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AN ASSESSMENT OF THE RECREATIONAL AND COMMERCIAL SKIBOAT FISHERY IN THE TRANSKEI

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A survey of the recreational and commercial skiboat linefishery in the Transkei was conducted from March 1997 to April 1999. Effort by commercial skiboats was substantially higher than by recreational skiboats, and catch rates on commercial boats were much higher than rates on recreational boats. Catch rates in the region were not greater than those in the adjoining provinces of KwaZulu-Natal and the Eastern Cape, but the mean size of fish caught on commercial skiboats in the southern Transkei was larger than that in either KwaZulu-Natal or the Eastern Cape. Total annual commercial catches estimated for the Transkei were substantially greater than those based on returns submitted by skippers to the National Marine Linefish System. Catches in the northern Transkei were more diverse than in the south, and catches from both regions contained a large number of endemic species. Northern Transkei catches were characterized by subtropical species, whereas those from the southern Transkei contained more warm-temperate species. In the northern region, subtropical species replaced warm-temperate ones during winter. Knowledge of fishing regulations by fishers was reasonable, but compliance was poor, mainly as a result of the low level of enforcement of regulations in this region, which needs to be improved if catches are to be sustained. Among other recommendations, the establishment of an effective marine reserve in the area is a priority; it would assist with the conservation of several species of endemic linefish.

Key words: access point survey, catch and effort, skiboat linefishery, Transkei

Despite being known as the Wild Coast, owing to its rough seas and treacherous coastline, the Transkei region of the Eastern Cape attracts both recreational and commercial skiboat fishers, who are drawn there by reports of big fish and large catches. However, unlike the adjacent regions of KwaZulu-Natal (Penney *et al*. 1999) and the Southern Cape (Griffiths 2000a), published data are few on general catches of skiboats from the Transkei. Garratt (1988), Hecht and Buxton (1993), Penney and Wilke (1993) and Fielding *et al*. (1994) examined aspects of this fishery sector. A national research programme, which evaluated participation in and management of all sectors of the marine linefishery was conducted along the South African coast between 1994 and 1996 (Brouwer *et al.* 1997, Lamberth *et al.* 1997, Mann *et al.* 1997a, Sauer *et al.* 1997). However, for logistical and socio-political reasons, the Transkei was omitted from the survey. Following the re-incorporation of this former homeland into South Africa, the survey was extended to include this area. The main objective of the survey was to collect information on the recreational and commercial skiboat fishery in the Transkei, and to evaluate and compare the relative participation of these sectors in the linefishery. This information was used to assist in the evaluation of the effectiveness of management measures in ensuring the sustainability of the main species targeted by the skiboat fishery.

MATERIAL AND METHODS

From March 1997 to April 1999, field trips were undertaken to Port Edward, Mzamba, Mkambati, Mbotyi, Port St Johns and Mngazana River mouth in the northern region, and to Coffee Bay and Kei Mouth in the southern region of the study area (Fig. 1). Port Edward and Kei Mouth proved to be the most productive sampling areas, because several recreational fishing competitions were held there, and commercial skiboats also regularly launched from these sites. Owing to the logistical difficulties involved in regular sampling of all potential launch sites, sampling effort was concentrated on these two sites. Both recreational and commercial boats that launched at these sites travelled into Transkei waters in order to fish.

The methods used here were similar to those employed during the National Marine Linefish Survey (Appendix I; Sauer *et al.* 1997). Interviews were conducted with skiboat skippers and catches were inspected during access-point surveys to determine catch composition and fishing effort. Recreational skiboat angling information was mostly collected during tournaments at Port Edward, Mkambati, Mngazana and Coffee Bay, because these events ensured that there were a number of anglers who could be interviewed within a localized area. Several field trips were undertaken, at

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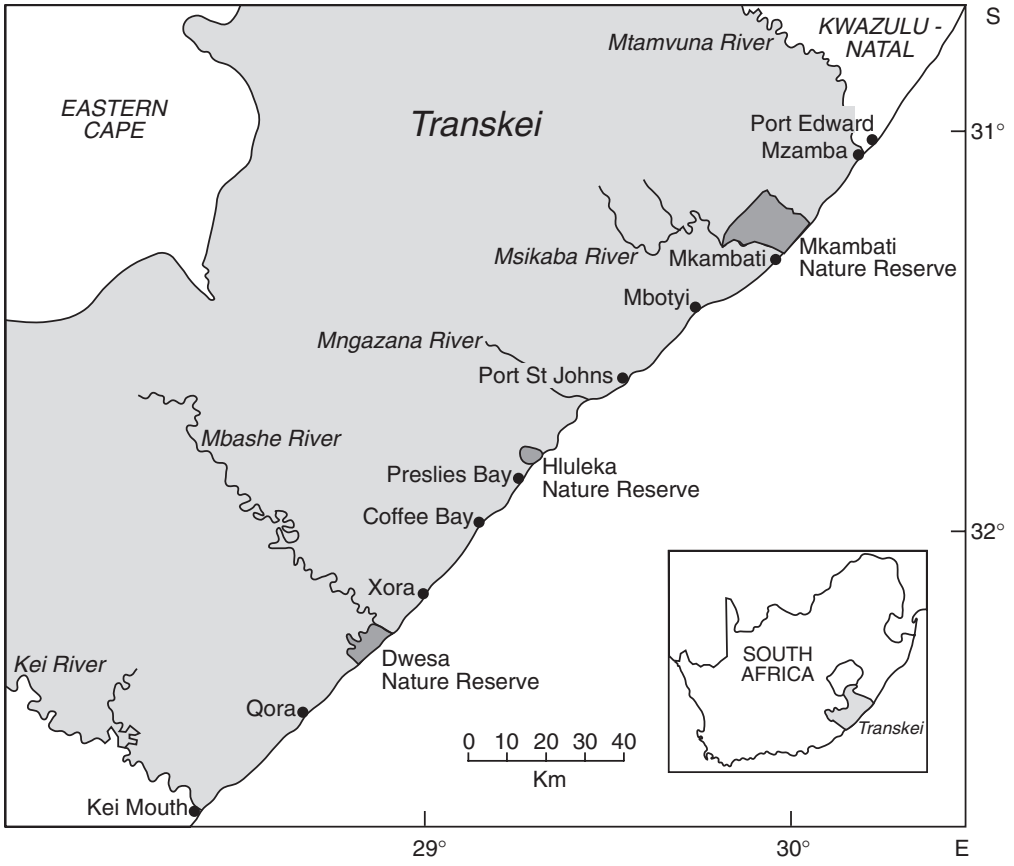

Fig. 1: Map of the Transkei region of South Africa showing places mentioned in the text

irregular intervals, to coincide with these events. Information on commercial fishers was collected by focussing on known launch sites for this sector, such as Port Edward, Mzamba, Port St Johns, Coffee Bay and Kei Mouth (Fig. 1). Attempts were made to obtain at least one commercial sample per calendar month at Port Edward and Kei Mouth, and additional irregular samples of commercial catches were collected from Port St Johns and Coffee Bay. The results of the economics component of interviews have not been included herein, but will be described elsewhere.

All fish in landed catches were counted and measured (total length *TL*, or fork length *FL*) to the nearest mm. If a species was particularly common, a representative subsample (approximately half the catch) was measured instead. Catch weights were estimated by converting individual lengths to weights, using length-weight relationships (van der Elst and Adkin 1991; Oceanographic Research Institute, unpublished data), and summing the individual weights. If no length-weight relationship was available, then that of a similarly-proportioned species was used.

Catch rates obtained during the survey were compared with those obtained during surveys in the adjacent provinces of KwaZulu-Natal (Mann *et al*. 1997b) and the Eastern Cape (Brouwer 2002) using a two-sample *t*-test assuming unequal variances. The average weight of individual fish caught per outing (i.e. the average of total weight per outing divided by total number caught per outing) was compared between regions using a Kruskal-Wallis rank test, followed by Scheffe's test for multiple comparisons of means (Zar 1974). Results of the surveys were compared with the relevant data in the National Marine Linefish

Table I: Temporal distribution of skiboat catch inspections in the Transkei, with data pooled across all years (March 1997 – April 1999). Northern refers to the coastline between the Mtamvuna and Mtata rivers and Southern from Coffee Bay to Kei Mouth. A blank means that no data were collected

Sector	Number of inspections												
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Northern													
Commercial	6	2	5	5	6	14	13	7	1	8	7	6	81
Recreational			1	60	1	15			2			2	81
Southern													
Commercial		3	2	11	10	1	6	1	1	2	2	2	41
Recreational	1	1	3	7	5	1	25					16	59

System (NMLS), i.e. the obligatory catch returns submitted by commercial skiboat skippers that fished in Transkei waters from 1997 to 1999.

The frequencies at which daily bag limits were attained were assessed (by species) by determining catch frequencies of selected species per crew member per outing. In the absence of information on targeting, and to reduce potential bias created by inclusion of outings on which the species of interest was not likely to be caught, only positive outings were analysed, i.e. only outings on which that particular species was caught were utilized for analysis.

RESULTS

In all, 62 interviews (8 commercial and 54 recreational) were conducted in the northern region and 13 (3 commercial and 10 recreational) in the southern region. Each interview had an associated catch inspection, and a further 100 (northern) and 87 (southern) inspections were conducted on subsequent catches made by anglers who had been previously interviewed (Table I). Most inspections in the northern region (n = 131, 82%) were of catches made between the Mtamvuna and Msikaba rivers, whereas in the southern region, 95% of inspected catches (n = 95) were either made between Xora and Preslies Bay, or between the Kei and Mbashe rivers. The timing of inspections was unevenly distributed throughout the year, particularly in the case of recreational catches (Table I).

Participation

Up until September 1998, 12 permits were allocated to Transkei-based commercial skiboats, allowing them to launch in the Transkei (three each at Mzamba, Port St Johns, Coffee Bay and Qora – Government Gazette 18357 of November 1997). Of these, only six commercial boats used their permits (one each at Port St Johns and Qora, and two each at Mzamba and Coffee Bay) over much of the survey period. However, several commercial boats and numerous recreational boats regularly launched at Port Edward and Kei Mouth in order to fish in Transkei waters. Recreational skiboat effort was extremely variable and seemed to be particularly influenced by holiday periods and fishing competitions. This is reflected by the origins of 64 recreational skippers who were interviewed, only 11 of whom were Transkei residents. Of these skippers, 53 used skiboats and 11 used inflatable boats, whereas all commercial skippers used skiboats. Commercial boats were mostly manned by black crew, whereas most recreational boat crews were white (Table II).

Effort and catch rates

As may be expected, fishing effort on commercial skiboats in the Transkei was higher than on recreational skiboats, and commercial boats launched 3–4 times as often as recreational boats and, in the northern region, fished for longer periods (Table III). The annual average numbers of launches by commercial and

Table II: Gender and racial composition of skiboat crew based on 75 skipper interviews in the Transkei (March 1997 – April 1999)

Sector	Total crew	Black male	White male	Indian male	White female
Commercial	67	47	20	–	–
Recreational	202	3	196	1	2

Table III: Results of the catch-and-effort component of interviews of skippers and catch inspections of commercial and recreational skiboats fishing in the Transkei (1997-1999). Northern refers to the coastline between the Mtamvuna and Mtata rivers and Southern from Coffee Bay to Kei Mouth. KwaZulu-Natal figures (April 1994–February 1996) are based on Mann *et al.* (1997b), Eastern Cape figures (April 1994–February 1996) are based on Brouwer (2002)

Parameters	Northern Transkei		KwaZulu-Natal		Southern Transkei		Eastern Cape	
	Comm.	Rec.	Comm.	Rec.	Comm.	Rec.	Comm.	Rec.
Number of inspections	81	81	35	213	41	59	230	165
Average number of crew	6	3.3	5.5	3	6.3	3.6	4.7	3.4
Average number of rods	6	5.1	7	5	6.7	3.5	3.5	3.7
Average daily fishing hours	7.7	5.4	6.7	5.5	7	7.2	8.3	7.2
Average launches in past year	139.1	32.4	134.7	38.5	58.7	22.5	159	37
Average skipper experience (years)	18.9	15.7	16	16	12.3	12.1	11	18
Average skipper age (years)	43.5	40	42	43	27.7	41.3	42	46
Total number of fish inspected	7 414	789	3 655	1 459	1 056	505	16 655	2 373
Total weight of fish inspected (kg)	8 557	1 289	3 082	2 849	2 831	998	21 680	4 866
Average number of fish fisher^{-1} h^{-1}	1.86	0.63	2.55	0.5	0.71	0.46	1.85	0.89
Average weight of fish fisher^{-1} h^{-1} (kg)	2.22	0.95	2.21	0.78	1.44	0.87	2.39	1.42

Comm. = Commercial
Rec. = Recreational

recreational skiboats in the northern region were similar to those recorded by Mann *et al*. (1997b) for KwaZulu-Natal, but the average number of launches by commercial skiboats in the southern Transkei was 2–3 times less than that recorded in the other regions (Table III).

Mean catch rates on commercial boats in the Transkei were about double those rates on recreational boats, and catch rates by commercials in the northern Transkei were 1.5–2 times greater than rates in the southern Transkei (Tables III, IV). Differences between mean catch rates in KwaZulu-Natal and the northern Transkei were not significant for either commercial or recreational sectors, whereas catch rates in the Eastern Cape were significantly greater than in the southern Transkei for both sectors (Tables III, IV). For the commercial sector, the average weight of individual fish caught per outing differed significantly between the four regions (KwaZulu-Natal, northern Transkei, southern Transkei, and Eastern Cape; Kruskal-Wallis $\chi^2 = 19$, $df = 3$), Scheffe's test indicating that the southern Transkei weights were significantly greater (Table V). The differences between the mean weights of fish in recreational catches from the four regions were not significant.

In Table VI, commercial catch and effort information obtained during the survey is compared with the information submitted by commercial skippers to the NMLS. The information from the two sources was not statistically compared, because NMLS information was obtained from overall catch-and-effort summaries produced by Marine & Coastal Management, i.e. raw data were not utilized. Nevertheless, it is apparent that the annual average number of outings per boat in the northern region recorded on the NMLS is at least half the median number of outings that the interviewed skippers estimated they undertook. In contrast, for two of the three years considered here, the average number of outings per boat in the southern region

Table IV: Results of *t*-tests comparing mean catch rates between fishing sectors and adjacent regions (Table III). Values of *t* are provided when the difference is significant at the $p < 0.05^{*}$ or $p < 0.01^{**}$ levels

Comparative catch rates	Number of fish h^{-1}	Weight of fish h^{-1}
Northern Transkei commercial v. Northern Transkei recreational	7.8**	8.1**
Southern Transkei commercial v. Southern Transkei recreational	ns	2.4*
Northern Transkei commercial v. Southern Transkei commercial	6**	3.3**
Northern Transkei recreational v. Southern Transkei recreational	ns	ns
Northern Transkei commercial v. KwaZulu-Natal commercial	ns	ns
Northern Transkei recreational v. KwaZulu-Natal recreational	ns	ns
Southern Transkei commercial v. Eastern Cape commercial	6.3**	3.2**
Southern Transkei recreational v. Eastern Cape recreational	2.5*	2.1*

ns = not significant

Table V: Results of Scheffe's multiple means test for comparison of mean fish weight from commercial skiboats in four regions. Values are grouped in subsets according to the degree of similarity between them ($p = 0.05$)

Region	Mean fish weight (kg)		
	Number of observations	Subset 1	Subset 2
Northern Transkei	81	1.62	
KwaZulu-Natal	35	1.67	
Eastern Cape	230	1.58	
Southern Transkei	41		3.68

recorded on the NMLS exceeded the median number of launches obtained during the survey. The latter value is based on only three skipper interviews, however, and the skipper's responses varied widely.

Hourly catch rates in the northern region based on returns submitted to the NMLS were up to three times lower than those obtained during the survey (Table VI). In the southern region, NMLS catch rates were about twice as high as the survey rates. In the northern region, total annual catches based on submitted returns were 4–16 times lower than those estimated during the survey (Table VI). In the southern region, estimates of total annual catch based on submitted catch returns were 1–5 times lower than estimates based on survey results. However, the survey estimates of total catch assume that the catch-and-effort parameters obtained during the survey remained constant from 1997 to 1999.

It was not possible to estimate total catch on recreational skiboats, because no estimates of total numbers of boats operating in the area were available.

Catch composition

Targeting of effort by recreational fishers in the northern Transkei was evenly distributed between pelagic and reef fish, and <3% of their fishing time was spent obtaining bait. In the southern Transkei, 90% of recreational effort was directed towards reef fish and only 10% towards pelagic species. In contrast, all commercial fishing effort was reportedly directed at reef fish. The relative importance of the different species in catches from the northern and southern Transkei differed markedly, and more species were recorded in the former ($n = 55$) than in the latter region ($n = 34$;

Table VI: Comparison of commercial effort, catch rates and total catch in the Transkei based on catch returns submitted to the NMLS (1997–1999) and results obtained during this survey (combined estimates for 1997–1999). The number of NMLS outings boat^{-1} year^{-1} was based on the total number of outings submitted per year divided by the average number of boats that submitted returns each month. Number of survey outings boat^{-1} year^{-1} is based on the median of responses obtained from seven interviews of boat skippers in the northern region and three interviews in the southern region. Estimates of total annual catch using the survey information were based on the product of number of boats, outings boat^{-1} year^{-1}, mean crew outing^{-1}, mean hours outing^{-1} and catch fisher^{-1} h^{-1}. Northern refers to the coastline between the Mtamvuna River and Mtata rivers and Southern from Coffee Bay to Kei Mouth

Parameter	Year	NMLS information		Survey information	
		Northern	Southern	Northern	Southern
Number of boats	1997	9	6		
	1998	6	6	8	6
	1999	3	5		
Outings boat^{-1} year^{-1}	1997	73	75		
	1998	51	73	140	50
	1999	73	23		
Mean crew outing^{-1}	1997	5.9	4.9		
	1998	6.7	4.9	6	6.3
	1999	7.7	5.7		
Mean hours outing^{-1}	1997	6.8	6.9		
	1998	5.6	5.3	7.7	7
	1999	6.6	7.3		
Catch fisher h^{-1} (kg)	1997	2.03	2.82		
	1998	1.55	2.85	2.22	1.44
	1999	0.76	2.67		
Annual catch (tons)	1997	26.4	16.5		
	1998	11.6	8.6	115	19
	1999	6.7	4		

Table VII: Relative percentage contributions of species to commercial catch composition by weight from 1997 to 1999, obtained during the survey and from catch returns submitted to the NMLS

Taxon	Frequency (%)		
	Survey catch (%)		NMLS catch (%)
Northern Transkei			
Pachymetopon aeneum	29.0	*Chrysoblephus cristiceps*	20.7
Chrysoblephus puniceus	11.7	*Epinephelus* spp.	12.5
Epinephelus spp.	9.9	*Chrysoblephus puniceus*	8.2
Chrysoblephus anglicus	9.0	*Petrus rupestris*	6.6
Chrysoblephus cristiceps	5.5	*Cheimerius nufar*	5.6
Polysteganus praeorbitalis	4.6	*Galeichthys* sp.	4.9
Polysteganus undulosus	3.8	*Chrysoblephus anglicus*	4.7
Cheimerius nufar	3.1	*Cymatoceps nasutus*	4.4
Polysteganus coeruleopunctatus	2.0	*Seriola lalandi*	4.2
Polyamblodon germanum	1.2	*Polysteganus coeruleopunctatus*	3.7
Other	21.2	Other	24.6
Southern Transkei			
Petrus rupestris	56.6	*Petrus rupestris*	38.5
Chrysoblephus cristiceps	10.4	*Chrysoblephus cristiceps*	13.4
Polysteganus undulosus	6.1	*Atractoscion aequidens*	8.5
Cymatoceps nasutus	4.9	*Argyrozona argyrozona*	8.4
Epinephelus spp.	4.4	*Cymatoceps nasutus*	5.6
Argyrozona argyrozona	3.7	*Polysteganus undulosus*	5.5
Cheimerius nufar	3.3	*Epinephelus* spp.	5.5
Pterogymnus laniarius	2.7	*Cheimerius nufar*	4.3
Pachymetopon aeneum	2.1	*Pterogymnus laniarius*	2.8
Atractoscion aequidens	1.9	*Argyrosomus* spp.	2.4
Other	3.9	Other	5.1

Appendices II, III). Although many species (64) were recorded in retained catches, relatively few were dominant, particularly in the southern region (Table VII). There was a very high proportion (48% of species) of endemic fish in both commercial and recreational catches (Appendices II, III).

There were differences between commercial catch composition determined by the survey and that obtained from catch returns submitted to the NMLS, particularly in the northern region (Table VII). Only composition by weight was compared, because these are the data submitted to the NMLS system by skippers. Although most of the commonly caught species co-occurred in both the survey and the NMLS data, their relative contributions often differed markedly. For example, in the northern region, blue hottentot *Pachymetopon aeneum* was not recorded in NMLS catches at all, whereas it was the dominant species by weight observed in the survey. Also, in the northern region, dageraad *Chrysoblephus cristiceps* constituted >20% of catch weight according to the NMLS, but only about 5% based on survey results. Only 31 taxa were identified in NMLS returns (northern and southern regions combined), compared to 64 species identified during the survey. In 1997, catch returns from the northern region contained a substantial component (20%) of reef fish that were not identified by skippers.

Length composition and seasonality

The most commonly caught fish were fairly small, apart from red steenbras *Petrus rupestris* (Fig. 2) and poenskop *Cymatoceps nasutus*. Most fish measured were above the relevant minimum legal size limits (where these limits existed), although some sublegal sized slinger *Chrysoblephus puniceus*, santer *Cheimerius nufar* and dageraad had been retained. Some of these were kept by the crew for personal consumption, or filleted for use as bait.

The seasonality of species abundance in commercial catches was examined by plotting catch per unit effort (*cpue*) of the commonest species on a monthly basis (Fig. 3). In the absence of information on targeting, fishing effort was assumed to be equally directed at all species. Only commercial catches were examined, because these provided the greatest monthly coverage of catches (Table I). Seasonality based on NMLS data was not examined, because skippers did not always identify fish to species level. In the northern region,

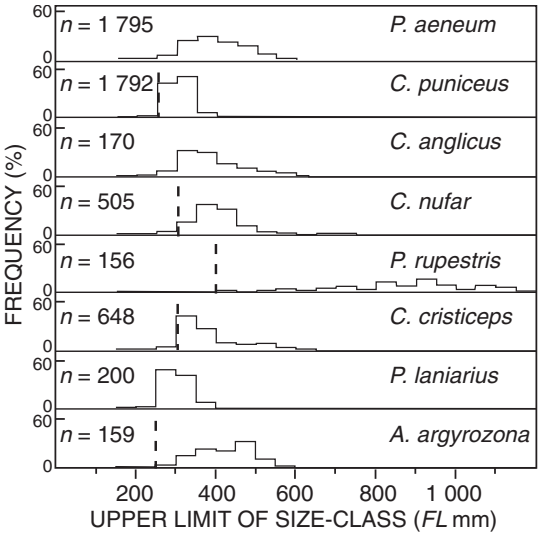

Fig. 2: Length frequencies of eight species of fish commonly retained by Transkei skiboat fishers, 1997–1999. Lengths of *P. aeneum*, *P. puniceus* and *C. anglicus* were from catches in the northern region, *C. nufar*, *P. rupestris* and *C. cristiceps* from the northern and southern region and *P. laniarius* and *A. argyrozona* from the southern region. Dashed vertical lines indicate the minimum legal size limit, where these exist

there was a clear change in composition from summer to winter, when slinger and Englishman *Chrysoblephus anglicus* were replaced by blue hottentot and dageraad. Seventyfour *Polysteganus undulosus* and red steenbras were more commonly caught in autumn/winter in the northern region, but were more common in summer/autumn catches in the southern region. In the southern region, dageraad, panga *Pterogymnus laniarius* and carpenter *Argyrozona argyrozona* were caught mostly during spring and/or summer, whereas santer were caught throughout most of the year.

Attitudes of skippers towards management

A high proportion of interviewed skippers agreed with current management measures, but compliance was poor (Table VIII). Despite their better knowledge of the regulations, commercial skippers were less compliant than recreational skippers, particularly with regard to minimum sizes and closed areas. For example, nine of the 11 commercial skippers interviewed agreed with minimum size regulations, and nine (82%) had disobeyed this regulation at some time. In contrast, of the 64 recreational skippers interviewed, 53 agreed with this regulation, and 31 (48%) had disobeyed it. Seven of the 11 (64%) commercial skippers interviewed had attained their bag limits for one or more species on the critical list (red steenbras, poenskop or seventy-four) at some stage. In all, 65% (n = 40) of recreational skippers had attained their bag limit for one or more species on the restricted list (as per Government Gazette No. 3782 of 1984). A total of 39% (n = 24) of recreational skippers admitted to selling their catch and 63% (n = 39) thought that they should be allowed to do so. Seven of the 11 (64%) commercial skippers indicated that they took charters on occasion.

In all, 10 of 11 commercial skippers had their catches inspected by enforcement officers after fishing in Transkei waters, whereas 63% (n = 40) of recreational skippers had been inspected. These values largely refer to inspections of boats launched at Port Edward and conducted by Ezemvelo KwaZulu-Natal Wildlife staff. Therefore, seven of the 10 commercial skippers and 37 of the 40 recreational skippers had been inspected at Port Edward. Frequency of inspection was three times annually for both the commercial and recreational sectors of the northern Transkei, but virtually nil for both sectors in the southern Transkei.

Table VIII: Responses of Transkei skiboat skippers to questions on management measures. Knowledge of regulations refers to those regulations pertaining to species being targeted by the fishers on the day of inspection. Figures given are percentages based on interviews with commercial (n = 11) and recreational fishers (n = 64)

Regulation	Frequency (%)					
	Agreed with regulations		Disobeyed regulations		Knowledge of regulations	
	Commercial	Recreational	Commercial	Recreational	Commercial	Recreational
Minimum size	82	86	82	50	73	31
Bag limit	91	79	36	36	96	56
Closed season	82	84	64	27	91	64
Closed area	91	90	46	15	–	–

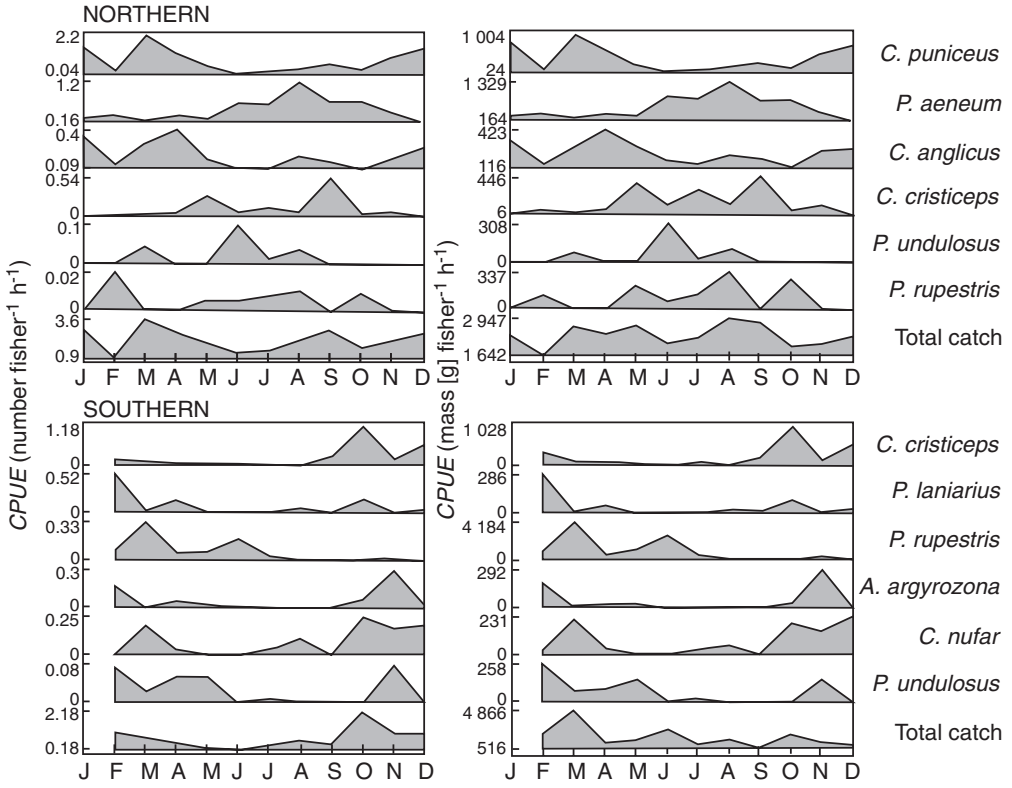

Fig. 3: Seasonal abundance of common fish species in catches by commercial skiboats in the northern and southern Transkei, 1997–1999, expressed as *cpue* by number and weight. Data were pooled over all years. No data were available for January in the southern region

Eight of 11 commercial skippers and 78% (n = 50) of recreational skippers felt that fishing had deteriorated, although some said that this was not the case for all species. The commonest reasons given for the decline were trawlers, overfishing and pollution (33, 28 and 20% of respondents respectively). The majority (95%) of recreational skippers said they would be prepared to pay for a licence to assist with fisheries conservation, and the average price they were prepared to pay was R105 per year.

Frequency of attaining daily bag limits

Only three species (red steenbras, seventyfour and poenskop) caught on commercial skiboats were subject to daily bag limits during this survey, and only the five most commonly caught species on recreational skiboats were examined (Table IX). Despite restricting the analysis to those outings during which the species of interest were caught, there was a substantial proportion of zero catches for all species examined. Bag limits for seventyfour (commercials), and slinger, blue hottentot and poenskop (recreationals) were exceeded at times, albeit at low frequencies (Table IX).

DISCUSSION

Despite anecdotal reports of big fish and large catches in the Transkei, this study shows that, although fish caught on commercial boats in the southern Transkei

Table IX: Observed daily catch frequencies of selected species in the Transkei skiboat fishery. Daily bag limits (Government Gazette No. 14353 of 1992) for the relevant species are provided in parenthesis. Positive outings refer to the fact that only outings on which a particular species was caught were used for the analysis. Total crew refers to the total number of crew on those positive outings. Values presented are percentages of crew attaining a particular number of fish per outing. For example, in the case of seventyfour caught in the northern Transkei commercial fishery, of the 16 outings on which that fish were caught, 47.4% of the crew caught none, 39.7% caught one fish, 5.2% caught two fish, 1.7% caught four fish and 6% caught five fish

Species	Positive outings	Total crew	Number of fish per crew member									
			0	1	2	3	4	5	6	7	8	9
Northern Transkei commercial												
Seventyfour (2)	16	116	47.4	39.7	5.2	0	1.7	6				
Red steenbras (10)	12	75	73.3	26.7	0	0	0	0				
Poenskop (2)	29	179	76.7	23.3	0	0	0	0				
Southern Transkei commercial												
Seventyfour (2)	13	80	35	47.5	17.5	0	0	0				
Red steenbras (10)	18	111	25.2	55.9	13.5	0	0	0				
Poenskop (2)	8	52	69.2	30.2	0	0	0	0				
Northern Transkei recreational												
Slinger (5)	33	111	23.4	27	23.4	10.8	4.5	8.1	0	0	1.8	0.9
Catface rockcod (5)	30	111	38.7	49.6	11.7	0	0	0	0	0	0	0
Dageraad (5)	14	45	28.9	31.1	26.7	8.9	4.4	0	0	0	0	0
Scotsman (5)	22	83	41	47	10.8	1.2	0	0	0	0	0	0
Blue hottentot (5)	18	59	42.4	50.9	1.7	0	0	1.7	3.4	0	0	0
Southern Transkei recreational												
Dageraad (5)	21	71	33.8	40.8	11.3	7	7	0	0	0	0	0
Carpenter (10)	10	35	22.9	37.1	8.6	2.9	11.4	2.9	14.3	0	0	0
Santer (10)	18	62	45.2	32.3	11.3	11.3	0	0	0	0	0	0
Blue hottentot (5)	13	47	38.3	51.1	8.5	2.1	0	0	0	0	0	0
Poenskop (2)	12	49	42.5	47.5	5	2.5	2.5	0	0	0	0	0

are larger than in adjacent regions, catch rates in the Transkei are not appreciably greater than in the other regions. In fact, catch rates on commercial and recreational skiboats in the Eastern Cape were about 1.5 times greater than their counterparts in the southern Transkei. It is also apparent that most of the skiboaters who fish in the Transkei are not resident there, but travel there on holiday (recreational) or for commercial gain on a daily basis (commercial). Consequently, fishing effort in this region is lower than that in the adjacent areas. The comparatively lower effort is also likely a reflection of the poor roads and lack of infrastructure, which discourage extensive immigration of people to the area, and rough seas, which frequently prevent skiboat fishing. In addition, the close proximity of the powerful Agulhas Current to the Transkei coast (Beckley and van Ballegooyen 1992) means that fishing for reef fish is often hampered, because crews cannot get their bait down to the reef. Therefore, although the lower fishing effort in the Transkei region can potentially lead to better catches, the difficult fishing conditions result in similar, or lower, average catch rates compared to KwaZulu-Natal or the Eastern Cape. However, the potential for catching large reef fish, such as red steenbras and poenskop, which are rare elsewhere, continues to lure both commercial and recreational anglers to this region.

Most of the fishing effort by the skiboat sector in the Transkei is directed at reef fish, particularly by the commercial sector. The even distribution of recreational fishing effort between pelagic and reef fish in the northern region is partially accounted for by the practice of fishing for pelagic species with a "trap stick"[1] while simultaneously targeting reef fish with bottom tackle. The high overall proportion of endemic sparids in both commercial and recreational catches was similar to that recorded by Mann *et al.* (1997b) in KwaZulu-Natal and Brouwer (2002) in the Eastern

[1] A trap stick is a fishing rod rigged with tackle suitable for catching pelagic fish while the crew are targeting demersal reef fish

Cape from Stil Bay to Kei Mouth. This includes species such as red steenbras, seventyfour, dageraad, slinger, Englishman, blue hottentot, panga, carpenter, poenskop and Scotsman *Polysteganus praeorbitalis*. Another commonly recorded endemic species, catface rockcod *Epinephelus andersoni*, was mainly caught in the northern region. It is probable that commercial catches of sea barbel *Galeichthys* sp., fransmadam *Boopsoidea inornata*, steentjie *Spondyliosoma emarginatum* and dane *Porcostoma dentata* were higher than those reflected here, because these species are often used as bait, or are retained for personal consumption. Therefore, these species were not always encountered during sampling.

Hecht and Buxton (1993) reported a high proportion of endemic species (particularly red steenbras) in commercial catches made in the Coffee Bay region during the early 1990s. In previous years, the contribution of kobs (family Sciaenidae) to catches in the northern region of the Transkei has been higher (Fielding *et al*. 1994). Based on commercial catch returns submitted to the NMLS, those authors found that sciaenids (*Argyrosomus* spp. and geelbek *Atractoscion aequidens*) formed the bulk (53% by weight) of catches in the northern Transkei in 1993. Anecdotal reports also suggest that large catches of the squaretail kob *Argyrosomus thorpei* were common in the northern region in the early 1990s (C. Louw, commercial skipper, pers. comm.). Reduced catches of sciaenids during this study may reflect the overexploited status of several of these species (Griffiths 1997a, b, Griffiths 2000b), but may also be a result of the discontinuous nature of the sampling, which, in combination with the migratory habits of these species, resulted in few sciaenids being encountered during the survey.

The contrast in species composition between the northern and southern Transkei clearly demonstrates the biogeographic transition from the predominantly subtropical ichthyofauna in the northern region (the subtropical East Coast province) to the mainly warm-temperate species in the south (the warm-temperate South Coast province; Brown and Jarman 1978). Studies on estuarine fish suggest that the transition zone between these two biogeographic provinces is between the Mbashe and Kei rivers (Maree *et al*. 2000) or just north of Coffee Bay (Harrison *et al*. 2000). A more generalized review of all fish inhabiting South African shelf waters suggests that the subtropical/temperate transition zone extends from the Mbashe River to the KwaZulu-Natal border (Turpie *et al*. 2000). Apart from the north/south differences in catches observed in this study, there are some differences between catches from boats based at Coffee Bay and Kei Mouth (Appendix II), which also suggest that the transition zone for reef-associated fish is in this region. For example, typical temperate-water species such as silver kob *Argyrosomus inodorus* and roman *Chrysoblephus laticeps* were lacking in catches from Coffee Bay, but were recorded in catches from boats based at Kei Mouth. Another temperate species, panga, was much more commonly recorded in catches of the Kei Mouth boats. In contrast, catches of subtropical species such as slinger and dane in the southern region were only recorded at Coffee Bay. In the absence of physical barriers, it is unlikely that the transitional zone for fish is narrow, and the information collected during this study is insufficient to clearly determine the temporal and spatial nature of its locality for reef-associated fish. However, Turpie *et al.* (2000) suggest that the persistent upwelling of cold water in the Mbashe River region (Beckley and van Ballegooyen 1992) constitutes a limiting factor for the southward expansion of subtropical species.

The seasonal changes in species composition recorded here support seasonal patterns recorded in the few other studies on skiboat linefish catches conducted in the region. Garratt (1988) reported catches of red steenbras, seventyfour and blue hottentot in the Transkei and southern KwaZulu-Natal from July to November. Penney and Wilke (1993), based on commercial catch returns from the NMLS, reported catches of red steenbras in the southern Transkei from July to November. However, Hecht and Buxton (1993) recorded catches of red steenbras throughout the year on commercial boats based at Coffee Bay, with peaks in May and August. These and other studies have postulated that several of the warm-temperate species observed in catches during this study undertake spawning migrations to KwaZulu-Natal and/or the Transkei during winter. These species include seventyfour, red steenbras, blue hottentot, yellowtail *Seriola lalandi* and poenskop (Buxton and Clarke 1986, 1989, Garratt 1988, Smale 1988). Such a migration could account for the increased catches of these species in the northern Transkei in winter. However, the seasonal changes in species composition may have resulted from changes in fishing practices. For example, red steenbras may be present throughout the year off the northern Transkei, but do not always occur in catches because fishers target other species or areas (perhaps because of seasonal difficulties such as increased currents that restrict fishing on red steenbras reefs). In contrast, the observed replacement of slinger and Englishman in winter catches with blue hottentot and dageraad in the northern region does not appear to be an artefact of sampling, or as a result of a change in fishing locality or method, because all four species are caught on the same reefs (P. Loomes, Tight Lines Fisheries, pers. comm.). This

indicates that the seasonal appearance of blue hottentot and dageraad in the northern Transkei is "real". An intensive survey, based on more regular and more frequent inspections of catches from the Transkei is required to resolve whether the observed seasonal changes in catch composition are because of changes in targeting or actual changes in abundance. Part of such a survey would require collection of information on depth and locality of catches.

Despite relatively good knowledge of the regulations, particularly in the case of commercial fishers, and the stated belief in them by both commercial and recreational fishers, compliance among skiboat fishers in the Transkei is generally poor. This can be ascribed to the lack of enforcement of fisheries regulations in the Transkei, particularly in areas where Ezemvelo KwaZulu-Natal Wildlife staff are not active. A similar conclusion was reached for the shore-fishery in that region (Mann *et al.* 2003). Other contributory factors are the incentive for commercial crew in the northern region to retain undersized fish for sale in local markets, and the existence of good fishing reefs in the Mkambati Reserve, an area closed to skiboat fishing. The relatively high compliance (64%) by commercial fishers with bag limits in comparison with the other regulations stems from the fact that only two species (poenskop and red steenbras) are affected by this regulation.

Based on NMLS returns (in terms of number of annual launches per boat), annual catch quantities and catch rates are substantially lower than estimates obtained during this survey. Under-reporting has also been found in surveys of commercial linefish catches in other areas of South Africa (Penney 1997, Sauer *et al.* 1997). For example, Sauer *et al*. (1997) suggested that reported commercial catches of slinger in KwaZulu-Natal underestimated actual catches by about one-third. The phenomenon of under-reporting is a result of the non-enforcement of the permit condition requiring returns to be submitted, and also stems from a reluctance by commercial skippers to provide accurate statistics for fear of having their catches limited, or incurring heavier taxes. Although many species recorded in the survey were reported in catch returns to the NMLS, estimates of the relative contributions of the species to catches differed between the two approaches, particularly in the northern region.

The disparities in catch composition between survey results and NMLS reports are partly a function of the discontinuous nature of sampling, and also because sampling frequencies were low, particularly in the southern region. However, it is likely that inaccurate reporting by skippers also plays a large role. In general, it may be deduced that many of the less commonly caught species are not reported by skippers, probably because these fish are not considered important. This has particular importance for monitoring of catches on the east coast of South Africa, where species diversity is considerably higher than in the Southern Cape. The complete absence of blue hottentot from NMLS catches in the northern region is concerning, because this was the second most commonly caught species according to the survey. This indicates that the information on the NMLS is substantially flawed for this region. On further enquiry, one of the commercial permit-holders who operates several boats in the area was adamant that he was reporting catches of blue hottentot, but the NMLS did not reflect this, for reasons that are not clear. Although under-reporting on the NMLS has been recognized (Sauer *et al*. 1997), the system is sometimes assumed to provide a useful means of assessing catch composition. However, the disparities between NMLS data and data obtained in this survey raise questions as to the usefulness of the NMLS information even for these types of analyses, particularly in areas of high species diversity, and highlights the necessity for regular independent monitoring of commercial catches.

Analysis of daily bag frequencies suggests that, for the species examined, the bag limits applicable at the time of the survey were rarely attained. The bag frequencies presented (Table IX) are likely to be inflated as a result of restricting the analysis to positive outings for the species in question, i.e. a higher proportion of zero catches is likely. More detailed interpretation of these results requires information on targeting to refine estimates of success in attaining bag limits. However, catches of two of the species on the critical list (seventyfour and poenskop) were above the bag limit for these species on 8 and 5% of sampled fisher outings for northern Transkei commercials and southern Transkei recreationals respectively.

Many of the species caught in the Transkei region possess one or more life-history characteristics (slow growth, late maturity, sex change, forming of aggregations) that render them vulnerable to overfishing (Mann 2000), and several species are already overexploited, e.g. slinger (Punt *et al.* 1993), dageraad (Buxton 1992), seventyfour (Chale-Matsau *et al*. 2001), red steenbras (Penney and Wilke 1993), Scotsman (Garratt *et al*. 1994), poenskop (Buxton and Clarke 1989), kob (Griffiths 1997a, b) and geelbek (Griffiths 2000b). Combined with the poor compliance and minimal enforcement of regulations in the area, the long-term prognosis for the skiboat fishery is not good. Compliance with fisheries regulations in the Transkei needs to be radically improved, and it can be achieved via the establishment of effective management at key skiboat launch sites. As well as undertaking law en-

forcement, management personnel need to collect basic information on effort, catch composition and size structure of catches. Consideration should also be given to reviewing the number of launch sites in the area, in order to rationalize access to offshore reefs and to effectively plan a compliance and monitoring programme.

As an alternative, but preferably in conjunction with the above improvements in management, urgent attention must be devoted to considering the establishment of an effective marine protected area for linefish species in Transkei waters. The existing marine reserves at Mkambati, Hluleka and Dwesa are currently ineffective, because they are not policed and therefore do not provide protection for endemic linefish from South Africa. Effective marine protected areas can reduce fishing mortality and are simpler to police than a suite of species-specific regulations such as closed seasons and size/bag limits. To date, the latter forms of legislation have been largely unsuccessful in preventing overexploitation of many linefish species in South Africa (Griffiths 1997c, Penney *et al*. 1999). This study has shown that substantial catches of species on the specially protected or critical exploitation list (red steenbras, poenskop and seventyfour) are made in the Transkei region at times. An effective marine protected area in the Transkei region would therefore not only assist in the conservation of these and other endemic linefish, but would also include a priority area for coastal diversity (Turpie *et al*. 2000). The siting of such a protected area needs to be thoroughly investigated for it to be effective and to provide maximum benefit. An initiative that is currently underway to establish a marine protected area in the Transkei region (Mann 1998) will provide further background.

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APPENDIX I

Transkei skiboat skipper questionnaire

Questionnaire no. _____

Transkei commercial and recreational boat fishing questionnaire

Section A: (to be completed by interviewer)

Locality: _____ Date: _____ Time: _____ Boat Reg No: _____

Own boat? YES/NO

Boat type:	Deckboat	1	Commercial	A	Bait:	Sardine
	Skiboat	2	Semi-commercial	B		Squid
	Inflatab	3	Charter	C		Prawn
	FW/Est	4	Recreational	D		Other

Number of rods: _____ Number of crew: _____ Crew composition: 1 2 3 4
M
F

Section B: (Catch and effort – Skipper interview)

Skipper code: _____ Where did you launch from? _____

Where did you fish? _____

What time did you start fishing? _____ What time did you stop fishing? _____

What type of fish were you targeting (list 3 main species)? _____

Apportion targeting of effort (hours fished): Gamefish _____ Reef-fish _____ Billfish _____ Baitfish _____

How many days have you spent fishing in the last week? _____ month? _____ and in the last 12 months? _____

Which fishing club do you belong to? _____

How many years have you been skiboat fishing? _____ How old are you? _____

Section C: (Attitude to management)

Which of the following regulations, in your opinion, are effective in managing our fish stocks? YES/NO

Minimum size limits? _____ Bag limits? _____ Closed seasons? _____ Marine Reserves _____

Ever kept undersized fish? _____ More than your bag limit? _____ Kept fish in a closed season? _____ Fished in a marine reserve? _____

(Recreationals) Have you ever sold your catch? ___ Do you think you should be allowed to sell your catch? ____

	Target 1	Target 2
Species:		
Minimum size:		
Bag limit:		
Closed season:		

Has your catch ever been inspected? YES/NO If YES, how often in the last 12 months? ___ Where? _____

While fishing have you ever reached your bag limit? YES/NO. If YES, specify for which species _____ and how often? _____

Section D: (Economics)

What is your occupation? (write in detail) _____

If unemployed/retired, what was your last occupation? _____

Where do you live? _____

Are you on an overnight, weekend or longer trip/holiday? (i.e. staying away from home) YES/NO

If YES (i.e. holidaymakers, trippers), where are you staying? (postal code) _____

What method of transport did you use to come on this trip? (describe vehicle type and cc.) _____

How many people came with you on this trip? _____ How many of this group will be fishing? _____

How many days will you spend away from home on this trip? _____

How many days of this trip will you spend fishing? _____

What is the estimated cost of your trip/holiday? (all members excluding transport and food) _____

How far did you travel to come fishing today? (kilometres one way) _____

What method of transport did you use (describe vehicle type, cc) _____

Specify number of people in vehicle _____ How many of this group will be fishing? _____

How much did you spend this outing on:

Bait? _____ Boat fuel? _____ How much did you spend on terminal tackle last month? _____

Expenditure on rods or reels in the last 12 months? _____ Is this your own boat? _____

What is the estimated value of your skiboating equipment? (what would they sell it for?)

Tow vehicle: _____ Boat (plus accessories): _____ Motors: _____ Trailer: _____

Rods: _____ Reels:_____ Tackle: _____

Do you use your vehicle exclusively for towing your boat? _____

What do you spend on maintenance (include storage, safety gear, club fees etc.) of your skiboat per year? _____

Why do you fish? Food _____ Recreation _____ Competition _____ Livelihood _____
Other (specify) _____

What will you do with your catch? Eat ___ Give away ___ Release ___ Sell ___ Other (specify) _____

COMMERCIALS

How many crew do you employ? _____ How much do you pay your crew per person per month? _____
Do you ever take charters? YES/NO If **YES**, how many times in the last 12 months? _____

On average, how many fishermen/divers do you take? _____ What do you charge per person? _____

Section E (general)

Have you ever caught a tagged fish? YES/NO If YES, what happened to the tag? (specify) _____

Has fishing deteriorated over the years? YES/NO If YES, what is the cause of this decline?

Pollution _____ Siltation _____ Seine-netting _____ Gillnetting _____ Trawling _____
General overfishing _____ Commercial overfishing _____ Other (specify) _____

(Recreationals) Would you be prepared to pay for a marine angling licence to provide funds for fisheries conservation?

YES/NO (Give reason for answer) _____

If **YES**, how much would you be prepared to pay for a licence of this nature? _____

Do you participate in any other forms of fishing? _____

(Attach catch data to this questionnaire)

Species	Number	Total length

* Remember to record discarded species

APPENDIX II

Overall catches of fish retained by skiboats in the northern Transkei, based on survey results

Species	Common name	Commercial		Recreational		Commercial		Recreational	
		No.	%	No.	%	Weight (kg)	%	Weight (kg)	%
*Chrysoblephus puniceus**	Slinger	2 278	32.5	188	24.9	967	11.7	92	7.1
*Pachymetopon aeneum**	Blue hottentot	2 020	28.8	49	6.5	2 399	29.0	36	2.8
*Chrysoblephus anglicus**	Englishman	606	8.6	40	5.3	741	9.0	48	3.8
*Polysteganus praeorbitalis**	Scotsman	333	4.8	58	7.7	383	4.6	53	4.2
Cheimerius nufar	Santer	294	4.2	46	6.1	255	3.1	29	2.3
*Chrysoblephus cristiceps**	Dageraad	253	3.6	58	7.7	452	5.5	79	6.2
Polysteganus coeruleopunctatus	Blueskin	234	3.3			162	2.0		
*Epinephelus andersoni**	Catface rockcod	135	1.9	77	10.2	303	3.7	148	11.6
*Polysteganus undulosus**	Seventyfour	102	1.5	1	0.1	311	3.8	2	0.2
*Polyamblodon germanum**	German	90	1.3	15	2.0	96	1.2	13	1.0
Epinephelus marginatus	Yellowbelly rockcod	84	1.2	25	3.3	442	5.3	69	5.4
Epinephelus rivulatus	Halfmoon rockcod	82	1.2	35	4.6	44	0.5	21	1.6
Galeichthys sp.*	Barbel	54	0.8	6	0.8	67	0.8	6	0.5
*Porcostoma dentata**	Dane	49	0.7	3	0.4	16	0.2	1	0.1
Lethrinus nebulosus	Blue emperor	43	0.6	10	1.3	26	0.3	5	0.4
*Cymatoceps nasutus**	Poenskop	41	0.6	23	3.0	363	4.4	188	14.7
Plectorhinchus chubbi	Dusky rubberlip	39	0.6	26	3.4	42	0.5	25	2.0
Scomber japonicus	Mackerel	38	0.5	5	0.7	32	0.4	2	0.1
Seriola lalandi	Yellowtail	32	0.5			322	3.9		
*Petrus rupestris**	Red steenbras	21	0.3			460	5.6		
*Epinephelus albomarginatus**	White-edged rockcod	21	0.3	3	0.4	36	0.4	6	0.4
Dinoperca petersi	Cavebass	14	0.2	7	0.9	18	0.2	9	0.7
Scorpaena scrofa	Largescale scorpionfish	13	0.2			4	<0.1		
*Spondyliosoma emarginatum**	Steentjie	12	0.2			4	<0.1		
*Pachymetopon grande**	Bronze bream	12	0.2	3	0.4	8	<0.1	5	0.4
Pomatatomus saltatrix	Elf	10	0.1			3	<0.1		
Argyrosomus thorpei	Squaretail kob	10	0.1			13	0.2		
Coryphaena hippurus	Dorado	10	0.1			10	0.1		
Atractoscion aequidens	Geelbek	10	0.1	2	0.3	80	1.0	10	0.8
Polyprion americanus	Wreckfish	9	0.1			48	0.6		
*Chrysoblephus lophus**	False Englishman	7	<0.1	1	0.1	7	<0.1	1	< 0.1
Etelis coruscans	Ruby snapper	7	<0.1			28	0.3		
Umbrina ronchus	Slender baardman	7	<0.1			9	0.1		
Argyrosomus japonicus	Dusky kob	7	<0.1			73	0.9		
*Diplodus cervinus hottentotus**	Zebra	6	<0.1	3	0.4	5	<0.1	3	0.2
Bodianus perditio	Saddle-back hogfish	5	<0.1			3	<0.1		
Parupeneus indicus	Black-saddle goatfish	3	<0.1	2	0.3	2	<0.1	2	0.1
*Branchiostegus doliatus**	Ribbed tilefish	2	<0.1						
Epinephelus poecilonotus	Dot-dash rockcod	2	<0.1			2	<0.1		
*Boopsoidea inornata**	Fransmadam	2	<0.1	1	0.1				
Lethrinus olivaceus	Longnose emperor	2	<0.1						
Priacanthus cruentatus	Glass bigeye	1	<0.1						
Epinephelus chlorostigma	Brownspotted rockcod	1	<0.1						
*Oplegnathus conwayi**	Cape knifejaw	1	<0.1			3	<0.1		
*Rhabdosargus holubi**	Cape stumpnose	1	<0.1						
Euthynnus affinis	Eastern little tuna	1	<0.1	12	1.6	8	<0.1	80	6.3
*Cheilodactylus jessicalenorum**	Natal fingerfin	1	<0.1			2	<0.1		
*Chrysoblephus gibbiceps**	Red stumpnose	1	<0.1			6	<0.1		
Thunnus albacares	Yellowfin tuna	1	<0.1			9	0.1		
Epinephelus flavocaeruleus	Yellowtail rockcod	1	<0.1			4	<0.1		
Scomberomorus commerson	King mackerel			18	2.4			324	25.3
*Epinephelus chabaudi**	Moustache rockcod			2	0.3			6	0.5
Etrumeus sp.	Round herring			35	4.6			6	0.4
Sphyraena sp.	Seapike			1	0.1			9	0.7
Plectorhinchus playfairi	White-barred rubberlips			1	0.1			3	0.2
Total		7 008		756		8 269		1 282	

* denotes endemic species

APPENDIX III

Overall catches of fish retained by skiboats in Coffee Bay and the Kei Mouth in the southern Transkei based on survey results

Species	Common name	Commercial		Recreational		Commercial		Recreational	
		No.	%	No.	%	Weight (kg)	%	Weight (kg)	%
		Coffee Bay							
*Chrysoblephus cristiceps**	Dageraad	204	32.5	13	11.6	195	15.8	26	7.0
Cheimerius nufar	Santer	71	11.3	4	3.6	58	4.7	4	1.1
*Boopsoidea inornata**	Fransmadam	44	7.0	11	9.8	6	0.5	3	0.7
*Argyrozona argyrozona**	Carpenter	42	6.7	2	1.8	37	3.0	1	0.2
Scomber japonicus	Mackerel	38	6.1	15	13.4	19	1.6	6	1.6
*Petrus rupestris**	Red steenbras	30	4.8			543	43.9		
Epinephelus marginatus	Yellowbelly rockcod	26	4.2	13	11.6	49	3.9	36	9.7
*Pterogymnus laniarius**	Panga	22	3.5			11	0.9		
Atractoscion aequidens	Geelbek	20	3.2	1	0.9	25	2.0	3	0.9
*Polysteganus praeorbitalis**	Scotsman	20	3.2			20	1.6		
*Polysteganus undulosus**	Seventyfour	19	3.0			59	4.8		
*Pachymetapon aeneum**	Blue hottentot	18	2.9	2	1.8	14	1.1	4	1.0
*Cymatoceps nasutus**	Poenskop	14	2.2	19	17.0	134	10.8	166	44.1
*Chrysoblephus puniceus**	Slinger	11	1.8			3	0.3		
*Porcostoma dentata**	Dane	11	1.8			6	0.5		
*Epinephelus chabaudi**	Moustache rockcod	10	1.6	2	1.8	16	1.3	4	1.2
*Chrysoblephus laticeps**	Roman	9	1.4			7	0.6		
Galeichthys sp.*	Barbel	3	0.5	3	2.7	5	0.4	6	1.7
Pomatomus saltatrix	Elf	3	0.5	2	1.8	1	0.1	1	0.2
Umbrina ronchus	Slender baardman	3	0.5			1	0.1		
Epinephelus rivulatus	Halfmoon rockcod	2	0.3	1	0.9	2	0.2	1	0.3
*Chrysoblephus anglicus**	Englishman	2	0.3	1	0.9	2	0.2	2	0.5
*Chrysoblephus gibbiceps**	Red stumpnose	1	0.2			4	0.3		
*Epinephelus andersoni**	Catface rockcod	1	0.2	3	2.7	3	0.2	5	1.5
*Diplodus cervinus hottentotus**	Zebra	1	0.2			1	0.1		
*Diplodus sargus capensis**	Blacktail	1	0.2			1	<0.1		
Sarda orientalis	Bonito			12	10.7			47	12.6
Thunnus albacares	Yellowfin tuna			7	6.3			49	13.1
*Lithognathus lithognathus**	White steenbras			1	0.89			10	2.7
Total		626		112		1 222		374	
		Kei Mouth							
*Pterogymnus laniarius**	Panga	102	23.8	76	19.3	48	3.0	24	3.9
*Petrus rupestris**	Red steenbras	92	21.5	16	4.1	1114	69.9	128	20.5
*Polysteganus undulosus**	Seventyfour	47	11.0	19	4.8	117	7.3	31	5.0
*Argyrozona argyrozona**	Carpenter	44	10.3	71	18.1	43	2.7	59	9.5
*Pachymetapon aeneum**	Blue hottentot	44	10.3	33	8.4	53	3.3	28	4.4
*Chrysoblephus cristiceps**	Dageraad	43	10.0	67	17.1	86	5.4	59	9.5
Cheimerius nufar	Santer	28	6.5	51	13.0	31	2.0	52	8.3
Atractoscion aequidens	Geelbek	7	1.6	12	3.1	23	1.4	58	9.3
*Epinephelus chabaudi**	Moustache rockcod	7	1.6	7	1.8	37	2.3	27	4.3
*Argyrosomus inodorus**	Silver kob	3	0.7			3	0.2		
*Boopsoidea inornata**	Fransmadam	2	0.5						
*Polysteganus praeorbitalis**	Scotsman	2	0.5	8	2.0	3	0.2	30	4.8
*Cymatoceps nasutus**	Poenskop	2	0.5	9	2.3	12	0.8	62	9.9
*Chrysoblephus laticeps**	Roman	2	0.5	3	0.8	1	0.1	2	0.3
Epinephelus marginatus	Yellowbelly rockcod	1	0.2	9	2.3	7	0.4	23	3.8
*Chrysoblephus gibbiceps**	Red stumpnose	1	0.2	5	1.3	6	0.4	13	2.1
Seriola lalandi	Yellowtail	1	0.2	1	0.3	9	0.6	6	0.9
*Spondyliosoma emarginatum**	Steentjie	1	0.2						
Galeichthys sp.*	Barbel			1	0.3			2	0.3
*Chrysoblephus anglicus**	Englishman			1	0.3			1	0.1
Polysteganus coeruleopunctatus	Blueskin			1	0.3			2	0.4
Coryphaena hippurus	Dorado			1	0.3			5	0.9
Total		429		391		1 593		612	

* denotes endemic species