MEMORANDUM

OREGON DEPARTMENT OF FISH AND WILDLIFE

DATE: October 7, 2002

TO: Don Bodenmiller

FROM: Bob Hannah

SUBJ: Analysis of 1999-2002 Recreational Data

This memo summarizes some recent analysis trying to answer the question "Are recreational fishers still targeting canary and/or yelloweye rockfish in offshore fishing trips?" The analysis I conducted indicates they are not targeting these fish, but appear to be actively avoiding them.

Methods

This analysis focused on the recreational catch and species composition data from 1999 through 2002. This time period was used for two reasons. First, prior to May 1999, species composition data was not tied to individual trips, so the type of analysis conducted here cannot be done on earlier data. This time period also encompasses fishing under less restrictive catch limits (1999), as well as fishing under the current limits of 1 canary rockfish and 1 yelloweye rockfish per angler per day. In 1999, the rockfish bag limit was 15 rockfish, with no sub-limits for offshore species. In 2000, the bag dropped to 10 rockfish with a sub-limit of 3 canary rockfish, then in 2001 the sub-limit was dropped to 1 canary rockfish. In 2002, a sub-limit of 1 yelloweye rockfish was added. Also, we began collecting catch data by reef area, either "inside" or "outside" in 1999, so this is really the only data set that can be used for this analysis.

In concept, determining how targeting is changing relies on analysis of changes in the frequency of catch rates above some threshold. Targeting increases these frequencies while avoidance should reduce them. Consider the distribution of canary rockfish per angler data (Figure 1). This is a frequency distribution of the total catch of canary from a trip, divided by the number of anglers, for 1999 offshore trips. The graph shows that, for example, somewhere around 85 trips averaged less than 1 canary per angler (first bar) in 1999. It's easy to see that, with no change in limits, if targeting was increased after 1999, then the number of trips reaching any threshold (say>1 canary/angler) should go up. If canary was being avoided, the frequency above the threshold should go down.

Changes in retention limits, however, complicate the issue. Assume you imposed a catch limit of 1 canary rockfish (arrow in Figure 1) after 1999, and further that all anglers retain canary rockfish until the boat limit is met. All the trips in the bar just to the left of the arrow would just meet the limit of 1 canary/angler, while the trips in the bars further to the right would discard some canary, however, they too would meet the limit of 1 canary/angler. Accordingly, the proportion of trips that "met or exceeded" the limit would be the same for 1999 and the next year when the new limit was imposed. So, in theory, if targeting behavior does not change, the proportion of trips that meet or exceed the new limit should not change. Increases in this proportion should indicate targeting, while decreases should indicate avoidance.

The only question, is whether the assumption that all boats retain fish until the boat limit is met is reasonable for the Oregon recreational fleet. Given the dominance of charter boats, and the fact that they generally retain fish until the boat limit is met, I believe this is a reasonable assumption.

Results

The proportion of offshore trips (Table 1) meeting or exceeding a threshold of 1 canary or 1 yelloweye rockfish per angler is going downwards for both species since 1999 (Table 2) suggesting anglers are avoiding them. The same trends are seen in Garibaldi (Table 3), considered alone (you had asked for this). This agrees with the catch data (Figures 2 and 3) showing less canary rockfish in the offshore catch over time and increases in yellowtail and widow rockfish. Note that 2000 is a bit anomalous, in that higher levels of black rockfish are included in the "offshore" data. This is probably because fishers were asked where they spent most of their time fishing, and some trips combined offshore and onshore fishing. Most likely, 2000 just had more of this mixed fishing.

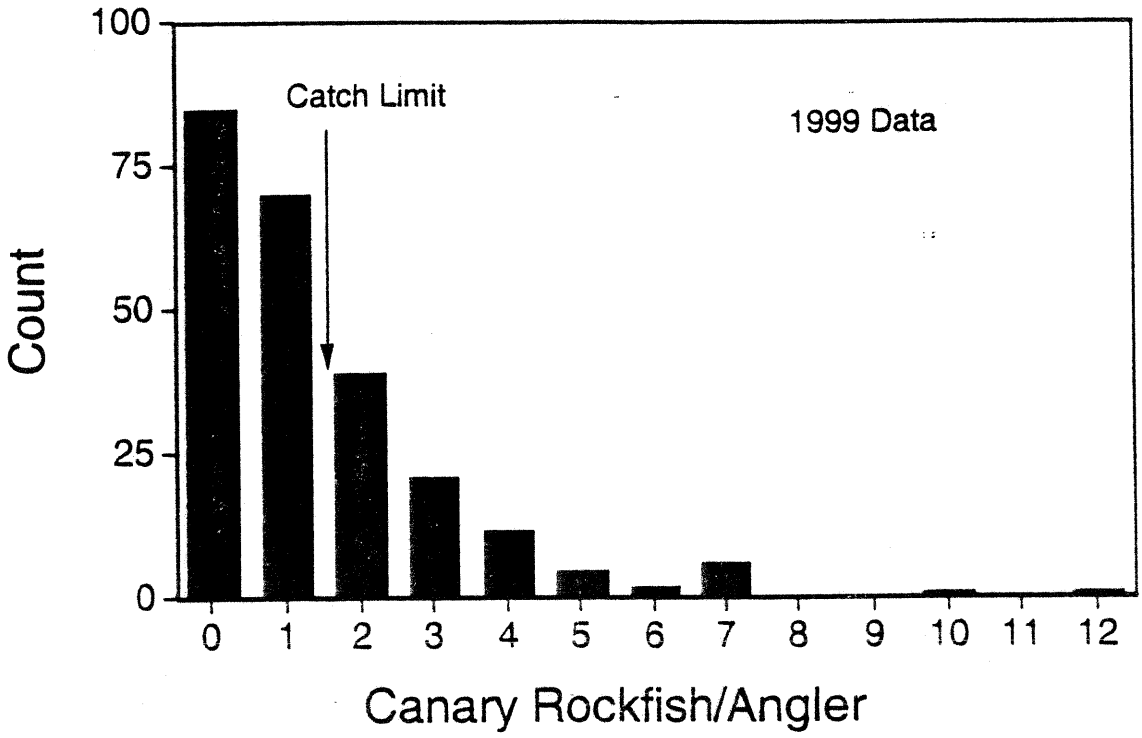

Figure 1. Frequency distribution of canary rockfish catch per angler, 1999. The x-axis shows the lower limit of the catch rate bin (the bin marked 0 is for catches less than 1 canary/angler).

Year	All Trips	Offshore Trips	Garibaldi Offshore Trips
1999	5619	277	122
2000	5862	252	111
2001	5054	152	77
2002	3914	168	84

Table 1. Summary of Oregon marine recreational fishing trips sampled for species composition, statewide and for the port of Garibaldi, 1999-2002.

Year	P-Canary/Angler	P-Yelloweye/Angler
1999	0.6488	0.2655
2000	0.4479	0.1942
2001	0.3173	0.0610
2002	0.3220	0.0476

Table 2. Proportion of offshore Oregon recreational fishing trips with a mean catch of □ 1 canary rockfish or yelloweye rockfish per angler (P-Canary/Angler, P-Yelloweye/Angler), 1999-2002.

Year	P-Canary/Angler	P-Yelloweye/Angler
1999	0.5182	0.1304
2000	0.4700	0.1410
2001	0.3729	0.0408
2002	0.3382	0.0000

Table 3. Proportion of offshore Oregon recreational fishing trips in Garibaldi with a mean catch of □ 1 canary rockfish or yelloweye rockfish per angler (P-Canary/Angler, P-Yelloweye/Angler), 1999-2002.

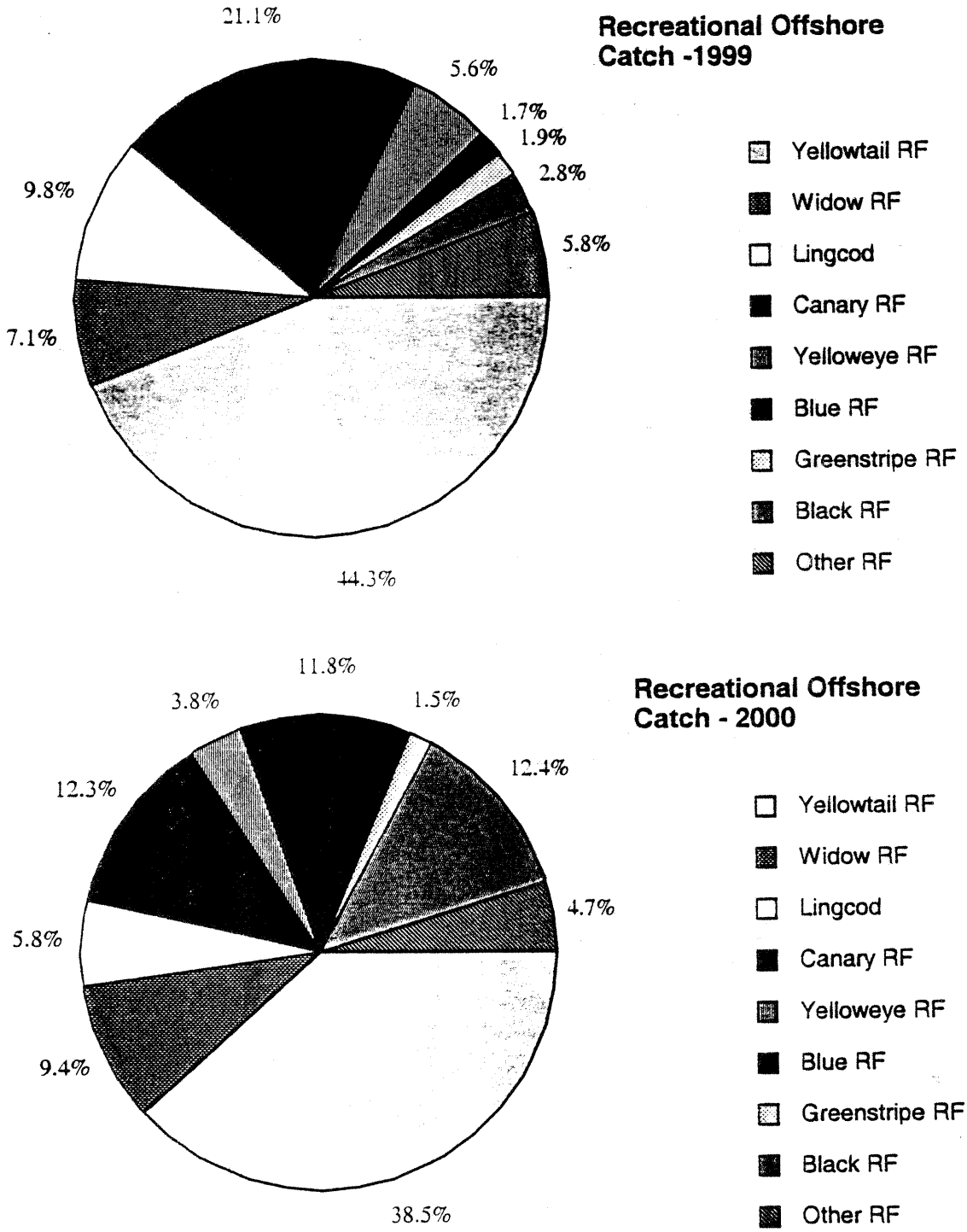

Figure 2. Species composition of offshore recreational fishery catch, 1999-2000.

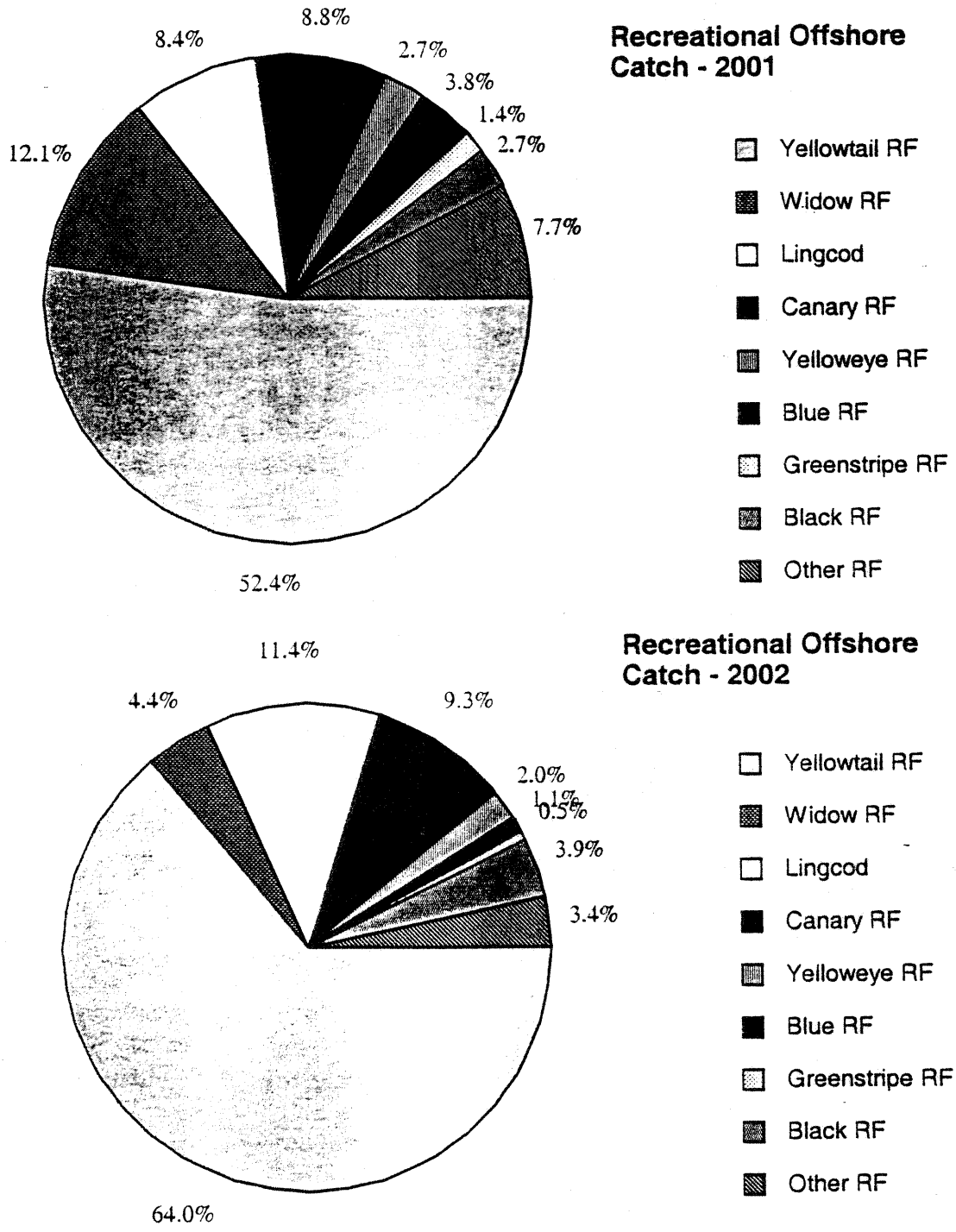

Figure 3. Species composition of offshore recreational fishery catch, 2001-2002.