Recreational fishing is a popular pastime in Tasmania, with around 120,000 Tasmanians (over one in four persons) fishing at least once a year. Offshore fishing activities are often the domain of many prized fisheries, particularly for reef species renowned for their excellent eating quality. Game fishing is also an important offshore activity, and some might say the elite realm of recreational fishing, where large trophy fish, including tunas, billfish and pelagic sharks are the target species. This study was undertaken to gain an understanding of the offshore and game fisheries in Tasmania, particularly in relation to catch of tunas, pelagic sharks, Striped Trumpeter and Blue-eye Trevalla. The study involved monitoring the fishing activity of private boat fishers using a diary system and regular telephone interviews between November 2011 and September 2012.

### Recreational catch of key species by private boats from Tasmania

**12 month period (October 2011 - September 2012)**

<table>
<thead>
<tr>
<th>Species</th>
<th>Retained catch</th>
<th>Retained catch (tonnes)</th>
<th>Release rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Bluefin Tuna</td>
<td>3,200</td>
<td>59.9</td>
<td>24%</td>
</tr>
<tr>
<td>Albacore</td>
<td>8,300</td>
<td>not estimated</td>
<td>14%</td>
</tr>
<tr>
<td>Skipjack Tuna</td>
<td>3,700</td>
<td>11.2</td>
<td>68%</td>
</tr>
<tr>
<td>Striped Trumpeter</td>
<td>7,300</td>
<td>31.9</td>
<td>15%</td>
</tr>
<tr>
<td>Blue-eye Trevalla</td>
<td>2,000</td>
<td>12.5</td>
<td>0</td>
</tr>
<tr>
<td>Shortfin Mako Shark</td>
<td>300</td>
<td>21.5</td>
<td>39%</td>
</tr>
</tbody>
</table>

Catch numbers throughout this summary have been rounded to the nearest hundred. More precise catch estimates and the associated levels of statistical confidence are presented in the full report.
Seal predation

Anecdotal evidence suggests that seals are interacting with both commercial and recreational fishers more frequently in Tasmania. This is the first study to quantify losses of fish due to seal interactions. Seal interactions with recreational fishers most commonly occur when trolling for tuna, in particular SBT, as well as mid-depth reef fishing, where Striped Trumpeter are regularly taken from recreational fishers in some areas.

Estimated numbers of key species lost to seals while recreational fishing

12 month period (October 2011 - September 2012)

<table>
<thead>
<tr>
<th>Species</th>
<th>Number lost</th>
<th>Tonnage lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Bluefin Tuna</td>
<td>1,300</td>
<td>24.9</td>
</tr>
<tr>
<td>Striped Trumpeter</td>
<td>800</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Seals most commonly take fish once they have been hooked and are being retrieved by a recreational fisher. Seals are typically very successful at removing the fish from the hook or breaking the fishing line, and mortality of the fish is the most common outcome. The estimated numbers and weight of key fish species lost to seals are reported below. These estimates provide an additional and unaccounted source of mortality associated with recreational fishing. Seal interactions occurred most commonly on the southeast coast and to a lesser degree on the east and south coasts.

Releasing fish

Recreational fishers release fish for a range of reasons. The graph below shows the main reasons given for the release of key species targeted offshore by recreational fishers in Tasmania.

Interestingly, all species listed are managed by possession limits, but only a few striped trumpeter were released due to this regulation. In fact, it appears that in most cases fishers took the initiative to release fish once they had retained sufficient quantity to meet their needs. A similar result occurred in relation to species that have minimum size limits (and some not regulated by size limits). A far greater proportion were released by fishers deciding the fish were too small rather than being undersize.
Recreational offshore fishing effort

Offshore fishing, for the purpose of this survey, was categorised as: trolling (for tuna species), pelagic shark fishing, mid-depth reef fishing (depths ~50–250m, where Striped Trumpeter are commonly caught) and deep sea fishing (depths greater than 250m, where Blue-eye Trevalla are most commonly caught).

Seasonal and regional patterns were observed in all four modes of fishing. Trolling for game fish occurred between December and June, peaking in February and April. The February peak related to targeting Albacore and the April peak targeting SBT. Trolling effort occurred exclusively off the east, southeast and south coasts of Tasmania. Skipjack Tuna and Albacore dominated catches from the east and southeast coasts, while SBT dominated the catch taken from the southeast and south coasts.

Most of the effort targeting pelagic sharks occurred off the north coast, with some activity along the east and southeast coasts of Tasmania. Limited effort was also recorded from the west coast. Shark fishing activity peaked strongly in January but was reported between November and April.

Mid-depth reef fishing activity was heaviest between November and January, dropping sharply outside of these months. Mid-depth reef fishing occurred all around Tasmania but in particular off the east and southeast coasts.

Deep sea fishing occurred mainly over the summer months, between January and April with low levels of activity at other times of the year. Effort was focused on the east coast, in particular the northeast coast.

The seasonality and distribution of effort when fishing for tunas and pelagic sharks is related to the temporal and spatial availability of the target species, whereas mid-depth reef and deep sea fishing seasons seem to be more related to weather conditions.

Number of boat days for offshore fishing types 12 month period (October 2011 - September 2012)

<table>
<thead>
<tr>
<th>Fishing type</th>
<th>Number of boat days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trolling</td>
<td>5,200</td>
</tr>
<tr>
<td>Pelagic shark fishing</td>
<td>900</td>
</tr>
<tr>
<td>Mid-depth reef fishing</td>
<td>3,400</td>
</tr>
<tr>
<td>Deep offshore fishing</td>
<td>300</td>
</tr>
</tbody>
</table>

Expenditure on boat based recreational fishing

Overall, more than $25M in attributed expenditure and costs was related to recreational fishing by owners of private vessels with an interest in offshore fishing during 2011/12.

The depreciation cost of vessels represented the greatest cost, accounting for 40% of all costs considered in this study. Other significant expenses included boat modifications and fittings, fuel and oil used for offshore fishing trips, and fishing tackle purchases. It is not surprising that boat fuel and fishing tackle are major expenses associated with offshore fishing. Large quantities of fuel are typically required to travel to offshore fishing grounds and/or when trolling for game fish, and specialist and expensive tackle is required for offshore and game fishing. Boat insurance and boat/trailer maintenance costs were also relatively important expense items.
Map of Tasmania showing the coastal regions as defined for this survey. Panel (A) illustrates the monthly trends in total catch (kept and released) of key tuna species from each coastal region (shaded areas represent upper and lower 95% confidence bounds). Panel (B) illustrates the trolling effort (boat days) within each coastal region (error bars represent 95% confidence bounds).

**Game fishing**

Three species dominated the tuna catch in 2012, namely Skipjack Tuna, Albacore and Southern Bluefin Tuna (SBT). Yellowfin Tuna were also reported but due to the low sample size expansion to total statewide catch was not attempted. This species composition is typical for Tasmanian waters.

Albacore were the first of the tunas caught off the east coast of Tasmania, with low numbers taken as early as December after which catches increased sharply to a peak in February before falling away to low catch numbers thereafter. Skipjack Tuna were recorded in low numbers in January and then catches rose sharply in February to a peak in March before declining sharply. The earliest catches of SBT were recorded in January but in very low numbers. Catches increased significantly in March and peaked in April before falling slightly in May and again in June. Very few SBT were captured during July and there were no catches of any tuna species reported between August and October.

Albacore and Skipjack Tuna were caught in relatively high numbers along the entire east coast of Tasmania to as far south as the Tasman Peninsula. Small numbers of Skipjack Tuna were also reported from Storm Bay. Southern Bluefin Tuna were caught from the area east of Tasman Peninsula, Storm Bay and the South Coast of Tasmania. The timing and distribution of tuna catches appear to be related to the water temperature preferences of each species and the prevailing water masses off Tasmania. SBT are known to be present and occasionally taken from the west coast of Tasmania, but generally unfavorable weather conditions and the remoteness of the region has meant that effort has traditionally been very low by comparison with the east coast.
Map of Tasmania showing the coastal regions as defined for this survey. Catch plots represent the regional catch composition of the main species caught. Panel (A) illustrates the effort (boat days) within each coastal region (error bars represent 95% upper and lower confidence bounds).

**Mid-depth reef fishing**

A range of species were caught while mid-depth reef fishing, the most common being Ocean Perch, Jackass Morwong, Striped Trumpeter, Bearded Rock Cod, Gurnard and Wrasse. Apart from Striped Trumpeter, catches of each of these species are likely to underestimate the total catch since many are also caught while targeting other species in different habitats, including inshore reef fishing and fishing over sand and cobble bottom for species such as flathead.

The vast majority of mid-depth reef fishing occurred on the east and south coasts of Tasmania, with small amount of effort reported on the west coast. The most commonly caught species were Ocean Perch; 23,200 and Jackass Morwong; 14,100. A large percentage of the Ocean Perch (70%) were released as they are generally not a desired species, while only 21% of the Jackass Morwong were released as they are considered a good eating fish.

Striped Trumpeter is the preferred species when mid-depth reef fishing. An estimated 8,500 Striped Trumpeter were caught over the survey period; 7,300 were retained and 1,300 released.

Other species that were commonly reported caught were:
- Gurnard: 8,400, 84% were released
- Bearded Rock Cod: 4,700, 60% were released
- Wrasse: 4,600, 73% were released
Survey method

The study used an offsite phone diary survey (PDS) to assess recreational catch and effort over a 12 month period (November 2011 – October 2012).

The PDS involved a two-stage process; an initial telephone interview to establish eligibility and collect profiling information; and a follow-up telephone-diary survey in which boat based offshore recreational fishing and game fishing activities were monitored in detail over a twelve month period.

A PDS requires a known sample frame so that survey results can be expanded to represent the target population. In this case we used the Marine and Safety Tasmania recreational vessel database.

The MAST recreational vessel registration database contained 28,595 vessels. Of these, 14,181 or 50% were deemed eligible (target population) for the survey on the basis of decision rules outlined in the full report.

A stratified random sample of owners of vessels registered on the Marine and Safety Tasmania (MAST) database was selected.

A total of 1,431 owners of powered recreational vessels over 4.5m participated in a screening survey during October 2011. It was determined that 510 (33%) of these participants expected to use their boat for game or offshore fishing in the following 12 months.

Of these boat owners 467 (92%) agreed to participate in the 12 month diary survey. A total of 413 respondents completed the full 12 month survey with 289 (63%) participating in some form of offshore fishing during the survey.

Pelagic Sharks

Shortfin Mako and Blue Shark were the two species of pelagic shark caught by recreational fishers

Catches of both species peaked in January with a second smaller peak in April for Shortfin Mako shark.

The estimated total number of Shortfin Mako shark caught by recreational fishers during the 12 month survey period was 520, of which 317 (were retained and 203 were released.

The estimated total retained weight of Shortfin Mako shark was 21.5 tonnes. An estimated 153 Blue Shark were caught by recreational fishers during the 12 month survey period, of which 46 (95% CI: 7 – 98) were retained and 107 (95% CI: 28 – 201) released.

Both shark species had a high release rates at 39% for Shortfin Mako and 70% for Blue Shark. For Shortfin Mako shark the reasons given for release were distributed equally between the shark deemed to be too small, the fishers decision that they had retained enough and catch and release fishing. Shortfin Mako shark was highly desired for personal consumption, with 61% of Mako Shark retained for human consumption and 31% given away, presumably to be consumed. Blue Shark is a less desirable species, this is reflected in the reasons for release with 53% of Blue Shark released because they were not wanted and the remaining 47% reported as catch and release fishing.
For most species assessed during the survey between 58 - 86% of the fish caught were consumed by the fisher* or their immediate family. The highest reported rates of personal consumption were for white flesh fish caught while bottom fishing (Striped Trumpeter, Jackass Morwong and Blue-eye Trevalla). A higher proportion of Southern Bluefin Tuna and Mako Shark was given away to other people. This is likely due to the larger size of these species and the large amount of meat each fish can yield.

With the exception of Skipjack Tuna, only a small proportion of all the fish retained, reported below, was used for bait.

*fishers, in this case, are vessel owners that participated in the diary survey. We assume that their behaviour is representative of all offshore recreational fishers.

What happens to retained catch?

Deep sea fishing

Blue-eye Trevalla is commonly the primary target species when deep sea fishing in Tasmania, other species also caught include Gemfish, Hapuku, Blue Grenadier and Pink Ling.

An estimated 1,960 Blue-eye Trevalla were caught during the survey period, the entire catch being retained. Based on the average size of Blue-eye Trevalla caught by commercial fishers off the East Coast of Tasmania, this suggests that the total recreational catch was in the order of 12.5 tonnes.

Fish lost to seals were reported however represented less than 2% of the total catch.

In addition, an estimated 550 Gemfish were caught, all of which were retained. Hapuku, Blue Grenadier and Pink Ling were reported but in very low numbers.

Regional effort targeting deep water species

Seasonal effort targeting deep water species
Opinion regarding potential management options

Survey participants were asked their opinions on a range of questions relevant to offshore recreational fishing. Below is a summary of responses to a series of potential management options.

The majority of respondents (82%) disagreed with the suggestion that SBT should be catch and release only. With the most avid fishers, and fishers with greater than 5 years game fishing experience, indicating stronger disagreement than respondents who had not game fished during the survey period or those with no previous game fishing experience. In contrast, the majority of respondents (69%) agreed that Striped Marlin should be catch and release only.

A question relating to reducing the current combined limit of two Southern Bluefin Tuna, Yellowfin Tuna or Bigeye Tuna to a combined limit of one fish elicited a polarized response, with 49% of respondents agreeing with this proposal and 46% disagreeing (the remainder reported a neutral response). In contrast, the majority of respondents (75%) agreed that the combined daily bag limit for Mako and Blue Shark should be reduced from two to one, with the more avid respondents significantly more supportive of this statement. Regionally, respondents from northern Tasmania were less supportive than respondents from the Hobart region.

There was strong coherence between respondents that boat catch limits should be implemented for key offshore and game fish species, with 69% agreeing with this statement. It is worth noting that this question was not asked in relation to charter operators for whom boat limits would have a greater impact.

There was also support for increasing the minimum size limit of Striped Trumpeter to match the estimated size at maturity for the species, with 58% of respondents agreeing that this should occur.

A question regarding the introduction of a saltwater angling licence in Tasmania, with the revenue generated used to enhance recreational fishing, was opposed by the majority of respondents (70%) and of all questions this elicited the greatest proportion of responses categorized as strongly disagree.

Mean scores and response distribution relating to attitudes toward potential management options for key offshore recreational species. A mean score closer to (1) indicates greater agreement with a statement, while a mean score of (5) indicates greater disagreement with the statement. Responses are ranked in terms of the strength of agreement between respondents.

<table>
<thead>
<tr>
<th>Question as presented</th>
<th>Mean</th>
<th>Rank</th>
<th>Response distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>An increase in the size limit for striped trumpeter to match size at maturity</td>
<td>3.71</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Introduce a saltwater angling licence, with revenue used to enhance recreational fishing</td>
<td>3.70</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Boat catch limits for key offshore and game fish species</td>
<td>2.49</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A personal combined bag limit of 1 mako shark or blue shark</td>
<td>3.38</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>A personal combined bag limit of 1 bluefin or yellowfin tuna</td>
<td>3.33</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Southern bluefin tuna to be catch and release only</td>
<td>2.80</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Striped marlin to be catch and release only</td>
<td>2.41</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Acknowledgments

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We would like to thank all of the recreational fishers who participated in the study.

Thanks also to those that provided photos for this report, including Alistair McGlashan.