A preliminary investigation into the accuracy of commercial catch reports using information from the St. Croix net fishery

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SEDAR26-RD-05

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February 26, 2007

Abstract

A preliminary study was undertaken to investigate the accuracy of U.S. Virgin Islands commercial catch report (CCR) information obtained from St. Croix net fishers. Reported CCR landings were compared to 35 coincident biostatistical samples of complete landings obtained by DFW port samplers from six different fishers. Comparisons revealed that fishers reported the date of fishing with poor accuracy, thus complicating the alignment of reported to observed fishing activities. Nonetheless a high frequency (17-20 %) of non-reporting was evident. In all examined cases the correlation between reported and observed landings was very poor, indicating that the accuracy of CCR landings information on any given date is highly suspect. Contrary to expectation, however, analyses of pooled data indicated that the sampled St. Croix net fishers significantly over-reported their total landings (by ~ 33 %). Landings of parrotfish - the primary species-group targeted by St. Croix net fishers – were also over-reported although to a lesser extent (~ 20 % over-reporting). When taxonomic diversity was evaluated, fishers tended to over-report almost all other (non-parrotfish) types of harvested species-groups. Reporting of bycatch on CCR forms was introduced in 2003 but few fishers utilized this field and a non-reporting frequency of 78.6 % was observed in the present study. However, direct observations of net fishing indicate that on average 33 pounds of bycatch (~ 10 % of the total landings by weight) are generated per net fishing trip. Examination of a seven-year time series for one St. Croix commercial net fisher indicated only a trivial decline in observed landings, but a detectable increase in reported landings, suggesting that reporting behavior - rather than actual landings - had changed over time. Due to limited sample size and inadequate distribution of samples among the net fisher population, the dataset analyzed in this study is considered minimally representative of the St. Croix net fishery, and results should not be generalized to the larger St. Croix commercial fishery. Recommendations are made to improve the validation of CCR data using port sampling results in future studies. For the purposes of managing St. Croix reef fish stocks, there is a pressing need to acquire better quantitative estimates of commercial landings to facilitate management decisions. Commercial landings of parrotfish, in particular, are typified by widely divergent estimates for reported and calculated annual landings which must be reconciled in order manage the harvest of these ecologically and economically important species.

Introduction

Landings statistics for commercial fisheries are often collected through heavily or entirely fisher-dependent mechanisms such as trip tickets or catch report forms. The accuracy of such information is frequently difficult to verify. In the US Virgin Islands, the accuracy of reported landings derived from commercial catch report (CCR) forms has been openly questioned (Rogers and Beets, 2001, anon. comm.). Despite criticisms, there has been no deliberate investigation into the accuracy of the USVI CCR database. A recent example from St. Croix, where imminent management measures will prohibit the use of gill and trammel nets for harvest of reef fishes, serves to underscore the magnitude and gravity of these uncertainties. The accuracy of reported commercial landings of reef fishes by net fisherman was questioned when much higher estimates were calculated based upon direct observations from port samples. Considerable disagreement still exists regarding harvest rate and stock status of parrotfish, although it is generally acknowledged that parrotfish landings by other gear types (especially traps) declined during the same period when harvests using nets expanded. At the request of the Director of the Division of Fish and Wildlife, the present study was undertaken to assess, in a preliminary manner, whether the accuracy of reported landings of St. Croix net fishers could be determined by cross-checking individual CCRs to direct observations from port sampling.

The scope of this analysis is limited to net fishing information for the island of St. Croix. Recent accounts (Tobias 2004, Toller and Tobias in press) provide a general description of net fishing, which has become the dominant commercial fishing method for harvesting reef fish on St. Croix. For the purposes of this report, it is important to distinguish between two types of net fishing: the more conventional "passive" fishing of nets (typically unattended gill nets) deployed from boats, and the novel St. Croix form of "active" net fishing on scuba to target parrotfish with trammel nets and/or gill nets. Unfortunately, at the present time little St. Croix-specific information exists for the passive form of net fishing. The data and analyses presented in this report will focus exclusively on the active form of net fishing which is believed to account for the vast majority of St. Croix landings reported by commercial fishers using nets.

Methods

Examination of DFW data files identified a total of 35 biostatistical interviews obtained from net fishers on St. Croix between August 27, 1998 and September 30, 2005 (Appendix). During biostatistical interviews DFW port sampling agents determined size (length, weight) and species composition of the complete catch from commercial fisher landings. The 35 biostatistical samples were obtained from six different fishermen, denoted here as Fisher #1 through Fisher #6. Sampling was not uniformly distributed among fishers (Table 1). The majority of samples (80.0 %) were obtained from Fisher #1 and Fisher #2 while the remaining four fishers (Fishers #3, #4, #5, and #6) contributed 4, 1, 1, and 1 samples each, respectively. Estimates for the actual population size of St. Croix net fishers ranges widely, ~~from 9 to 43 individuals (Kojis 2004)~~ Kojis (2004) reported 9 trammel net and 35 gill net fishers in the St. Croix ~~from 9 trammel net fishers~~ net fishery. Thus, the results presented below are a sub sampling that may represent anywhere from 14 % to over 66 % of the total population of net fishers.

In principle, every commercial fisher logs all of his fishing activities and landings onto a CCR form according to date. Thus, it should be possible to examine reported activities and landings for every date where biostatistical observations were obtained through port sampling. Towards this end, the fishers' original CCRs corresponding to each sampling date were pulled from DFW files for examination. Each of the original CCRs was located, and a total of 27 CCRs were examined [the smaller number of CCRs was due to the fact that multiple samples were obtained from the same fisher within certain months].

For the purposes of this report, each biostatistical interview was considered to represent one "Observed" sample of a St. Croix commercial net fisher landing and the coincident CCR entry was considered to represent one "Reported" sample. Reporting accuracy was then calculated as a percentage of the ratio of reported to observed landings using the formula:

$$\% \text{ Accuracy} = (\text{Reported Landings} / \text{Observed landings}) * 100$$

It is noted here that fishers used a great variety of notations to indicate fishing method on CCR forms. In the 35 examined dates, fishers used the following 11 different codes to record what was, presumably, a single type of net fishing: G, N.S., N.T., N/S, NS, R, R/S, S/G, S/N, S-N, and T.n. Although these inconsistencies did not affect the present analyses (fisher and fishing method were always unambiguously identified in the port sampling interview), they are likely to be a confounding factor in future analyses of the CCR database.

Results

Accuracy of Reported Fishing Date

For six of 35 sampling dates, the CCR forms clearly indicated "no fishing" on the observed date of fishing. One additional fisher (Fisher #2) recorded fishing effort but no landings information on the observed date of fishing (22-May-02). Thus, for six of the 35 sampled dates (17.1 %), the fishing activities were not reported and for seven of 35 sampled dates (20.0 %) the landings information was not reported. This provides a preliminary estimate for the frequency of non-reporting by St. Croix commercial net fishers.

Biostatistical samples obtained on dates where fishers reported "no fishing" were considered non-reported fishing. Four of the six sampled fishers participated in non-reported fishing (Table 1). Combined total landings from the six non-reported fishing days were 1,777.4 lbs (average 296.3 pounds/trip), which included 1,534.8 pounds of parrotfish (86.4 % parrotfish by weight). The quantity and species composition of the catch in these samples did not deviate in any appreciable way from reported fishing trips (see below). Thus, there is no obvious reason why these four fishers would have elected to non-report landings on these six days.

Initial comparison of the 29 samples where observations coincided with at least some reported fishing activity indicated that there was a poor correspondence between the date of sampling and the reported date of fishing. Only 37.1 % of observed fishing dates coincided precisely with reported fishing dates. The average discrepancy between observed and reported date of fishing

was -0.14 ± 1.55 days (± St. Dev.) with a median value of 0 and a range of -3 to +4 days. The frequency distribution for reporting date discrepancy resembled a bell curve (Figure 1). This necessitated alignment criteria for comparing reported and observed (sampling) dates. Inspection of the frequency distribution suggested that discrepancies > 3 days were indicative of reported fishing that occurred during the proceeding/subsequent week (typically when a sample was not obtained). Therefore, reported fishing dates that were >3 days from sampled dates were excluded from further analyses of landings. This resulted in exclusion of two interviews (on 20-Nov-03 and 21-Nov-03) from correlation analyses. However these two interviews were included in calculations of pooled averages for reported and observed landings.

Total Landings

Reported total landings were derived from CCRs by summing the catch weights across all taxonomic categories (see below). For biostatistical data (observed total landings), species-level information was first pooled into CCR reporting groups (Surgeon, Parrot, Trigger, etc.). Total invertebrate landings (lobster and conch) were initially treated separately from total finfish landings. However, because landings of lobster (average reported landings of 4.1 pounds per trip, average observed landings of 1.3 pounds per trip) and conch (average reported landings of 1.2 pounds per trip, average observed landings of 0.0 pounds per trip) were generally >> 1 % of total finfish landings, they were aggregated into Total Landings. Parrotfish are the primary target of the St. Croix net fishery. Therefore observed and reported landings of parrotfish were also examined separately from total landings.

Linear regression of reported versus observed data for total landings showed a very weak correlation ($R^2 = 0.0448$, Figure 2A). A slightly improved fit was obtained when linear regression was performed on reported versus observed parrotfish landings (Figure 2B) although the correlation remained poor ($R^2 = 0.0733$).

When data from the 29 samples were pooled, the average reported total landings was 402.8 ± 205.3 (± St. Dev.) pounds per trip and the average observed total landings was 303.5 ± 141.2 pounds per trip (Figure 3). Differences between reported and observed total landings were statistically significant (*t*-test, paired two sample for means, two-tailed, $t = 2.454$, $P = 0.021$, $df = 28$). This indicates that the sampled population of net fishers tended to over-report their total landings on any given fishing date by approximately 32.7 %.

Examination of pooled data indicated that reported landings of parrotfish exceeded observed landings (Figure 3). The average reported landings for parrotfish was 310.4 ± 184.0 pounds per trip (± St. Dev.) while the average observed landings for parrotfish was 257.3 ± 151.2 pounds per trip (± St. Dev.). Although these differences were not statistically significant (*t*-test, paired two sample for means, two-tailed, $t = 1.438$, $P = 0.162$, $df = 28$), they suggest that net fishers were over-reporting their parrotfish landings by as much as 20.1 %.

Taxonomic Composition of Landings

In addition to parrotfish, landings from twelve other finfish groups and two invertebrate groups (lobster and conch) were recorded by net fishers on CCRs. Reported groups were: Angel, Barra, Goat, Grouper, Grunt, Jack, Porgy, Shellfish (Ostraciidae), Snapper, Surgeon, Trigger, Lobster and Conch. Observed groups (recorded in biostatistical samples) included each of the reporting groups listed above except for Conch, which was not observed. In addition, biostatistical sampling frequently identified taxa within the catch that could not be readily assigned to the aforementioned groups (see below).

DFW made two changes to CCR forms which interrupted the continuity for reporting type of reef fish caught during the period covered in this study. In July 1999, the Angel reporting category was removed from the CCR form, and in July 2004, the reporting category "Other Catch" was introduced to the CCR form (Messineo 2004). Reported landings data for Angel (a single entry by Fisher #1 on 27-Aug-98 of 21 lbs) and biostatistical data for angelfishes were transferred to the Other Catch category

Biostatistical sampling indicated that most (79.3 %) net landings contained specimens of Other Catch. The collective weight of Other Catch was, on average, 10.4 ± 2.8 pounds per trip (Figure 4). Taxa that were assigned to the "Other Catch" category were, in decreasing order of numeric abundance: Spanish hogfish (*Bodianus rufus*), puddingwife (*Halichoeres radiatus*), squirrelfish (*Holocentrus* sp.), and yellowfin mojarra (*Gerres cinereus*) [More detailed information on the taxonomic composition of St. Croix net fisher landings is provided in Toller and Tobias (in press)]. Fishers rarely utilized the Other Catch category for reporting since its introduction in 2004 (1 of 9 samples, or 89 % non-reporting). There was a single entry by Fisher #2 on 28-Oct-04 which identified 15 pounds of Atlantic spadefish as Other Catch.

Collectively, reported reef fish landings (exclusive of parrotfish) represented an average weight of 94.8 ± 81.4 pounds per trip (± St. Dev.). Observed reef fish landings were 46.2 ± 39.0 pounds per trip (± St. Dev.). The composition of reported and observed types of reef fishes is shown in Figure 4. The most important group was Surgeon, which comprised nearly half of the non-parrotfish landings. Average reported landings of Surgeon were 41.6 ± 44.7 pounds per trip (± St. Dev.) although average observed landings were 17.9 ± 21.0 pounds per trip (± St. Dev.), indicating that fishers over-reported Surgeon landings by > 200 %. Reporting accuracy was highly variable among the remaining groups (see Figure 4 and Table 2) but landings were consistently over-reported for all groups except Jacks. Linear regressions were performed on observed versus reported landings for each category of fish. Resulting correlations were found to be poor, with R^2 values less than 0.02 in all comparisons (not shown). The accuracy of reporting appeared to decline rapidly as a function of proportion of total catch: species-groups with low average weight in catches had the greatest percentage of over-reporting (Table 2).

Reported Discards

In July of 2003, a revised CCR form was introduced which incorporated a column for reporting discards (see Messineo 2004). Fishers were instructed to indicate the weight in pounds and condition (alive or dead) of fish (F) or lobster (L) that the fisher released. Fourteen biostatistical samples were obtained during the period of the catch report. Of the 14 samples obtained during

the "discard form" period, on only 3 days was discarded material recorded onto CCRs. This represents 21.4 % reporting of bycatch (or 78.6 % non-reporting). All three bycatch entries were reported by Fisher #1, and each corresponded with the presence of a DFW observer onboard the vessel on the day of fishing.

Were non-reporting fishers deliberately under-reporting their bycatch? Existing data do not suggest a motivation for biased reporting. The most recent nine biostatistical samples trips included independent measurements of bycatch by DFW agents during a bycatch study (MRAG 2006). In that study, the observed average weight of net fishing discards was 33.2 pounds per trip. For the six samples where bycatch was not reported, the average weight of discards was comparable (33.0 pounds per trip). Further, the bycatch estimates provided by Fisher #1 were reasonably accurate (25.7 pounds per trip, Average Accuracy = 77.1 ± 22.2 %).

Longer Term Trends in a Net Fishers' Landings

Due to the fact that Fisher #1 has been a regular participant in the DFW port sampling program, his catch information provided a unique opportunity to examine longer term trends within a limited dataset. As expected from the foregoing analyses, reported and observed landings from Fisher #1 were poorly correlated ($R^2 = 0.0369$). Both observed and reported landings showed great variability over time. Examination of observed landings did not show clear evidence of decline over the seven-year period of sampling (Figure 5). Linear regression of observed landings versus date showed a "flat" or slightly negative relation ($y = -0.0059x + 359.5$) and a poor fit to the data ($R^2 = 0.0011$). However, reported landings versus date showed a slight positive relation ($y = 0.0693x + 335.35$) with an improved fit to the data ($R^2 = 0.278$). This suggests that the individual reporting behavior of Fisher #1 changed during the course of the sampling period.

Discussion

Previously, reported landings data for the USVI commercial fishery has been dismissed by some as inaccurate information. Critics, however, have rarely attempted to provide evidence in support of this assertion. The present preliminary study brings quantitative information to the discussion of the accuracy of USVI commercial catch report data for at least one segment of the reef fish fishery. Results confirm that 1) non-reporting of fishing activities is commonplace, 2) non-reporting of landings occurs frequently, and 3) reporting for the date of fishing is often inaccurate. Further, within this fishery segment, there was a significant tendency to over-report landings. While these conclusions do not allow generalizations to the entire St. Croix commercial fishery, they are indicative of mis-reporting errors that may skew calculations of total annual landings which are based exclusively on commercial catch report data.

That net fishers had a tendency to over-report landings was an unexpected result. This finding should be tempered by the observation of a high rate of non-reported fishing. The two contrasting reporting behaviors appear to cancel one another in this study, but caution should be

used in extrapolating these results to estimates of annual landings. We do not yet know whether this preliminary estimate for non-reporting rate is robust, nor whether over-reporting is common to most net fishers.

Despite evidence for mis-reporting, the analysis of pooled data indicated a surprising level of congruence between reported and observed landings in terms of average total landings, average parrotfish landings, and species-group composition of landings. This stands in contrast to the observation that at fine temporal scales (a single day) reported landings are very poorly correlated with observed landings. Congruence of pooled datasets over longer time intervals would not be expected if fishers were randomly reporting landings. Therefore, the result presents something of an enigma.

It is hypothesized that at least some fishers "backfill" CCR forms based upon informed or intuitive guessing. That is, rather than diligently recording landings at the close of each day of fishing, fishers may periodically estimate their landings for entry onto forms. This backfilling practice can involve reporting for an entire week, a month, or longer time periods (Fisher #1, pers. comm.). In support of this hypothesis, it was observed that parrotfish landings were reported with a higher degree of accuracy than was total catch or the landings of other species-groups. This would be expected of fishers who selectively target parrotfish. Parrotfish landings would serve as a more appropriate measure of the cash value of the catch - a fact which fishers are likely to be more acutely aware. This hypothesis might also explain why the proportion of species-groups was similar between reported and observed landings.

If net fishers have indeed over-reported parrotfish landings, then the reliability of estimated annual harvests for this group becomes even more uncertain. Toller and Tobias (in press) identified the substantial discrepancy between reported and calculated annual parrotfish landings and concluded that fishers must be *under*-reporting landings. Reported annual parrotfish landings for 2002/03 for the island of St. Croix were ~ 200,000 pounds, of which ~ 150,000 pounds were reported by net fishers. Calculations of net fisher landings indicate that these reported landings are unreasonably low (Table 3) - at a harvest rate of 260 pounds per trip, it would require only 3 fishers making 3 trips per week to exceed the reported annual parrotfish landings with nets. Commercial fishery census information (Kojis 2004) suggests that landings should be much greater (Table 3) and that the population of net fishers is larger (Kojis estimated 43 St. Croix net fishers). With a net fisher population at only half this size, it is not realistic to consider parrotfish harvests exceeding 1,000,000 pounds annually (R. McAuliffe, pers. comm.). Given the vital ecological role that herbivores (parrotfishes and surgeonfishes) play in near shore marine habitats, fisheries and resource managers must appreciate the magnitude of uncertainties associated with estimation of commercial harvest rates.

Recommendations

Cross validation of CCR information with biostatical interviews requires representative sampling of the participating population. To fully assess the accuracy of reported commercial landings, it is essential to use a random stratified sampling design for the collection of port samples. This

will be challenging to implement because commercial fisher participation in port sampling is voluntary – not compulsory (W. Ventura, pers. comm.).

Improved accuracy for reporting of fishing date may be facilitated by making minor changes to the CCR form. For example, the form should indicate the day of the week alongside the date as is common in most calendars.

The very poor accuracy of CCR reporting data for individual species-groups suggests that these datafields are not adequately serving their intended purpose. Proposed future revisions of the CCR form should consider collapsing and/or eliminating some of these fields, depending upon specific fishery management objectives and realistic reporting requirements.

This preliminary examination of the discards field in the CCR form suggests that non-reporting of bycatch is prevalent. The author suspects this to be a more general pattern which may apply to other gear types and fishing methods. Although this suspicion should be confirmed by a more comprehensive analysis, it seems likely that reported discards - as presently solicited on CCR forms - will be of little use for fisheries management. Accurate discard information should be obtained through other means.

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List of Tables and Figures

Table 1. Distribution of samples and reporting frequency among fishers.

	Fisher Number						
	#1	#2	#3	#4	#5	#6	Total
Total No. of Port Samples	15	13	4	1	1	1	35
Total No. of Reported Days	14	10*	4	0	0	1	29
No. of Non-Reported Days	1	3*	0	1	1	0	6
Non-Reporting Frequency (%)	6.7%	23.1%	0%	100%	100%	0%	17.1%

* For one interview, fishing activity was recorded but landings were not.

Table 2. Accuracy of Reported Commercial Landings Using Aggregated Data from St. Croix Net Fishers.

	Avg. Weight (lbs)/Trip		Proportion of Landings		% Accuracy	% Accuracy
	Reported	Observed	Reported	Observed	by Weight	by Proportion
Total Landings	402.8 ± 205.3	303.5 ± 141.2	-	-	132.7 %	-
Type of Catch						
Parrot	310.4 ± 184.0	257.3 ± 151.2	77.1 %	84.8 %	120.6 %	110 %
Surgeon	41.6 ± 44.7	17.9 ± 21.0	10.3 %	5.9 %	232.7 %	175.3 %
Grunt	15.93 ± 17.85	3.74 ± 5.18	3.96 %	1.23 %	426.5 %	321.4 %
Snapper	6.38 ± 12.39	0.94 ± 1.94	1.58 %	0.31 %	> 500 %	> 500 %
Jack	5.79 ± 15.84	5.33 ± 8.35	1.44 %	1.76 %	108.7 %	81.9 %
Trigger	5.62 ± 8.44	3.25 ± 10.26	1.40 %	1.07 %	172.8 %	130.2 %
Porgy	4.48 ± 8.70	0.29 ± 0.68	1.11 %	0.10 %	> 500 %	> 500 %
Shellfish	3.52 ± 5.49	0.95 ± 2.62	0.87 %	0.31 %	372.1 %	280.4 %
Grouper	3.28 ± 6.71	1.30 ± 2.25	0.81 %	0.43 %	251.5 %	189.5 %
Barra	1.14 ± 3.03	0.17 ± 0.73	0.28 %	0.06 %	> 500 %	496.3 %
Goat	0.55 ± 1.94	0.11 ± 0.26	0.14 %	0.04 %	496.9 %	374.4 %

Percent accuracy was calculated as the ratio between Reported and Observed values (R/O)*100.

Table 3. Alternate Calculations of Annual Parrotfish Landings by St. Croix Net Fishers.

No. of Net Fishers	No. of Trips Per Week	Calculated† Annual Parrotfish Landings (lbs)	Comparison to Reported Commercial Landings, 2002/03
6	2	162,240	Calculated landings would exceed reported net fishery parrotfish landings
9*	3.3**	401,544	Calculated landings would exceed combined St. Croix reef fish landings by all gear types
23	3.3	1,026,168	Calculated landings would greatly exceed combined St. Croix landings of all types of catch, all gears combined

† Calculated Annual Parrotfish Landings were determined using the following formula:
(no. fishers) x (no. trips/week) x (52 weeks/yr) x (avg lbs of catch/trip)

* Kojis (2004) estimated that there were 9 trammel net fishers in the St. Croix commercial fishery.

** Kojis (2004) estimated that St. Croix commercial net fishers make an average of 3.3 trips per week.

Figure 1. Frequency distribution of accuracy for reported date of fishing. Discrepancy between reported and observed date of fishing was identified by comparing commercial catch report information to known fishing dates obtained from 35 port samples. For six port samples (red column), fishers clearly indicated "no fishing" (NF). Two samples with date discrepancies >3 days (gray column) were excluded from subsequent correlation analyses.

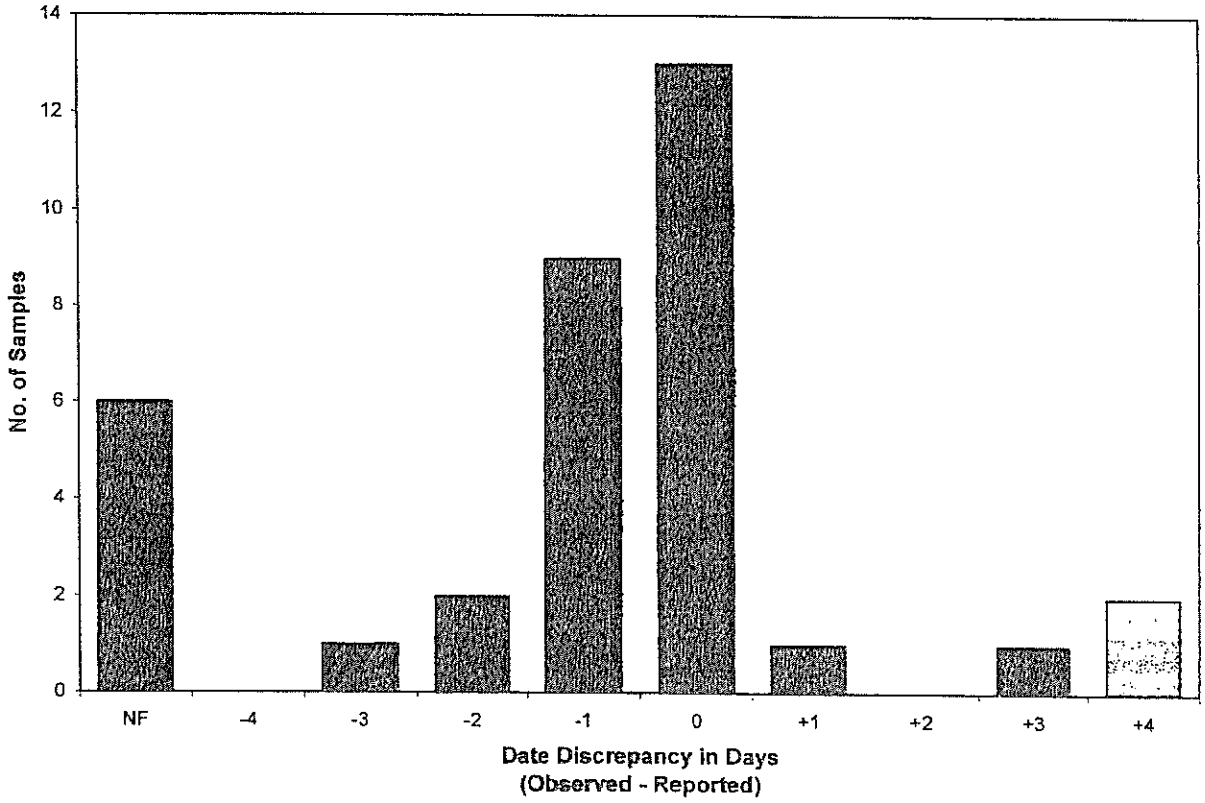
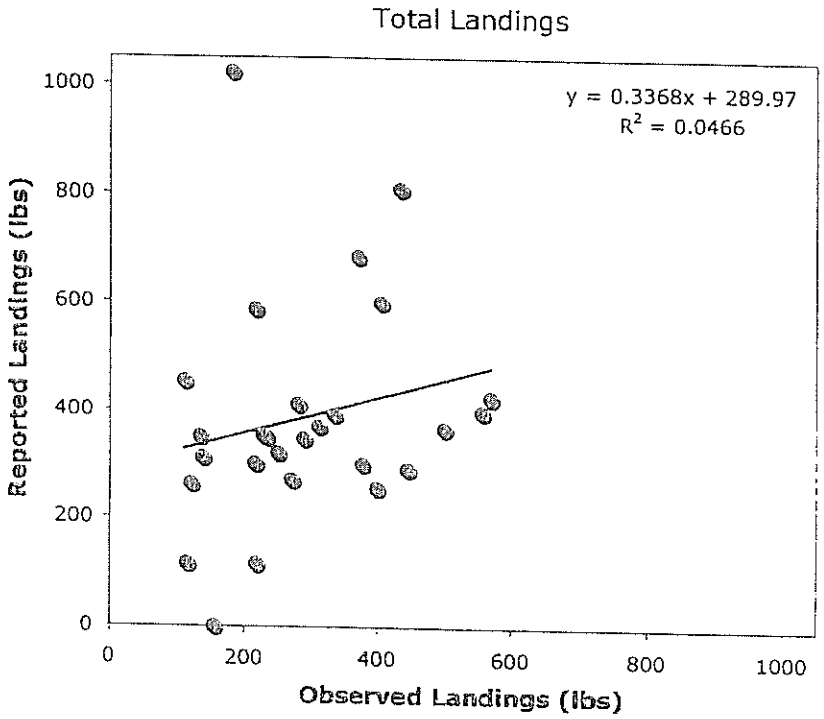


Figure 2. Correlation of reported vs. observed landings. Linear regressions are shown for 27 coincident samples from St. Croix net fishers. **A.** Total landings. **B.** Parrotfish landings.

A.



B.

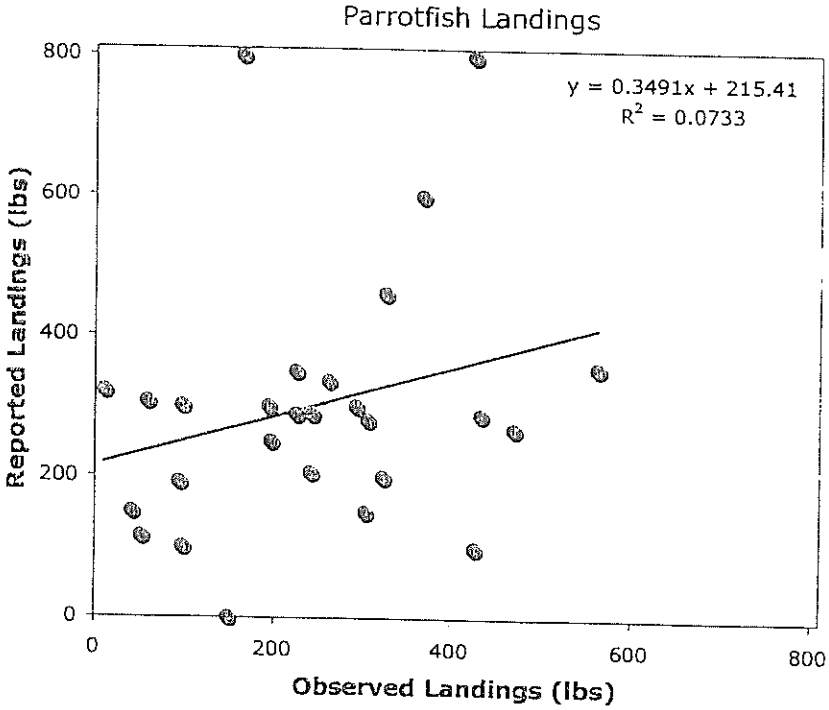


Figure 3. Comparison of reported and observed average total landings and parrotfish landings by St. Croix net fishers. Average landings (lbs) per trip were calculated from 29 port samples. Error bars show standard deviation. Asterisks indicate a significant difference.

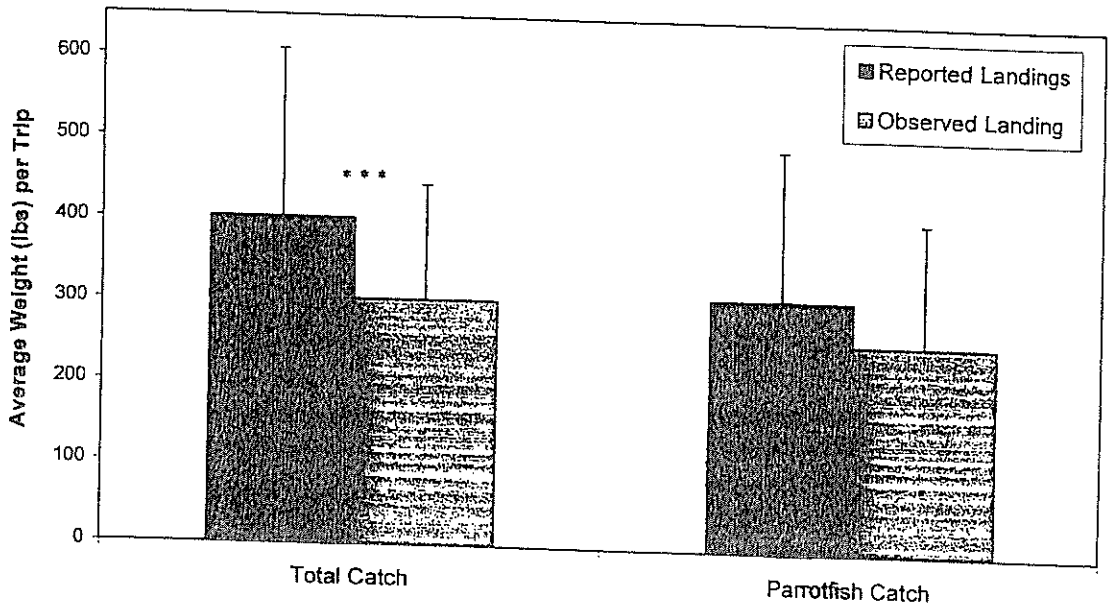
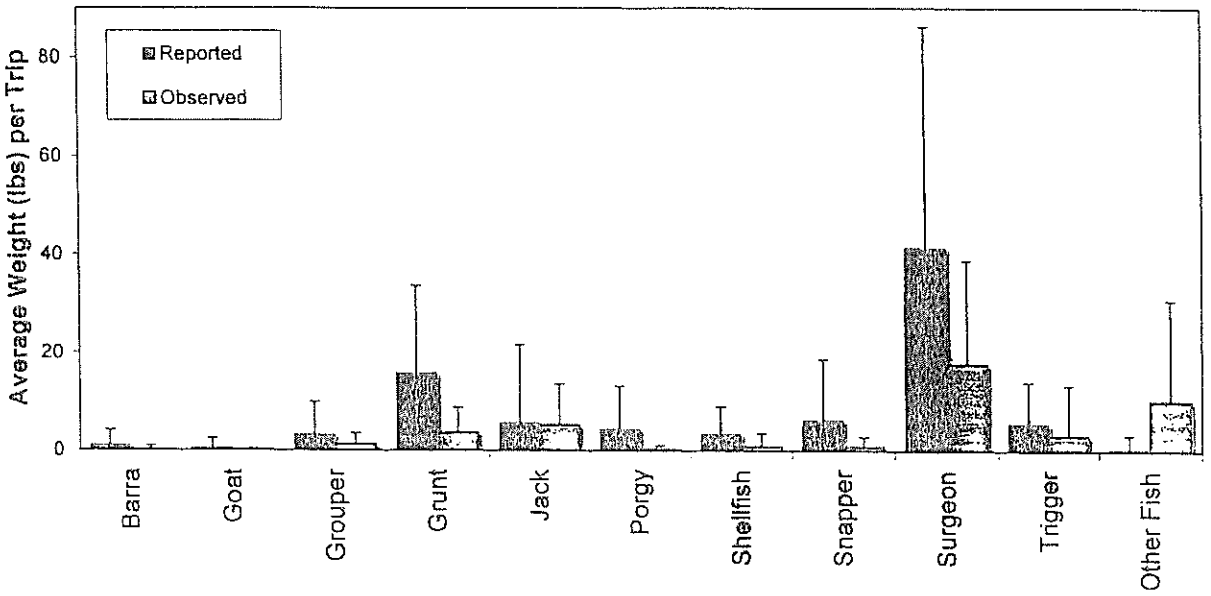


Figure 4. Comparison of reported vs. observed landings for non-parrotfish landings of finfish by St. Croix net fishers. Error bars show standard deviation.



Appendix . Biostatistical interviews used in this study.

Sample No.	Date	Fisher No.	DFW Biostat Interview No.	TIP No.	Comment
1	29-Apr-98	Fisher #1	9878IC00013	000243135	-
2	27-Aug-98	Fisher #1	9878IC00042	000243164	-
3	07-Jun-00	Fisher #1	0078IC00147	000241461	-
4	18-Oct-00	Fisher #1	0078IC00163	000241477	-
5	10-Jan-01	Fisher #1	0178IC00173	000241487	"No Fishing" recorded on CCR
6	7-Feb-01	Fisher #1	0178IC00179	000241493	-
7	1-Mar-01	Fisher #6	0178IC00184	000241498	-
8	7-Mar-01	Fisher #1	0178IC00186	000241500	-
9	24-May-01	Fisher #1	0178IC00194	000241508	-
10	13-Mar-02	Fisher #1	0278IC00229	000241542	-
11	22-May-02	Fisher #2	0278IC00243	000241556	Landings not recorded on CCR
12	15-Aug-02	Fisher #2	0278IC00261	000220584	-
13	20-Aug-02	Fisher #4	0278IC00262	000220585	"No Fishing" recorded on CCR
14	21-Aug-02	Fisher #2	0278IC00265	000220588	-
15	22-Aug-02	Fisher #2	0278IC00266	000220589	"No Fishing" recorded on CCR
16	27-Aug-02	Fisher #2	0278IC00268	00020591	-
17	10-Oct-02	Fisher #5	78IC00283	000162926	"No Fishing" recorded on CCR
18	2-Dec-02	Fisher #2	78IC00306	000162942	-
19	3-Apr-03	Fisher #2	78IC00333	000221681	-
20	11-Apr-03	Fisher #2	78CI00337	000221682	"No Fishing" recorded on CCR
21	14-May-03	Fisher #2	78CI00342	000221683	"No Fishing" recorded on CCR
22	9-Oct-03	Fisher #2	78CI00355	000221685	-
23	20-Nov-03	Fisher #1	78CI00366	000221689	Date discrepancy > 3 days*
24	21-Nov-03	Fisher #1	78CI00367	000221247	Date discrepancy > 3 days*
25	3-Feb-04	Fisher #1	164117	000164117	-
26	25-Mar-04	Fisher #3	221561	000221561	-
27	28-Oct-04	Fisher #2	MRAG 001	000230211	-
28	1-Nov-04	Fisher #3	MRAG 002	000231846	-
29	2-Nov-04	Fisher #2	MRAG 003	000231655	-
30	5-Nov-04	Fisher #3	MRAG 004	000231683	-
31	18-Nov-04	Fisher #2	MRAG 005	000231687	-
32	26-Nov-04	Fisher #3	MRAG 006	000231719	-
33	11-Aug-05	Fisher #1	MRAG 031	000235493	-
34	12-Aug-05	Fisher #1	MRAG 032	000235437	-
35	30-Sep-05	Fisher #1	MRAG 045	000235558	-

* Reported date of fishing > 3 days from date of observation.