roxndox@gmail.com
James Gabriel	kingkrabby@comcast.net
James Goetz	jim@divotworks.com
James Grieve	chris.nffa@gmail.com
James Hipp	jrhipp010@gmail.com
James Hubbard	hubbardhawker@gmail.com
James Langley	mlangley@olypen.com
James Loran	jvlcml@olypen.com
James Merryweather	huntsup@theyorkwaits.org.uk
James Montonye	terrymontonye@msn.com
James Mulcare	xsecretsx@cableone.net
James Murphy	j.murphy.7@mac.com
James Noron	dog_boone@hotmail.com
James Pasola	pasolaja@yahoo.com

James Schafer	jimsch43@comcast.net
James Sheldon	jamessheldon@earthlite.com
James Smith	jamesvsmith@gmail.com
James Taylor	taybre1@telus.net
James Yoder	jyender76@gmail.com
Jamet Hamill	janethamill5@gmail.com
Jami Cantrell	jamicantrell10@gmail.com
Jamie Glasgow	jamie@wildfishconservancy.org
Jamie Hascall	mr.wascall@gmail.com
Jamie Hatten	indiemvivere@aol.com
Jan Ellis	janellis16@hotmail.com
Jan Kessel	jankessel@gmail.com
Jan Rose Heeg	roseheeg@protonmail.com
Jan Weisel	weiscon@comcast.net
Jane Kurzeja	jkurzeja@gmail.com
Jane Montonen	janemontonen@comcast.net
Jane Peak	quiltiker@gmail.com
Jane Peterson	ljaway@earthlink.net
Jane Vanderhoof	janevavan@gmail.com
Janet Alderton	janetmalderton@gmail.com
Janet Holmes	jangunnholmes@gmail.com
Janet Jacobson	djj1909@yahoo.com
Janet Mahan	jansp51@comcast.net
Janet Marx	janetmarx_76@msn.com
Janet Neihart	janeihart66@aol.com
Janet Riordan	janetmriordan@gmail.com
Janet Wynne	jmarwy@msn.com
Janice Klinski	jazklinski@earthlink.net
Janice Tobin	jtobinofc1@aol.com
Janie Pulsifer	silkpoet@whidbey.com
Janis Swalwell	islglass@whidbey.com
Janise Hadley	torgtorga@frontier.com
Jarad Skeels	drysideoutfitters@gmail.com
Jari Brenner	jari@distantshore.com
Jason Chadick	jasonpchadick@gmail.com
Jason Fitschen	jlfitschen@gmail.com
Jason Krapf	jasonkrapf1125@hotmail.com
Jason Lepre	redspider1313@hotmail.com
Jason Miller	jaymon23@gmail.com
Jay H. Beckstead	j.beckstead@me.com
Jay Harmeyer	jayh@mbiseattle.com
Jay L Wells	jaylwells@earthlink.net
Jayne Mardesich	jaynem19@yahoo.com
Jayni Detrick	jayni_detrick@msn.com
Jazz Morgan	riverdrawings@gmail.com
Jean Jensen	jeans4u@msn.com
Jean Singer	singer@whidbey.com
Jean Slocum	jslocum222@yahoo.com
Jean Thompson	31k153@msn.com
Jeanne Beck	jbeck@rockisland.com
Jeanne Classetti	jeannec223@hotmail.com
Jeanne Hyde	l41l57@yahoo.com
Jeanne McNae	jamthebee@gmail.com
Jeff Griffiths	griffdalt@earthlink.net

Jeff Hamblin	jeffreyhamblin@live.com
Jeff Hansen	pdljeff53@gmail.com
Jeff Hendriks	jeff_hendriks@hotmail.com
Jeff Mcgrath	jeffmcgrath30@gmail.com
Jeff Miner	jeffminer3@gmail.com
Jeff Pufnock	jeff.pufnock@gmail.com
Jeff Renner	jeffrenner3@comcast.net
Jeffery Labrum	jlabrum1@spscc.edu
Jeffrey Bahr	driftlessone65@gmail.com
Jeffrey Dyer	12cimi@gmail.com
Jeffrey Martin	jlmtrout@aol.com
Jeni Woock	jeniawoock@gmail.com
Jennie Sanford Arnold	jensanarn@gmail.com
Jennie Sheldon	jwoodsheldon@gmail.com
Jennifer Ash	jj_ash@yahoo.com
Jennifer Fairchild	fairchildjl@gmail.com
Jennifer Giluydis	supermas@gmail.com
Jennifer Glowa	jenglowa@gmail.com
Jennifer Macdonald	macd2333@gmail.com
Jennifer May	jennmay1007@gmail.com
Jennifer Sand	citizensand@gmail.com
Jennifer Wilson	jencranfill@gmail.com
Jennifer Woodbridge	outsidelanguage1@gmail.com
Jenny De Groot	degroot_jennifer@yahoo.com
Jenny Twohig	twigifer@gmail.com
Jeremy Heyl	jeremy_heyl@sbcglobal.net
Jeremy Jacoby	stretchdaddy420@gmail.com
Jeremy Maldonado	jeremy.maldonado@ymail.com
Jerry Dodson	dodobird48@gmail.com
Jesse Barr	jvbarr251@gmail.com
Jessica Jasper	jessica_jasper@hotmail.com
Jessica Labrum	jhie21@gmail.com
Jessica Leon	jessicaireneleon@hotmail.com
Ji-Young Kim	jiyoungk98@hotmail.com
Jill Yetter	jillyetter@msn.com
Jillian Shea	jsheacpa@hotmail.com
Jim Ballweber	ballwebers@harbornet.com
Jim Casey	jc.audax@gmail.com
Jim Erckmann	jim.erckmann2@gmail.com
Jim McRoberts	jim4fish@comcast.net
Jim Morrison	solarjimbo@gmail.com
Jim Pruett	jfpruett@icloud.com
Jimmie Mathis	jim.mathis@wavecable.com
Jimmy Kintzele	jtrout78@gmail.com
Jiri Janecek	jirij45@gmail.com
Jj L.	jhawk@gglbbs.com
Jo Ann Comstock	jacoxey@gmail.com
Jo Tiffany	jotiffany10@gmail.com
Joan Bird	jbird202@hotmail.com
Joan Cotta	jcotta@ymail.com
Joan Douglas	j.abraham@frontier.com
Joan Ostendorff	jaosten@gmail.com
Joann Margo	tjkkmargo@juno.com
Joanna Wild	joanna.wild1@btinternet.com

Joanne Hedou	jhedou@gmail.com
Joanne Repman	joannerep@hotmail.com
Jocelyn Rutter	joceistheword@hotmail.com
Jodi Mcneil	jodi.mcneil@hotmail.com
Joe Ferguson	j-fergusonpls@comcast.net
Joe Griffin-Harte	joegharte.tightlines@gmail.com
Joe Lynch	jojolynch@live.com
Joe Rutter	j.rutt@hotmail.com
Joel Janetski	joel_janetski@byu.edu
Joel Stewart	jstewartkyoto@yahoo.com
Joey May	apartsalamander@gmail.com
John Anderson	johnandnormandie@live.com
John Anderson	jta76@hotmail.com
John Bancroft	johnnybancroft@gmail.com
John Bare	jjbare@gmail.com
John Box	johnbox22@gmail.com
John Bremer	johnpaulbremer@gmail.com
John Conley	jconley@icloud.com
John Corso	corso1965@live.com
John Durfee	steelie14@hotmail.com
John Edison	jeedison@frontier.com
John Foltz	jfoltz123@gmail.com
John Gasperini	jrg7390@gmail.com
John Harley	jdharley@comcast.net
John Hillding	johnhillding@icloud.com
John Kimbell	jpkimbell@whidbey.com
John Lee	john.lee@whidbey.net
John Lell	ljsandia@msn.com
John Little	jwlittle2002@yahoo.com
John Lobid	dtopcat@gmail.com
John Mcglenn	johnmcglenn@gmail.com
John Mikenis	jmikenis@comcast.net
John Moran	jkmoran42@gmail.com
John Murdoch	john.7.murdoch@gmail.com
John Murray	jjahearn_2000@yahoo.com
John Rawlins	john235mary@earthlink.net
John Raymond	skipper@cablespeed.com
John Smith	jmyronsmith@gmail.com
John Spence	janddspence@aol.com
John Sprouse	jsprouse01@gmail.com
John Wolf	peterwolf@whidbey.com
John Zey	omid1941@olypen.com
Jon Akira Doyle	jnohdoyle@aol.com
Jon Atmore	jjatmore@yahoo.com
Jon Lund	lundj41@comcast.net
Jon Martin Mccallum	martinandval@comcast.net
Jonathan Benoit	jbenoit9882@gmail.com
Jonathan Boyne	boyne@hawaii.edu
Jonathan Fisher	jjfisher@gmail.com
Joni Dennison	manifestjkpd@aol.com
Joni Zimmerman	jonizim@gmail.com
Jonny Taylor	jbteezo@gmail.com
Jordan Monez	jordanwestmonez@gmail.com
Jordan Van Voast	jordanvvvv@gmail.com

Jordy Albert	psublue81@aol.com
Joseph Gilman	lu817@aol.com
Joseph Herrin	jherrin@heliotropearchitects.com
Joseph Kennedy	joseph.spencer.kennedy@gmail.com
Joseph Mara	jmara6864@gmail.com
Josephine Fletcher	seaswallowfly@gmail.com
Josephine Hendrix	josette@whidbey.com
Josh Anderson	jdavoice@gmail.com
Josh Bergesen	joshgbergesen@gmail.com
Josh Lusher	mbfly@comcast.net
Josh Swift	jwswift1@gmail.com
Joshua Arbit	jaarbit@yahoo.com
Joshua Francy	cleanstreamsandmemes@yahoo.com
Joshua Kellogg	thegrizz00@yahoo.com
Joy Zizz	joynzizz.jz@gmail.com
Joyanna Erickson	joyannae@yahoo.com
Joyce Swanson	jaswanson@mac.com
Joyce Volmut Volmut	joyce.volmut@gmail.com
Jude Nash	jude_nash@hotmail.com
Judith Brophy Curley	jadcurley@comcast.net
Judith Klinkam	brawandjk@gmail.com
Judith Leader	jjudi18@gmail.com
Judith Leconte	tbacgster@gmail.com
Judy Dittmer	alohajudyd@gmail.com
Judy Merrick	jhmerrick@comcast.net
Judy Miller	mannarx@hotmail.com
Judy Murray	murrj@hotmail.com
Judy Prisoc	judyprisoc@gmail.com
Jules Michel	jjnm@aol.com
Julia Guard	julia.guard@gmail.com
Julia Lewicki	applejuuice666@gmail.com
Julie Conroy	julietec3@gmail.com
Julie Cook	infojules@gmail.com
Julie Greco	gardenkeeperjg@earthlink.net
Julie Higgins	juliehg@mcn.org
Julie Kelner	hilkengirl@gmail.com
Julie Matthews	sjmatthews1986@gmail.com
Julie Mckee	shamrock364@hotmail.com
Julie Schmidt	julieschmidt830@gmail.com
Juliyya Vandenburg	juliyya@gmail.com
Justin Boucher	jtboucher13@yahoo.com
Justin Cordonnier	justin.cordonnier@yahoo.com
Justin Myers	justin@myersphoto.com
Justin Rose	rosetime101@comcast.net
Jutta Schneider	jutta@centralphysicaltherapy.com
K Wayne	tootsieinoly@comcast.net
Ka Wai Cheung	kawaicheung3@gmail.com
Kader Hastings	rainweaver.hastings@gmail.com
Kai Sanburn	kaisanburn@yahoo.com
Kaija Jones	kaija@wearewatts.com
Kaitlin Kominsky	kaitlinkominsky08@gmail.com
Kalen Lakoduk	klakoduk26@gmail.com
Karen B Kiehlmeier	karen@karenkrealestate.com
Karen Davis	kadavis9801@gmail.com

Karen Edwards	karenedwards6@gmail.com
Karen Hadac	karenhadac@comcast.net
Karen Hart	hart@olympus.net
Karen Klein	twicelovedbooks@hotmail.com
Karen Kosoglad	kk4108@hotmail.com
Karen Sziel	ksziel@yahoo.com
Karen Walker	kspliethoff@gmail.com
Karen White	karenlwhite1962@yahoo.com
Karine Werner	karinejw@whidbey.com
Karl Shearer	karl.shearer@gmail.com
Karla Oman	karlaoman@yahoo.com
Karyn Knebel	karynknebel@gmail.com
Kasey Kersnowski	kasey.kersnowski@patagonia.com
Kate Jewell	drkatejewell@yahoo.com
Kate Llewellin	kredman.cetologist@gmail.com
Kate Long	kateclong@gmail.com
Katherine Beal	katherinebeal@hotmail.com
Katherine Gravendyk	kgravendyk@hotmail.com
Katherine Jensen	kathjensen@gmail.com
Katherine Keoough	keddak@hotmail.com
Katherine Krueger	katibird@gmail.com
Katherine Marshall	kjwmarshall@gmail.com
Kathie E Takush	ktakush@yahoo.com
Kathleen Grimbly	bluemoonexplore@gmail.com
Kathleen Habegger	kphabegger@gmail.com
Kathleen Hallum	mothqueen@comcast.net
Kathleen Hansen	kathy.hansen206@gmail.com
Kathleen Hunt	kahuntiwolf@gmail.com
Kathleen Malone	kathleenmalone17@gmail.com
Kathleen Nalen	grangmahappy@gmail.com
Kathleen Price	kkprice@comcast.net
Kathleen Waldron	kathleen.waldron@icloud.com
Kathryn Adams	kitgord@whidbey.com
Kathy Antle	kathyantle0@gmail.com
Kathy Bradley	khayb55@aol.com
Kathy Duprey	ladyofthefield@gmail.com
Kathy Hopkins	sweenkins@mac.com
Kathy Price	priceshopping@comcast.net
Kathy Vermeeren	seattle.expresso@gmail.com
Katie Howard	ktjhoward@gmail.com
Katie Smith	ktesmi@gmail.com
Katie Strohbehn	katiewestlake@hotmail.com
Katrina Campbell	tyzane503@hotmail.com
Kaya Jacolev	kjacolev@gmail.com
Kaye Krause	jrkrause756@yahoo.com
Kaylee Andrews	kaylee34@gmail.com
Kaytie Scott	kaytiephyllis@hotmail.com
Keeva Kroll	keevakroll@gmail.com
Keith Carpenter	keith@lummiislandwild.com
Keith Elkon	k.elkon@comcast.net
Keith Kemplin	keith_kemplin1@hotmail.com
Keith Possee	posseek@gmail.com
Keith Prior	krprior@mac.com
Keleigh Muzaffar	keleighm@stanfordalumni.org

Kelle Fitzpatrick	kellefitz@gmail.com
Kelley Govan	govanke@gmail.com
Kelley Swanstrom Shaw	kellswanstrom@gmail.com
Kelly Mcconnell	prvt@2ezgroup.com
Kelly Shepard	kbellamind@yahoo.com
Kelly Vogt	kellyvogt01@gmail.com
Ken Arakawa	elwha009@gmail.com
Ken Berg	krberg@seanet.com
Ken Burkhardt	ken_burkhardt@yahoo.com
Ken Lang	iamnofool1@hotmail.com
Ken MacDonald	kdmacdon10@gmail.com
Ken Rea	captken@spiritoforca.com
Kenneth Jackson	feote@mac.com
Kenneth Petrovich	kpetrovich@mail.greenriver.edu
Kenneth Russell	kenruf1@gmail.com
Kenneth Van Dyken	kennethvan.dyken@gmail.com
Kent Yost	creighton.yost@gmail.com
Keri Leighton Stone	skipastone1@gmail.com
Keri Marshall	keriann76@yahoo.com
Kerry Knighton	kerryknighton@hotmail.com
Kerry Wasson-Quirk	capitolkerry@gmail.com
Kevin Govan	k.d.govan@gmail.com
Kevin Redden	kredden@comcast.net
Kevin Taylor	kevin@taylordev.com
Kevin Thomas	kevin.tyner.thomas@gmail.com
Kim Hopkins	dukekd22@gmail.com
Kim Kittoe	kim.kittoe@gmail.com
Kim Maynard	kimcozzetto@yahoo.com
Kim Missal	mayaglory@aol.com
Kim Saunders	blueyednewt@gmail.com
Kim Suyama	theolucy@comcast.net
Kim Thomas	kimmichelle@earthlink.net
Kimberly Davis	kimstanley01@gmail.com
Kimberly Izzi	kimiiz@hotmail.com
Kimberly Rose	kimr8244@gmail.com
Kimberly Skarda	kimskarda@yahoo.com
Kirk Francis Francis	kirkyhoehoe@whidbey.com
Kirk Meyers	kirkmey@comcast.net
Kirk Werner	unaccomplishedangler@gmail.com
Ko Ferrandes	kopawlowski@gmail.com
Kresine Reed	nopvoices@att.net
Kris Kreger	krisorcas@gmail.com
Kris Mokma	fishtofer1@hotmail.com
Kristen Anthony	kanthony11814@gmail.com
Kristen Ragain	kristenragain@gmail.com
Kristen Stafie	kris@inclowd.com
Kristen Thomas	thomas8584@comcast.net
Kristen-Marie Kirkby	catostomus33@gmail.com
Kristin Freeman	snicklefritzin43@hotmail.com
Kristin Timken	ktimken@ucsc.edu
Kristine Kevorkian	drkkevorkian@gmail.com
Kristofer Nystrom	knystrom2@comcast.net
Kristy Royce	kristyroyce@gmail.com
Krystal Miller	krystalannmiller@gmail.com

Kurt Baumann	kurt.r.baumann@gmail.com
Kurt Beardslee	kurt@wildfishconservancy.org
Kurt Wochholz	kwochholz@gmail.com
Kyla Sawtell	kyla825@gmail.com
Kyle Huntley	kyle.huntley33@gmail.com
L. Fielder	malankad@hotmail.com
L. Godbey	caseyg82@hotmail.com
Laine Pechacek	lainrmariep@gmail.com
Larry Acord	acord.larry@gmail.com
Larry Bridges	bridgesvoice@gmail.com
Larry Coachman	coachaveli@gmail.com
Larry Eimermann	larry.eimermann@gmail.com
Larry Fox	larryleefox@yahoo.com
Larry Franks	pearsonfr@comcast.net
Laura Arnone	lauraarnone@yahoo.com
Laura Bailey	ljb8@me.com
Laura Bauer	lbauerart@hotmail.com
Laura Brakke	llbrakke@hotmail.com
Laura Hendricks	lauralhendricks@gmail.com
Laura Rich	lrich1054@yahoo.com
Laura Robinson	lcmc4@msn.com
Laura Werner	laura.werner@broadstripe.net
Laura West	mljcwest1@aol.com
Laura Zerr	godawgz5@msn.com
Laurel Brant	laurelmbrant@gmail.com
Lauren Bosch	laurenwhitleybosch@gmail.com
Lauren Fylan	romancebylaurenf@gmail.com
Laurie Cooper	lcoop96@hotmail.com
Laurie Sherman	shermanpt@gmail.com
Lawrence Asmann	larry.asmann@gmail.com
Lawrence Magliola	lawrence.magliola@gmail.com
Leah Frost	paanaakala@hotmail.com
Lee Chebert	slowpokelee@yahoo.com
Lee Harrison-Smith	redmushroom@gmail.com
Leila Jerene	beyondwords@whidbey.com
Lela Perkins	lelaperkins@comcast.net
Leland Block	leland.block@comcast.net
Lesley Miles	imma.pirate.girl@gmail.com
Liann Finnerty	liannza@yahoo.com
Lianne Hart-Thompson	lunardragonfly@live.com
Lidia Mori	wluecke@comcast.net
Liisa Wae	liisawale@gmail.com
Liliana Fiorini	lilianaclaudia68@gmail.com
Lilly Woodbury	chaptermanager@pacificrim.surfrider.org
Linda Avinger	lavendula@netscape.com
Linda Bainbridge	lkgbirder@gmail.com
Linda Creed	creedlindasue@hotmail.com
Linda Ellsworth	lindaellsworth51@gmail.com
Linda Godfrey	lindagodfrey1950@gmail.com
Linda Gregory	zgrbell3@gmail.com
Linda Hart	lindafranhart@gmail.com
Linda Morris	lindam@whidbey.com
Linda Sollars	lincolnsollars@comcast.net
Lindsey Danner	lindseyemerson@hotmail.com

Lindsey Wooten	linz.wooten@gmail.com
Lionel Ehlert	lionelehlert@gmail.com
Lisa Dutton	lisa-dutton@comcast.net
Lisa Heisinger	lisaheisinger@hotmail.com
Lisa Morlan	gsmorlan@hotmail.com
Lisa Rea	lisadrea@msn.com
Lisa Van Horn	lisajvanhorn@gmail.com
Lizbeth Dewitt	lizbethanndewitt@gmail.com
Lizzy Adams	lizzya0725@gmail.com
Lois Danks	lfdanks@yahoo.com
Lon Zimmerman	zimco@ymail.com
Lorayne Peterson	lorriepeterson2@gmail.com
Loren Baker	lorenjbaker@gmail.com
Loretta Atkins	libbyatkins@yahoo.com
Lori Holcomb	lolilookie28@gmail.com
Lori Peelen	lori.peelen@gmail.com
Lorraine Garnier	lorraineparis@msn.com
Lorraine Holcomb	raineyholcomb@gmail.com
Lorraine Thompson	lorrainemary55@live.com
Lou Ann Pacocha	lou_ann_p@hotmail.com
Louise Rifenbery	weezer1952@nwi.net
Loulou Borys	loulouborys@gmail.com
Ludwig Suju	ludwigsuju@hotmail.com
Lyle Anderson	lyleand2@comcast.net
Lyndi Radmilovich	lyndirad@gmail.com
Lynn Beck	lynn.beck@gmail.com
Lynn Colson	lmmcemail@yahoo.com
Lynn Koopmans	lynnbkoop@gmail.com
Lynn Patterson	ldedanaan2@hotmail.com
Lynn Wyckoff	lynnwyck@yahoo.com
Lynne Bannerman	lynneabann@gmail.com
Lynne Roberson	foxches@yahoo.com
Lys Burden	wpburden@aol.com
Macarthur Luu	macarthurluu@gmail.com
Madelaine Kenney	mjk@seanet.com
Madeleine Siamas	madeleine.siamas@gmail.com
Madelyn Van Der Hoogt	mvdh@whidbey.net
Madison Harth	madiharth@gmail.com
Maeva Kelly D Anjou	whishka@hotmail.com
Maggie Straub	maggieross16@gmail.com
Maja Cox	clamdiggr@wavecable.com
Malcolm Lamay	mlamay@whidbey.net
Malena Duffield-Palin	samhain.xxxi@gmail.com
Manfred Schmiedl	manfredschmiedl@mac.com
Manny Mankowski	msmanko@gmail.com
Mara Mason	mmmason51@gmail.com
Maradel Gale	mkgale@uoregon.edu
Marc Santos	marcpolosantos@gmail.com
Marcia Lagerloef	mlagerloef@seanet.com
Marcos Franco	marcos23franco@gmail.com
Mardelle Hansn	mardellehansen@gmail.com
Margaret Crossman	mag.crossman@gmail.com
Margaret Kaczyk	meg.kaczyk@gmail.com
Margaret Lambert	yeeoldebat@aol.com

Margaret Pepper	mpep9@hotmail.com
Margaret Read	margread@msn.com
Margaret Rivard	mollyrivard1@gmail.com
Margaret Ross	tygerize1963@yahoo.com
Margaret Taylor	peggy@whidbey.com
Margaret Woll	marjean23@aol.com
Margie Miles	memsjm@hotmail.com
Margo Macdonald	margomac53@comcast.net
Margo Rolf	margorolf@aol.com
Margo Waring	margowaring@gmail.com
Marguerite Pappaioanou	mpappa1821@gmail.com
Maria Mendes	memendes@hotmail.com
Marianne Mitchell	heritagesea@aol.com
Marianne Tompkins	sumpumpkin@gmail.com
Marilyn Friedrich	marilyninpt@msn.com
Marilyn Mclauchlan	marilynm@homesonbainbridge.com
Marilyn Stonebraker	stonebrakered@yahoo.com
Marilyn Tuohy	mtuohy75@gmail.com
Marine Carr	marine4512@yahoo.com
Marion Crook	crookmarion@yahoo.com
Marion Goldenberg	spears.heather@gmail.com
Marjorie Fields	mvfields@me.com
Mark Adams	markaja@cs.com
Mark Blitzer	pfeffer828@comcast.net
Mark C. Weller	tewell@wavecable.com
Mark Canright	rebeccagroovypeace@gmail.com
Mark Darling	125435hip@gmail.com
Mark Davis	mdavis@dhtech.org
Mark Dawson	mwdawson_inc@msn.com
Mark Dietrich	mark.dietrich56@gmail.com
Mark Dudley	dudmark@gmail.com
Mark Frank	markfrank2102@gmail.com
Mark Hahn	mhahn@tcbtech.com
Mark Parrett	mark.parrett@comcast.net
Mark Powell	markpowell33@gmail.com
Mark Roberts	mjrpga@hotmail.com
Mark Sherwood	mark@nativefishsociety.org
Mark Steudel	msteudel@gmail.com
Mark Sutton	alumaweldsutton@gmail.com
Mark Tuttle	mark.tuttle001@gmail.com
Marleen Neus	marleen.neus@proximus.be
Marlene Clark	msclark147@gmail.com
Marsha Maguire	mmaguireb3@gmail.com
Marshall Goldberg	mfgold@comcast.net
Martha Gray	martigraycam@comcast.net
Martha Kramer	nwmarthakramer@yahoo.com
Martin Kimeldorf	kimeldorf@comcast.net
Martin Lynn	martyslynn@gmail.com
Martine Felts	mcfelts1@yahoo.com
Marty Leith	marty.leith@ngkf.com
Marty Webb	webbkin@blarg.net
Mary And Brian Jokela	bmjokela@msn.com
Mary Ann Crawford	birchbay.mary@gmail.com
Mary Banner	ndnchik32@gmail.com

Mary Bennett	clydmarbenn@aol.com
Mary Eggert	mdeggert@gmail.com
Mary Gleysteen	marygleysteen@gmail.com
Mary Gropp	marygropp10@gmail.com
Mary Jo Stansbury	maryjo@estansbury.com
Mary Karen Mchattie	marykaren1@peoplepc.com
Mary Mclean Phd	mayr0@sonic.net
Mary Moreno-Cain	moreno-cain@juno.com
Mary Parker	maryinmountains@gmail.com
Mary Paynter	payntermary@comcast.net
Mary Peteinaraki	mpeteinaraki978@hotmail.com
Mary Sprague	cms@cablespeed.com
Mary Watson	mary.watson727@gmail.com
Maryann Baxter	writermab@gmail.com
Maryann Lirkby	islandgardendesigns@yahoo.com
Matt Mardesich	matthewjm30@yahoo.com
Matt Waldron	ucrage01black@gmail.com
Matthew Clark	maooto@gmail.com
Matthew Ross	matthewross1001@gmail.com
Maureen Foss	pmfoss@icloud.com
Maureen Wall	revival@wavecable.co
Max Chase	max.chase89@gmail.com
Maxine Clark	maxclark90@gmail.com
Maxine Dodge	neitz@hotmail.com
Maya Landry-Livshetz	mayamaximovna@outlook.com
Maya Nathani-Sim	maya.ns@live.com
Meg Cochrane	megeliz303@hotmail.com
Megan Morrissey	morrissey.megan@gmail.com
Megan Uken	megan.uken@gmail.com
Megan Wittenberg	megan@ofearthandvine.com
Meghan Berg	meghanfernald@gmail.com
Meghan Schrock	meghanschrock@gmail.com
Meichen Plumhoff	meichenelise@gmail.com
Melani Nagao	melaninagao@gmail.com
Melissa Adams	madamstea@gmail.com
Melissa Kokaly	makokaly@yahoo.com
Melissa Lebo	melissalebo@gmail.com
Melissa Ropke	melaropke@gmail.com
Mendel Skulski	mendel@futureecologies.net
Mercedita Del Valle	bernardmercy38@gmail.com
Meredith Riley	mgriley7@comcast.net
Meryle A. Korn	meryle.korn@gmail.com
Mezan Mascorro	mezanoly@gmail.com
Mia Steinberger	mia.steinberger@gmail.com
Micah Wait	micah@wildfishconservancy.org
Michael Chandler	chandler@artisthome.org
Michael Clyburn	mclyburn@whidbey.com
Michael D Mcvay	mmcvay@whidbey.com
Michael Demarco	michaeldecom@yahoo.com
Michael Gallart	trallag@mac.com
Michael Hesch	heschco@hotmail.com
Michael Hom	homsters2@msn.com
Michael Honke	mjhonke@aol.com
Michael Johnson	mdjishere@gmail.com

Michael Kovacs	mtkovacs@comcast.net
Michael Krall	mkrall_wyo@yahoo.com
Michael Krause	nemolvr41@yahoo.com
Michael Lawson	michaellawson6@gmail.com
Michael Nesbitt	africafundi@gmail.com
Michael O'Connell	moconnel@mindspring.com
Michael Reppy	mreppy@dolphinspirit.org
Michael Rynes	discubs697@hotmail.com
Michael Smith	mikes@amhardware.com
Michael Spafford	spikemafford@gmail.com
Michael Squilla	michael.j.squilla@gmail.com
Michael Whitlock	mickwhitlock@gmail.com
Michel Vis	michel77@mac.com
Michele Berry	redberry71@gmail.com
Michele Eskridge	welcometothezoo1951@yahoo.com
Michele Mueller	shel48@broadstripe.net
Michelle Bergner	michellebergner@hotmail.com
Michelle Borsz Kuntz	mborsz@hotmail.com
Michelle Hayward	kittyandmoose@yahoo.co.uk
Michelle Hoff	hofmich22@yahoo.com
Michelle Mccarthy	hiilawe@gmail.com
Miguel Reabold	miguelreabold@yahoo.com
Mikael Frödin	frodinflies@telia.com
Mike And Mindy Thompson	mmb@whidbey.com
Mike Butkovic	acousticmikeb@gmail.com
Mike Cox	toxman57@gmail.com
Mike Culcasi	mculcasi@sbcglobal.net
Mike Ericsson	michael.ericsson@icloud.com
Mike Igna	iggyriver@mail.com
Mike Nelson	nelson@olypen.com
Mike Rehder	wmrehder@gmail.com
Mike Webb	mikewebb@blarg.net
Mikisha Herzog	mikanddan@bigpond.com
Mindy Meyer	ayaamassage@mac.com
Miriam Gray	grayinfremont@gmail.com
Mitch Blanton	mitchblanton@yahoo.com
Mj Mariano	doctormjm@aol.com
Mj Wood	mjwood0110@gmail.com
Molly Armstrong	mollyarmstrongv@gmail.com
Molly Ciliberti	molly.ciliberti@comcast.net
Monika Shields	monika.wieland@gmail.com
Morgan Greenfield	greenfieldmorgan@gmail.com
Morgan Hebert	shredder4ever@yahoo.com
Nadine Au	nauyndn@netscape.net
Nadine Barrick	poppysiddal@gmail.com
Nadine Zygas	dinodino97@hotmail.com
Nancy Craig	nancycraig7@gmail.com
Nancy Gleason	ncgleason@gmail.com
Nancy Klimp	nklimp@gmail.com
Nancy Lemay	dispatcher67@comcast.net
Nancy Little	nllittle@gmail.com
Nancy Nowlin	nnowlin@comcast.net
Nancy Quackenbush	nkquackenbush@gmail.com
Nancy Schafer	nschaferlmt@msn.com

Nancy Shaw	jnshaw1@comcast.net
Nancy Shimeall	nshimeall@gmail.com
Nanette Oggiono	nanykat@aol.com
Natalie Klotzer	natalie.klotzer@gmail.com
Natalie Van Leekwijck	hoepagirl@gmail.com
Natasha Roque	nroque1227@gmail.com
Nathalie Op De Beeck	ivyfern@msn.com
Nathan Hall	natefish13@yahoo.com
Nathan Warrick	warri282@gmail.com
Nathan Wilson	natewilson848@gmail.com
Nathaniel Heeg	roseheeg@yahoo.com
Neil Bauman	ntbauman@comcast.net
Neil Van Blaricom	neilvanb@gmail.com
Nelia Swayze	neliajosh@gmail.com
Nelly Vasquez	loboferozcerditos@gmail.com
Nelson Morgan	nmorgan79@gmail.com
Nicholas Chatfield	nickcharles60@gmail.com
Nicholas Curtright	nicsmind@yahoo.com
Nicholas Evans	evansofak@gmail.com
Nicholas Lenchner	airbat@pacbell.net
Nick Barcott	nbarcott@msn.com
Nick Gayeski	nick@wildfishconservancy.org
Nick Lowry	nick_random@yahoo.com
Nicol Smith	n.smith1970@icloud.com
Nicola Edgar	nickye@cwgsy.net
Nicole Cline	the3ncs@gmail.com
Nicole Jenkins	orcachic99@gmail.com
Nicole Pidgeon	nmpidgeon@gmail.com
Nicolette Ludolphi	agwang@hotmail.de
Nik Mardesich	nikmardesich222@gmail.com
Nikoli Stevens	nikoli99@uw.edu
Nina Sarmiento	nsarmie2@gmail.com
Nora Lindberg	moosehaven2@msn.com
Nora Shapiro	nora.weaves@gmail.com
Norb Ziegler	ziegler98075@gmail.com
Noreen Parks	noreen.parks@gmail.com
Norman Baker	ntbakerphd@gmail.com
Norman Parks	normparks@hotmail.com
Norman Pinch	berrynrenate@hotmail.com
Normandie Anderson	johnandnormandie@live.com
Olivia Ganyard	ganyardolivia@yahoo.com
Olivia Smith	oliviasmith23@hotmail.com
Olivia Wright	owright2@gmail.com
Owen Fairbank	fairbao@gmail.com
P Elle	selerby1@comcast.net
P Perron	patriciaperron@hotmail.com
Pageant Estes	page.estes@hotmail.com
Paige Nilles	paigenilles@yahoo.com
Pam Borso	borsope@aol.com
Pam Harlan	pamh@islandwood.org
Pam Pritzl	ppritzl@frontier.com
Pamela Benson	pamelalbenson@gmail.com
Pamela Church	psdc1221@yahoo.com
Pamela Gray	pamgray@olypen.com

Pamela Hastings	pamela@pamelahastings.com
Pamela Oconnor	poconnor0512@gmail.com
Pamela Turner	pturner239@comcast.net
Pamella Denotter	pdenotter9@gmail.com
Pat Gulick	patsdragon@gmail.com
Pat Pearson	pearsonpat@me.com
Patricia Byrnes	pastryguru8@icloud.com
Patricia Carroll	patutie1@comcast.net
Patricia Coe	pcoe@sdsu.edu
Patricia Frank	pmkfrank@gmail.com
Patricia Garley	pat@alexandermetals.ca
Patricia Gibson	patattac@msn.com
Patricia Keegan	trish@lennonkeegan.com
Patricia Lazzar	ptt.lzzr@gmail.com
Patricia S. Garcia	montanapup@gmail.com
Patricia Santangelo	patti_santangelo@yahoo.com
Patricia Shields	shieldstrish@gmail.com
Patricia Slaten	sweetwater@olypen.com
Patrick Cahill	cahill31@gmail.com
Patrick Freeny	freeny@uw.edu
Patrick Kahne	azkahne@aol.com
Patrick Mckee	patmckee@sbcglobal.net
Patrick Myers	patrick.myers04@gmail.com
Patrick Trotter	ptrotter@halcyon.com
Paul Adler	paul-adler@frontier.com
Paul Dudley	golfman68@comcast.net
Paul Dunn	pauldunn118@aol.com
Paul Faulds	fauldspaul@gmail.com
Paul Joseph Wolcott	pjwolcott@whidbey.com
Paul Neave	edgewalker@rockisland.com
Paul Neis	paul_neis@yahoo.com
Paul Nelson	paul.leonard.nelson@gmail.com
Paul Sammons	paulcsammons@gmail.com
Paul Sarvasy	psarvasy@gmail.com
Paul Sherman	pshermanpt@gmail.com
Paul Simmons	pshomes@whidbey.com
Paul Stann	pstanngrizz@netzero.net
Paul Sykes	sykes_paul@hotmail.com
Paula Nairn	akiwi123@gmail.com
Paula Rotondi	perotondi@comcast.net
Peggy Hanson	peggy_g_hanson@yahoo.com
Peggy Kimbell	pkimbell@whidbey.com
Peggy Walker	peggy@peggywalker.net
Penelope Wood	peneleope@msn.com
Peter Arneil	parneil@me.com
Peter Gallant	cedarcreekbows34@gmail.com
Peter Harrison	zapville@olypen.com
Peter J. Crowley	lifeinphotographicart@gmail.com
Peter Millett	millettbip@aim.com
Peter Von Christierson	pvonc@olypen.com
Peter Wiant	wiantfilm@gmail.com
Peter Zabriskie	zcomp2@aol.com
Phaedra Booth	ptbooth@gmail.com
Phil Hanson	phanson@spiretech.com

Phil Wade	phil@wadeolsen.net
Pierre Davidson	pierre_davidson@hotmail.com
Pilar Blas	pilar.zulueta@gmail.com
Priscilla Murray	cillamurray@yahoo.com
Proctor Schenk	dpschenk@aca-assoc.com
R. Jeffers	robert.jeffers@comcast.net
Rachael Benedict	benedictr4388@gmail.com
Rachael Payne	rachaelsage.payne@gmail.com
Rachel Easton	rachel@harborwildwatch.org
Rachel Matsuda	rachelmatsuda@gmail.com
Rachel Messerschmidt	rachelsamess@aol.com
Rafael Lopez	rafaelnoellopez@gmail.com
Ralph Lloyd	ralph.g.lloyd@gmail.com
Ramsey Gregory	ramseyg49@gmail.com
Randa Achi	randa_achi123@hotmail.com
Randall Collins	rancol23@yahoo.com
Randy Corbett	rlcor@msn.com
Randy Whitehill	rfwhitehill@gmail.com
Ranell Nystrom	private-idaho@comcast.net
Raphiell Nolin	raphiell@gmail.com
Ray Foster	ray@homeinspections.org
Ray Mcdougall	raywmcdougall@gmail.com
Ray Uriarte	muchofilter@gmail.com
Raynar Holtz	raynaholtz@aol.com
Reanna Wheeler	reanna530@yahoo.com
Rebecca Canright	rchorse11@aol.com
Rebecca Christensen	dragonfly_11@comcast.net
Rebecca Nerison	rebeccanerison@gmail.com
Rebecca Sykes	rjhsykes@hotmail.com
Reed Thomas	rthomas4455@gmail.com
Regine Klein	shegrip@hotmail.com
Regula Hess	regula.hess@wanadoo.fr
Renate Pinch	berrynrenate@hotmail.com
Rene Kopf	reneekopf78@gmail.com
Renee Erickson	renee@eatseacreatures.com
Rex Stroup	rbstroup1@gmail.com
Rhen Benson	rabarch@sonic.net
Rhonda Salerno	rhonda@whidbey.com
Rich Allen	rallen1729@gmail.com
Richard Bingham	richbar@cox.net
Richard Eric Strom	sirestrom@comcast.net
Richard Johnson	jazzpacnw@yahoo.com
Richard Weiss	reweiss38@gmail.com
Rick Cain	ch3rrc@gmail.com
Rick Davis	rjtj19@gmail.com
Rick Freeman	bizrickfreeman@gmail.com
Rick Hatten	rickerbock@aol.com
Rick Rupp	crr6087@yahoo.com
River Steenson	river.steenson@gmail.com
Rj J.	jhawkjani@gmail.com
Rob Dalton	robertbevandalton@gmail.com
Rob Kirschner	rkj50@hotmail.com
Rob Wagoner	rcw@kwarch.com
Robert Adamson	radamson1788@gmail.com

Robert Alexander	seatrials@hotmail.com
Robert Ast	robast@hotmail.com
Robert Balanda	rhbalanda@gmail.com
Robert Buck	buckeye1@olypen.com
Robert Burdick	reburdick@comcast.net
Robert Davies	fshnfool56@gmail.com
Robert Dejong	bobdejong@comcast.net
Robert Edwards	robandrobine@gmail.com
Robert Gasper	bgaspy@msn.com
Robert Gerlach	rwg@anewds.com
Robert Johnson	rjohn22736@aol.com
Robert Juidici	bpjuidici@yahoo.com
Robert Maurus	rmaurus@gmail.com
Robert Parks	steveparks22@msn.com
Robert Pelant	rkp56@yahoo.com
Robert Phreaner	blueball431@gmail.com
Robert Richardson	r.richardsoningh@gmail.com
Robert Rorex	cloud9@whidbey.com
Robert Spaggiari	rspaggiari30@gmail.com
Robert St Andre	robert.standre@gmail.com
Robert Steiner	steiner@uw.edu
Robert Sullivan	bobsully@live.com
Roberta Blinder	bblinder@sbcglobal.net
Robin Anderson	robin.anderson130@gmail.com
Robin Boyer	robinboyerr@hotmail.com
Robin Fitch	rbnfitch@gmail.com
Robin Thaler	robin@mayflyeng.com
Robin Vanhyning	rvanhyning@gmail.com
Robin Williams	gypsyjewels333@gmail.com
Rod Robinson	rod.robinson3@me.com
Roger Clark	rogerbclark@yahoo.com
Roger Gilmore	roger5747@yahoo.com
Rolf Parks	sparks.parks60@gmail.com
Ron Fleury	sngman4@yahoo.com
Ronald Blakely	rblakx@telus.net
Ronald Howlett	rhowlett@maui.net
Ronald Leer	buzardbreath@hotmail.com
Ronald Meza	ronaldmeza10@gmail.com
Ronaye Tylor	ronaye@comcast.net
Ronda Good	rondasgood@gmail.com
Roscoe Petroff	roscoepetroff@gmail.com
Rosemary Steffes	rrsteffes@comcast.net
Rowan Baker	watershedfishbio@yahoo.com
Roxana Moya	roxanamoyac@gmail.com
Roxanna Marck	roxymarck@aol.com
Roy Treadway	royctreadway@comcast.net
Ruchi Stair	ruchi.stair@outlook.com
Ruth Carroll	intothetrees@msn.com
Ruth Peddinghaus	ruthpeddinghaus@gmail.com
Ruth Ross	ross@ls.net
Ryan Beck	rybeck13@gmail.com
Ryan Dunn	ryandunnphotography@gmail.com
Ryan Kovach	rpkovach@gmail.com
Ryan Viers	ryan.viers@gmail.com

Ryan Welch	w3lch@live.com
S C Sunde	s45d14@protonmail.com
Sabine Bischofberger	sabinebinebine@gmail.com
Sally Bartow	sallybartow@comcast.net
Sally Emerich	emo@kvalley.com
Sally Hodson	sallyhodson@wildhaven.com
Salome Henry	salomehenry2003@yahoo.fr
Sam Cunningham	samcunn@gmail.com
Sam Featherston	saminchina@hotmail.com
Sam Horn	samhorn6@hotmail.com
Sam Rutledge	rutledge04@gmail.com
Samantha Johnson	johnson06282015@outlook.com
Samantha Martin	samjanemartin22@gmail.com
Sammy Low	cougarcreek7@gmail.com
Sandra Hoffelt Olson	shoffeltolson@yahoo.com
Sandra Lee Harper	sandraleeharper722@gmail.com
Sandra O'Conner	oconnorsandra2@gmail.com
Sandra Palm	wentletrap8@hotmail.com
Sara Eldridge	seeldridge22@hotmail.com
Sara Fogan	calminsensehypnosis@yahoo.com
Sara Henshaw	saratonehome@gmail.com
Sara Montgomery	sheskis@outlook.com
Sara Ziegenbein	sarod25@gmail.com
Sarah Bauman	sarahweilbauman@gmail.com
Sarah Carnahan	sarahcarnahan23@gmail.com
Sarah Hanson	hansonsarahliz@gmail.com
Sarah Lane	sarahlane04@yahoo.com
Sarah Lonigro	sarahlonigro@gmail.com
Sarah Lyle	thomlyle@mac.com
Sarah Shaefer	sarah.shaefer@yahoo.com
Sarah Weber	snw2088@gmail.com
Sarah Wyckoff	claesen@mindspring.com
Scott Birrer	sbirrer@comcast.net
Scott Campbell	straitjdf@gmail.com
Scott Granlund	sgranlund@gmail.com
Scott Hiddelston	shiddelston@mac.com
Scott Powell	scottlpowell@comcast.net
Scott Tallman	scott.tallman@gmail.com
Scott Walker	walkers@olympus.net
Se Parsons	grazietoo@comcast.net
Sean Den Adel	sean.denadel@gmail.com
Sean Gallagher	sean_m_gallagher@msn.com
Sean O'Connell	seanpwro@gmail.com
Sebastian Guastavino	sebastiang27c@gmail.com
Selby Lighthill	slighthill@gmail.com
Shaelee Evans	shaelee.e@gmail.com
Shaiyeda Silverwolf	shaiyeda@gmail.com
Shan Morrison	shan.morrison1@gmail.com
Shane Clyburn	shaneclyburn@gmail.com
Shannon Quishenberry	sgqberry@gmail.com
Shar Emerick	tatankamerlot@aol.com
Shari Tarantino	orcaconservancy@gmail.com
Sharol Hallanger	shar98290@yahoo.com
Sharon Dunn	shardunn@whidbey.net

Sharon Grace	parons@rockisland.com
Sharon Kenyon	kenyonjs@comcast.net
Sharon Schlentner	sschlentner@olypen.com
Sharon Swift	sharonbuddy@wavecable.com
Shaun Hubbard	shaunalice@gmail.com
Shawna Isom	caligirlup@hotmail.com
Shelby Dopp	sdoppsmith@gmail.com
Shelly Ackerman	shellya@whidbey.com
Sherri Gallant	psgallant2009@gmail.com
Sherri Mcnamara	slmcnamara21@yahoo.com
Sherrie Jarrett	sherriej123@gmail.com
Sherry Mccullough	mcculloughshe@aol.com
Sherry Perkins	perksher@gmail.com
Shirley Bennett	s9ben11@comcast.net
Shirley Hoh	shoh@comcast.net
Shirley M Metz	ecox@olympus.net
Shirley Nixon	shirleynixon@olympus.net
Sija Sur	sija1810@gmail.com
Silas Mcafee	silasm1996@gmail.com
Simone Peter	iruka@gmx.ch
Sinclair Ball	ball.sinclair@gmail.com
Sissi Bruch	123sissi@gmail.com
Sophia Anderson	sophia22@uw.edu
Spencer Anderson	spencer2135@gmail.com
Stacey Holliday	staceyholliday22@gmail.com
Stan Isley	stanisley@charter.net
Stan Parker	parkerstan1@yahoo.com
Stan Wagner	spwagner5@gmail.com
Stanley Zyskowski	stanzski@hotmail.com
Stella Rogers	stellanator@yahoo.com
Stephanie Colony	spcolony@gmail.com
Stephanie Hagen	river.lady@comcast.net
Stephanie Henry	stephjdhenry@gmail.com
Stephanie Holbert	sdsholbert@gmail.com
Stephanie Peron	sauseyp77@yahoo.com
Stephen Bailey	stilltruckinsb@yahoo.com
Stephen Bernheim	sabernheim@gmail.com
Stephen Conroy	skeena20@live.com
Stephen Dipietro	stephen.dipietro@gmail.com
Stephen Perry	kvpnw@hotmail.com
Stephen Selby	stephenselby@yahoo.com
Stephen Wille	sawille1@gmail.com
Stephen Wippich	swipp6@yahoo.com
Steve Casebolt	steve.casebolt@gmail.com
Steve Erickson, Whidbey Environmental Action	wean@whidbey.net
Steve Hawes	stevehawes1950@mac.com
Steve Henninger	schenninger56@yahoo.com
Steve Koehler	steve@stevekoehler.com
Steve Marett	stmarett@gmail.com
Steve Nagode	spnagode@gmail.com
Steve Schiller	permaculture@rocketmail.com
Steve Schramm	reelsafari@yahoo.om
Steve Yoder	syoder1759@gmail.com

Steven Harper	stevenharper2@msn.com
Steven Jung	sjung1@sbcglobal.net
Steven Remmer	steveandadrienne@gmail.com
Steven Rodriguez	steven.rodriguez@cardno.com
Sue Anderson	sueanderson003@gmail.com
Sue Christensen	schrstensn@aol.com
Sue Larkin	suelarkinphoto@gmail.com
Susan Crampton	scrampton@methownet.com
Susan Crane	susand_crane@hotmail.com
Susan Daly	sueandmikelay@hotmail.com
Susan Emerson	semerson4@cox.net
Susan Hampel	islandhampel@gmail.com
Susan Hooper	suehoo222@yahoo.com
Susan Knobel	susanmk377@hotmail.com
Susan Lee	sturdes@gmail.com
Susan Lewis	susanlewis111@gmail.com
Susan Macomson	susanshaf@comcast.net
Susan Malins	susan.malins@gmail.com
Susan Martin	ssigman1@aol.com
Susan Mickey	mkrinbring@aol.com
Susan Munn	susmunn@yahoo.com
Susan Munson	cory.munson@verizon.net
Susan Nattinger	snattinger@hotmail.com
Susan Placanica	flamingoatdawn@gmail.com
Susan Rehder	reeds@uw.edu
Susan Rhomberg	suedoe@outlook.com
Susan Ross	jerseysu1@yahoo.com
Susan Salveson	sue.salveson@gmail.com
Susan Sargis	greenshutters@aceweb.com
Susan Smith	stsmith.art@gmail.com
Susan Taylor	bluenite@hotmail.com
Susan Vogt	bias@alaska.net
Susan Wepking	smwepking@gmail.com
Suzanne Delaney	nanykat1@gmail.com
Suzanne Fageol	spirit@whidbey.com
Suzanne Myers	suzanneinolga@gmail.com
Suzanne Price	resmprice@me.com
Suzanne Selfors	selforssuzanne@yahoo.com
Suzanne Suther	spjsuther@msn.com
Sydney Williams	sydney.williams@ofarrellschool.org
Sylvia Carlton	sylviacarlton@mac.com
Sylvia Feder	sylshopping@mac.com
Tami Pokorny	valleyrockfarm@gmail.com
Tana Decoslek	betrece67@yahoo.com
Tara Demers	demerst13@gmail.com
Teagan Fossenier	tfossenier@yahoo.ca
Ted Detrick	tadetrick@mac.com
Ted Jones	bijones4@comcast.net
Tenille Icard	tenille286@hotmail.com
Teresa Fleener	tessgf@hotmail.com
Teresa Young	downtown3enator@gmail.com
Teri Wright	twright57e@gmail.com
Terrance Baker	ternkiem1972@yahoo.com
Terri Martensen	terrimartensen@sbcglobal.net

Terrill Lueck	terlue52@gmail.com
Terry Bendock	tbendock@icloud.com
Terry Stein	terry8@sbcglobal.net
Thangam Chandrasekavan	cthangam@me.com
Tharyce Morgan	tessa72@hotmail.com
Theodore Lewis	tlux8126@gmail.com
Thierry Rautureau	thierry@thechefinthehat.com
Thom Lufkin	thomlufkin@comcast.net
Thom Peters	voice4wild@aol.com
Thomas Brady	placerminer@me.com
Thomas Byun	tbyun2@gmail.com
Thomas Gilmore	tgilmore66@comcast.net
Thomas Hahn	thahn@tcbtech.com
Thomas Kelly	kellysfreshfish@hotmail.com
Thomas Lennon	tom@lennonkeegan.com
Thomas Marshall	tomasaurus@gmail.com
Thomas Mccormack	thomas@sunsetlakesranch.com
Thomas Rice	speelyai@gmail.com
Thomas Swedberg	thomas_swedberg@me.com
Tim Abbe	tim@naturaldes.com
Tim Caviness	tigercav@comcast.net
Tim Crowley	tcrowley411@gmail.com
Tim Lockwood	tdlockwood@hotmail.com
Tim Teets	timateets@gmail.com
Timothy Grigas	tim_grigas@hotmail.com
Timothy Manns	bctm@fidalgo.net
Timothy Mccabe	darksound13@gmail.com
Tina Green	tina-green@hotmail.com
Tisa Agloro	tisa.agloro@gmail.com
Tod Johnston	todjjohnston@aol.com
Todd Obenauer	todd.obenauer@gmail.com
Todd Sandell	troutsahoy@gmail.com
Tom Borst	theupriverrat@gmail.com
Tom Buckingham	tom@401kplanninggroup.com
Tom Burns	tjburns7@comcast.net
Tom Creaden	tcreaden@yahoo.com
Tom Gagne	tompgagne@gmail.com
Tom Gideon	gideon5019@gmail.com
Tom Hansen	tom.hansen206@gmsil.com
Tom Linde	wakeflood@gmail.com
Tom Sexton	trsexton@gmail.com
Tom Shuhda	tshuhda@plix.com
Tom Stuth	tstuth@aol.com
Tony Schiro	atschiro@whidbey.net
Tori Wyman	t_zinda@yahoo.com
Tova Cubert	tova@tovaland.com
Traci Cole	watersprite@inbox.com
Traci Fairbanks	tleafairbanks@hotmail.com
Tracy Kessler	verdent@protonmail.com
Tracy Ouellette	tracyjouellette@gmail.com
Tracy Powell	stonebard@gmail.com
Travis Morrison	travismorrison@live.com
Tray Olson	rodastrandhuset@mac.com
Trenny Mcelwain	mcelwain@vvmc.com

Trent Burkard	tburkard@tangentis.com
Trevor Covich	opflyguy@gmail.com
Tristan Gordon	tristan.gordon@patagonia.com
Tula Pitcher	tulapitch@gmail.com
Ty Sadowski	tbs2@msn.com
Tyler Coleman	serenityrideshop@gmail.com
Tyler Danyluk	danyluk.tyler@gmail.com
Tyler Hoyt	thoyt12512@yahoo.com
Tyrell Hedlund	tyrellhedlund@gmail.com
Tyson Kemper	idlemotion@gmail.com
Ursula Mass	ursmas919@gmail.com
Valerie Chu	chuvr3@gmail.com
Vance Jennings	vancedjennings@gmail.com
Vanessa Baez	vanessak.baez@yahoo.com
Verleen Boyer	rfboyer@comcast.net
Verna Sampson	verna.sampson@icloud.com
Veronica Anguiano	therioview@yahoo.com
Vicki Elledge	v.elledge@gmail.com
Vickie Gairaud-Hinkley	newheritagefarms@yahoo.com
Vicky Arcaro	vickyarcaro@gmail.com
Vicky Miller	vickymiller@hotmail.com
Victor M	flyfsheridaho@hotmail.com
Victoria Fairbanks	glenfae@whidbey.com
Vilma Quintana	vilma1147@gmail.com
Virginia Kuehn	ginnyk@whidbey.com
Virginia White	pvonc@olypen.com
Virginia Winfield	ginny@ecomsystem.com
Vivian Junkin	missviviandora@hotmail.com
Vivian Le	lesjsu@yahoo.com
W.Ronald Moore	rodi@telus.net
Wallace Smith	wdsmith@hotmail.com
Walter Jorgensen	waltjorgensen@comcast.net
Walter Kuciej	walterk74@comcast.net
Wendi Woods	oh_ur@yahoo.com
Wendy Geldien	disneygeld@comcast.net
Wendy Gray	wendygray@hotmail.com
Wendy Green	wchgreen248@gmail.com
Wendy Kliment	wkliment@gmail.com
Wendy Lehman	wenleh@msn.com
Wendy Underhill	wmunderhill@gmail.com
Wes Canfield	wesleyacanfield@gmail.com
Weyshawn Koons	weyshawn@hotmail.com
Whitley Mike	whitley.mike@clynch.com
Whitney Neugebauer	director@whalescout.org
Will Carnaghi	wcarnaghi@gmail.com
William Appel	appelllb@aol.com
William Fitzsimmons	wdfitz1@gmail.com
William King	wmvking@yahoo.com
William Kroontje	liamkroontje@msn.com
William Mcwha	wmcwha@gmail.com
William Rayburn	wrrayburn@aol.com
William Smothers	aloha@olympus.net
William Vanderheiden	bvissurfn@yahoo.com
William Young	loon13@comcast.net
Winfield Hobbs	wshobbs2@hotmail.com

Yadira Gonzalez	wingedwhispers.yg@gmail.com
Yanzeh Nolin	raphiell@yahoo.com
Yazmin Gonzalez	evaunit2001@yahoo.com
Yvette Goot	yvetteolsen@yahoo.com
Zach Little	mzlittle@gmail.com
Zbigniew Kostrzewski	zbigk@sbcglobal.net