FINDINGS

The recreational usage of Shoalwater Bay and adjacent waters was studied through mail, club, self selection and commercial operator surveys, GBRMPA and QDoE data sources as well as through 'expert' opinion.

Expert opinion

The experts who were consulted indicated that the primary users of the area would be Yeppoon residents and then Rockhampton residents. Some experts indicated that people in the mining centres of the Capricorn region would also access the area for recreational use[15]. The key usage areas nominated by experts were Five Rocks, Corio Bay and Port Clinton and Stanage Bay environs. The primary modes of transport to these locations were by boat from Yeppoon to Corio Bay and Port Clinton as well as by vehicle to launching locations in several of the aforementioned areas. It was suggested that Stanage Bay was accessed primarily by vehicles 'trailering' boats, with the latter being launched within the Stanage Bay area. Experts mentioned that smaller boats would use the Shoalwater Bay area and Corio Bay areas via road access initially, whilst persons with larger ocean going vessels would access the areas between Yeppoon and Cape Townshend including Corio Bay, Port Clinton, and Island Head Creek primarily with their vessels departing from Rosslyn Bay.

Experts believed that smaller boats would use the area on weekends and holiday periods, and that larger boats would access Corio Bay on weekends. Local experts also noted that yachts would use the area primarily during holiday periods due to the distance which needed to be travelled which primarily excluded two day weekend visitation. Experts also mentioned that non-local vessels in transit north and south would also use the area particularly, Island Head Creek, Port Clinton and Corio Bay, as these provided safe anchorages. It was suggested that this usage was confined mostly to the months between May to October/November. These months being mainly outside of cyclone season. All experts stated that usage of the area was dependent on Defence operations. If the area was closed due to Defence operations, recreational activities would subsequently be suspended. Weather also affected usage patterns with unfavourable weather and subsequent sea conditions reducing usage rates.

Secondary data source findings - Aerial surveillance

Both QDoE and GBRMPA aerial surveillance records were accessed. Data collected from those records suggested the following usage patterns for the period September 1988 to September 1995. Patterns only are suggested as some records were incomplete and bias was introduced when fishing vessels and yachts were present in the vicinity of launches and open vessels. Since both yachts, fishing vessels and trawlers have one, if not more dinghies or tenders (launches and open vessels) determination of user numbers was difficult. Subsequently, counting vessels may have involved doubling counting of some users. Further, vessels which were under way were also included in the count. This was done because it was impossible to determine the destination of such vessels, they could have been passing through or they could have been heading for any of the fishing spots within the study area or anchorage sites. As such by including these vessels, an indication of the potential number of users is able to be proposed. Care must be taken when using these figures as they are not a representative sample, merely an indication of trends[16].

Tables 3-10 provide an overview of yearly recreational patterns (1988 to 1995) based on aerial surveillance data. The Shoalwater Bay and adjacent waters usage is reported using the same sections which were marked on the Shoalwater Bay Recreational Usage Survey, Map 2 (see Appendix 1). When reviewing the tables, it should be remembered that aerial surveillance of the

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[15] This latter group has been targeted in a study proposed for 1998.

[16] See also Honchin (1991) and Pettitt and Haynes (1994) for further comments regarding problems associated with the use of aerial surveillance data.

waters is randomly selected by day and area. This random selection differs between years, thus, the tables below do not provide a complete picture of the usage patterns for every day in each of the years studied. Further, the use of the area as a Defence Training Area necessitates the closing of various sections or the entire area to recreational and commercial use. This must also be remembered when reading the tables below.

Table 3: Vessel Usage of Shoalwater Bay and Adjacent Waters, 1988[17]

Year	Location	No.	Class of Activity	No.	'Vessel' Types	No.
1988	Section A & B	9	Recreational	5	Motorised	4
					Sail powered	1
					Vehicle	
					Camps	
			Commercial	4	Fishing vessels	4
	Subtotal	**9**	**Subtotal**	**9**	**Subtotal**	**9**
	Island Head Creek	25	Recreational	63	Motorised	19
	Port Clinton	21			Sail powered	42
	Section E	23			Vehicle	2
	Corio Bay	7			Camps	
			Commercial	13	Fishing vessels	13
	Subtotal	**76**	**Subtotal**	**76**	**Subtotal**	**76**
	Total	**85**	**Total**	**85**	**Total**	**85**

Of the days in which surveillance data was available for 1988, it would appear that Section A and B (Shoalwater Bay, itself) were utilised more by motor powered vessels and that Island Head Creek, Port Clinton and Section E (from approximately Little Corio Bay to Cape Clinton) were equally used. These three sections also had a greater usage by sail powered vessels.

Table 4: Vessel Usage of Shoalwater Bay and Adjacent Waters, 1989

Year	Location	No.	Class of Activity	No.	'Vessel' Types	No.
1989	Section A & B	58	Recreational	45	Motorised	33
					Sail powered	6
					Vehicle	5
					Camps	1
			Commercial	13	Fishing vessels	13
	Subtotal	**58**	**Subtotal**	**58**	**Subtotal**	**58**
	Island Head Creek	98	Recreational	170	Motorised	53
	Port Clinton	32			Sail powered	111
	Section E	28			Vehicle	6
	Corio Bay	12			Camps	
			Commercial	??*	Fishing vessels	
	Subtotal	**170**	**Subtotal**	**170**	**Subtotal**	**170**
	Total	**228**	**Total**	**228**	**Total**	**228**

??* Data unable to be determined.

The pattern of usage displayed in Table 3 is mirrored in Table 4. Again motorised vessels were the predominant users of Shoalwater Bay, while sail powered vessels were the dominant users of the Corio Bay to Cape Townshend area. It is also worth noting that approximately one third of the recreational users used motorised vessels whilst two thirds used sail powered vessels.

[17] The locations used are those presented on Map 2 in the survey, see Appendix 1.

Surveillance records for 1992 indicated a predominance of usage by motorised vessels in Shoalwater Bay. Again vehicular access and camps were reported. In the outer coastal area, motorised vessels (47%) exceeded the number of sailing vessels (32%). Island Head Creek and Corio Bay were popular locations for the periods of surveillance however, Section E was the most popular. The outer coastal section was also accessed by vehicles (17.8%)

Table 8: Vessel Usage of Shoalwater Bay and Adjacent Waters, 1993

Year	Location	No.	Class of Activity	No.	'Vessel' Types	No.
1993	Section A & B	79	Recreational	61	Motorised	58
					Sail powered	3
					Vehicle	0
					Camps	0
					Fishing vessels	11
			Commercial	18	Trawlers	7
	Subtotal	**79**	**Subtotal**	**79**	**Subtotal**	**79**
	Island Head Creek	62	Recreational	214	Motorised	93
	Port Clinton	40			Sail powered	62
	Section E	113			Vehicle	52
	Corio Bay	50			Camps	7
					Fishing vessels	17
			Commercial	51	Trawlers	34
	Subtotal	**265**	**Subtotal**	**265**	**Subtotal**	**265**
	Total	**344**	**Total**	**344**	**Total**	**344**

During the 1993 surveillance periods, 95% of recreational usage in Shoalwater Bay was associated with motorised vessels activities. Within the outer coastal area, 43.5% of recreational activity was related to motorised vessels, 29% to sailing vessels and 24.2% from vehicular access. Section E was the most popular location associated with 53% of recreational activity, with Island Head Creek (29%) and Corio Bay (23%) and Port Clinton (18.7%) being the least popular location during the surveillance periods.

During the surveillance periods conducted in 1994, motorised vessels were the primary means to recreate in Sections A and B, while motorised vessels accounted for 38.2% of recreational usage of the outer coastal area and sail driven vessels accounted for 29.6%. Vehicles (15%) also were utilised to access the outer coastal area for recreational activities. In the outer coastal area, Island Head Creek was the mode for location, followed by Section E and Corio Bay.

Table 9: Vessel Usage of Shoalwater Bay and Adjacent Waters, 1994

Year	Location	No.	Class of Activity	No.	'Vessel' Types	No.
1994	Section A & B	46	Recreational	24	Motorised	21
					Sail powered	3
					Vehicle	0
					Camps	0
					Fishing vessels	21
			Commercial	22	Trawlers	1
	Subtotal	**46**	**Subtotal**	**46**	**Subtotal**	**46**
	Island Head Creek	64	Recreational	154	Motorised	71
	Port Clinton	33			Sail powered	55
	Section E	48			Vehicle	28
	Corio Bay	40			Camps	0
					Fishing vessels	21
			Commercial	32	Trawlers	11
	Subtotal	***185**	**Subtotal**	**186**	**Subtotal**	**186**
	Total	***231**	**Total**	**232**	**Total**	**232**

* indicates some data is missing

- Shoalwater Bay is predominantly used by motorised vessels;
- the outer coastal area between Corio Bay and Cape Townshend is visited by both motorised and sail driven vessels;
- usage of the outer coastal area by those vessels approaches parity;
- the outer coastal area is also accessed for recreational purposes by vehicular traffic, particularly, Section E.

Mail Survey

The mail survey focussed on the recreational usage of the Shoalwater Bay and adjacent waters for a period of one year, which ranged from June 1995 to June 1996. The mail survey achieved 400 returns. The data was entered into and analysed using SPSS for Macintosh computers and the following tables were developed based on the data analysis completed by SPSS.

Table 12: Usage of Shoalwater Bay and adjacent waters by mail survey respondents during June 1995 to June 1996. (Frequencies and percentages summed in columns). N = 400

Response	Frequency	Percentage
Yes	256	64
No	142	35.5
Data missing	2	0.5
Total	**400**	**100**

Of the people who responded, 64% had used the Shoalwater Bay and adjacent waters area during the period June 1995 to June 1996, while 35.5% had not used the area.

Table 13: Locations used for recreational purposes. Percentages are row summed. N = 256 [400 surveys were returned, 256 respondents indicated they used the study area, 142 respondents did not use the area, 3 respondents did not provide data for this question.]

Location	Frequency	Percentage of the 256 users
Section A: Northern area of Shoalwater Bay	72	28.1
Section B: Southern area of Shoalwater Bay	14	5.5
Section C: Island Head Ck environs	104	40.6
Section D: Port Clinton environs	50	19.5
Section E: above Cape Manifold to Cape Clinton	104	40.6
Section E: above Five Rocks to Cape Manifold	101	39.5
Section E: Little Corio Bay to Five Rocks	70	27.3
Corio Bay	123	48.1
Yeppoon, Keppel, & Fitzroy River	78	30.5
Outside study area	33	12.9

Frequencies do not sum to 256 and percentages do not sum to 100% as respondents indicated several locations for their recreational use within the study area. Readers should note that the frequency and percentage presented for Yeppoon, Keppel Islands and Fitzroy River area are not representative of all users of the those areas, as respondents to the survey were focussed on the study area and not the aforementioned three locations. These were included by some users as additional sites which were locatable on Survey Map 1, see Appendix 1. Refer to Appendix 8 for specific locations accessed by mail survey respondents.

From Table 13, it can be seen that of the respondents who used the area, Corio Bay drew 48.1% of recreational users into the study area, while both Island Head Creek and environs and the waters between Cape Manifold and Cape Clinton contained in Section E on Map 1 (Appendix 1) attracted 40.6% and the waters between Five Rocks and Cape Manifold were used by 39.5% of the mail survey respondents.

Table 16: Recreational activities pursued by mail survey respondents in the study area. (Row summed percentages) N = 256. [400 surveys were returned: 256 respondents indicated they used the study area; 142 respondents indicated that they did not use the area, 2 respondents did not provide data for this question.]

Activities	Frequency	Percentage who engaged in this activity	Percentage who did not mention this activity	Total
Boating	122	47.7	52.3	**100**
Recreational fishing	245	95.7	4.3	**100**
SCUBA diving	10	3.9	96.1	**100**
Kayaking	1	0.4	99.6	**100**
Tourist activity	12	4.7	95.3	**100**
Spearfishing	5	2.0	98.0	**100**
Snorkelling	26	10.2	89.8	**100**
Sightseeing	75	29.3	70.7	**100**
Camping	97	37.9	62.1	**100**
Other	29	11.3	88.7	**100**
Missing data	2	-	-	-

Table 17: The main activity pursued by mail survey respondents within the study area.(Row summed percentages). N = 256 [400 surveys were returned: 256 respondents indicated they used the study area; 142 respondents indicated that they did not use the area, 9 respondents did not provide data for this question.]

Activities	Frequency	Percentage who engaged in this activity	Percentage who did not engage in this activity	Total
Boating	16	6.3	93.7	**100**
Recreational fishing	185	74.9	25.1	**100**
SCUBA diving	0	0.00	100	**100**
Kayaking	0	0.00	100	
Tourist activity	0	0.00	100	**100**
Spearfishing	1	0.4	99.6	**100**
Snorkelling	1	0.4	99.6	**100**
Sightseeing	4	1.6	98.4	**100**
Camping	9	3.6	96.4	**100**
Other	31	12.6	87.4	**100**
Missing data	9	-	-	-
Total	**256**	**100.0**	-	-

The primary recreational activity engaged in within the study area was recreational fishing. See Appendix 10 for the 'Other" category.

Table 18: Frequency of visitation to the study area by mail survey respondents. (Frequencies and percentages summed in columns). N = 256 [400 surveys were returned: 256 respondents indicated they used the study area; 142 respondents indicated that they did not use the area, 10 respondents did not provide data for this question.]

Time frame	Frequency	Percentage
Daily	1	0.3
Weekly	8	3.1
Fortnightly	20	7.8
Monthly	40	15.6
11 times per year	0	0
9 - 10 times per year	1	0.3
7 - 8 times per year	1	0.3
5 - 6 times per year	46	17.9
3 - 4 times per year	54	21.1
1 - 2 times per year	30	11.7
Whenever I can	8	3.1
When weather permits	12	4.6
When defence allows	0	0
Not often	2	0.7
Other	25	9.8
Missing data	10	3.7
Total	**400**	**100**

The mail survey respondents who used the Shoalwater Bay and adjacent waters did so at least several times a year. The mode was 3 - 4 times per year (21.1%), followed by 5 - 6 visits per year (17.9%) while 15.6% of users visited monthly, and 11.7% visited once or twice a year.

Table 19: Time periods of visitation by mail survey respondents of the survey area. (Percentages summed by rows). N = 256 [400 surveys were returned: 256 respondents indicated they used the study area; 142 respondents indicated that they did not use the area, 9 respondent did not provide data for this question.]

Time	Frequency who go there	Frequency who did not note this item	Missing data	Percentage who go there	Percentage who did note this item	% of Missing Data
Week days	99	156	1	38.7	60.9	0.4
Weekends	158	97	1	61.7	37.9	0.4
Holidays	77	178	1	30.0	69.6	0.4
Long weekends	7	248	1	2.7	96.9	0.4
Public Holidays	6	249	1	2.3	97.3	0.4
Other	41	214	1	16.0	83.6	0.4

Respondents were asked to only indicate one time, several respondents indicated more than one item, consequently, this table records more than one response for each respondent who so noted. The mode for time of visitation was the weekends (61.7%) then weekdays for 38.7% of mail survey respondents.

Table 20: Month in which the last visit occurred for mail survey respondents who used the study area. (Frequencies and percentages are column summed.) N = 256 [400 surveys were returned: 256 respondents indicated they used the study area; 142 respondents indicated that they did not use the area, 18 respondents did not provide data for this question.]

Date	Frequency	Percentage	Date	Frequency	Percentage
May 1995	0	0	January 1996	8	3.1
June 1995	3	1.2	February 1996	11	4.3
July 1995	3	1.2	March 1996	20	7.8
August 1995	3	1.2	April 1996	52	20.3
September 1995	4	1.6	May 1996	65	25.3
October 1995	0	0.0	June 1996	52	20.3
November 1995	1	0.4	Outside May 1995 - 1996	4	1.6
December 1995	12	4.7	Missing data	18	7.0
Total	**26**	**10.3**		**230**	**89.7**

65.9% of the mail survey respondents who used the study area had visited it within the last three months of the study period, that is between April and June 1996.

Table 21: Types of passengers who accompany the mail survey respondents. (Percentages are row summed.) N = 256 [400 surveys were returned: 256 respondents indicated they used the study area; 142 respondents indicated that they did not use the area, 2 respondents did not provide data for this question.]

Passengers	Frequency with this passenger	Frequency who did note this passenger	Percentage with this passenger	Percentage who did note this passenger	Total %
Co-worker	24	232	9.4	90.6	**100**
Family	159	97	62.1	37.9	**100**
Club members	15	241	5.9	94.1	**100**
Friends	175	81	68.4	31.6	**100**
Tourist operator	1	255	0.4	99.6	**100**
Tourists	3	253	1.2	98.8	**100**
Relatives	53	203	20.7	79.3	**100**
Other	5	251	2.0	98.0	**100**

Respondents were asked to indicate the number of people in each of the categories who accompanied them, as some people did indicate numbers and others did not, the data sets were

Amenity included scenic amenity, lack of people, the wilderness settings, peace and quiet and solitude. The proximity to mail survey respondents' residence was noted by 23.8% of the users.

Most activities listed in the activity guide presented on the *GBRMPA Shoalwater Bay BRA Q120 map* were considered appropriate by the mail survey respondents. The activities which were considered as inappropriate for the area were trawling (68.3% of respondents), commercial collecting (66.5% of respondents), commercial netting (66.8% of respondents). Also 49.3% of respondents considered both commercial line fishing and spearfishing as inappropriate in Section A. Indigenous fishing, hunting and collected received an almost divided response with 41.2% of respondents noting that it should be allowed and 36.8% considered that it should not be allowed in Section A.

Table 24: Activities which mail survey respondents believed were suitable for Section B on Map 2 of the survey (Percentages are row summed.) N =400 [400 surveys were returned, the number of respondents who did not provide data for each section of this question varied from 79 to 89, only the percentages of missing data are included in the table.]

Activities	Frequency Yes Response	Frequency No Response	Frequency of No Comment	Percentage Yes Response	Percentage No Response	Percentage of No Comments	Percentage Missing
a) Bait netting and gathering	230	78	7	57.5	19.5	1.8	21.2
b) Camping	236	70	7	59.0	17.5	1.8	21.7
c) Recreational collecting (eg shells)	166	141	8	41.5	35.3	2.0	21.2
d) Commercial collecting	40	269	9	10.0	67.3	2.3	20.4
e) Sightseeing	281	27	6	70.3	6.8	1.5	21.4
f) Crabbing and oyster gathering	239	66	7	59.8	16.5	1.8	21.9
g) Diving	239	67	7	59.8	16.8	1.8	21.6
h) Commercial line fishing	96	212	7	24.0	53.0	1.8	21.2
i) Recreational line fishing	276	36	6	69.0	9.0	1.5	20.5
j) Research activities	287	17	8	71.8	4.3	2.0	21.9
k) Boating activities	268	38	7	67.0	9.5	1.8	21.7
l) Tourist & education facilities/programs	242	62	7	60.5	15.5	1.8	22.2
m) Spearfishing	92	210	9	23.0	52.5	2.3	22.2
n) Commercial netting	41	271	8	10.2	67.8	2.0	20.0
o) Indigenous hunting, fishing, collecting	153	151	9	38.3	37.8	2.2.	21.7
p) Photography	294	16	6	73.5	4.0	1.5	21.0
q) Snorkelling	272	34	6	68.0	8.5	1.5	22.0
r) Trawling	31	282	8	7.8	70.5	2.0	19.7

The activities which the mail survey respondents considered should not be allowed in Section B were trawling (70.5% of respondents), commercial collecting (67.3% of respondents), commercial netting (67.8% of respondents), commercial line fishing (53% of respondents), and spearfishing (52.5% of respondents). Respondents were divided between the appropriateness of indigenous hunting, fishing and collecting (37.8% of respondents) within the section.