GROUNDFISH MANAGEMENT TEAM REPORT ON PORT SAMPLING SURVEYS

In April 2013, the Groundfish Management Team (GMT) discussed the possibility of collecting information that might help inform decisions related to restructuring existing groundfish stock complexes (Agenda Item D.3.b, Supplemental GMT Report, April 2013). Changes to existing stock complexes could result in additional sorting requirements. Sorting requirements allow for better tracking of individual stocks that may be of concern to fisheries managers and improves the quality of data available for management of these stocks. Prior to the June 2013 meeting, a subgroup of the GMT designed and implemented two surveys: one intended for state sampling program managers and supervisors, and a second for state agency port biologists and samplers (including seasonal samplers, where applicable).

The primary purpose of both web-based surveys was to provide the GMT and the Pacific Fishery Management Council (PFMC) with information to aid discussions about whether and how to change existing groundfish stock complexes. Information of interest to the GMT included how often individual stocks within existing stock complexes were encountered, what tools were used to distinguish these individual stocks, and perceived impacts to state sampling programs, fishing activities, and processing operations. These areas of interest have been mentioned in previous GMT statements (Agenda Item F.8.b, Supplemental GMT Report 2, June 2013; Agenda Item D.3.b, Supplemental GMT Report, April 2013) and in Appendix C of the 2013-14 Final Environmental Impact Statement for the Pacific Coast Groundfish Fishery (pp. C-45 – C-46, FEIS 2012). The Oregon Department of Fish and Wildlife (ODFW) submitted a state report in June that discussed potential impacts to ODFW's sampling program and Oregon fisheries with greater specificity (Agenda Item F.8.b, ODFW Report, June 2013). Collecting information that provides greater specificity to the GMT's current understanding was a goal of both surveys.

An overview of each survey and summarized results are provided below. Both survey instruments are included as part of this report: Appendix A is the program manager/supervisor survey and Appendix B is the port biologist/samplers survey and Appendix B.

Program manager and supervisor survey

A reoccurring discussion related to changing existing stock complexes is focused on the types and magnitude of impacts to state agencies, fishing operations, and processing plants (see Agenda Item D.3.b, Supplemental GMT Report, April 2013 for an example). As is the case with inferring which groundfish species may be difficult to distinguish (see "Port biologist and samplers survey" section below), many on the GMT, Council staff, and others could speculate about potential impacts or "costs" associated with changes to existing complexes. For example, increasing the number of market categories may increase the sampling burden on port samplers. The team thought it worthwhile to survey those whose jobs are to balance existing sampling program resources with state sampling goals, existing stock complexes, and market categories: state sampling program managers and supervisors. These employees could also have some insight into potential impacts to fishing and processing operations since identifying and

surveying this population was not feasible at the time. Changes to sorting requirements are expected to have a larger impact on state port sampling programs, fishing operations, and processing facilities (p. C-45, FEIS 2012). No impact was expected for federal observers and "minimal to moderate" impact was expected for catch monitors and enforcement (p. C-45, FEIS 2012). A survey was designed by a subgroup of the GMT using Google Forms™; a web link to that survey was sent to state sampling program managers and supervisors between 6/10 – 6/11/13. The survey was open for one week, closing on 6/17/13. All five program managers and supervisors were invited to participate; all five responded.

The survey comprised of eight questions (see Appendix A). These questions and corresponding results are described below.

Current port sampling coverage

Question 1 in this survey sought to gain information about the ability of state sampling programs to have groundfish sampling coverage across their state given the current funding levels available. Responses to this question may provide information about baseline or current levels of coverage, before possible changes to stock complexes.

Consistent between all three states was that sampling coverage was greater at fishing ports with more fishing activity; similarly, fewer species composition samples are taken at fishing ports with lower levels of groundfish fishing activity. This response, in addition to others mentioned by respondents that may also be applicable coastwide, are listed below as reasons why sampling coverage may be lower at some port locations:

- Ports with the highest volume of fish landed are more likely to have more sampling resources spent there.
- Likewise, ports with fewer groundfish fishery participants, less processing capacity, and smaller volumes of landed catch have proportionally fewer samples taken from them.
- However, some port sampling program resources are spent in ports with lower volumes of groundfish landings in order to sample different fishing strategies and areas in these lower volume ports. Otherwise, it was mentioned that these fishing strategies and areas would not be represented. Lower volume ports that support nearshore fisheries and the different gears that are used (trawl, longline, pot, or hook-and-line) were noted as an example.
- Sampling coverage may depend on the season or the year. For example, non-hake groundfish trips may have less sampling coverage during hake season due to sampling program resource limitations.
- Ports with more trawl-caught groundfish landings have more sampling coverage.
- Travel distance to ports due to the actual distance and/or traffic conditions were cited as influencing sampling coverage in some ports.
- An existing shortage of port biologists due to limited funding for more positions was mentioned as a factor determining the number of composition samples taken.

- The presence of "mobile dealers" was also mentioned as a reason why fewer samples might be taken from a particular port. When fish are offloaded, it is often transferred directly to trucks or vans, leaving little or no time for taking composition samples. The ability to take samples is also dependent on voluntary cooperation from fishermen or dealers.

Possible challenges to state port sampling programs

Questions 2 and 3 provided program managers and supervisors an opportunity to reflect on how increasing market categories might impact state port sampling programs. Question 2 provided respondents with nine possible response categories (including an "Other" category) that the GMT suggested as possible impacts. Question 2 asked respondents the following:

> In June, the PFMC will decide on preliminary alternatives for reorganizing the slope rockfish and "other fish" stock complexes. **In general**, how might your port sampling program be affected if the reorganized stock complexes increases the number of market categories? *Please check all that apply. This list may not be complete; please tell us more in the following question.*

Nine response categories were provided for this question. These response categories and the number of respondents who agreed with that category, are listed in Table 1 below.

Table 1. Increasing market categories and how state port sampling programs may be affected.

Potential impacts to state sampling programs	**Number of respondents**
Achieving our state's groundfish sampling goals may become more difficult.	4
Prior to sampling landings, port biologists and other sampling personnel will spend more time waiting for groundfish landings to be sorted.	4
A greater number of groundfish samples will need to be taken if the number of market categories increases.	4
A greater number of groundfish samples taken by port biologists or other port samplers will likely contain higher levels of contamination (i.e., more misidentified fish in each sample)	3
Each groundfish species composition sample may take more time to process due to higher levels of misidentified species	4
Each groundfish species composition sample may take more time to process due to an increased number of market categories.	3
Existing fish ticket or landing receipt books and/or data management software and programs will have to be updated.	5
Additional training of state agency staff, fishing operations personnel, and/or fish processing employees will be necessary.	5
Other – please tell us more in the next question	2

All five program managers/supervisors agreed that the following impacts may occur if the number of market categories were to increase:

- Existing fish ticket or landing receipt books and/or data management software and programs will have to be updated.
- Additional training of state agency staff, fishing operations personnel, and/or fish processing employees will be necessary.

Respondents who indicated "Other" in the above question were given an opportunity to describe in more detail what other impact might result from changing market categories (Q3). Possible changes in the level of accuracy of data collected by port biologists and samplers was a theme of one of the comments:

> "Because there may be more 'gaps' in sampling due to the increase in market categories, there will likely be more 'borrowing' sample information from one port to another or from the same port from another time period. This may result in less accurate data, rather than the more accurate data that was expected by reorganizing the stock complexes."

Another respondent mentioned the challenges relative to current funding levels for state sampling programs and how this will also affect sampling coverage and editing landing receipts (in addition to the possibility of new market categories):

> "We were cut significantly on our funding this year. If that happens again we are looking at loosing 1.5 PYs.[1] We will not be able to sample as much as we have in the past and I doubt we will be able to cover new market categories. Port Biologists also edit landing receipts. It will take more time to edit (properly code) if there are new/more market categories. The QSM system… will have to be rewritten to handle the new market categories."

A detailed description of similar challenges and other challenges that may affect the Oregon Department of Fish and Wildlife (ODFW) is available in an ODFW report under this agenda item in the June 2013 Briefing Book (Agenda Item F.8.b, ODFW Report).

Possible challenges to fishing operations and processing plants

Questions 4 and 5 provided respondents an opportunity to reflect on how increasing market categories might impact fishing operations and processing plants. Question 4 provided respondents with seven possible response categories (including an "Other" category) that the GMT suggested as possible impacts. Question 4 asked respondents the following:

> What challenges do you think **fishing operations and/or processing plants** might face if reorganized stock complexes increases the number of market categories? *Please check all that apply. This list may not be complete; please tell us more in the following question.*

[1] This respondent mentioned "PYs" but what this was an abbreviation for was unclear. Considering the comment as a whole, we interpreted this acronym as referring to port biologist and sampling staff.

Seven response categories were provided for this question. These response categories and the number of respondents who agreed with that category, are listed in Table 2 below.

Table 2. Increasing market categories and how fishing and processing activities may be affected.

Potential impacts to fishing operations and/or processing plants	**Number of respondents**
Having to increase the number of bins needed for sorting more market categories	4
Finding space for additional bins is going to be a challenge (i.e., on a vessel, in a plant)	4
Fishing operations and/or processing plants will be need to train new or existing employees to accurately sort these market categories	5
Fishermen, plant workers, etc. will spend more time sorting groundfish landings if the number of market categories increases	5
Additional fishermen, plant workers, etc. may need to be hired to help sort groundfish landings	2
The quality of groundfish products may change due to landings spending more time on ice before plants can process them, misidentified species, etc.	0
Other – please tell us more in the next question	3

All five program managers/supervisors agreed that the following impacts were likely to occur if the number of market categories were to increase:

- Fishing operations and/or processing plants will be need to train new or existing employees to accurately sort these market categories
- Fishermen, plant workers, etc. will spend more time sorting groundfish landings if the number of market categories increases

Respondents who indicated "Other" in the above question were asked to provide more information in an open-ended question (Q5) following the one above. In addition to the response categories listed in the question, one respondent suggested that the "frustration level" of plant managers and workers might increase if they are asked to re-sort species that are difficult to differentiate. Similarly, another respondent stated that state sampling staff often ask processing personnel to re-sort when contamination levels (that is, when the proportion of misidentified fish) are too high. What is "too high" is a judgment call made by the port sampler[2] and depends on factors such as species, market category, and landing volume. Asking processing personnel to re-sort requires "extra time for both [port biologists] and processing personnel" and stops everyone's "work flow to educate plant personnel" and re-sort.

Also regarding time, one respondent further stated that "species with similar appearances that are difficult to distinguish from each other will require more additional time than those that are relatively easy to identify." This comment suggests that if species that are difficult to differentiate are now required to be differentiated, the time to do so would increase.

[2] This was mentioned for Oregon and Washington samplers. This protocol to ask fishermen and processing personnel to re-sort landings was not mentioned as a practice in California.

One respondent commented on impacts to fish buyers. That is, that the "quality of fish" may not decline as much as might be anticipated because fish buyers will maintain quality by using more ice or making other changes during the offloading process. However, this may cost fish buyers more time and money. From this comment, it could be surmised that this higher cost may be passed on to someone along the supply chain.

One respondent commented about the potential need for the GMT or others to talk to fishing operations and processing plants directly: "I can't speak to the potential need to hire extra plant workers, or a degradation in quality due to more time needed for sorting prior to processing. Please don't interpret my lack of checks in those boxes to mean I don't think they will occur (although if I had to guess, I'd guess they would not be significant issues... but this guess is coming from someone who has never worked in a fish plant)."

Other information collected

Three general questions were asked in this final section: how long these individuals had been working for the state agency in their current capacity (Q6; range of 4 to 21 years); where they have been employed as a port biologist, other port sampler, or program management involved with groundfish (Q7; each had experience in one of the following states: CA, OR, and WA; no one had experience in AK or two or more states); and whether they have been employed as a fishermen, plant monitor, or dock or plant worker where they handled or sorted groundfish (Q8; one had been employed in CA doing this).

One final opportunity was provided at the end of the survey to comment on the contents of the survey (Q9). One respondent took that opportunity to write: "Increasing the number of market samples by reorganizing the species complexes does not necessarily increase the accuracy of determining the percentage of a given species from a complex when the species are difficult to tell apart on the sorting belt."

Port biologist and sampler survey

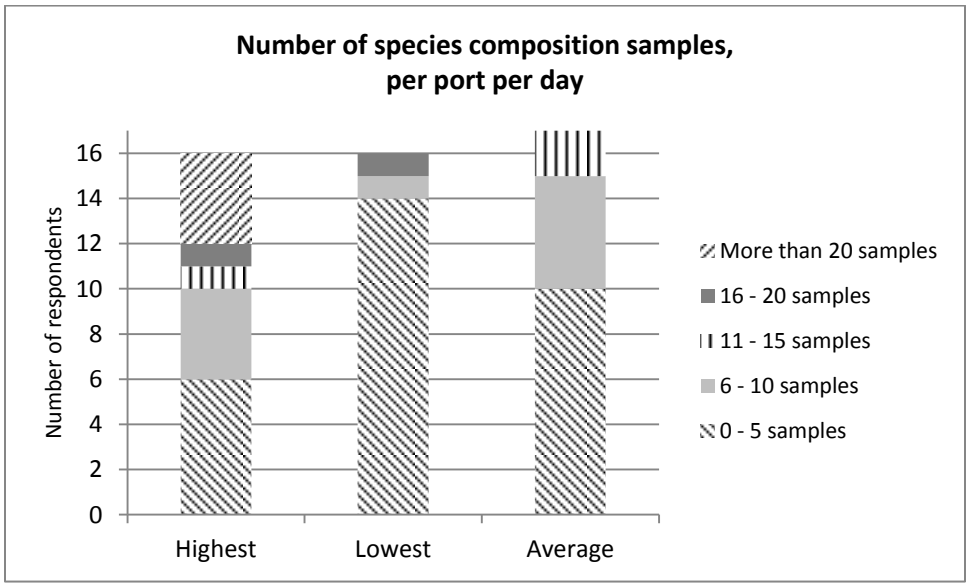
One of the main reasons for organizing stocks into a complex is when individual stocks are "difficult for fishermen, observers, plant monitors, port biologists, and others to distinguish" (Agenda Item D.3.b, Supplemental GMT Report, April 2013). Though many on the GMT, Council staff, and others could speculate which species might be difficult to distinguish (for example, aurora rockfish from splitnose rockfish), the team thought it was worthwhile to survey those whose jobs require positive identification of species within complexes and market categories: port biologists and samplers. Though federal observers and catch monitors are recognized as having similar training and expertise in groundfish identification, only state port biologists and samplers were surveyed at that time. It is assumed that information collected from port biologists and samplers would be similar to their federal observer and catch monitor counterparts. A survey was designed by a subgroup of the GMT using Google Forms™; a web link to that survey was sent to state program managers and supervisors between 6/10 – 6/11/13 to be forwarded to their staff. The survey was open for one week, closing on 6/17/13. All 21 state agency port biologists and samplers were invited to participate; 17 responded.

The survey consisted of 28 questions (see Appendix B). Due to the high number of questions and survey length, the survey was split into two parts. This allowed respondents to complete each part at different times, if needed. Of the groundfish stock complexes currently in the Pacific Coast Groundfish Fishery Management Plan, the PFMC prioritized the slope rockfish and "other fish" complexes for possible restructuring in time for the 2015-16 biennial groundfish management cycle (PFMC Decision Summary Document, June 2013). Stocks included in the "other fish" complex are cartilaginous species and various roundfishes. Other flatfish and shelf rockfish complexes were given lower priority for restructuring at this time. Nearshore rockfish complexes were dropped from further consideration during this cycle.

General port sampling questions

The following results are from questions related to: the number of groundfish species composition samples taken at any given port location on an average day (Q1); amount of time it takes to process species composition samples given three levels of contamination (i.e., proportion of misidentified species; Q2); number of market categories encountered in a given port location (Q3); amount of time spent waiting for catch to be offloaded prior to starting their species composition sampling protocol (Q4); and how often do port biologists and samplers work with fishermen, dock workers, or plant workers to accurately identify groundfish species (Q5).

Figure 1. Number of species composition samples processed, per port per day (Q1)



Question 2 asked respondents to estimate how much time they spend processing groundfish species composition samples with different levels of contamination ranging from less than 10% to greater than 25%. Table 3 displays the time estimates from 10 of the 17 respondents:

Table 3. Number of respondents and their estimated time to process species composition samples, given different levels of contamination.

	Estimated time to process species composition samples						
% contamination	*< 10 min*	*10 – 20*	*21 - 30*	*31 - 45*	*46 - 60*	*61 – 90*	*> 90 min*
< 10%	4[1]	3	2				1[2]
10 – 25%	3[1]	2	3[3]	1			1[2]
> 25%		3[4]	1	3	1	1	1[2]

[1]One respondent added the caveat that this was true if the task was sampling "50 lb of rockfish".

[2]One respondent noted a range of 5 – 100 minutes, which varied based on a number of factors such as volume of landings, species landed, etc.

[3]One respondent noted a range of 30 – 90 minutes, which was variable based on a number of factor (see table note 2 and the discussion that follows this table).

[4]One respondent noted that this was true for "50 lb of rockfish". For "5,000 lb of rockfish," 30 – 180 minutes was noted as the time needed to process landings.

Several of these 10 respondents, as well as the other seven, mentioned multiple reasons why this question was difficult to answer. That is, the time needed to process species composition samples was not only based on the proportion of contamination but also many other factors including:

- <u>The fishery or the boat itself</u>. One respondent noted that their responses referred only to "… the shoreside hake fishery." Another respondent noted that "[t]he amount of time to complete the sample varies greatly not just from boat to boat, but also from offload to offload of the same boat."
- <u>Volume of catch</u>. Many port biologists and samplers mentioned this to be a factor when estimating the time needed to process species composition samples. One respondent noted that "… the new IFQ [program] limits the amount of fish to be sorted [and] varies greatly from trip to trip. If there is a total of 50 pounds of rockfish landed with less than 10% contamination, I am only looking at maybe 2-5 min to sort out contamination. 10-25% [contamination] may take me 5-10 min, greater than 25% really isn't going to take much longer. Ok, now make that off-load 5,000 pounds and it's going to take maybe half an hour to three hours."
- <u>Depends on the species, complex, and/or size of individual fish.</u> Several respondents mentioned this to be a factor. Comments included:
    - For less than 10% contaminated, a composition sample may take "approximately 5 min for most species. [However] slope [composition samples] usually take the longest at around 15 min because it requires more species sorting. If contamination is low, it doesn't add much time to the process in the field or in the write up."

    - "The greatest species contamination I have experienced would be long/short [spine] thornyheads. If the contamination was greater than 25%, processing time would be significant. If the contamination occurred with larger species of fish such as roundfish, slope, nearshore, shelf, etc. [then the] process time would be insignificant. If contamination occurred with smaller flatfish species, such as rex [sole], sanddabs, etc. [then] time would be a factor."
    - "The time required… greatly depends on which species is being sampled. For something like blue rockfish contamination of black rockfish landings, species comp[osition] sampling is very quick since its immediately apparent what species each fish is. It might only take a couple extra minutes to do such a sample if there were greater than 25% contamination. [However f]or something like shortspine thornyhead contamination of longspine thornyhead [landings], it takes much longer since each fish must be examined for a positive ID. In this example, 10%, 10-25%, and greater than 25% would all take the same amount of time, since you are looking at every fish regardless. In another example, you could consider splitnose and aurora . Again, both species are fairly readily identifiable and a sample could be quickly sorted much like with blacks and blues. Contamination [level] might add a couple extra minutes of time."
    - "These questions show that the author is (completely) unfamiliar with the process... the time that [it] takes [to sample] depends on the category, boat, dock crew, type of fish, conditions, etc..."
- Depends on the number or variety of species present. One respondent wrote that "[t]his time estimate is dependent on the number of species present. Following our project protocol for species composition, it would take less than 5 minutes if composed of two species (e.g., longspine vs. shortspine thornyhead). If composed of four to five species (e.g., slope rockfish), it would take 8-10 minutes."
- Depends on whether the species are familiar. One respondent wrote that sampling "… times would greatly depend on [whether] they were common species that I see often and on a regular basis. If they were it wouldn't take me much longer to sort each one of these contamination percentages. However, if there are species that I don't see often or would need to be keyed out, then it would take me longer and that is represented in my above estimated times. These are just estimates, each situation is different and it is hard to quantify."
- Greater than 25% contaminated requires a change in their sampling process. One respondent wrote that "if it's really contaminated, I would start pulling all the different species out and put them in separate baskets according to species." Doing this would add time to the time needed to process samples.
- Several respondents noted that high levels of species contamination is rare. One respondent mentioned that "… nearly all of my samples come in without contamination. All my groundfish samples are of such low total quantities that regardless of species

composition, the most time it would take me is approximately 15 minutes per sample." Other respondents mentioned that:

  - "It is very unusual to see… [10-25%] contamination. If it is just one species of contamination it might add on a few minutes in the field plus a few more minutes [for] processing papers."
  - "I've only seen [>25% contamination]… a couple times in the past decade. Usually, [this is due to] someone new sorting the fish and it's a matter of fish ID education. In the past, I've notified the person in charge of sorting to the problem and they have made the new worker(s) resort the species correctly. This has been effective."
  - "Normally I do not see a species contamination level greater than 10%."

- Whether landings must be re-sorted influences how long it takes to sample. One respondent wrote that "[t]his [question] is difficult to answer as currently structured due to my sampling protocol as follows: When [there is] a tote consisting of >10% contamination, I stop doing the composition [sampling] and inform the dock foreman of the contamination and ask for a re-sort. This ensures that the fish ticket will portray the best accurate weights for individual species or species complexes. I will, however, resume sampling a contaminated tote if the dock foreman refuses to do a re-sort on this tote. In this case it will typically take an hour to process highly contaminated totes of fish (>10%)."
- Talking or working with those who sort landings (i.e., fishing and processing industry) may add time to their sampling protocol. One respondent noted that if the contamination level was less than 10%, they would not mention this to the processing crew. However, a contamination level of 10-25% would require some "casual talk about ID to workers and crew" and greater than 25% contamination would require "extra cluster sampling, lots of talk with crew and workers about ID, and possible resort[ing of landings]."
- Related to the above, sample processing time depends on the experience level of fishing and processing personnel. Some comments included:
  - "[Time to process samples m]ostly depends on the plant crew and how fast the fish is coming off the boat. If there are 1 or 2 novices on the [processing] line and the fish are coming off here and there, it can take up to 30 mins or more to go over the different species… In [it is] an IFQ landing and there is a dock monitor, some [will] with help and spend time with the crew and some will not. If [the dock monitor] helps, I may not have to spend any time with the crew on the line."
  - "There is quite a large turn-around with people sorting fish for the [processing] plants. Therefore, we are frequently working with new sorters and fish ID."
  - "The real problem with these sorting scenarios is not with trained sampling biologists. The problem is with industry. The average deckhand or dockworker will have a tough time identifying aurora versus splitnose [rockfishes]. Not only will [new] sorting requirement[s] add significantly to offload times… the sorting

> will not be accurate anyway. There has been a black/blue rockfish sorting requirement for many years, yet contamination is still routinely found in landings since many buyers just don't notice the difference between species..."

Relative to this last comment, one respondent mentioned that they themself are not always able to identify a species while sampling. In these cases when a species cannot be "… 100% identified in the field… [it is] thoroughly photographed and then keyed later that day."

In addition, potential differences in the sampling protocols between states were discernible from many comments made by respondents relative to Q2. Port biologists and samplers mentioned the following differences:

- Whether they were taking biological samples. There may be some slight differences between states relative to whether biological samples (e.g., for age, size, gender) are always taken in tandem with species composition samples.
    - For Washington, their protocol for processing a species composition sample was described in two steps (WDFW, personal communication, 5/16/13). First, a "quick check" is made to assess the level of contamination in that sample. If it is greater than 10%, the fishermen/dock worker/processing personnel are asked to re-sort those landings. Once the level of contamination is "low enough", the port biologist/sampler will re-sample and assess the species composition of those samples. Biological sampling was described as somewhat separate from this process. Thus in the survey, we asked respondents to consider only species composition sampling when responding to our questionnaire.
    - However, a comment made by one respondent from Oregon seemed to suggest that separating the species composition sampling process from the biological sampling process was not so clear cut, at least for our ODFW respondents: "… you asked us to please exclude 'biological sampling' [and it] is largely the point of being there – our methods used to collect biological samples yield the species comp[osition]s… Occasionally when pressed for time we might collect a species comp only…"
    - For California, one respondent stated that "[e]very sample we collect is a species composition sample." Thus framing the survey questions by asking respondents to consider only species composition sampling (versus biological sampling) protocols may have not made as much sense to our CDFW respondents.

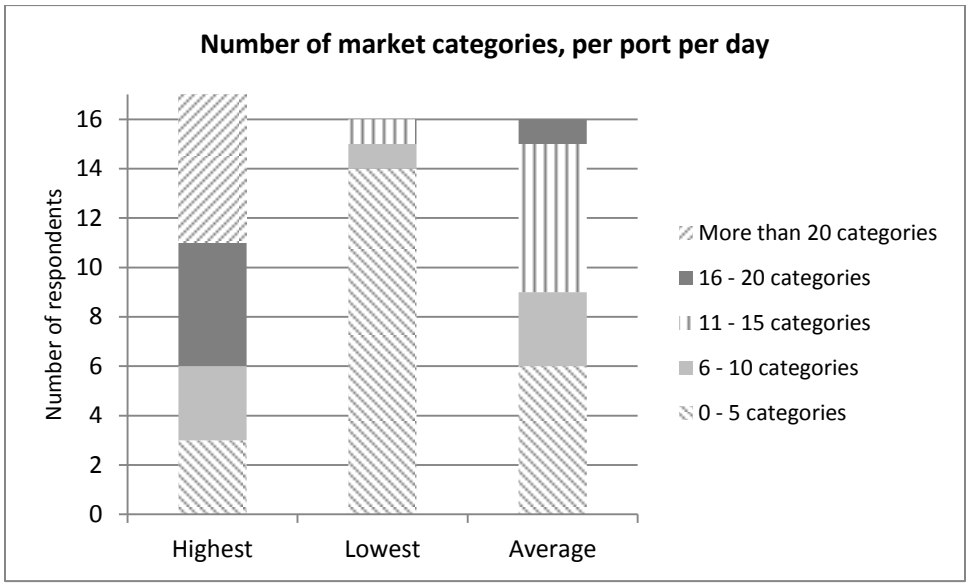
- Whether fishing and processing personnel were asked to re-sort landings.
    - In Washington and Oregon, port biologists and samplers may ask fishing and processing personnel to re-sort landed catch if the contamination level is too high. What is "too high" in Oregon is up to the discretion of that port biologist/sampler. However in Washington, port biologists/samplers typically ask that landings be

resorted when species composition samples contain contamination levels greater than 10%.

- In California, port biologists/samplers do not ask fishing or processing personnel to re-sort, regardless of contamination level. However, if the contamination level is consistently high at a particular location, the state's sampling program manager may be notified and discussions with fishing/processing personnel may occur.

Question 3 asked respondents how many market categories (highest, average, and lowest,) they might encounter at any given port location in a day. We acknowledge that many different factors such as port location, what is marketable at that location, and species distribution along the coast will influence an individual's response to this question. The intent was to learn, roughly, the range of market categories port biologists and samplers might encounter during the course of their species composition sampling work day.

Figure 2. Number of market categories encountered at any given port location (Q3)



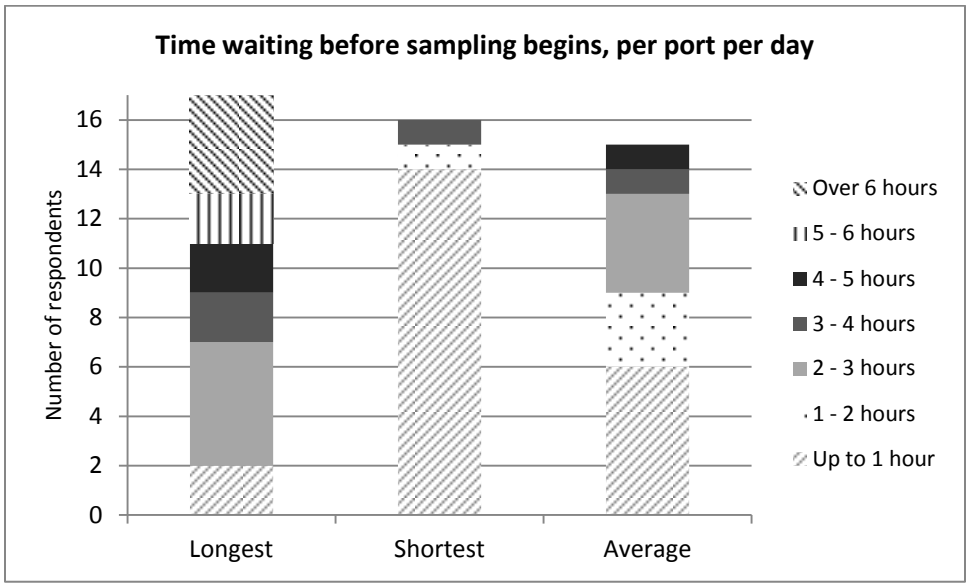
Some respondents commented directly about market categories. Regarding chondrichthyes (elasmobranchs and other cartilaginous fishes), one respondent noted that there are "too many categories and there is not enough room, physically, for all the totes and baskets – [there is] only so much space on the docks." Another respondent stated that the number of market categories is "not too much of a burden on me – I was going to identify that fish to [the] species level and collect biologicals on it anyway, regardless of what category it is in."

Regarding who is responsible for sorting landed catch, "[i]t's the boat crews and plant crews who are legally responsible to sort the catch into the categories prior to first weighing." That is, the role of a port biologist/sampler is to sample landed catch and note the proportion of catch not sorted to the correct market category. Market category can refer to a specific species (e.g., black rockfish) or category of species (e.g., red rockfishes), depending on the state, which species are marketable, and which species have sorting requirements (federal or state regulations). In

addition, market categories are periodically updated and have increased over time (e.g., Agenda Item F.8.b, ODFW Report, June 2013).

Question 4 asked respondents how much time (longest, average, and shortest, waiting times) they spent waiting for catch to be offloaded prior to starting their species composition sampling protocol. The intent of this question was to learn how much waiting time is part of a port biologist/sampler's job. The time spent waiting is time not spent on composition sampling.

Figure 3. Time spent waiting before groundfish species composition sampling begins (Q4)



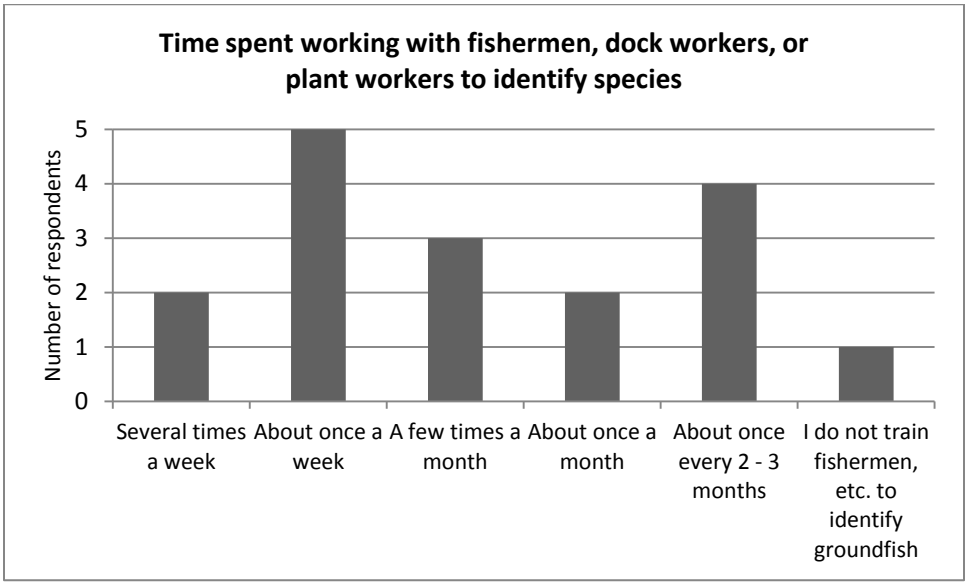
One respondent commented directly about their time spent waiting at the docks. Regarding slope rockfish sampling, this individual noted that "if there is any sorting by size dockside, the time frame for sampling is longer and usually restricted to [the] time period directly after completion of offload so th[at] all sort[ed] size groups can be sampled." So in addition to the number of market categories a port biologist/sampler may have to sample, if those market categories have been further sorted for size, the port biologist/sampler will also have to subsample those different sizes. Species within a market category might be sorted by size due to requests made by buyers.

Also regarding size of individual fish, one respondent wrote: "Since trawl went ITQ, our sampling efforts [with] regards to man power and time have changed [with] regards to species composition sampling. If the processor is sorting any rockfish complex by size prior to weighing, we typically have to wait much longer to get access to all sort groups (usually [at the] conclusion of [the] offload)… with a shorter time window to complete [processing of] the sample/"

It was also noted that in California, port biologists/samplers try to take their samples during the off-loading process but only after the fish totes have been weighed (CDFW, personal communication, 8/21/13). Therefore, the exact wording of Q4 may not have made sense to respondents in all situations they encounter.

Question 5 asked port biologist/samplers how much time they spent (within the last 12 months) working with fishermen, dock workers, or plant workers to accurately identify groundfish species. The intent of this question was to learn how frequently their job entailed working with and/or training fishing and processing personnel to correctly identify species that may be difficult to differentiate.

Figure 4. Time spent working with fishermen, dock workers, or plant workers to identify groundfish species (Q5)



One respondent mentioned that this question was "hard to answer or put a time to… [due to] the [number of] different fisheries, plants, crews, and categories. All require some time with novices, or even someone that hasn't been on the line in several months." Another respondent wrote that "the amount of time spent training people on species ID and sorting / reporting requirements is entirely variable on the situation - ranges from 20+hrs [per] week to 20+ hrs [per] year. [I]t is important when its necessary and about every 2-3 years we have [a] total turnover in dock crews at a plant or new dealers opening with new crews. Then we have to be there all the time. Once they know what they're doing, our time spent goes way down. Reduced landings can make it difficult for plants to keep knowledgeable crews working, [i.e.,] not enough work hours [are available], then we get a 'new' crew more often."

<u>Overarching written comments from port biologists for this section:</u>

- "In all cases, regardless of species groups, any ID that cannot be made quickly often has more to do with what fisheries are regularly seen in a given port, rather than any true difference in how difficult the ID is. If a given sampler is used to seeing a broad range of nearshore rockfish for example, all IDs will be made quickly by visual means. However, since most of the shelf is closed and most fisheries do not land any of these rockfish, a sampler may need to consult a key when first exposed to these species."
- "Port Biologists and samplers are trained in fish ID, so even if a key is consulted, species ID will be pretty quick in most cases."

- "I'm frankly a little puzzled why the GMT would spend so much time on this when Port Bio initial feedback stressed the difficulty for industry, not our programs. Many dock workers and deckhands will have significant problems with many of these species if they are required to sort further."
- "There are still significant problems with sorting, even for market categories that were split out many years ago. The implementation of catch monitors has done nothing to change that (most catch monitors don't even touch a single fish during an offload, let alone determine contamination levels)."
- "Adding further layers of market categories is a great feel-good thing for fisheries managers, but it will essentially increase the amount of inaccurate data that managers are basing decisions on..."

Frequency of species encounters

Question 15 asked respondents to tell us how often they encountered species found within each of the six species categories. Their responses are summarized in the following tables (Tables 4 through 9).

Table 4. Frequency of encounter: slope rockfishes.

	Always or often	Sometimes	Rarely	Never	Total
Aurora	12	3	1	1	17
Bank	3	4	7	3	17
Blackgill	8	7	2	0	17
Darkblotched	11	4	1	1	17
Longspine thornyhead	13	2	2	0	17
Pacific ocean perch	7	4	4	2	17
Redbanded	10	4	2	1	17
Rougheye	12	0	2	3	17
Sharpchin	1	6	7	3	17
Shortraker	5	4	5	3	17
Shortspine thornyhead	15	1	1	0	17
Splitnose	13	2	1	1	17
Yellowmouth	0	3	10	4	17

Table 5. Frequency of encounter: flatfishes

	Always or often	Sometimes	Rarely	Never	Total
Arrowtooth flounder	13	2	1	1	17
Butter sole	0	2	6	9	17
Curlfin sole	0	3	4	10	17
Deep sea sole	5	4	3	4	16
Dover sole	15	1	1	0	17
English sole	12	3	2	0	17
Flathead sole	2	5	3	6	16
Pacific sanddab	3	7	5	2	17
Petrale sole	12	3	1	1	17
Rex sole	13	2	1	1	17
Rock sole	1	5	5	6	17
Sand sole	2	4	4	7	17
Slender sole	5	1	6	5	17
Starry flounder	0	6	4	7	17

Table 6. Frequency of encounter: elasmobranches and other fishes (chondrichthyes)

	Always or often	Sometimes	Rarely	Never	Total
Aleutian skate	0	4	4	9	17
Bering/sandpaper skate	2	6	3	5	16
Big skate	6	7	3	1	17
Black/roughtail skate	1	3	6	7	17
Brown catshark	4	3	5	5	17
California skate	0	2	8	7	17
Longnose skate	14	3	0	0	17
All other skates	0	3	5	9	17
Ratfish	3	6	6	2	17
Leopard shark	0	1	1	14	16
Soupfin shark	0	0	10	7	17
Spiny dogfish	8	6	1	2	17

Table 7. Frequency of encounter: roundfishes

	Always or often	Sometimes	Rarely	Never	Total
Cabezon	7	4	2	4	17
California scorpionfish	0	1	0	16	17
California slickhead	1	4	1	11	17
Finescale codling	0	0	3	14	17
Lingcod	14	3	0	0	17
Pacific cod	5	4	3	5	17
Pacific whiting	8	3	2	4	17
Sablefish	16	1	0	0	17
Giant grenadier	0	8	3	6	17
Pacific grenadier	5	6	4	2	17
All other grenadiers	0	2	6	9	17
Kelp greenling	5	4	1	7	17
All other greenlings	0	2	5	10	17

Table 8. Frequency of encounter: nearshore rockfishes

	Always or often	Sometimes	Rarely	Never	Total
Black	8	2	3	4	17
Black and yellow	2	5	2	8	17
Blue	7	3	2	5	17
Brown	1	5	5	6	17
Calico	0	0	1	16	17
China	3	6	2	6	17
Copper	4	4	5	4	17
Gopher	5	2	3	7	17
Grass	2	4	3	8	17
Honeycomb	0	0	2	15	17
Kelp	0	2	3	12	17
Olive	0	3	6	7	16
Quillback	2	4	6	5	17
Treefish	1	1	1	14	17

Table 9. Frequency of encounter: shelf rockfishes

	Always or often	Sometimes	Rarely	Never	Total
Bank	3	6	6	2	17
Bocaccio	5	9	3	0	17
Bronzespotted	0	1	4	12	17
Canary	6	6	3	1	16
Chameleon	0	0	1	16	17
Chilipepper	3	7	4	3	17
Cowcod	1	1	7	8	17
Dusky	0	0	3	14	17
Dwarf red	0	0	1	16	17
Flag	0	0	5	12	17
Freckled	0	0	1	16	17
Greenblotched	0	3	4	10	17
Greenspotted	1	5	5	5	16
Greenstriped	4	10	3	0	17
Halfbanded	0	0	4	13	17
Harlequin	0	0	2	15	17
Longspine thornyhead	13	1	3	0	17
Mexican	0	0	2	15	17
Pink	0	1	3	13	17
Pinkrose	0	0	2	15	17
Puget Sound	0	0	2	15	17
Pygmy	0	0	3	14	17
Redstripe	2	5	5	4	16
Rosethorn	4	6	3	4	17
Rosy	1	1	5	10	17
Shortbelly	0	3	6	8	17
Shortspine thornyhead	15	0	2	0	17
Silvergray	3	7	2	5	17
Speckled	0	0	1	16	17
Squarespot	0	0	2	15	17
Starry	0	1	5	11	17
Stripetail	1	6	4	6	17
Swordspine	0	0	1	16	17
Tiger	2	3	6	6	17
Vermilion	4	3	7	3	17
Widow	9	6	1	1	17
Yelloweye	1	5	7	4	17
Yellowtail	9	5	1	2	17

Overarching written comments from port biologists for this section:

- Encounter rates with species and/or market categories is based on their level of exposure to various fisheries and/or ports:
    - "All my answers are primarily related to the shoreside hake fishery."
    - "Some species I only see in the 'trash' bin, for example grenadiers or hake. Most of what I see landed in my port is usually in pretty pure market categories. I don't have access to all fish being landed or may miss some while sampling, so my answers are generalized for what I have seen [and are] not necessarily [true] for all the landings in this port."
    - "For all questions involving how often I encountered individual species, I only reflected what I've seen during the past five years. Prior to that time, I did see such species as curlfin sole, butter sole and at a time when I used to have regular beach-trawl landings. These flatfish species, as some other rockfish species, will not be encountered in waters where my current vessels fish due to depth and area fished."
- Levels of contamination :
    - "Longspine thornyhead may occur in ALL trawled market categories (including flatfishes and roundfishes). Usually, this is the result of net-fed fish not being removed from [the] buccal/gill cavity. On occasion (1 in 10 landings), I have seen a significant number (~5%) of longspine stuck in sablefish. At present, this is not accounted for in our program protocol and [the] market category [is] reported as 'clean'."
- The impact of additional sorting requirements:
    - "I just want to reiterate that additional sorting requirements are not an issue for the fisheries/biology [port biologist/sampler] community. The issue is with industry. Some of the proposed sorting requirements will cause a lot of confusion among dock workers and deckhands. The end result may be continued poor sorting, even years later. Some effort should be made to gather industry feedback, especially with regard to some of the proposed slope rockfish sorting requirements."
    - "My biggest concern with adding more species (or species complexes)… is in regards to collecting enough samples for each strata. We shoot for a quarterly 25% comp sampling rate per species (or complex) by total pounds landed for port, gear, condition, and PMFC area. As it is now, we struggle to make that goal when considering area because our port covers so many PMFC areas. I believe that add[ing] more comps will likely cause us to miss a strata if PMFC areas are still included. Currently, borrowing rules (which are less than perfect) go into effect when this occurs." (More information about ODFW's borrowing rules is available in Agenda Item F.8.b, ODFW Report, June 2013.)

Tools used to identify species

In Part II of this survey, port biologists and samplers were asked which tool they used to identify species within each category. The five categories of "tools" were: (1) quick visual/external look; (2) closer visual/internal look, etc.; (3) quick tactile/skin texture, etc.; (4) closer tactile, headspine count, etc.; and (5) identification key. The intent of this question was to learn "how far" they had to go to identify a particular species. For example, all respondents indicated that longnose skate could be identified with a "Quick visual: external look". In contrast, 12 out of 17 respondents indicated that they would have to pull out their "Identification key" to correctly identify an Aleutian skate.

However, one respondent indicated that the five categories of "tools" may not be mutually exclusive as we intended, stating that the "[s]urvey was a bit unclear as to the cut-off point on when 'quick visual' becomes 'quick tacti[le].'" This individual cited three examples:

1. The anal fin of a chilipepper is sometimes quickly viewed but it may be necessary to "abduct spines to note length," necessitating a "quick tactile".
2. Differentiating an aurora rockfish from a splitnose rockfish may require viewing its "nose" that "requires abducting dentary." Thus, is this a quick visual or tactile identification?
3. For small shortspine thornyheads, "if you only execute tactile on occasion (1 in 25) [that requires] spreading [its] pectoral fin [to look] for [a] white checkered pigment pattern, or lifting [its] operculum to view medial surface pigment," which tool should be indicated for this species?

The following tables (Tables 10 through 15) indicate species in each category (slope rockfish, flatfishes, chondrichthyes, roundfishes, nearshore rockfish, shelf rockfish) relative to the five categories of identification tools.

Table 10. Tools to identify species: slope rockfishes (Q16)

	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Aurora	13	2	0	1	1
Bank	10	1	1	1	4
Blackgill	10	7	0	0	0
Darkblotched	16	1			
Longspine thornyhead	16	1			
Pacific ocean perch	13	2			2
Redbanded	14	3			
Rougheye	6	2	7	1	1
Sharpchin	8	3	0	4	2
Shortraker	5	5	3	3	1
Shortspine thornyhead	16	1			
Splitnose	14	2			
Yellowmouth	6	4	1	2	4

Table 11. Tools to identify species: flatfishes (Q18)

	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Arrowtooth flounder	15	1			1
Butter sole	1	4	3	1	8
Curlfin sole	6	1	2		8
Deep sea sole	12		1	1	3
Dover sole	17				
English sole	17				
Flathead sole	7	2	2	2	4
Pacific sanddab	13	1	1		2
Petrale sole	16	1			
Rex sole	17				
Rock sole	6	5	2	2	2
Sand sole	7	4	2	1	3
Slender sole	10	1		3	3
Starry flounder	16				1

Table 12. Tools to identify species: chondrichthyes (elasmobranchs and other cartilaginous fishes, Q20)

	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Aleutian skate	2	2		1	12
Bering/sandpaper skate	5	1	4	3	4
Big skate	14	2			1
Black/roughtail skate	6	2			9
Brown catshark	12	1			4
California skate	2	3		3	9
Longnose skate	17				
All other skates		2		1	13
Ratfish	13	1			2
Leopard shark	10	2			4
Soupfin shark	7	3			7
Spiny dogfish	16				1

Table 13. Tools to identify species: roundfishes (Q22)

	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Cabezon	17				
California scorpionfish	5	3			9
California slickhead	6	1	1		9
Finescale codling	2	3			11
Lingcod	17				
Pacific cod	12	2			3
Pacific whiting	13	1		1	2
Sablefish	17				
Giant grenadier	7	3	1		6
Pacific grenadier	11	1		1	4
All other grenadiers	2	1		1	13
Kelp greenling	17				
All other greenlings	7	4		1	5

Table 14. Tools to identify species: nearshore rockfishes (Q24)

	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Black	17				
Black and yellow	9	2			6
Blue	17				
Brown	9	3			5
Calico	3	1	1	1	11
China	17				
Copper	13	2			1
Gopher	8	3			6
Grass	7	4			6
Honeycomb	3	1		2	11
Kelp	5	2			10
Olive	6	3			8
Quillback	16	1			
Treefish	9	1			7

Table 15. Tools to identify species: shelf rockfishes (Q26)

	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Bank	10	2	1		4
Bocaccio	16		1		
Bronzespotted	3	3		1	10
Canary	16	1			
Chameleon	1	2		2	12
Chilipepper	11	2		1	3
Cowcod	9	5			3
Dusky	2	4			11
Dwarf red	1	2			14
Flag	6	2	1	3	5
Freckled	1	2	1	1	12
Greenblotched	2	4	2	2	7
Greenspotted	6	3	2	1	5
Greenstriped	16	1			
Halfbanded	3	3		3	7
Harlequin	1	2	1	1	12
Longspine thornyhead	17				
Mexican	1	2	1	1	12
Pink		4			13
Pinkrose		3		1	13
Puget Sound		2	2		13
Pygmy		3	2		12
Redstripe	11	3		2	1
Rosethorn	12	1	1	1	2
Rosy	4	4	1	1	7
Shortbelly	5	5		1	6
Shortspine thornyhead	17				
Silvergray	11		2	1	3
Speckled	2	3		1	11
Squarespot	2	3			12
Starry	5	3			9
Stripetail	8	2	1		6
Swordspine	2	2	1	1	11
Tiger	15	1		1	
Vermilion	14	1	1		1
Widow	16	1			
Yelloweye	14		1	1	1
Yellowtail	15	1			1

Differentiating between similar looking species

Immediately following questions about tools used to identify species, port biologists and samplers were asked to list any species they might mistake with another species. That is, they were asked to write-in any species that would require them to take a more careful look to positively differentiate it from a similar looking species (e.g., small-sized rougheye rockfish may look similar to small-sized shortraker rockfish). There were six open-ended questions of this type (Q17, Q19, Q21, Q23, Q25, Q27), one for each species category (slope, flatfishes, chondrichthyes, roundfishes, nearshore, shelf). The following tabulates the responses.

Among the slope rockfishes, Table 16 shows species that were noted by respondents as ones which could potentially be mistaken for another species. Slope rockfish species not noted by respondents as possibly mistaken for others were: longspine thornyhead, redbanded rockfish, and shortspine thornyhead.

Table 16. Slope rockfishes (first column) and species mentioned by port biologists/samplers as similar in appearance (Species A - D). The number of respondents who indicated a species is noted in parentheses. (Q17)

	Species A	Species B	Species C	Species D
Aurora[2]	Sharpchin[2] (1)	Splitnose[2] (3)	--	--
Bank[2, 4]	Widow (1)	--	--	--
Blackgill	Rougheye (1)	--	--	--
Darkblotched	Sharpchin (1)	--	--	--
POP	Sharpchin (1)	--	--	--
Rougheye[2]	Blackgill[2] (1)	POP[2] (1)	Shortraker[2] (4)	Blackspotted[1, 3] (3)
Sharpchin[2]	Darkblotched[2] (1)	POP[2, 6] (4)	Yellowmouth[2] (1)	Stripetail[1, 2, 5] (2)
Shortraker[2, 7]	Redbanded[2] (1)	Rougheye[2, 7] (3)	Cowcod[1] (1)	--
Splitnose	Aurora (1)	--	--	--
Yellowmouth[2]	POP[2] (2)	Rougheye (1)	Shortraker (1)	--
Chilipepper[1]	POP (1)	--	--	--

[1]This species or group is not part of the current slope rockfish stock complex.
[2]Juvenile or smaller-sized fish were noted as more difficult to identify.
[3]One respondent wrote, "dark spotted" in relation to rougheye. We interpreted this as blackspotted.
[4] This species or group was mention by itself. We interpreted this to mean that it was generally difficult to identify. Also, one respondent stated that "Milton Love['s] book is wrong on head spine count."
[5]One respondent noted that small stripetail look similar to sharpchin when "stripes on [the] tail [are] not prominent."
[6]One respondent noted that a "washed out sharpchin – not showing the '>' mark on [the] gill plate" looked similar to Pacific Ocean perch.
[7]One respondent mentioned that shortraker and rougheye were commonly misidentified by those who sort groundfish. This individual also asked the question, "how short do the rakers have to be for it to be a shortraker?"

Among the flatfishes, Table 17 shows species that were noted by respondents as ones which could potentially be mistaken for another species. Flatfish species not noted by respondents as possibly mistaken for others were: arrowtooth flounder, curlfin sole, deep sea sole, Dover sole, rex sole, slender sole, and starry flounder.

Table 17. Flatfishes (first column) and species mentioned by port biologists/samplers as similar in appearance (Species A - D). The number of respondents who indicated a species is noted in parentheses. (Q19)

	Species A	Species B	Species C	Species D
Butter sole[3]	Curlfin sole(1)	Flathead sole (1)	Rock sole(1)	Sand sole(2)
English sole	Flathead sole (1)	Forkline sole[1] (1)	--	--
Flathead sole[3]	Petrale sole(2)	--	--	--
Pacific sanddab[3]	All other sanddabs[1, 3] (1)	--	--	--
Petrale sole[2, 3]	Flathead sole[2] (3)	--	--	--
Rock sole[3]	Butter sole (1)	Curlfin sole (1)	Sand sole (1)	
Sand sole[3]	Rock sole (1)	--	--	--

[1]This species or group is not part of the current "other flatfish" stock complex.

[2]Juvenile or smaller-sized fish were noted as more difficult to identify.

[3]Species or group mentioned as uncommon or rare.

Among the chondrichthyes (elasmobranchs and other cartilaginous fishes), Table 18 shows species that were noted by respondents as ones which could potentially be mistaken for another species. Chondrichthyes species not noted by respondents as possibly mistaken for others were: Bering/sandpaper skate, big skate, black/roughtail skate, brown catshark, California skate, longnose skate, ratfish, leopard shark, soupfin shark, and spiny dogfish.

Table 18. Chondrichthyes (elasmobranchs and other cartilaginous fishes, first column) and species mentioned by port biologists/samplers as similar in appearance (Species A - B). The number of respondents who indicated a species is noted in parentheses. (Q21)

	Species A	Species B
Aleutian skate	Longnose skate (1)	--
All other skates[1]	California skate (1) [1]	Soupfin shark (1) [1]

[1] One respondent listed these species in a format that left their response open to interpretation. Their response could be interpreted as skates and soupfin sharks are difficult to differentiate – an assertion that some on the GMT think is unlikely – or could be interpreted as "all other skates" and California skates are difficult to differentiate from one another, and soupfin sharks are difficult to differentiate from other sharks.

Among the roundfishes, Table 19 shows species that were noted by respondents as ones which could potentially be mistaken for another species. Roundfish species not noted by respondents as possibly mistaken for others were: cabezon, California slickhead, finescale codling, lingcod, Pacific whiting, sablefish, giant grenadier, "All other grenadiers," kelp greenling, and "All other greenlings." Of these, Pacific whiting, giant grenadier, and "all other grenadiers" were noted by respondents as uncommon or rare.

Table 19. Roundfishes (first column) and species mentioned by port biologists/samplers as similar in appearance (Species A - B). The number of respondents who indicated a species is noted in parentheses. (Q23)

	Species A	Species B
California scorpionfish[2]	Cabezon[2] (1)	
Pacific cod[3]	Pacific whiting (1)	Pollock[1] (1)
Pacific grenadier[3]	Giant grenadier (1)	

[1]This species or group is not part of the current "other fish" stock complex.

[2]Juvenile or smaller-sized fish were noted as more difficult to identify.

[3]Species or group mentioned as uncommon or rare.

Among the nearshore rockfishes, Table 20 shows species that were noted by respondents as ones which could potentially be mistaken for another species. Nearshore rockfish species not noted by respondents as possibly mistaken for others were: brown, calico, china, gopher, grass, kelp, quillback, treefish.

Table 20. Nearshore rockfishes (first column) and species mentioned by port biologists/samplers as similar in appearance (Species A). The number of respondents who indicated a species is noted in parentheses. (Q25)

	Species A
Black	Blue (1)
Black and yellow	Gopher (1)
Blue[3]	Black[3] (2)
Copper[2]	Brown (1)
Honeycomb	Freckled[1] (1)
Olive	Yellowtail[1] (2)

[1]This species or group is not part of the current nearshore rockfish stock complex.

[2]One respondent mentioned that copper rockfishes were more difficult to identify in El Nino years.

[3]One respondent noted that blue and black rockfishes were "commonly mixed up".

Among the shelf rockfishes, Table 21 shows species that were noted by respondents as ones which could potentially be mistaken for another species. Shelf rockfish species not noted by respondents as possibly mistaken for others were: bocaccio, bronzespotted, canary, chameleon, dwarf red, flag, greenspotted, greenstriped, harlequin, longspine thornyhead, Mexican, pink, Puget Sound, pygmy, shortbelly, speckled, squarespot, starry, swordspine, tiger, vermilion, and widow. One respondent listed pink, Puget Sound, and pygmy rockfishes alone without noting a corresponding species each might be mistaken for. This was interpreted to mean that these species were generally difficult to identify.

Table 21. Shelf rockfishes (first column) and species mentioned by port biologists/samplers as similar in appearance (Species A - C). The number of respondents who indicated a species is noted in parentheses. (Q27)

	Species A	Species B	Species C
Bank[2]	Rougheye[2] (1)	--	--
Chilipepper[2]	Redstripe[2] (1)	--	--
Cowcod	Rougheye (1)	Shortraker[7] (1)	--
Dusky	Bank (1)	--	--
Freckled	Speckled (1)	Honeycomb (1)	--
Greenblotched[4]	Greenspotted (1)	Greenstriped (1)	--
Halfbanded	Stripetail (1)	--	--
Pinkrose[3]	Rosethorn (1)	Rosy (1)	Swordspine (1)
Redstripe[2]	Chilipepper[2] (1)	--	--
Rosethorn	Pink(1)	Pinkrose[6] (1)	Rosy (1)
Rosy[8]	Bronzespotted (1)	Pinkrose (1)	Rosethorn (2)
Shortspine thornyhead[2]	Longspine thornyhead[2] (1)	--	--
Silvergray	Bocaccio (1)	--	--
Stripetail	Sharpchin (1)	--	--
Yelloweye[5]	Vermilion (1)	Rougheye (1)	--
Yellowtail	Olive (1)	--	--
Sharpchin[1, 2]	Stripetail (1)	POP[2] (1)	--

[1]This species or group is not part of the current shelf rockfish stock complex.

[2]Juvenile or smaller-sized fish were noted as more difficult to identify.

[3]Species or group mentioned as uncommon or rare.

[4]This species or group was mention by itself. We interpreted this to mean that it was generally difficult to identify.

[5]One respondent noted that adult yelloweye rockfish which were "washed out without the obvious yellow color in [the] eye" might be mistaken for vermilion or rougheye rockfishes.

[6]One respondent mentioned that pinkrose rockfish was not common in "northern coastal waters" but could be mistaken for rosethorn rockfish.

[7]One respondent mentioned that some "people call shortrakers 'cowcods'."

[8]One respondent wrote "rose" rockfish as a species mistaken for rosethorn, pinkrose, and bronzespotted rockfishes. We interpreted "rose" as rosy rockfish.

In many instances, respondents left Questions 17, 19, 21, 23, 25, and 27 blank. Initially, we interpreted this as that port biologist/sampler did not have any difficulty differentiating between species in that particular species category. However, when we considered some of the comments made in response to these questions, and considered other open-ended questions that provided opportunities to share their thoughts (i.e., Q15, Q28), we could infer the following about these individuals:

- Respondents who left these questions blank do not have concerns about mistaking one species for another (due to years of experience or overall confidence in their abilities); or

- Respondent who left these questions blank have little or no experience with species within that category (due to lack of years of experience or lack of exposure to those species at particular port locations, despite many years of experience). These individuals were therefore unable to tell us other species that they might mistake it for.

For respondents who answered these questions (i.e., wrote in species and their similar looking counterparts), we could infer the following:

- These individuals encountered these species enough times to be aware of their similarities and distinguishing (but perhaps subtle) differences.

The experience level of a port biologist/sampler likely factors into how they responded to questions about similar looking species. Experience level can be defined in a number of different ways:

1) How many years they have worked as a port biologist/sampler;
2) Which state they have worked or currently work in;
3) Which ports they have worked or currently work in;
4) The variety of species they have been exposed to;
5) The number of times they have been exposed to various species; and
6) The number of times they have been exposed to different sizes of each species (smaller-sized/juvenile fish vs. larger-sized/adult fish).

Points 4, 5, and 6 may be influenced by where they have worked or work (i.e., geographic location), and/or which species and sizes are marketable at the port(s) they have worked or currently work in.

Some of these points were echoed by port biologists/samplers in their responses to the open-ended questions (Q15, Q17, Q19, Q21, Q23, Q25, Q27, and Q28). Other factors that may influence whether similar looking species are mistaken for each other are listed below. These factors were derived from written comments made by respondents.

- <u>The size of individual fish</u> that are landed can influence how easy or hard it is to identify. Species where size was a factor in mistaking one species for another were flagged with a "[2]" (table note) in Tables 16 through 21. For example, aurora and splitnose rockfishes were noted as species mistaken for one another (Table 16).

- The volume of landed catch can make a difference in terms of the ability of fishermen, dock workers, or plant workers to accurately sort their catch. This catch is then sampled by a port biologist/sampler for accuracy. One respondent wrote, that "thousands of pounds of [an] Aurora/Splitnose mix [particularly the small ones] … would take the sorting belt crew all day to sort through – with questionable results" (comment relative to slope rockfishes).
- Rare or uncommonly seen species were also noted as more difficult to differentiate from others and some respondents mentioned that an identification key was necessary to accurately identify them. Whether a species was rare or uncommon could be influenced by geographic location (e.g., port), season (e.g., summer), or oceanographic conditions (e.g., El Nino). Respondents wrote:
    - "A lot of these species I don't see on a regular basis or at all, so it was hard to say what I could potentially mistake them for. The ones I do see regularly I no longer think it possible to mistake. However, there are always those few that pop up and I need to use my identification key" (general comment; not specific to a species category).
    - "A lot of these species I probably won't see or sample, so it is difficult to accurately report sampling concerns [about] them" (general comment; not specific to a species category).
    - "Rosethorn [can be mistaken for] pinkrose that oddly shows up in the northern coastal waters" (comment relative to shelf rockfishes).
    - "Flathead… being uncommon here, are often pitched in with the petrale" (comment relative to flatfishes).
    - "Rock/butter/sand/curlfin – the ever more rare beach trawler delivering these seldom seen, or seasonally seen [flatfishes] usually have to explain species [identification] to the dock crew, which is likely a new crew since last summer or have forgotten which ones are what. Currently each [species] are their own category" (comment relative to flatfishes).
    - "Besides all the flatfish I see on regular basis[,] I would need to key out all others to make sure which… species [each] was[.] [T]herefore, they all could be mistaken for each other until further examination" (comment relative to flatfishes).
    - "With [the exception of longnose skate, big skate, and spiny dogfish], I would need further identification of [every] other species. So at this point I wouldn't be able to tell you what I would be concerned with mistaking" (comment relative to chondrichthyes).
    - "I don't see grenadier enough to know which ones I would mistake, same with Pacific cod and whiting" (comment relative to roundfishes).
    - "Note: I would use an ID key for most of the species I never see" (comment relative to nearshore rockfishes).
    - "Coppers are so variable – [they] get squirrely to [identify in] [E]l [N]ińo years" (comment relative to nearshore rockfishes).
- Quality of the fish after it has been landed may influence whether a species is mistaken for another:
    - "Adult washed out yelloweye without the obvious yellow color in [the] eye [may be mistaken for] vermilion [or] rougheye" (comment relative to shelf rockfishes).

- "[Identifying species is] not as bad now that the shelf [rockfishes] are more hook caught. [W]hen they [were] all trawled [un]til the scales were all gone... good luck. [Also], less commonly seen = more difficult" (comments relative to shelf rockfishes).

- Type of gear used to catch fish makes a difference. As was mentioned in the previous comment, hook caught shelf rockfishes, for example, are easier to identify than trawl caught shelf rockfishes.
- Whether a port biologist/sampler or fishermen/plant/dock worker was identifying species may be a factor. In a comment above, a respondent noted that certain flatfishes (rock, butter, sand, and curlfin soles) can be difficult to distinguish because they are rare or seasonal, and a new crew of dock workers (relative to the previous summer) may be sorting landings. Other comments included:
  - "Shortraker [and rougheye] are commonly switched – [misidentified] – how short do the rakers have to be for it to be a shortraker?" (comment relative to slope rockfishes)
  - "I am not concerned about [identifying] any of these species. I am concerned about industry [identifying] some of these species" (comment relative to slope rockfishes).
  - "Blue rockfish and black rockfish are commonly mixed up – although I don't believe that I have a problem identifying them" (comment relative to nearshore rockfishes).
- The diversity of species within a category may influence whether individual fish are identified accurately. Relative to shelf rockfishes, one respondent seemed to suggest that remembering "just the names themselves..." was a challenge, due to the diversity of species in this category.

Other information collected

The following general information was collected about each respondent. Information about years of experience in their current position was collected. However, for two respondents who had port biologist/sampler experience in states other than the one they are currently employed in, their experience in other states may have been included in their response. Figure 5 and Table 22 show the range of experience report by respondents.

Figure 5. Number of years as a port biologist or sampler in their current position (Q12).

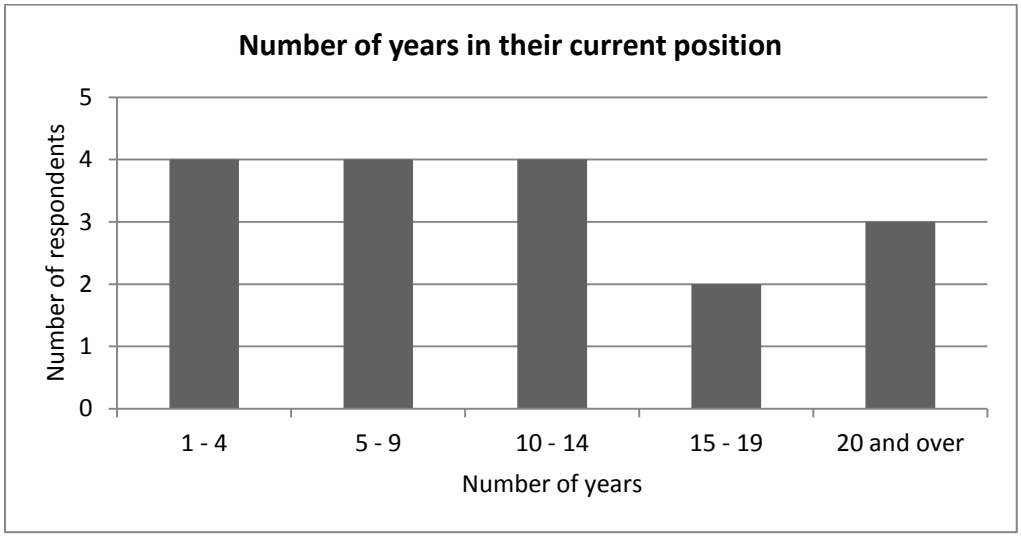


Table 22. Experience as a port sampler: average number of years in their current position only, range of experience in their current position, experience in other states where Pacific Coast groundfish are landed, and experience as a fishermen, plant monitor, dock or plant worker.

	Number of respondents	Average number of years[1]	Range of experience	Experience in a state other than current?	Experience as a fishermen, etc.?[3]
WA	5	13.8 years	4 – 25 years	Yes = 0	Yes = 2
OR	6	14.5 years	8 – 35 years	Yes = 2[2]	Yes = 2
CA	6	7.3 years	1 – 20 years	Yes = 0	Yes = 4

[1]Refers to the average number of years as a port biologist/sampler in their *current position* only. However, it was discovered that some respondents may have included other related work experience.

[2]One respondent worked as a port biologist/sampler in OR and AK. The other worked in OR, CA, and AK.

[3]One respondent from ODFW had experience in OR and CA. All other respondents who answered, "Yes" to this question had experience in their respective state only.

Pacific Coast Groundfish Fishery
Species Composition Sampling – Program Managers

Currently, the Pacific Fishery Management Council (PFMC) is discussing possible changes to the composition of stock complexes in the Pacific Coast groundfish fishery. Changes to existing ***groundfish*** stock complexes may result in changes to sorting requirements that may affect the work of port biologists, other port samplers, groundfish observers, plant monitors, fishermen, and others who must sort, identify, or sample landed catch. Specifically, changes to the slope rockfish and "other fish" (i.e., other flatfish, other roundfish, and other elasmobranchs) complexes are being given priority for consideration at this time. The PFMC may recommend changes to the other stock complexes as well.

To engage those whose work may be most affected by these changes, the following survey has been developed by the Groundfish Management Team (GMT), an advisory body of the PFMC.

This survey is an initial attempt to collect general information about possible challenges that state port sampling programs may face if current stock complexes and associated market categories and sorting requirements are changed.

Participation in this survey is voluntary but is greatly appreciated. Results from this survey will be considered by the GMT in their analyses of existing and proposed stock complex configurations. All results from this survey will be confidential and will be reported in summary form so that the identity of each respondent will not be linked to their response.

This survey is comprised of **8 questions** that should take approximately 15 – 20 minutes to complete. Thank you for your participation.

Groundfish species composition sampling – NOT biological sampling (age, sex, and length)

Q1 Availability of resources (time and personnel) often dictates the ability of sampling programs to have a presence at every port location in a given year. Keeping these resource constraints in mind: **a)** in which **groundfish port location(s)** does your program have the fewest number of groundfish species composition samples taken in a given year; and **b) why** are there fewer samples taken at these groundfish ports?

Please list the groundfish port locations (or port complexes, if applicable) and why fewer samples are taken.

[Space for them to type]

Challenges to your state's sampling program

Q2 In June, the PFMC will decide on preliminary alternatives for reorganizing the slope rockfish and "other fish" stock complexes. **In general**, how might your port sampling program be affected if the reorganized stock complexes increases the number of market categories? *Please check all that apply. This list may not be complete; please tell us more in the following question.*

- ❑ Achieving our state's groundfish sampling goals may become more difficult.
- ❑ Prior to sampling landings, port biologists and other sampling personnel will spend more time waiting for groundfish landings to be sorted.
- ❑ A greater number of groundfish samples will need to be taken if the number of market categories increases.
- ❑ A greater number of groundfish samples taken by port biologists or other port samplers will likely contain higher levels of contamination (i.e., more misidentified fish in each sample)
- ❑ Each groundfish species composition sample may take more time to process due to higher levels of misidentified species
- ❑ Each groundfish species composition sample may take more time to process due to an increased number of market categories.
- ❑ Existing fish ticket or landing receipt books and/or data management software and programs will have to be updated.
- ❑ Additional training of state agency staff, fishing operations personnel, and/or fish processing employees will be necessary.
- ❑ Other – please tell us more in the next question

Q3 If you indicated "Other" in the previous question or have other thoughts you'd like to share, please tell us more here:

[Space for them to respond]

Challenges to fishing operations and/or processing plants

Q4 What challenges do you think **fishing operations and/or processing plants** might face if reorganized stock complexes increases the number of market categories? *Please check all that apply. This list may not be complete; please tell us more in the following question.*

- ❑ Having to increase the number of bins needed for sorting more market categories
- ❑ Finding space for additional bins is going to be a challenge (i.e., on a vessel, in a plant)
- ❑ Fishing operations and/or processing plants will be need to train new or existing employees to accurately sort these market categories
- ❑ Fishermen, plant workers, etc. will spend more time sorting groundfish landings if the number of market categories increases
- ❑ Additional fishermen, plant workers, etc. may need to be hired to help sort groundfish landings
- ❑ The quality of groundfish products may change due to landings spending more time on ice before plants can process them, misidentified species, etc.
- ❑ Other – please tell us more in the next question

Q5 If you indicated "Other" in the previous question or have other thoughts you'd like to share, please tell us more here:

[Space for them to respond]

Final questions

Q6 **Approximately how long** have you worked for your state agency in your current capacity? *Please indicate the number of years.*

[Space for them to fill in]

Q7 In which states have you been employed as a port biologist, other port sampler, or program manager where you were involved with **groundfish**? *Please check all that apply, including the location of your current job.*

- ❑ Washington
- ❑ Oregon
- ❑ California
- ❑ Alaska

Q8 Have you ever worked as a fisherman, plant monitor, dock or plant worker, or other profession where you **handled and/or sorted groundfish**? *Please check all that apply.*

- ❑ Yes, in Washington
- ❑ Yes, in Oregon
- ❑ Yes, in California
- ❑ Yes, in Alaska
- ❑ No

Thank you for your participation!

If you have any additional comments you would like to share, please provide them here:

[Space for them to fill in]

If you have any questions about this survey, please contact one of the following GMT representatives:

Bob Leos, CDFW	831-649-2889	rleos@dfg.ca.gov
Dan Erickson, ODFW	541-961-2053	daniel.l.erickson@state.or.us
Corey Niles, WDFW	360-249-1223	corey.niles@dfw.wa.gov

Pacific Coast Groundfish Fishery – Part I
Species Composition Sampling – Port Biologists and Other Port Samplers

Currently, the Pacific Fishery Management Council (PFMC) is discussing possible changes to the composition of stock complexes in the Pacific Coast groundfish fishery. Changes to existing ***groundfish*** stock complexes may result in changes to sorting requirements that may affect the work of port biologists, other port samplers, groundfish observers, plant monitors, fishermen, and others who must sort, identify, or sample landed catch. Specifically, changes to the slope rockfish and "other fish" (i.e., other flatfish, other roundfish, and other elasmobranchs) complexes are being given priority for consideration at this time. The PFMC may recommend changes to the other stock complexes as well.

To engage those whose work may be most affected by these changes, the following survey has been developed by the Groundfish Management Team (GMT), an advisory body of the PFMC.

This survey is intended to collect information about **groundfish species composition sampling**: which species are most difficult to differentiate, how difficult is it to differentiate these species, which life stages are particularly troublesome, etc. We are **not** collecting information about biological sampling protocols at this time.

Participation in this survey is voluntary but is greatly appreciated. Results from this survey will be considered by the GMT in their analyses of existing and proposed stock complex configurations. All results from this survey will be confidential and will be reported in summary form so that the identity of each respondent will not be linked to their response.

This survey is comprised of two parts: Part I and Part II. Part I consists of 15 questions and may take approximately 20 – 30 minutes to complete. Each part can be completed at different times. Thank you for your participation.

Please enter your unique identification number below:

[Space to write-in]

Groundfish species composition sampling – NOT biological sampling (age, sex, and length)

Q1 In any given port location on an average day, **how many species composition samples for groundfish** do you have time to check for sorting accuracy and species proportions? *Please include both "quick checks" for species contamination level and sampling for proportion by species, and exclude biological sampling (age, sex, and length). The number of samples may vary by port location and circumstance; please estimate as best you can.*

Per port per day	0 – 5 samples	6 – 10	11 – 15	16 – 20	More than 20
Highest number of species comp samples	❑	❑	❑	❑	❑
Lowest number of species comp samples	❑	❑	❑	❑	❑
Average number of species comp samples	❑	❑	❑	❑	❑

Q2 Please tell us approximately **how long** it could it take to process groundfish species composition samples given the following levels of contamination: **a) less than 10%, b) 10-25%, and c) greater than 25%**. *Species contamination refers to the proportion of a sample that includes species that have been misidentified. In the space below, please tell us about your process of dealing with each level of contamination, and the time it takes to process each for groundfish species proportions. Please exclude biological sampling (age, sex, and length).*

[Space for write-in]

Q3 Please tell us approximately **how many market categories for groundfish** you encounter in a given port location. *This may vary by port location and circumstance; please estimate as best you can and consider only the last 12 months*.

Per port per day	0 – 5 categories	6 – 10	11 – 15	16 – 20	More than 20
Highest number of categories	❑	❑	❑	❑	❑
Lowest number of categories	❑	❑	❑	❑	❑
Average number of categories	❑	❑	❑	❑	❑

Q4 Please tell us approximately **how much time you spend waiting** before starting your groundfish species composition sampling protocol at a given port location. *Please consider the time you spend waiting from the beginning to the end of an offload. This may vary by port location and circumstance; please estimate as best you can and consider only the last 12 months.*

Per port per day	Up to 1 hour	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	Over 6 hours
Longest waiting time	❑	❑	❑	❑	❑	❑	❑
Shortest waiting time	❑	❑	❑	❑	❑	❑	❑
Average waiting time	❑	❑	❑	❑	❑	❑	❑

Q5 **How often do you spend time working with** new or existing fishermen, dock workers, or plant workers to accurately identify groundfish species? *Please estimate how often you spend time working with those who sort landings within the last 12 months.*

- ❑ Several times a week
- ❑ About once a week
- ❑ A few times a month
- ❑ About once a month
- ❑ About once every 2-3 months
- ❑ I do not train fishermen, dock workers, or plant workers to accurately identify groundfish.

The following questions are focused on different groundfish stock complexes that may be modified by the PFMC. These complexes include the following categories: slope rockfishes, other flatfishes, elasmobranchs and other fishes, roundfishes, nearshore rockfishes, and shelf rockfishes. We are interested in learning how often you encounter the species within these categories.

Groundfish species – frequency of encounter

Q6 How often do you see the following **slope rockfishes**? *Please check one box for each species.*

Slope rockfishes	Always or often	Sometimes	Rarely	Never
Aurora	❑	❑	❑	❑
Bank	❑	❑	❑	❑
Blackgill	❑	❑	❑	❑
Darkblotched	❑	❑	❑	❑
Longspine thornyhead	❑	❑	❑	❑
Pacific Ocean Perch	❑	❑	❑	❑
Redbanded	❑	❑	❑	❑
Rougheye	❑	❑	❑	❑
Sharpchin	❑	❑	❑	❑
Shortraker	❑	❑	❑	❑
Shortspine thornyhead	❑	❑	❑	❑
Splitnose	❑	❑	❑	❑
Yellowmouth	❑	❑	❑	❑

Q7 How often do you see the following **flatfishes**? *Please check one box for each species.*

Flatfishes	Always or often	Sometimes	Rarely	Never
Arrowtooth flounder	❑	❑	❑	❑
Butter sole	❑	❑	❑	❑
Curlfin sole	❑	❑	❑	❑
Deep sea sole	❑	❑	❑	❑
Dover sole	❑	❑	❑	❑
English sole	❑	❑	❑	❑
Flathead sole	❑	❑	❑	❑
Pacific sanddab	❑	❑	❑	❑
Petrale sole	❑	❑	❑	❑
Rex sole	❑	❑	❑	❑
Rock sole	❑	❑	❑	❑
Sand sole	❑	❑	❑	❑
Slender sole	❑	❑	❑	❑
Starry flounder	❑	❑	❑	❑

Q8 How often do you see the following **elasmobranchs and other fishes**? *Please check one box for each species.*

Elasmobranchs and others	Always or often	Sometimes	Rarely	Never
Aleutian skate	❑	❑	❑	❑
Bering/sandpaper skate	❑	❑	❑	❑
Big skate	❑	❑	❑	❑
Black/roughtail skate	❑	❑	❑	❑
Brown catshark	❑	❑	❑	❑
California skate	❑	❑	❑	❑
Longnose skate	❑	❑	❑	❑
All other skates	❑	❑	❑	❑
Ratfish	❑	❑	❑	❑
Leopard shark				
Soupfin shark	❑	❑	❑	❑
Spiny dogfish	❑	❑	❑	❑

Q9 How often do you see the following **roundfishes**? *Please check one box for each species.*

Roundfish	Always or often	Sometimes	Rarely	Never
Cabezon	❑	❑	❑	❑
California scorpionfish	❑	❑	❑	❑
California slickhead	❑	❑	❑	❑
Finescale codling	❑	❑	❑	❑
Lingcod	❑	❑	❑	❑
Pacific cod	❑	❑	❑	❑
Pacific whiting	❑	❑	❑	❑
Sablefish	❑	❑	❑	❑
Giant grenadier	❑	❑	❑	❑
Pacific grenadier	❑	❑	❑	❑
All other grenadiers	❑	❑	❑	❑
Kelp greenling	❑	❑	❑	❑
All other greenlings	❑	❑	❑	❑

Q10 How often do you see the following **nearshore rockfishes**? *Please check one box for each species.*

Nearshore rockfishes	Always or often	Sometimes	Rarely	Never
Black	❑	❑	❑	❑
Black and yellow	❑	❑	❑	❑
Blue	❑	❑	❑	❑
Brown	❑	❑	❑	❑
Calico	❑	❑	❑	❑
China	❑	❑	❑	❑
Copper	❑	❑	❑	❑
Gopher	❑	❑	❑	❑
Grass	❑	❑	❑	❑
Honeycomb	❑	❑	❑	❑
Kelp	❑	❑	❑	❑
Olive	❑	❑	❑	❑
Quillback	❑	❑	❑	❑
Treefish	❑	❑	❑	❑

Q11 How often do you see the following **shelf rockfishes**? *Please check one box for each species.*

Shelf rockfishes	Always or often	Sometimes	Rarely	Never
Bank	❑	❑	❑	❑
Bocaccio	❑	❑	❑	❑
Bronzespotted	❑	❑	❑	❑
Canary	❑	❑	❑	❑
Chameleon	❑	❑	❑	❑
Chilipepper	❑	❑	❑	❑
Cowcod	❑	❑	❑	❑
Dusky	❑	❑	❑	❑
Dwarf red	❑	❑	❑	❑
Flag	❑	❑	❑	❑
Freckled	❑	❑	❑	❑
Greenblotched	❑	❑	❑	❑
Greenspotted	❑	❑	❑	❑
Greenstriped	❑	❑	❑	❑
Halfbanded	❑	❑	❑	❑
Harlequin	❑	❑	❑	❑
Longspine thornyhead	❑	❑	❑	❑
Mexican	❑	❑	❑	❑
Pink	❑	❑	❑	❑
Pinkrose	❑	❑	❑	❑
Puget Sound	❑	❑	❑	❑
Pygmy	❑	❑	❑	❑
Redstripe	❑	❑	❑	❑
Rosethorn	❑	❑	❑	❑
Rosy	❑	❑	❑	❑
Shortbelly	❑	❑	❑	❑
Shortspine thornyhead	❑	❑	❑	❑
Silvergray	❑	❑	❑	❑
Speckled	❑	❑	❑	❑
Squarespot	❑	❑	❑	❑
Starry	❑	❑	❑	❑
Stripetail	❑	❑	❑	❑

Swordspine	❑	❑	❑	❑
Tiger	❑	❑	❑	❑
Vermilion	❑	❑	❑	❑
Widow	❑	❑	❑	❑
Yelloweye	❑	❑	❑	❑
Yellowtail	❑	❑	❑	❑

Final questions

Q12 Approximately **how long** have you worked for your state agency in your current capacity? *Please indicate the number of years.*

[Space for write-in]

Q13 In which states have you been employed as a port biologist, other port sampler, or program manager, where you were involved with **groundfish**? *Please check all that apply, including the location of your current job.*

- ❑ Washington
- ❑ Oregon
- ❑ California
- ❑ Alaska

Q14 Have you ever worked as a fisherman, plant monitor, dock or plant worker, or other profession where you **handled and/or sorted groundfish**? *Please check all that apply.*

- ❑ Yes, in Washington
- ❑ Yes, in Oregon
- ❑ Yes, in California
- ❑ Yes, in Alaska
- ❑ No, this is my first gig

Q15 Do you have any additional comments you would like to share?

[Space for write-in]

Thank you for participating!

If you have any questions about this survey, please contact one of the following GMT representatives:

Bob Leos, CDFW	831-649-2889	rleos@dfg.ca.gov
Dan Erickson, ODFW	541-961-2053	daniel.l.erickson@state.or.us
Corey Niles, WDFW	360-249-1223	corey.niles@dfw.wa.gov

Pacific Coast Groundfish Fishery – Part II
Species Composition Sampling – Port Biologists and Other Port Samplers

Currently, the Pacific Fishery Management Council (PFMC) is discussing possible changes to the composition of stock complexes in the Pacific Coast groundfish fishery. Changes to existing ***groundfish*** stock complexes may result in changes to sorting requirements that may affect the work of port biologists, other port samplers, groundfish observers, plant monitors, fishermen, and others who must sort, identify, or sample landed catch. Specifically, changes to the slope rockfish and "other fish" (i.e., other flatfish, other roundfish, and other elasmobranchs) complexes are being given priority for consideration at this time. The PFMC may recommend changes to the other stock complexes as well.

To engage those whose work may be most affected by these changes, the following survey has been developed by the Groundfish Management Team (GMT), an advisory body of the PFMC.

This survey is intended to collect information about **groundfish species composition sampling**: which species are most difficult to differentiate, how difficult is it to differentiate these species, which life stages are particularly troublesome, etc. We are **not** collecting information about biological sampling protocols at this time.

Participation in this survey is voluntary but is greatly appreciated. Results from this survey will be considered by the GMT in their analyses of existing and proposed stock complex configurations. All results from this survey will be confidential and will be reported in summary form so that the identity of each respondent will not be linked to their response.

This survey is comprised of two parts: Part I and Part II. Part II consists of 13 questions and may take approximately 20 – 30 minutes to complete. Each part can be completed at different times. Thank you for your participation.

Please enter your unique identification number below:

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Identifying groundfish species

The following questions will ask you about tools and/or references you may use to identify individual groundfish species.

Slope rockfishes

Q16 How far do you have to go to identify the following species? *Please check one for each species.*

Slope rockfishes	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Aurora	❑	❑	❑	❑	❑
Bank	❑	❑	❑	❑	❑
Blackgill	❑	❑	❑	❑	❑
Darkblotched	❑	❑	❑	❑	❑
Longspine thornyhead	❑	❑	❑	❑	❑
Pacific Ocean Perch	❑	❑	❑	❑	❑
Redbanded	❑	❑	❑	❑	❑
Rougheye	❑	❑	❑	❑	❑
Sharpchin	❑	❑	❑	❑	❑
Shortraker	❑	❑	❑	❑	❑
Shortspine thornyhead	❑	❑	❑	❑	❑
Splitnose	❑	❑	❑	❑	❑
Yellowmouth	❑	❑	❑	❑	❑

Q17 The GMT would also like to collect your views on which species you are concerned about mistaking with one another. For each species listed above, please list all other species you might mistake it for when sampling. If you do not have such a concern for a particular species, then you do not need to list it below. *Please use the format given in the following example when typing in your responses: rougheye (blackspotted, small shortraker); aurora (splitnose). That is, please type the name of the species you are focusing on and place the ones you are concerned with mistaking it for inside parentheses, each separated by a comma. If age or size differences – adult, juvenile or small – are important to identification, please note this as well.*

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Flatfishes

Q18 How far do you have to go to identify the following species? *Please check one for each species.*

Flatfishes	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Arrowtooth flounder	❑	❑	❑	❑	❑
Butter sole	❑	❑	❑	❑	❑
Curlfin sole	❑	❑	❑	❑	❑
Deep sea sole	❑	❑	❑	❑	❑
Dover sole	❑	❑	❑	❑	❑
English sole	❑	❑	❑	❑	❑
Flathead sole	❑	❑	❑	❑	❑
Pacific sanddab	❑	❑	❑	❑	❑
Petrale sole	❑	❑	❑	❑	❑
Rex sole	❑	❑	❑	❑	❑
Rock sole	❑	❑	❑	❑	❑
Sand sole	❑	❑	❑	❑	❑
Slender sole	❑	❑	❑	❑	❑
Starry flounder	❑	❑	❑	❑	❑

Q19 The GMT would also like to collect your views on which species you are concerned about mistaking with one another. For each species listed above, please list all other species you might mistake it for when sampling. If you do not have such a concern for a particular species, then you do not need to list it below. *Please use the format given in the following example when typing in your responses: rougheye (blackspotted, small shortraker); aurora (splitnose). That is, please type the name of the species you are focusing on and place the ones you are concerned with mistaking it for inside parentheses, each separated by a comma. If age or size differences – adult, juvenile or small – are important to identification, please note this as well.*

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Elasmobranchs and other fishes

Q20 How far do you have to go to identify the following species? *Please check one for each species.*

Elasmobranchs and others	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Aleutian skate	❑	❑	❑	❑	❑
Bering/sandpaper skate	❑	❑	❑	❑	❑
Big skate	❑	❑	❑	❑	❑
Black/roughtail skate	❑	❑	❑	❑	❑
Brown catshark	❑	❑	❑	❑	❑
California skate	❑	❑	❑	❑	❑
Longnose skate	❑	❑	❑	❑	❑
All other skates	❑	❑	❑	❑	❑
Ratfish	❑	❑	❑	❑	❑
Leopard shark	❑	❑	❑	❑	❑
Soupfin shark	❑	❑	❑	❑	❑
Spiny dogfish	❑	❑	❑	❑	❑

Q21 The GMT would also like to collect your views on which species you are concerned about mistaking with one another. For each species listed above, please list all other species you might mistake it for when sampling. If you do not have such a concern for a particular species, then you do not need to list it below. *Please use the format given in the following example when typing in your responses: rougheye (blackspotted, small shortraker); aurora (splitnose). That is, please type the name of the species you are focusing on and place the ones you are concerned with mistaking it for inside parentheses, each separated by a comma. If age or size differences – adult, juvenile or small – are important to identification, please note this as well.*

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Roundfishes

Q22 How far do you have to go to identify the following species? *Please check one for each species.*

Roundfish	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Cabezon	❑	❑	❑	❑	❑
California scorpionfish	❑	❑	❑	❑	❑
California slickhead	❑	❑	❑	❑	❑
Finescale codling	❑	❑	❑	❑	❑
Lingcod	❑	❑	❑	❑	❑
Pacific cod	❑	❑	❑	❑	❑
Pacific whiting	❑	❑	❑	❑	❑
Sablefish	❑	❑	❑	❑	❑
Giant grenadier	❑	❑	❑	❑	❑
Pacific grenadier	❑	❑	❑	❑	❑
All other grenadiers	❑	❑	❑	❑	❑
Kelp greenling	❑	❑	❑	❑	❑
All other greenlings	❑	❑	❑	❑	❑

Q23 The GMT would also like to collect your views on which species you are concerned about mistaking with one another. For each species listed above, please list all other species you might mistake it for when sampling. If you do not have such a concern for a particular species, then you do not need to list it below. *Please use the format given in the following example when typing in your responses: rougheye (blackspotted, small shortraker); aurora (splitnose). That is, please type the name of the species you are focusing on and place the ones you are concerned with mistaking it for inside parentheses, each separated by a comma. If age or size differences – adult, juvenile or small – are important to identification, please note this as well.*

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Nearshore rockfishes

Q24 How far do you have to go to identify the following species? *Please check one for each species.*

Nearshore rockfishes	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Black	❑	❑	❑	❑	❑
Black and yellow	❑	❑	❑	❑	❑
Blue	❑	❑	❑	❑	❑
Brown	❑	❑	❑	❑	❑
Calico	❑	❑	❑	❑	❑
China	❑	❑	❑	❑	❑
Copper	❑	❑	❑	❑	❑
Gopher	❑	❑	❑	❑	❑
Grass	❑	❑	❑	❑	❑
Honeycomb	❑	❑	❑	❑	❑
Kelp	❑	❑	❑	❑	❑
Olive	❑	❑	❑	❑	❑
Quillback	❑	❑	❑	❑	❑
Treefish	❑	❑	❑	❑	❑

Q25 The GMT would also like to collect your views on which species you are concerned about mistaking with one another. For each species listed above, please list all other species you might mistake it for when sampling. If you do not have such a concern for a particular species, then you do not need to list it below. *Please use the format given in the following example when typing in your responses: rougheye (blackspotted, small shortraker); aurora (splitnose). That is, please type the name of the species you are focusing on and place the ones you are concerned with mistaking it for inside parentheses, each separated by a comma. If age or size differences – adult, juvenile or small – are important to identification, please note this as well.*

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Shelf rockfishes

Q26 How far do you have to go to identify the following species? *Please check one for each species.*

Shelf rockfishes	Quick visual: external look	Closer visual: internal look, etc.	Quick tactile: skin texture, etc.	Closer tactile: headspine count, etc.	Identification key
Bank	❑	❑	❑	❑	❑
Bocaccio	❑	❑	❑	❑	❑
Bronzespotted	❑	❑	❑	❑	❑
Canary	❑	❑	❑	❑	❑
Chameleon	❑	❑	❑	❑	❑
Chilipepper	❑	❑	❑	❑	❑
Cowcod	❑	❑	❑	❑	❑
Dusky	❑	❑	❑	❑	❑
Dwarf red	❑	❑	❑	❑	❑
Flag	❑	❑	❑	❑	❑
Freckled	❑	❑	❑	❑	❑
Greenblotched	❑	❑	❑	❑	❑
Greenspotted	❑	❑	❑	❑	❑
Greenstriped	❑	❑	❑	❑	❑
Halfbanded	❑	❑	❑	❑	❑
Harlequin	❑	❑	❑	❑	❑
Longspine thornyhead	❑	❑	❑	❑	❑

Mexican	❑	❑	❑	❑	❑
Pink	❑	❑	❑	❑	❑
Pinkrose	❑	❑	❑	❑	❑
Puget Sound	❑	❑	❑	❑	❑
Pygmy	❑	❑	❑	❑	❑
Redstripe	❑	❑	❑	❑	❑
Rosethorn	❑	❑	❑	❑	❑
Rosy	❑	❑	❑	❑	❑
Shortbelly	❑	❑	❑	❑	❑
Shortspine thornyhead	❑	❑	❑	❑	❑
Silvergray	❑	❑	❑	❑	❑
Speckled	❑	❑	❑	❑	❑
Squarespot	❑	❑	❑	❑	❑
Starry	❑	❑	❑	❑	❑
Stripetail	❑	❑	❑	❑	❑
Swordspine	❑	❑	❑	❑	❑
Tiger	❑	❑	❑	❑	❑
Vermilion	❑	❑	❑	❑	❑
Widow	❑	❑	❑	❑	❑
Yelloweye	❑	❑	❑	❑	❑
Yellowtail	❑	❑	❑	❑	❑

Q27 The GMT would also like to collect your views on which species you are concerned about mistaking with one another. For each species listed above, please list all other species you might mistake it for when sampling. If you do not have such a concern for a particular species, then you do not need to list it below. *Please use the format given in the following example when typing in your responses: rougheye (blackspotted, small shortraker); aurora (splitnose). That is, please type the name of the species you are focusing on and place the ones you are concerned with mistaking it for inside parentheses, each separated by a comma. If age or size differences – adult, juvenile or small – are important to identification, please note this as well.*

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Final questions

Q28 Do you have any additional comments you would like to share?

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Thank you for your participation!

If you have any questions about this survey, please contact one of the following GMT representatives:

Bob Leos, CDFW	831-649-2889	rleos@dfg.ca.gov
Dan Erickson, ODFW	541-961-2053	daniel.l.erickson@state.or.us
Corey Niles, WDFW	360-249-1223	corey.niles@dfw.wa.gov