OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON UNIDENTIFIED
ROCKFISH FROM THE RECREATIONAL FISHERY

The Recreational Fisheries Information Network (RecFIN) provides estimates of recreational catches separately for three 'types' of recreational catch. Type A catch estimates are based on "sampler examined catch" and represent landed fish. Type B1 catch estimates are based on "angler reported harvested dead catch" and may represent fish that were landed but not observed by the sampler, fish that were released dead at sea, or a combination of these depending on the year and region. For Oregon, type B1 estimates currently represent only fish that were released dead at sea. Type B2 catch estimates are based on "angler reported released alive catch". Catch is estimated in units of numbers of fish, which may be converted to weight of catch via multiplication by stratified estimates of average weight. All three RecFIN catch types contain estimates of unidentified rockfish in at least some years for Oregon, but because the primary interest here is accounting for fishery mortality by species, this report focuses on addressing type A and B1 estimates.

1. Magnitude of the Issue

ODFW examined recreational catch data from 1980 through 2008 to determine the magnitude of unidentified rockfish ("rockfish genus" in RecFIN) catch (Figure 1). In the early 1980s, there were large numbers (415,000 in 1982) of unidentified rockfish, primarily released fish and likely artificially high due to a small sample size and high expansion factors. Since the early 90's, with the exception of 2000, the number of unidentified rockfish has been much lower. Similar to the early 1980s, 2000 may be due to a change in sample design, as this was the beginning of the transition from Marine Recreational Fishery Statistical Survey (MRFSS) to the Ocean Recreational Boat Survey (ORBS) in Oregon.
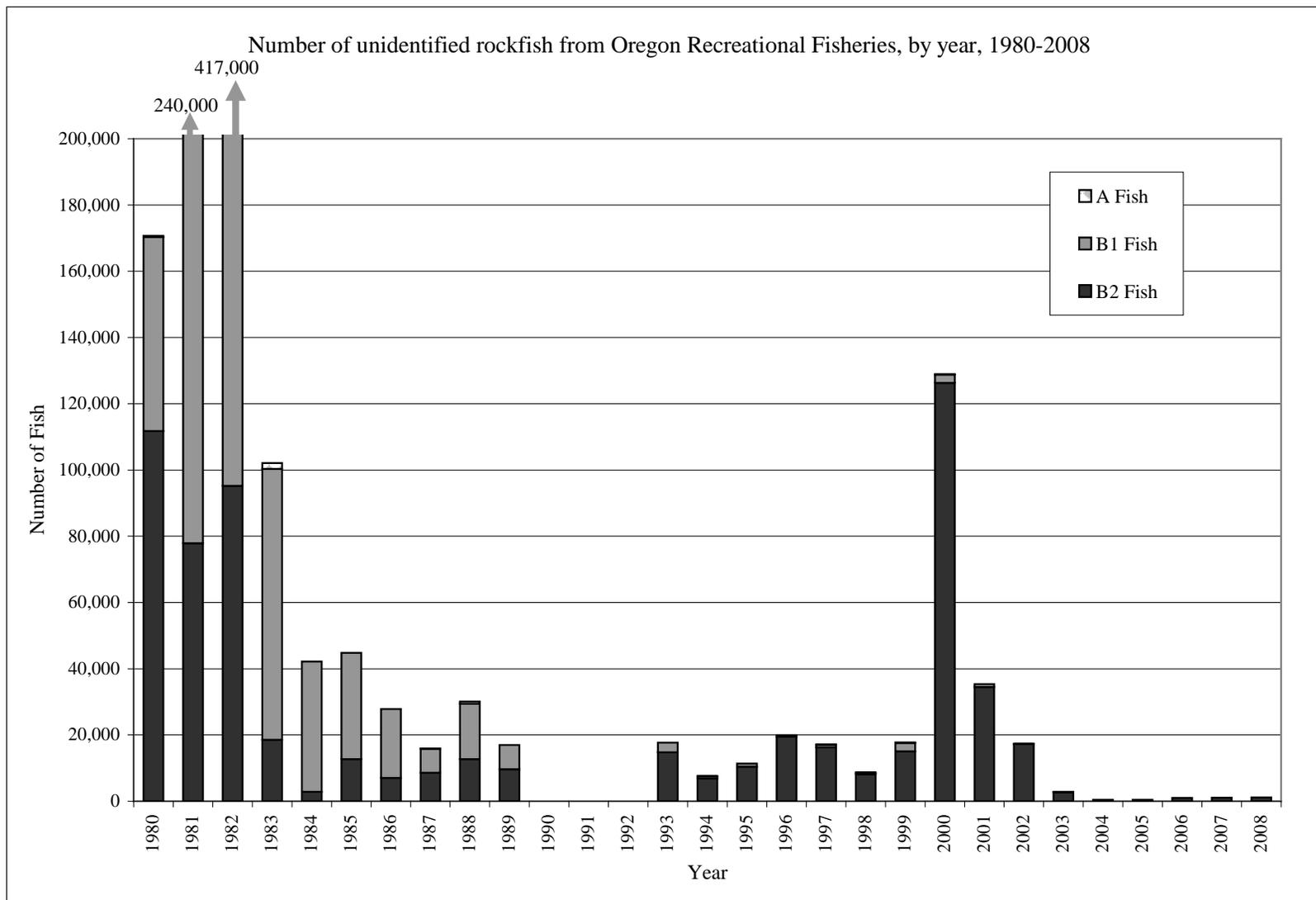
Figure 1. Total number of unidentified rockfish (A, B1 and B2) from Oregon recreational fisheries 1980-2008 from the RecFIN database.

Looking more closely at recent (2004-2008) data, there has been an average of seven unidentified A fish, zero B1 fish and 872 B2 fish per year (Table 1).

Table 1. Total number of unidentified rockfish (A, B1 and B2) from Oregon recreational fisheries, 2004-2008, from the RecFIN database.

Year	A	B1	B2	Total
2004	9	0	793	802
2005	8	0	393	401
2006	7	0	982	989
2007	8	0	1,075	1,083
2008	4	0	1,117	1,121
Average	7	0	872	879

Between 2004 and 2008, 52% of unidentified rockfish came from anglers targeting halibut (Figure 2). Anglers on bottomfish trips reported 36%, 11% on combination trips, and salmon and tuna trips combined account for less than 1% of the unidentified rockfish.
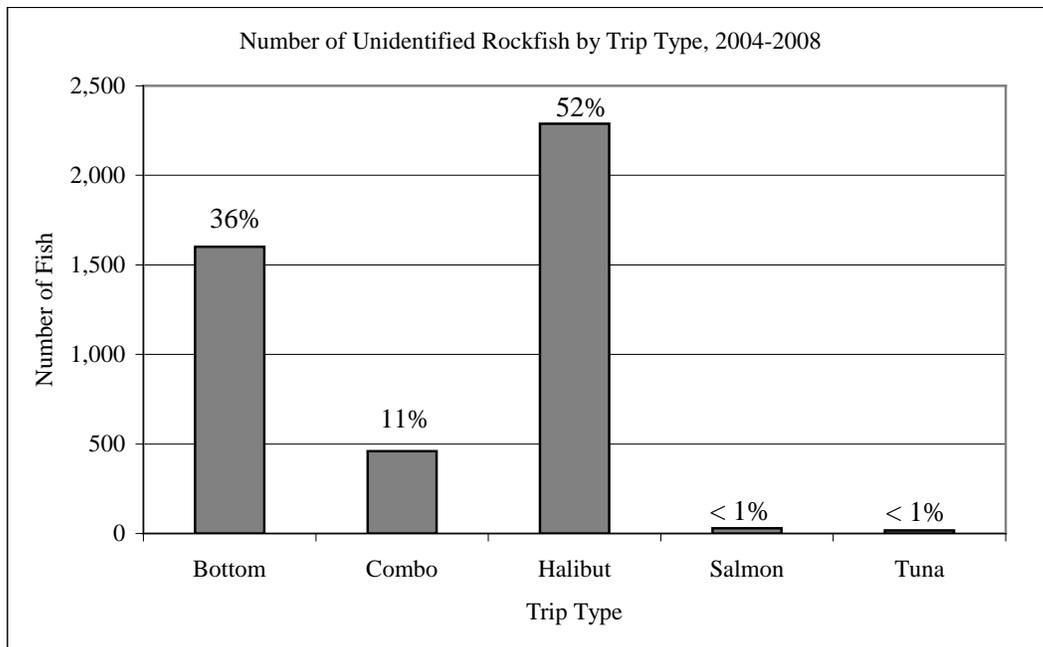

Figure 2. Total number of unidentified rockfish (A, B1 and B2) from Oregon recreational fisheries by trip type, 2004-2008.

The methodology used to produce historical estimates of unidentified fish, whether landed or discarded, has changed through time. There are three periods of estimates based on differing methodologies. The earliest spans the period from the early 1980's through 1989 and is based on MRFSS. In this survey anglers were asked if they discarded any fish and about the disposition of the fish (live or dead). Unless the sampler was confident the angler knew the rockfish species discarded, the fish were recorded as unidentified rockfish. During the period from 1990 through 2001 the landed statistics reported to RecFIN were from ODFW's ORBS. During that period discards, except for salmon and lingcod in the later years, were not recorded. The MRFSS

program was also conducted during that period, but the landed estimates from the ORBS program were considered more accurate, and thus used in RecFIN. The sources of discards reported during that period on RecFIN are unknown and may be a product of the MRFSS sampling. The third period started in 2001 when ORBS began recording all fish landed by species and inquiring about all discards at the species level. Anglers were not asked about the disposition of fish discarded (i.e., dead or alive) yet they are reported on RecFIN as B1 and B2. This distinction could not be due to MRFSS sampling starting in July 2003 as the program was discontinued in Oregon. How RecFIN assigns discarded fish to B1 versus B2 will be examined and taken into account when the partitioning methodology is finalized. The estimates are not available by trip type in many years. Since 1999 they have been available by trip type and boat type.

The sampling programs described above represent sampling of ocean, shore and estuary fisheries. From July 2003 through June 2005 MRFSS was replaced by the Shore and Estuary Boat Sampling (SEBS) program. Shore and estuary sampling was discontinued in July 2005 due to lack of funding.

Several factors influence the accuracy of the catch estimates including regulations. Prior to the late 1990s with the advent of a sub-bag limit for canary rockfish there was little reason not to report releases. Most fish were either sub-legal (lingcod) or smaller fish. This changed with the adoption of a canary rockfish sub-limit in 1999 and intensified when retention of both canary rockfish and yelloweye rockfish were prohibited. Anglers did not always report releases of these species as they would count toward an annual limit on impacts, which included release mortality. In fact, these restrictions resulted in an increase in the release of "red" rockfish due to uncertainty in identification. Other examples of the influence of regulations are offshore closures and non-retention of groundfish in the directed halibut fishery. The advent of these regulations either promoted discards (prohibition) or influenced species composition (offshore closures), therefore careful attention must be given to the effects of regulation when developing methodologies for partitioning unidentified rockfish.

2. Conservation Risks

The conservation risks associated with the unidentified rockfish are that the actual impacts in a year may have exceeded a species' Optimum Yield (OY or Acceptable Biological Catch (ABC). Based on preliminary calculations, none of the additional impacts from Oregon recreational fisheries caused the total species' OY or ABC to be exceeded. However, this may not be the case when all three states include their additional impacts. Preliminary calculations (based on RecFIN data 2004-2008) of additional impact from partitioning all unidentified catch (A, B1 and B2) into species (the worst case scenario), shows that the additional impacts from Oregon recreational fisheries would have caused the Oregon portion of the yelloweye harvest guideline, but not the ABC or OY, to be exceeded by less than 0.1 mt in 2008 and 0.2 mt in 2005. The black rockfish recreational harvest guideline, but not the ABC or OY, was exceeded in 2004 by approximately 5 mt; however, partitioning of unidentified rockfish contributed less than 0.1 mt to that exceedence. No other rockfish species federal harvest guideline, OY, or ABC's would have been approached in the time period 2004-2008, even with the additional impacts. Just examining A and B1 fish, there are currently less than ten A and B1 unidentified rockfish per year (Table1). Even if all ten unidentified rockfish were yelloweye rockfish, there would be less than 0.03 mt of additional impacts per year, not enough to cause an exceedence of the ABC or OY in any given year. However, it is unknown (to ODFW) how released fish are currently

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partitioned into B1 and B2 estimates, but it is assumed that some type of mortality rate calculation is used. If species specific mortality rates are greater than that applied to unidentified rockfish, the conservation risks may increase substantially.

3. Reasons for Unidentified Rockfish

ORBS relies on a combination of sampler examination of landed catch and angler reported discards to estimate total catch data. Over the last five years, 99% of the unidentified rockfish were reported by anglers as discarded, and are estimated as B2 (released alive) fish in RecFIN. The reasons for the angler reports of unidentified rockfish could be due to anglers' inexperience with rockfish identification. A second possibility is that the anglers can identify rockfish by species but don't want to report their discarded catch for fear that the information may close an area or the entire fishery. A more likely scenario is that anglers correctly identify and report the common rockfish species, and the species of concern (yelloweye and canary rockfish), but are unfamiliar with rare or unusual rockfish. Finally, ORBS protocol does not request that the samplers investigate/ask further questions about species ID. They simply ask "what did you discard" and are not instructed to try to dig in and investigate if unknown.

ODFW has been working to educate anglers on rockfish identification. ODFW produced a Red Rockfish Guide to assist with rockfish identification for common species such as vermillion, canary, and yelloweye rockfish. In the ports of Brookings and Newport, traditionally the two highest angler effort ports for marine recreational fishing in Oregon, ODFW built informational kiosks. These kiosks include regulations, the Red Rockfish Guides, and other information related to fish identification. During the summer of 2009, ODFW held two open house angler education events, in Brookings and Newport that focused on fish identification, collaborative research projects, navigating the management process, and regulations. The two events were attended by approximately 300 people. Most participants were interested in how to identify fish that they were allowed to retain from those they could not. Future angler education events will be scheduled in other ports in future years, dependent upon funding.

4. Methodology for Partitioning Unidentified Catch into Species

Since there are no direct data on the species composition of unidentified rockfish, partitioning to species will require the application of species composition estimates derived from other data sources. Development of alternative methodologies for partitioning will consist of at least three steps. First, appropriate datasets for deriving species composition estimates must be identified for each type of RecFIN catch estimate. Second, a method for deriving estimates of species composition and applying these to estimates of unidentified rockfish must be chosen. Third, a method for converting estimated numbers of fish (by species) to weight must be chosen because weight is the quantity of interest to managers. This report does not seek to develop or recommend a particular methodology, but rather to outline the data and methods available.

Species composition data for Oregon recreational fisheries is available from three independent sources; ORBS, MRFSS/SEBS, and ODFW's charter vessel observer program (Observer) (Table 2). ORBS has collected rockfish species composition samples for fish landed by boat-based anglers fishing in ocean waters from a subset of dockside interviews since 1979. Through 1998 samples were recorded as weekly tallies, with the consequence that the number of fishing trips sampled for rockfish species composition is unknown. Starting May 1999, species composition samples were linked to individual fishing trips, and in 2000 rockfish species composition samples became mandatory for all dockside interviews. ORBS began collecting data on the

species composition of rockfish discarded at sea (as reported by anglers) in May 2001. MRFSS has collected data on landed and discarded rockfish species composition from both boat-based and shore-based anglers fishing in ocean and estuary waters for 1980-1988 and 1993-2003. ODFW's observer program has collected species composition data for both landed and discarded fish for 2001 and 2003-present. These samples are restricted to charter vessels targeting bottomfish, with the majority of the samples from fishing activity taking place shallower than 40 fathoms. In addition, observers did not begin recording the condition (live or dead) of released fish until 2005. All three data sources are applicable to the partitioning of type A unidentified rockfish and to the partitioning of type B1 unidentified rockfish for those years that type B1 estimates represent released dead fish only. For those years that include angler reported landings in the estimates, only MRFSS data is applicable to partitioning type B1 unidentified rockfish. For all three catch types, only MRFSS/SEBS data is applicable to partitioning shore and estuary catch prior to 2001. After 2001, ORBS data may be applicable to partitioning catches made by boat-based anglers fishing in estuary waters. However, estuaries are not the focus of ORBS, and it does not sample all estuaries or estuary fisheries.

Table 2. Summary of data sources available for partitioning unidentified rockfish to species.

Survey	Years	Modes	Waters	Number landed	Number discarded	Disposition (alive or dead)	Trip type or target species	Boat type
						Available data from species composition sampling		
MRFSS	1980-1989	Shore and Boat	Ocean and Estuary	Y	Y	Y	N	Y
	1993-2003	Shore and Boat	Ocean and Estuary	Y	Y	Y	Y	Y
SEBS	2003-2005	Shore and Boat	Estuary	Y	Y	Y	Y	Y
ORBS	1979-1987	Boat	Ocean	Y	N	N	N	Y
	1987-2000	Boat	Ocean	Y	N	N	Y	N
	2001-present	Boat	Ocean and Estuary	Y	Y	N	Y	Y
Observer	2001, 2003-2004	Charter boat	Ocean	Y	Y	N	Y	Y
	2005-present	Charter boat	Ocean	Y	Y	Y	Y	Y

Given an appropriate source of species composition data, the method of partitioning that is the simplest, most straightforward, and consistent with current methods is to stratify the data by factors thought to affect species composition, calculate the average proportion of each species within each unique strata combination, then multiply the average proportion by the estimated number of unidentified rockfish in the corresponding strata combination. The stratification used will be a major decision point when applying this methodology and to a degree will be dictated by the available data. For 1979-May 1999, ORBS data may be stratified by year, month, port, and boat type (1979-1987 only) or trip type (1988-May 1999 only). For May 1999 to present, ORBS data may be stratified by both trip type and boat type, and at higher temporal (calendar date) and spatial (reef area) resolutions. MRFSS data may be stratified by time period (e.g. week, month, year), interview site (finer spatial resolution than port), primary target species (1993-2003), and waters fished (inland, state, or federal). Observer data may be stratified by time period, port, and location. For all data sources this method will likely require some aggregation of strata levels due to small sample sizes for some unique strata combinations. Alternatively, a statistical model similar to that developed by Sampson and Lee (2008) may be used to describe the relationship of species composition to factors such as year, port, boat type, etc. These relationships may then be used to predict the expected proportion of each species for any combination of factor levels. However, such an approach will likely be difficult to incorporate into the estimation and reporting process currently used by RecFIN. A hybrid approach may be to use a statistical model to inform decisions regarding stratification and aggregation of strata levels used in calculating average proportions.

Average weight for each species may be estimated for each combination of strata where estimates of unidentified rockfish occur. However, it is likely that a simplified stratification (compared to that used for calculating average species proportions) will be necessary due to the very small sample sizes for fish weights (e.g. one fish) that occur in some individual strata.

5. Resources Necessary to Partition Catch
Key in determining how much staff time to dedicate for the multiple agencies involved will be the level of priority given this item by the Council, along with the budget and staffing status of the respective agencies. ODFW would need to commit staff time to (1) finalize the methodology for portioning catch, (2) back calculate estimates by species both in numbers of fish and in weight, and (3) make the appropriate updates to databases, reports, calculations, etc. For the Council processes, time will be needed for both the SSC and GMT to review the proposed methodologies, as well as Council staff time working on this issue. The RecFIN Technical Team and/or Statistical Team will need to spend some time determining how unidentified rockfish should be dealt with in RecFIN. Finally, staff time for Pacific States Marine Fisheries Commission staff will also be necessary to make updates and/or corrections to the RecFIN database.

6. Pros and Cons of Partitioning
Will the species specific estimates be accurate? If so, they could provide better information for stock assessments. If not, they could detract from stock assessments and

possibly overestimate or underestimate impacts for depleted species. Either way the revised estimates may result in increasing or decreasing previous estimates of depleted species and either put the estimate over or under the state harvest guidelines.

It is important to note that all of the methods of partitioning discussed will likely result in catch estimates that are biased high for common species and biased low for rare species because both samplers and anglers are more likely to be able to identify common species than rare species. The extent of this bias is unknown and it is likely not resolvable given our current knowledge. Research on the ability of anglers to identify rockfish to species may help resolve this issue, but to the best of our knowledge no such research is currently being undertaken.

7. Implementation Preference
ODFW believes that the most logical time to implement accounting for unidentified rockfish would be at the beginning of a biennial specification (SPEX) cycle. However, if there are conservation concerns for any species, action should be taken as soon as possible to mitigate those effects. All three states should begin accounting for the unidentified rockfish at the same time to prevent any one state from being held to a higher or lesser standard than the others.

ODFW will also continue with its angler education activities to promote accurate identification of rockfish, proper release techniques including use of recompression devices, and fishing strategies to avoid overfished species.

References

Sampson, D.B. and Y-W. Lee. 2008. Evaluation of Estimators for Rockfish Species Compositions. Project Progress Report to the Oregon Department of Fish and Wildlife Marine Resources Program. 23 pp.