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Outdoor Recreationists' Experiences at Hinchinbrook Island National Park, Australia



Final Technical Report
October, 2012

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Introduction

The final technical report of social values for natural landscapes at Hinchinbrook Island National Park (HINP) presents the findings from a social science research project designed to inform environmental planning and management. This project was designed to inform a larger study of human-environment interactions in the context of island national park settings. The findings include a spatial analysis of social values for natural landscapes, descriptive results from outdoor recreationists' environmental worldviews, motivations, and place attachment, as well as socio-demographic characteristics. We hope the information presented in this report can be used to improve the information, services, and products that managers use to protect environmental conditions and provide quality experiences to constituents of HINP.

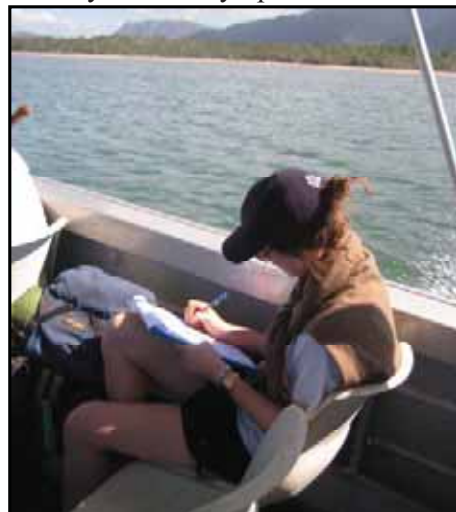
Research Team

The research team was comprised of associates of the Human Dimensions of Natural Resources Laboratory at Texas A&M University, USA, and the Fishing and Fisheries Research Centre at James Cook University, Australia. Carena van Riper, Dr. Gerard Kyle and Dr. Jee In Yoon from Texas A&M University, as well as Drs. Stephen Sutton and Renae Tobin from James Cook University contributed to various phases of this research.

Methods

Self-administered survey questionnaires were distributed to a random sample of adult recreationists (see Appendix 1). A total of 400 people were contacted and asked to participate in the study over the course of a six-week period mid-June through September, 2011. Survey days were stratified by day of the week (weekend vs. weekday) and time of the day (a.m. vs. p.m.) and respondents were contacted at various sampling points, including two boat ramps, a fishing pier, two ferries that provide transportation to and from the island, a caravan park, and the Hinchinbrook Island Fishing Club meeting in the town of Ingham. During these sample periods, respondents were approached and asked to reflect on their most recent visit to the island and/or surrounding waters. For groups, the individual with the most recent birthday (and over the age of 18 years) were asked to participate (Battaglia et al., 2008). Contact logs were used to estimate response rates.

Data were also collected via a mailback survey distributed by local ferry operators on the primary investigator's behalf. Surveys were given to two ferry operator companies following methods outlined in Young (2006). The ferry operators asked respondents to complete the survey at the conclusion of their visit and return it in a postage paid envelope. A total of 59 of 200 survey questionnaires were returned by mail. The on-site and mailback surveys resulted in an **overall sample size of 209 and a response rate of 52%**. Completed and usable data were coded and entered into a database and analyzed using Statistical Package for Social Sciences (SPSS) Version 20.0 and GIS Version 9.2.1. This study was reviewed by the Texas A & M University Institutional Review Board and approved under exempt status (IRB Protocol Number 2010-0330).



Survey respondent fills out questionnaire on Hinchinbrook ferry

Executive Summary of Findings

- Outdoor recreationists were highly satisfied with their experience at HINP. A total of 93% reported being either satisfied or very satisfied.
- There were two distinct groups of respondents that can be defined by their engagement in consumptive (e.g., fishing, prawning) and non-consumptive (e.g., hiking, camping) activities. Differences in socio-demographic and trip characteristics, environmental values, attachment to places, and motivations suggest that these two groups can be targeted in different ways to increase management efficacy.
- There were several places within HINP that were considered relatively important. The most intensely valued areas were Sunken Reef Bay, Zoe Bay, and Little Ramsay Bay located along the Thorsborne Trail, as well as the southern end of the Hinchinbrook Channel and the Missionary Bay creeks.
- A variety of social values types were assigned to places by outdoor recreationists to illustrate why different regions of HINP were considered important. Based on the most frequently assigned social value types, results suggest that Aesthetic, Recreation, Biological Diversity qualities were embodied by natural landscapes.
- The distribution and intensity of social values were examined in relation to three landscape metrics including average slope, distance to water, and distance to the Thorsborne Trail. The emergent trends can be referenced to better understand which biophysical characteristics of HINP are most likely to carry social values.
- Outdoor recreationists at HINP were, in general, environmentally oriented. Survey respondents believed in the fragility of nature, the possibility of an eco-crisis due to human use, rejected the notion of human exceptionalism from ecological constraints, thought there were limits to population growth, and believed that nature had a right to exist irrespective of human use.
- The strongest motives for visiting HINP were to enjoy nature, escape personal and/or social pressure, be with similar people, learn, and obtain physical fitness.
- Survey respondents felt personally connected to the HINP, reporting high levels of place identity, place dependence, and social bonding.

Detailed Study Findings

This section of the report we describe each of the variables included in the survey questionnaire. We present valid percents (percentage excluding missing values), means (averages), standard deviations for selected variables, and several figures.

Socio-demographic Characteristics

Overall, respondents included more men (59%) than women and the average age was 65 years. Respondents were well-educated, in that the average individual had at least a college degree. The average annual income before taxes was approximately \$100,000.

Table 1: Gender distribution (n = 199)

		Valid Percent
Gender	Female	38.9
	Male	60.6
Total		100.0

Table 2: Age distribution (n = 187)

	Years
Mean	44.9
Median	45.0
Min	18.0
Max	80.0

Table 3: Level of educational attainment (n = 188)

		Valid Percent
Level of Education	finished primary school (grades 1-7)	1.6
	some secondary school	11.2
	finished secondary school (grades 8-12)	13.3
	some technical or commercial / tafe	8.5
	finished technical or commercial / tafe	14.4
	some university / c.a.e. training	5.9
	university / c.a.e. degree	21.8
	Honors	3.2
	Masters	14.9
Ph.D., J.D. or equivalent	4.8	
Total		100.0

Table 4: Income (n = 162)

		Valid Percent
Level of Income	Less than \$20,000	9.9
	\$20,000 - \$49,999	16.7
	\$50,000 - \$99,999	32.7
	\$100,000 - \$149,999	19.8
	\$150,000 - \$199,999	8.0
	\$200,000 - \$249,999	5.6
	\$250,000 - \$300,000	3.1
	greater than \$300,000	3.1
Total		100.0

A total of 72% were born in Australia and 88% lived in Australia. For respondents that lived in Australia, the most common towns of residence were Townsville, Brisbane and Cairns. Regarding ethnic identification, 98% did not consider themselves to be of Aboriginal or Torres Strait Islander descent. The average number of people per household was just under three.

Table 5: Towns of residence for respondents that visited the Hinchinbrook area (n = 176)

Town	Valid Percent
Townsville	11.4
Brisbane	5.7
Cairns	5.7
Lucinda	5.1
Melbourne	4.0
Sydney	2.8
Others	65.3
Total	100.0

Table 6: Country of birth if respondents were not living in Australia (n = 20)

Country	Valid Percent
Belgium	20.0
Germany	15.0
U.S.	10.0
Others	55.0
Total	100.0

Table 7: Country of birth if respondents were not born in Australia (n = 42)

Country	Valid Percent
Germany	23.8
New Zealand	16.9
UK	7.1
Others	52.2
Total	100.0

Table 8: Ethnic identification (n=201)

Ethnicity	Valid Percent
Not a native descent	97.5
Native descent	2.5
Total	100.0

Table 9: Number of people in household (n=200)

	Number of people in household
Mean	2.9
SD	2.2
Median	2.0
Min	1.0
Max	21.0

Trip/Visit Characteristics

On average, respondents made 23 visits in the previous 12 months, which included individuals in caravan parks and local residents that counted each boat trip as a visit. Respondents had been frequenting the area for 13 years and over half traveled in a family group type. Day users' visits lasted for an average of six hours and overnight users for approximately 20 days. It should be noted that overnight users included individuals staying in a caravan park for several months at a time, as well as hikers staying on the HINP for several day backpacking trips.

Table 10: Respondents that have made previous visits to the Hinchinbrook area (n = 187)

		Valid Percent
Likelihood of return	No	39.6
	Yes	60.4
Total		100.0

Table 11: Number of times visited in prior 12 months (including the current visit)(n = 85)

Mean	23.8 days
Median	9 days
Max	200 days

Table 12: Number of years visiting (n = 101)

Mean	13.5 years
Median	9 years
Max	61 years

The average number of people per group was just over three with an average of approximately four adults and two children.

Table 13: Group size (n = 196)

		Valid Percent
Size of Personal Group	Alone	11.2
	2 people	55.6
	3 People	9.7
	4 People	9.7
	5-7 People	11.2
	More than 8 People	2.5
Total		100.0

Table 14: Number of children (n = 45)

		Valid Percent
Number in Party Under 18	None	15.6
	1	26.7
	2	24.4
	3	22.2
	More than 4	11.1
Total		100.0

Table 15: Personal group type (n = 198)

		Valid Percent
Group Type	Traveling alone	12.6
	Family	55.1
	Friends	19.2
	Family and/or friends	10.1
	Organized commercial tour	0.5
	Organized fishing trip	1.5
Total		100

Table 16: Day or overnight visit

		Valid Percent
Type of Visit	Day use only	16.6
	Overnight use	76.9

Table 17: Average length of stay for daytime and overnight respondents

Length of Stay	Day use only	6.0 hours
	Overnight use	21 nights

Table 18: Likelihood of return within the next 12 Months (n = 192)

		Valid Percent
Likelihood of Return	No	15.6
	Yes	80.9
Total		100

For respondents who did not expect to return, the most common reasons were “too far,” “would like to visit other places” and “too expensive.”

Table 20: Open-ended responses describing the primary reasons for not returning to HINP

Reason	Valid Percent
Too far	33.3
Would like to visit other places	18.2
Too expensive	9.1
No time	6.1
Other reasons	33.3
Total	100.0

Evaluation of Park Facilities, Programs, and Services

Respondents were asked to rate their level of satisfaction with a variety of programs, facilities, and services, and were generally satisfied with their park experience (M = 4.48, SD = 0.80). For individuals (41%) that took ferries to and from the island, these experiences were also viewed as satisfactory (M = 4.25, SD = 0.94).

Table 21: Overall satisfaction with recent visit (n = 190)

		Valid Percent
Satisfaction	Very dissatisfied	2.1
	Dissatisfied	0.5
	Neither satisfied nor dissatisfied	3.7
	Satisfied	36.3
	Very Satisfied	57.4
Total		100.0

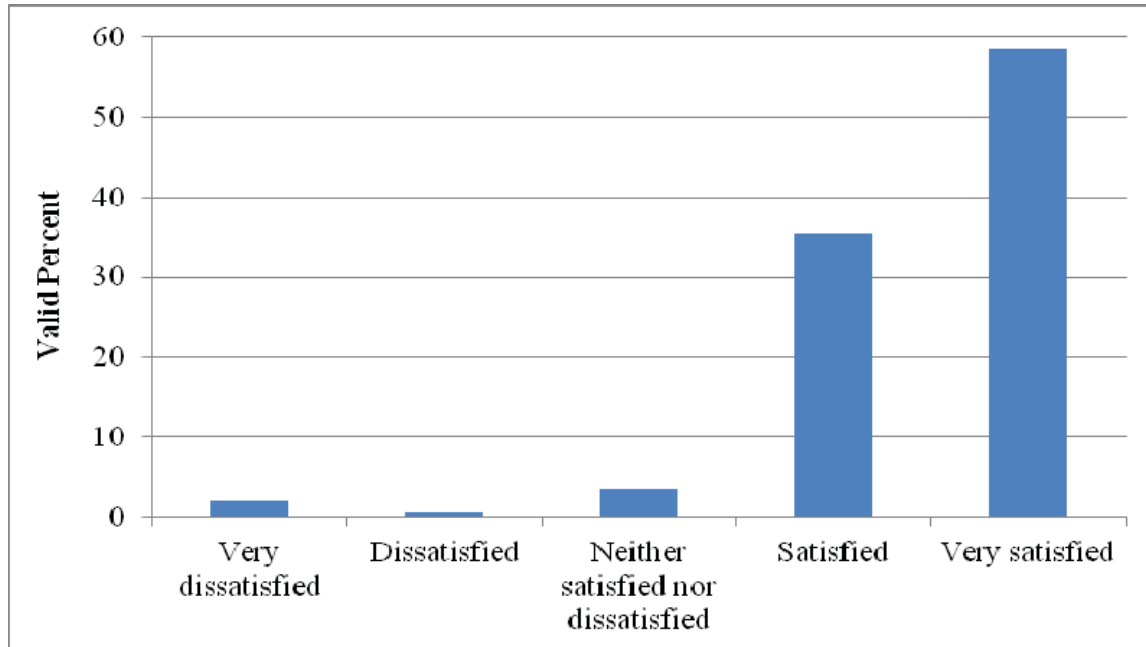


Figure 1: Overall satisfaction

Table 22: Impact of natural disasters (e.g., Cyclone Yasi) on satisfaction (n = 189)

Impacted satisfaction	Valid Percent	
	Yes	12.2
No	87.3	

Table 23: Travel to Hinchinbrook by ferry (n = 189)

Ferry experience	Valid Percent	
	Yes	41.3
No	58.7	

Table 24: Overall satisfaction with ferry operator (n = 122)

		Valid Percent
Satisfaction	Very dissatisfied	2.6
	Dissatisfied	1.3
	Neither satisfied nor dissatisfied	9.1
	Satisfied	37.7
	Very Satisfied	49.4
Total		100.0

Activity Participation

The most common recreation activities were hiking (51%), fishing (57%), camping (51%), taking photographs (52%), and wildlife viewing (41%). In contrast, few respondents reported kayaking (2%) and birding (10%).

Table 24: Activity participation (n = 195)

	Valid Percent
Activity	
Hiking Thorsborne Trail	37.4
Hiking, in general	9.6
Kayaking	2.0
Fishing	60.4
Camping	47.2
Picnicking	22.3
Birding	10.7
Taking photographs	50.8
Backpacking	18.8
Swimming	38.1
Wildlife viewing	39.6

Note. Respondents could check all that applied so column totals may not equal 100%.

Respondents' Recommendations for Managers

Respondents were asked, "If you could ask management to change some things about the way they oversee Hinchinbrook Island and the surrounding waters, what would you ask them to do?" The most common response was about cleaning up the site (9.4%). Many people were also concerned with improving the quality of facilities (8.7%), as well as providing or installing signs to teach people about the area (6.3%). These recommendations are provided to managers as options to improve the visitor experience.

Table 25: Summary of open-ended recommendations for managers

Recommendation	Valid Percent
Clean up the area	9.4
Facility improvement	8.7
Better or more signs	6.3
Be environmentally friendly or leave as it is	5.5
Regulate fishing	3.1
Control fire	2.4
Others	64.6
Total	100.0

Table 26: Comprehensive list of open-ended responses

Case	Comments
1	An alternative series of tracks across the island (east-west) would be nice. If there is to be any development on Hinchinbrook Island it must be away from the east coast and limited to a series of huts similar to New Zealand with the first and last huts being a minimum of two and a half hours walk from drop-off or pick-up points.
2	Build a skate park, make the paths in Lucinda concrete, and take away boat licenses
3	Increase sustainable fishing and farming relationship, expand wetland catchments, permit less commercial non-sustainable fisheries, offer artificial reefs in mid-depth in shore waters, lower fish bag limits, and implement a usage permitting system instead of boat regulations.
4	The Thorsborne trail between the Ramsey bay and Zoe Bay passes through a boggy and swampy area. I definitely would not like to see unnecessary infrastructure along the trail but very limited lengths of boardwalk in these areas would greatly reduce damage to the areas caused by visitors. You could make one route through the bog to minimize impact. Also, toilets should be maintained
5	At the southern end of Ramsey beach near the start of the Thorsborne trail there are notices about a series of enclosures used for an environmental study between 2002 and 2007. The enclosures are in disrepair now, and absurdly, the study is no longer current. Why has James Cook University (which ran the study) left this aging and damaged infrastructure in place for the forest to grow through? It doesn't seem right that an environmental study should leave behind its decaying infrastructure.
6	The Thorsborne trail at Hinchinbrook island is one of the best natural hiking trails I have done. I hope people learn fast to live within their footprints to give this island and our complete environment the chance to survive. The ferry is too expensive!
7	By allowing hikers/tourists to traverse this beautiful island, we are learning more about the environment so we can pass this on to friends and family and we can all help to look after our beautiful natural areas. Yes, this island has been devastated by cyclone Yasi, but it's not the first time and it won't be the last. DERM has done a good job of cleaning up and eventually it will regenerate!
8	Do not change a thing. Great work rebuilding/clearing the track after cyclone Yasi. Perhaps open some day walks into other valleys/mountains with marked trails, but don't allow more people. There wasn't much information on the cultural and historical aspects of Hinchinbrook Island. Perhaps consider making a map or a guide to Hinchinbrook Island / Thorsborne trail. Relevant questions that need to be answered: Are there Aboriginal artifacts? Where are the fish traps? What about folk art?
9	Ferry from Cardwell was very good. Ferry from Lucinda was not.
10	Fires at campsites! Less crocodiles. Clean the track near Sunken Reef Bay.
11	Government should provide more support (insurance wise) for families affected by cyclone. Effort should be directed away from Aborigines. Carbon tax not good.
12	I feel it is of great importance for students to gather information. It allows them to develop their skills and studies, and also helps in the area they have chosen.
13	I hope this place and places like these continue to exist in this unexploited way. I think it's good that there is a limit to the amount of people that can be at the island at one time, but that national park fees make it unaffordable for anyone to enjoy this beautiful place and enjoy, care for (and hopefully want to protect) nature.
14	I would have loved to have had more information about the plant life during the walk, the vegetation changes from forest to heathland to mangrove, etc. I would have more fully appreciated the variety and diversity of plant life and reasons why (e.g., aspect, geology, altitude). I would love to see the island again in a year or two to see how to

	regenerates the after the effects of Yasi. As a biologist myself, I would be interested in the findings from this survey.
15	I would have liked to be contacted about the changes in the operation of the ferry to the northern end of the island. Either upon my booking (February) or closer to the start of my trip (July).
16	Most humans are bad and don't deserve to be on this planet
17	I'm not sure how outcomes-based this survey design is. Would be a shame to collect data that isn't used for a protective purpose, because Hinchinbrook is a great place. I'd prefer to see data collected about user impact (i.e., toilet use versus not, soaps and detergents, rubbish collection, etc.). Many of the beaches on Hinchinbrook are in need of rubbish (sea debris) collection and it would be amazing if the ferry operators had an obligation to remove some of the debris as a small gift back to the park for taking so much money for their service!
18	If Hinchinbrook Island waterways are closed to recreational fishing, Lucinda, Ingham and the area will lose a valuable resource, and the economic consequences would be disastrous for the area and the state of Queensland.
19	It's an amazing survey that is very well put together
20	Keep all the big resorts out leave it as natural as much as possible
21	Keep the beach; that was the joy to us.
22	Make less money to visit. Make more information available on what people see and/or experience on the island.
23	The cost of ferries and camping fees makes it a very expensive trip for a family.
24	The lack of decent signage was by times very frustrating. Other times it was very confusing (multiple trails without signs/markers).
25	There is need for better cost effective boating facilities such as pontoon access lining the water, no rocks on banks to avoid damage if wind carries boats, and water way should be facing the direction of the wind.
26	Please make a walking trail up to the bomber crash site.
27	All areas of the Thorsborne trail are equally as special for all the feelings listed. What a great place.
28	The toilet on the campsites needs some attention and not all sites have rat boxes. A very beautiful island - keep up on the good work!
29	Tea would be nice with the survey! This would definitely encourage hikers to fill it in
30	Thanks for a great experience walking Hinchinbrook Island. All those involved who helped plan and provide services (Cardwell Info center, QPWS, bus driver, ferry services (north and south), caravan park) provided an excellent standard of service. They were friendly, informative and helpful. Also, a big thanks to all those who helped clear the track and restore campsites and facilities after what was obviously a most destructive storm.
31	Thank you for your interest in this special place. The damage from cyclone Yasi was severe. I wish to record my thanks to those that helped clean the track.
32	The root cause of most of our problems is overpopulation. Control that and most other problems will solve themselves.
33	We were a bit surprised to see the palm trees cut at Nina Bay and elsewhere. Later the locals told me it was because they were not native plants. I think an explanation somewhere would be great. We thought the formula tropical island = Palm Trees was always right. Same for the consequences of Cyclone Yasi. We don't know how nature handles the destruction and how long it takes to recover. I would appreciate some explanations to get a better sense.

34	We would like to express our appreciation to everyone involved in the re-opening of the Thorsborne trail in the wake of cyclone Yasi. Obviously A LOT of work was involved, and we were very thankful to be able to do our hike. Thank you also for the rangers - the rat-proof boxes were clean and we hope the recovery continues after such devastation.
35	We come here five months every year to go fishing.
36	I am worried about other countries telling us what we can do
37	With fishing laws (e.g. bag limits), there should be more consultations with fishermen. This would help compliance. Sometimes not consulting is unsustainable. Bag limits shouldn't be based on household.
38	We think a survey like this is important because people like us give information that might help to keep this place beautiful and unspoiled.

Social Value Mapping

This subsection of the report includes the results from a mapping exercise that asked respondents to rank 12 social values that could be associated with the natural land and seascapes within HINP (see Table 27). Next, respondents were asked to situate values on a map of the study area to illustrate which regions carried some kind of worth or importance (van Riper et al., 2012).

Table 27: Definitions of 12 social value types assigned to places by survey respondents.

Aesthetic Value. I value these places because I enjoy the scenery, sights, sounds, smells, etc.
Biological Diversity Value. I value these places because they provide a variety of fish, wildlife, plant life, etc.
Cultural Value. I value these places because they allow me to continue and pass down the wisdom and knowledge, traditions, and way of life of my ancestors.
Economic Value. I value these places because they provide useful resources (e.g., fisheries, tourism opportunities).
Future Value. I value these places because they allow future generations to know and experience Hinchinbrook as it is now.
Historic Value. I value these places because they have natural and human historical significance that matters to me, others, or the country.
Intrinsic Value. I value these places in and of themselves, whether people are present or not.
Learning Value. I value these places because we can learn about the environment through scientific observation or experimentation.
Life Sustaining Value. I value these places because they help produce, preserve, clean, and renew air, soil and water.
Recreation Value. I value these places because they provide opportunities for outdoor recreation.
Spiritual Value. I value these places because they are sacred, religious, or spiritually special to me or because I feel reverence and respect for nature there.
Therapeutic Value. I value these places because they make me feel better physically or mentally.

Our results suggested 12 social value types were unevenly distributed, thus indicating places of particular importance. In other words, there was evidence to support the idea of “hotspots” or high priority areas that emerged according to outdoor recreationists’ perceptions of places that embodied relatively important social values for natural landscapes (Alessa et al., 2008). The most intensely valued places were Sunken Reef Bay, Zoe Bay, and Little Ramsay Bay along the Thorsborne Trail, as well as the southern end of the Hinchinbrook Channel and the Missionary Bay Creeks nestled within mangrove estuaries at the north end of the island. These areas accommodated multiple recreational activities such as fishing, kayaking, hiking, and swimming in freshwater falls (see Figure 2).

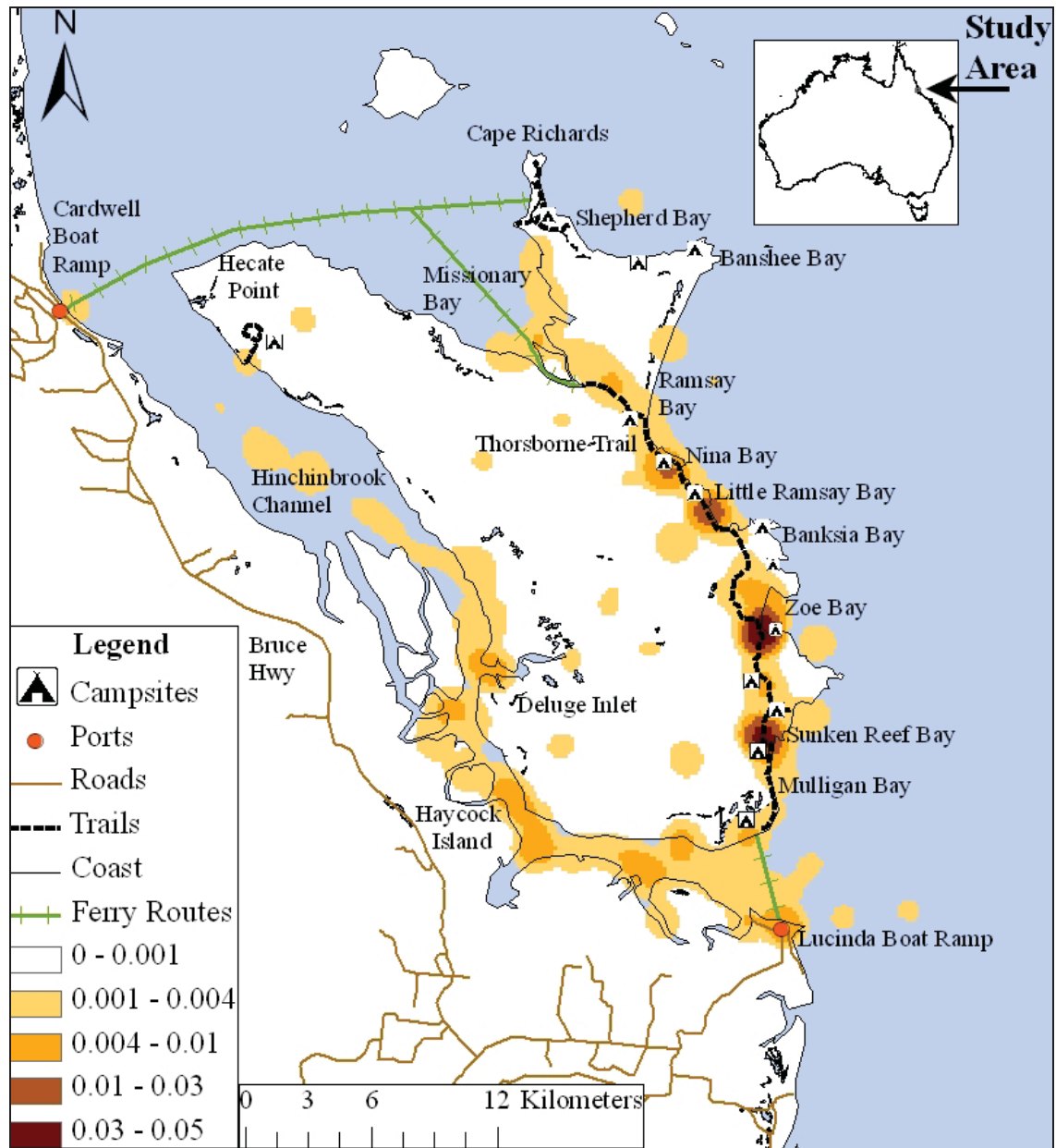


Figure 2: Results from the kernel density analysis of social value points assigned to places by outdoor recreationists at Hinchinbrook Island National Park. The darker the color, the more intensely valued the place.

Our analysis of spatial data collected for this study was applied to two subgroups that engaged in consumptive (e.g., fishing, crabbing, prawning) and non-consumptive (e.g., hiking, camping, kayaking) activities. These two groups assigned multiple values to places; however, the *most* important values were associated with Aesthetic, Biological Diversity, and Recreation qualities. A total of 236, 236, and 400 points were respectively marked by survey respondents. We reported average nearest neighbor statistics in a Geographic Information System including R values (i.e., ratio of the observed versus expected distance among points), Z scores (i.e., number of standard deviations from the mean of each R value), and the ranks of each social value to illustrate the relative importance of each social value type (see Table 28) (Sherrouse et al. 2011).

Table 28: Average nearest neighbor statistics for 12 social value types among two subgroups and the pooled sample of outdoor recreationists

Value Type	Non-Consumptive Subgroup		Consumptive Subgroup		Pooled Sample	
	Rank (n)	R value (Z score)	Rank (n)	R value (Z score)	Rank (n)	R value (Z score)
Aesthetic	2 nd (134)	0.5 (-10.7)*	3 rd (102)	0.6 (-8.7)*	3 rd (236)	0.4 (-16.5)*
Biological Diversity	3 rd (95)	0.6 (-7.3)*	2 nd (131)	0.9 (-3.0)*	2 nd (236)	0.7 (-9.5)*
Cultural	12 th (5)	0.6 (-7.3)*	12 th (6)	1.6 (2.8)	12 th (11)	0.8 (-1.4)*
Economic	9 th (13)	1.4 (2.4)	7 th (24)	0.9 (-1.2)*	7 th (37)	0.7 (-3.7)*
Future	4 th (49)	0.8 (-2.8)*	4 th (51)	1.1 (1.0)	4 th (100)	0.7 (-5.1)*
Historic	7 th (17)	1.0 (0.1)	9 th (16)	1.4 (3.1)	8 th (33)	1.0 (-0.5)
Intrinsic	6 th (39)	1.0 (0.3)	6 th (47)	1.0 (-0.6)	6 th (86)	0.8 (-3.0)*
Learning	11 th (8)	2.1 (5.9)	8 th (19)	1.1 (0.5)	9 th (27)	1.1 (0.6)
Life Sustaining	8 th (14)	1.8 (5.8)	11 th (6)	3.3 (10.8)	10 th (20)	1.0 (0.1)
Recreation	1 st (147)	0.5 (-10.9)*	1 st (253)	0.5 (-14.8)*	1 st (400)	0.5 (-19.3)*
Spiritual	10 th (12)	1.3 (2.2)	10 th (8)	1.4 (2.1)	11 th (20)	0.9 (-0.5)*
Therapeutic	5 th (48)	0.6 (-5.4)*	5 th (49)	0.8 (-2.3)*	5 th (97)	0.7 (-5.8)*

* = statistically significant spatial clustering at $p < 0.01$

Social Values Related to Natural Landscapes

We compared social values to three measures of the natural environment at HINP (see Table 29).

Table 29: Data utilized to examine social values and characteristics of the natural environment

Data	Description	Source
Social Value Points	Values assigned to places by survey respondents. These points illustrated the distribution and point density of social values assigned to HINP's land and seascapes.	On-site and mailback surveys administered by Primary Investigator and Hinchinbrook Island ferry operators, respectively.
ASTER-GDEM	Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model (GDEM) was a product of METI and NASA.	http://gcmd.gsfc.nasa.gov/index.html
Slope	Percent slope.	Derived from Global Digital Elevation Model.
Distance to Trails	Distance between social value points and the Thorsborne Trail.	Calculated from digitized features.
Distance to Water	Distance between social value points and all bodies of water including wetlands, the Hinchinbrook Channel, and the open ocean.	Calculated from digitized features.
Hillshade	Grayscale background used for illustration purposes.	Derived from Global Digital Elevation Model.
Wetlands	All wetlands found on the island. Used to calculate distance to water.	http://dds.information.qld.gov.au/dds/
Landsat	Satellite imagery (2005) of the HINP used for illustration purposes.	http://www.derm.qld.gov.au/services_resources/category.php?class_id=8
Great Barrier Reef Marine Park Waters	The open ocean surrounding Hinchinbrook Island. Used to calculate distance to water.	http://www.gbrmpa.gov.au/resources-and-publications/spatial-data-information-services/spatial-data-information
Queensland Parks and Wildlife Service waters	The Hinchinbrook Channel next to Hinchinbrook Island. Used to calculate distance to water.	http://www.derm.qld.gov.au/services_resources/category.php?class_id=8
Roads	The Bruce Highway running along the Cassowary Coast.	http://www.derm.qld.gov.au/services_resources/category.php?class_id=8
Hinchinbrook Towns	Data points for the two ports that lead to Hinchinbrook Island, including Cardwell and Lucinda.	http://www.derm.qld.gov.au/services_resources/category.php?class_id=8
Coast line	Boundary of Hinchinbrook Island and the adjacent coastline.	http://www.gbrmpa.gov.au/resources-and-publications/spatial-data-information-services/spatial-data-information

The three layers generated to represent natural landscapes on the HINP included: 1) distance to water (i.e., the shortest straight-line distance of each cell to water features including the coastline, wetlands, and mangroves estimated with the Euclidian Distance tool included in the ArcGIS Spatial Analyst extension); 2) distance to trails (i.e., shortest straight-line distance of each cell to the primary trail system, The Thorsborne Trail, using Spatial Analyst); and 3) slope (i.e., percent slope using the Surface Analysis tool in Spatial Analyst).

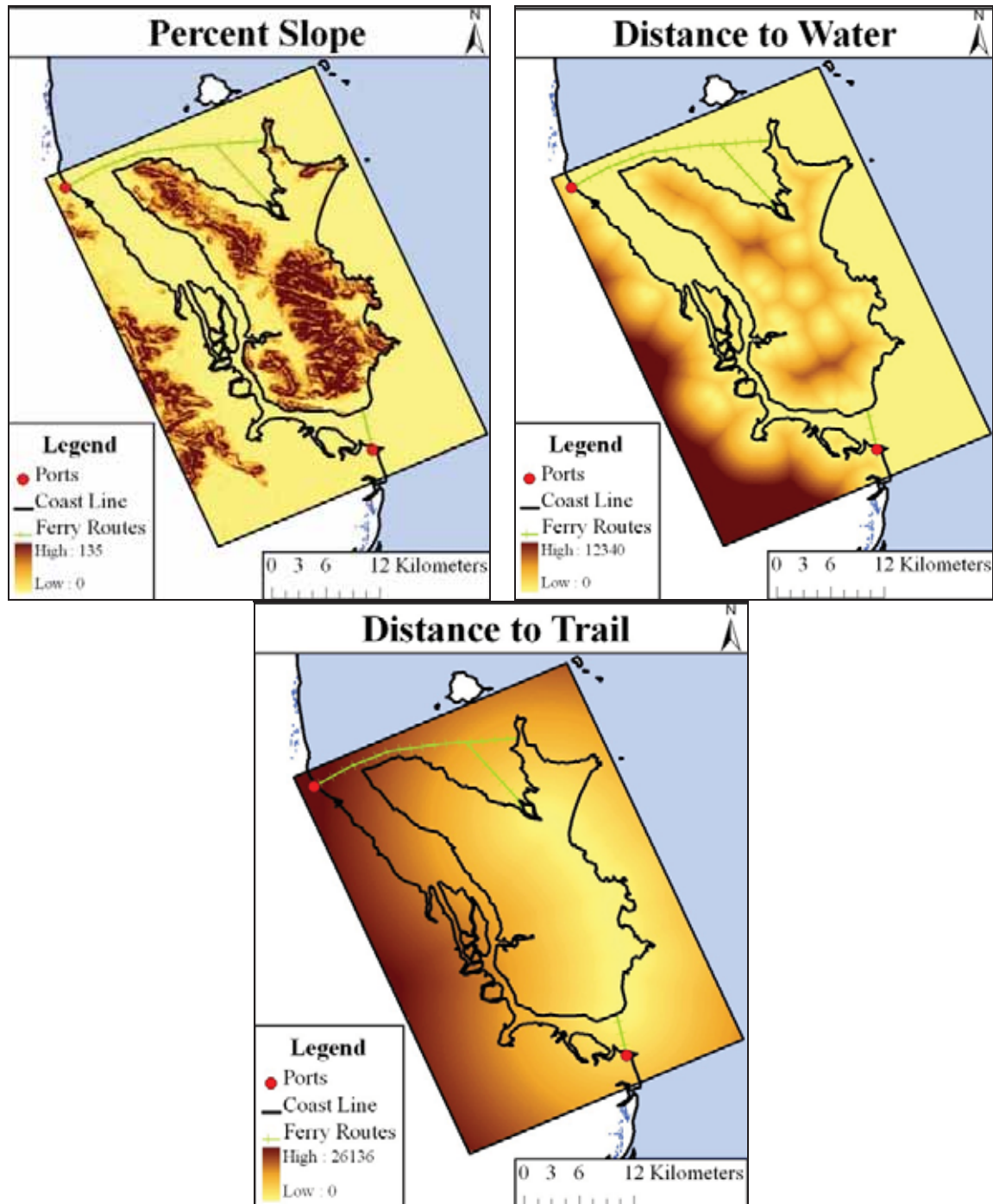


Figure 3: Three spatial layers of natural resource conditions that were compared to the spatial analysis of social values. These layers represented percent slope, distance to bodies of water on and around the island, and distance to the Thorsborne Trail on HINP.

Next, the three most important social values – Aesthetic, Biological Diversity, and Recreation – were examined for the two subgroups of outdoor recreationists defined by the activity types of consumptive and non-consumptive use. A “Value Index” was generated to reflect the intensity of social values assigned to places. Results suggested that on one hand, the consumptive subgroup associated Aesthetic value with a broader area that spanned across the terrestrial and aquatic environments of Hinchinbrook (Value Index = 7). This subgroup assigned Aesthetic value to places near the water and the island’s walking track. No discernible trend emerged in the relationship between slope and the consumptive subgroups’ assignments of Aesthetic value. In comparison, the non-consumptive subgroup more intensely valued a smaller area on the east side of the island (Value Index = 10). Places considered most important to this subgroup had steeper slopes, were closer to the trail, and farther from bodies of water on and around the island.

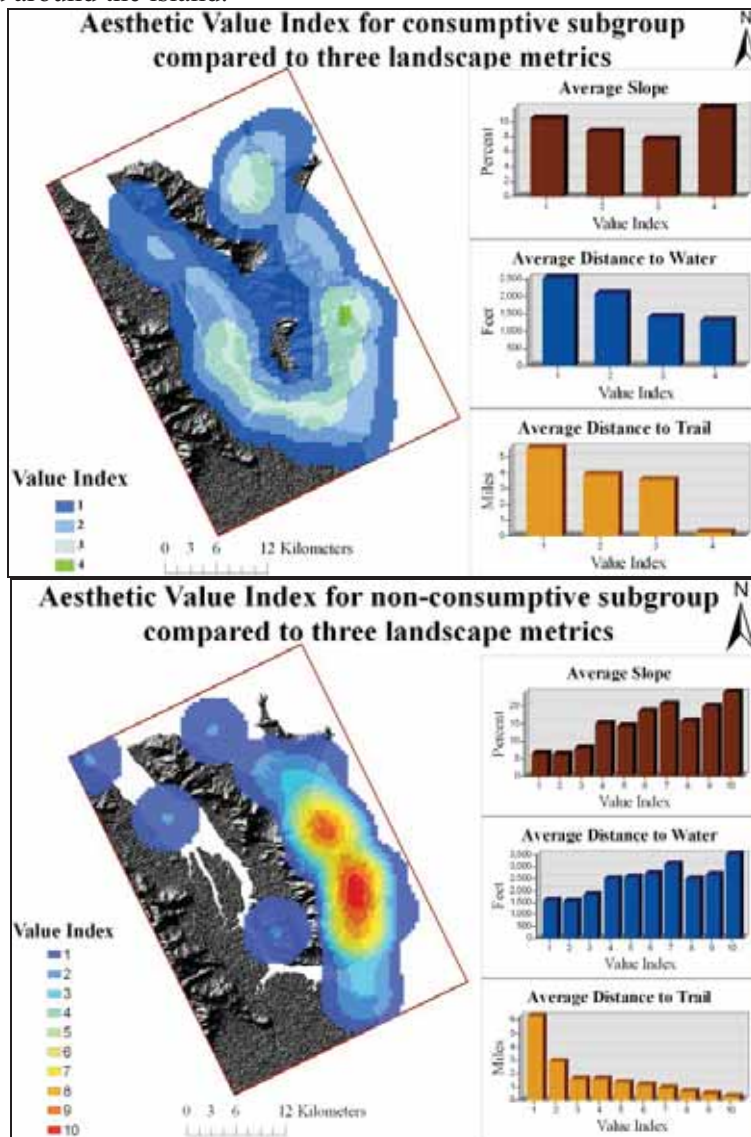


Figure 4: Value Index scores for Aesthetic social values assigned to places by two subgroups of outdoor recreationists on HINP. Graphical representations of the Value Index scores are overlaid on maps of the study area to illustrate which places were most and least intensely valued. The three charts illustrate the relationship between the Value Index scores and three landscape metrics including slope, distance to water, and distance to trail.

Biological Diversity values were spread across a larger area indicated by low Value Index scores of five for both consumptive and non-consumptive subgroups. Similar to the differences found in the allocation of Aesthetic value points, the consumptive subgroup assigned Biological Diversity values to an area that covered most of the HINP. There was variation in the relationship between social values and measures of the natural environment, though the general trend suggested places with less steep slopes, closer to the trail, and closer to the water carried Biological Diversity value. The non-consumptive subgroup felt that the east side of the HINP primarily embodied Biological Diversity value, as did areas with steeper slopes and in close proximity to the trail.

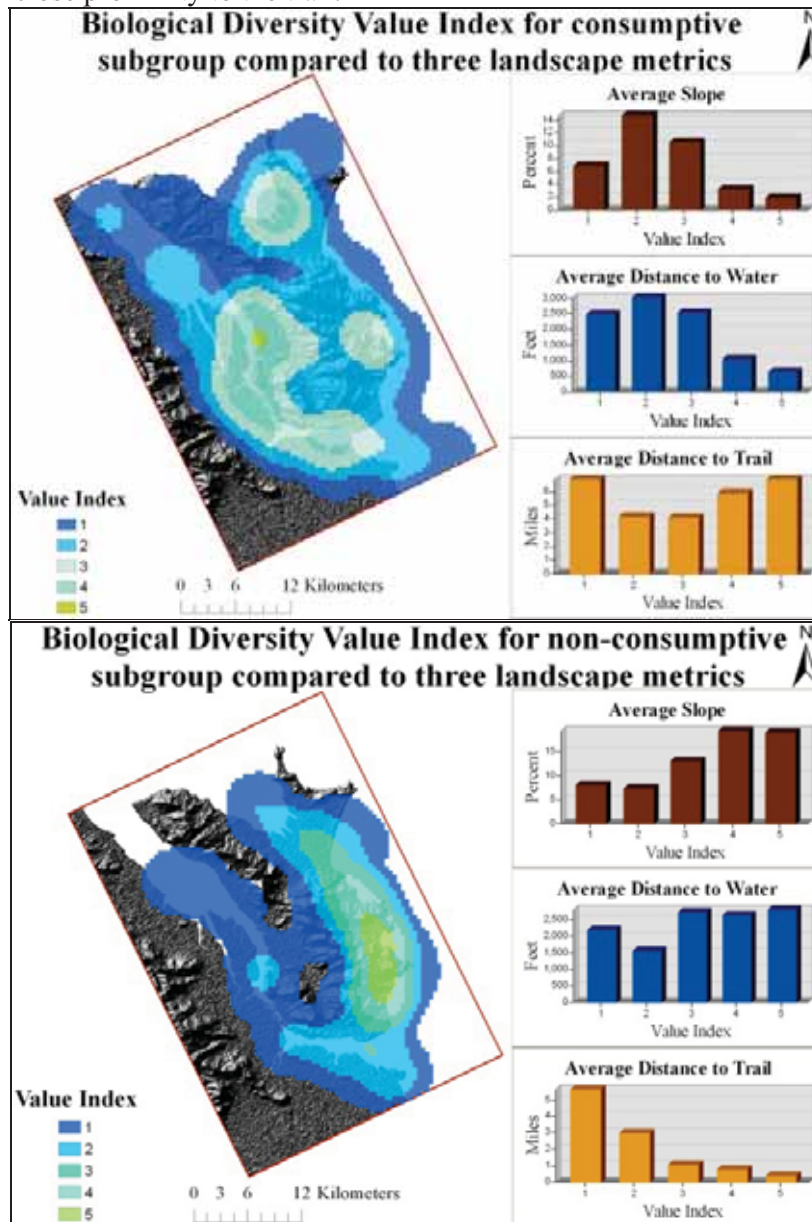


Figure 5: Value Index scores for Biological Diversity social values assigned to places by two subgroups of outdoor recreationists on HINP. Graphical representations of the Value Index scores are overlaid on maps of the study area to illustrate which places were most and least intensely valued. The three charts illustrate the relationship between the Value Index scores and three landscape metrics including slope, distance to water, and distance to trail.

Pronounced differences emerged in the two subgroups' allocations of Recreation values, and the relationship between social data and the three landscape metrics. On one hand, the consumptive subgroup most intensely valued the Hinchinbrook Channel and preferred places for recreational activities with less steep slopes, closer to the water, and closer to the trail. On the other hand, the non-consumptive subgroup associated Recreation value with the Thorsborne Trail and contrasting relationships with natural resource conditions emerged. This subgroup assigned Recreation value to places with steeper slopes, farther from the water, and closer to the trail. The subgroup engaged in consumptive activities attained a Value Index score of 10 and the subgroup engaged in non-consumptive activities attained a score of 9.

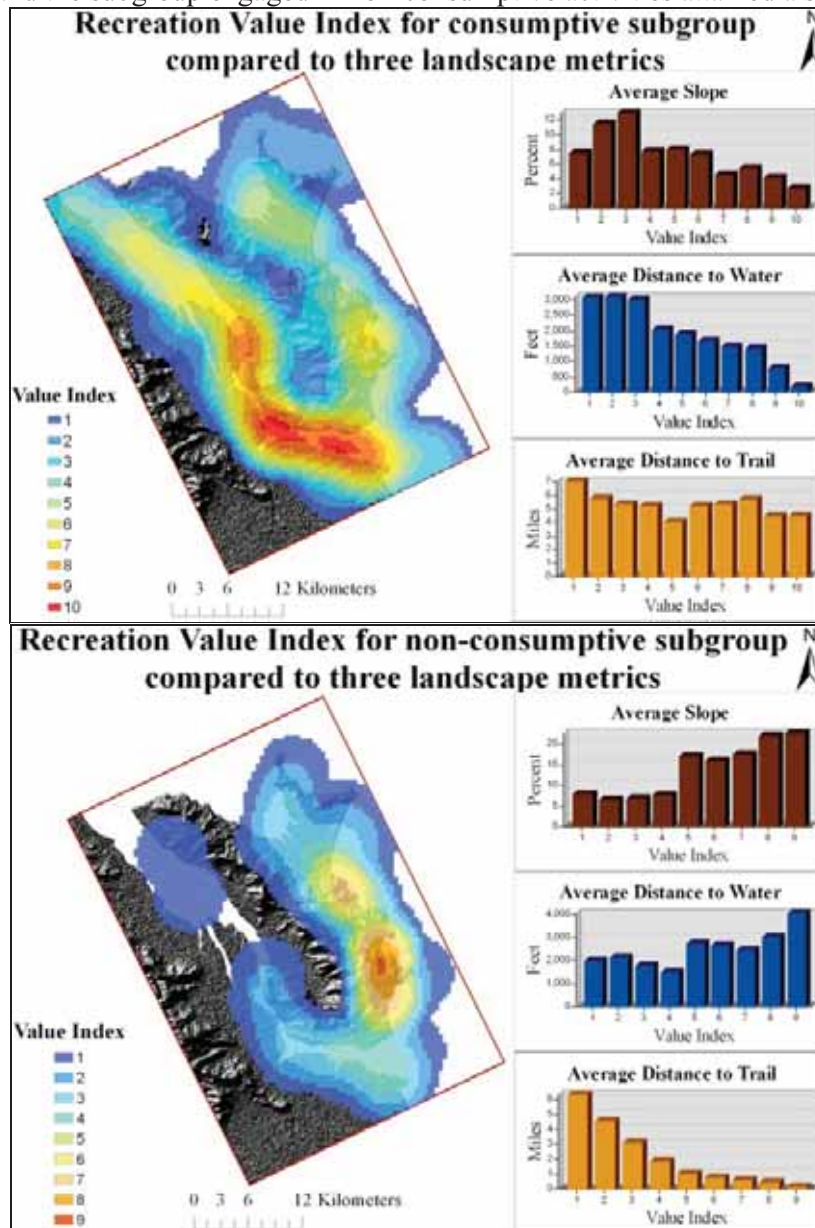


Figure 6: Value Index scores for Recreation social values assigned to places by two subgroups of outdoor recreationists on HINP. Graphical representations of the Value Index scores are overlaid on maps of the study area to illustrate which places were most and least intensely valued. The three charts illustrate the relationship between the Value Index scores and three landscape metrics including slope, distance to water, and distance to trail.

Environmental Concern

Outdoor recreationists were asked to report their level of agreement with statements that expressed their beliefs / environmental concerns about the relationship between people and nature. Respondents' views were thought to constitute a "New Ecological Paradigm" that represents a shift in how people interact with natural landscapes (Dunlap & Van Liere, 1978). Environmental concerns influence attitudes and behavior, and can be organized into five dimensions (see Table 30). In general, respondents endorsed the New Ecological Paradigm and believed in the fragility of nature, the possibility of an eco-crisis due to human use, rejected the notion of human exceptionalism from ecological constraints, thought there were limits to growth, and that nature was intrinsically valuable (see Figure 7).

Table 30: Level of agreement or disagreement with statements about environmental concern

Subscale Items	Percent			Mean	SD
	Disagree	Neutral	Agree		
Balance of Nature				3.3	0.5
When human interfere with nature it often produces disastrous consequences	9.5	22.8	67.8	3.8	0.9
The balance of nature is strong enough to cope with modern industrial nations	64.8	25.8	9.3	2.2	0.9
The balance of nature is very delicate and easily upset	7.1	18.7	74.2	3.9	0.9
Eco-crisis				3.3	0.6
Humans are severely abusing the environment	16.5	18.6	65.0	3.6	1.1
The so-called "ecological crisis" facing humankind has been greatly exaggerated	39.8	31.5	28.7	2.7	1.1
If things continue on their present course we will soon experience a major ecological catastrophe	17.7	27.1	55.3	3.5	1.1
Anti-Exemptionism				3.2	0.6
Human ingenuity will insure that we do not make the earth unlivable	32.2	35.0	32.8	2.9	1.0
Despite our abilities, humans are still subject to the laws of nature	4.3	12.1	83.5	4.0	0.8
Humans will eventually learn enough about how nature works to be able to control it	50.8	29.3	19.9	2.5	1.1
Limits to Growth				3.5	.6
We are approaching the limit to the number of people the earth can support	18.7	18.1	63.0	3.6	1.2
The Earth is like a spaceship with very limited room and resources	16.7	30.0	53.3	3.4	1.0
The Earth has plenty of resources if we just learn how to develop them	21.6	21.5	56.9	3.4	1.0
Anti-anthropocentrism				2.9	0.5
Humans have the right to modify the natural environment to suit their needs	51.9	27.9	20.2	2.5	1.0
Plants and animals have as much right as humans to exist	10.4	11.5	41.0	4.0	1.0
Humans were meant to rule over the rest of nature	59.3	29.9	10.8	2.2	1.0

Note. Values are mean scores on a scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

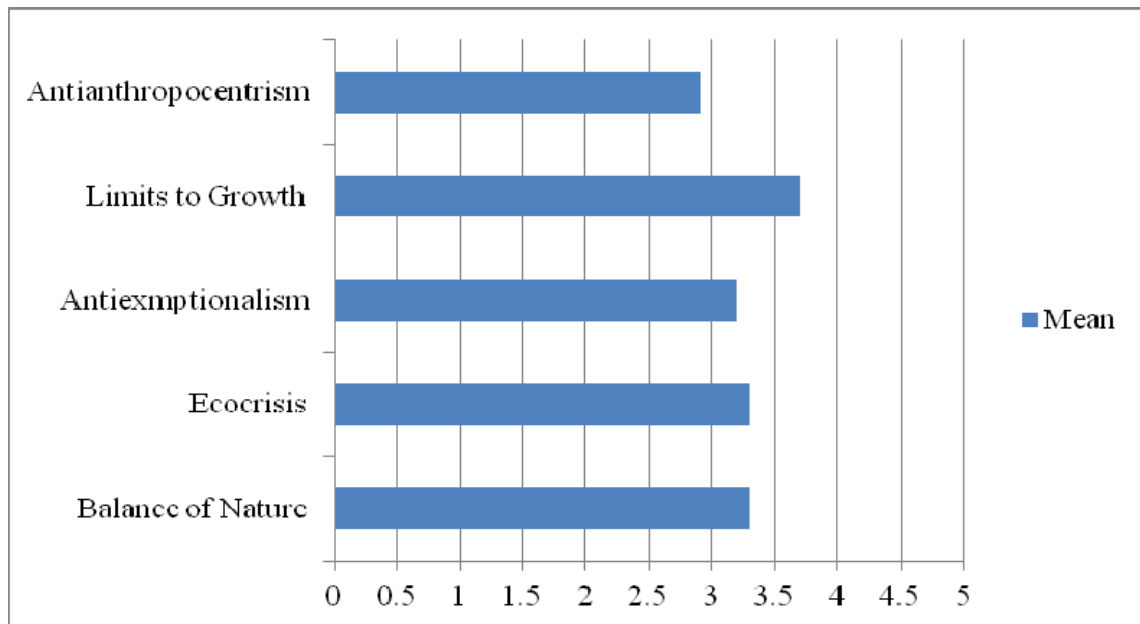


Figure 7: Average scores of respondents' reported levels of environmental concern for five dimensions of the New Ecological Paradigm scale.

Motivations

Motives for visiting the park were measured using 31 survey items assessing the importance of desired experiences (see Table 31) (Moore & Driver, 2005). Respondents were asked to indicate their level of agreement with statements on a five-point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The types of motives that pushed or pulled people into outdoor recreation on Hinchinbrook fell within the following categories: Achievement (three items), Autonomy (two items), Equipment (two items), Being with similar people (four items), Learning (four items), Enjoying nature (four items), Introspection (four items), Physical fitness (two items), Escaping personal / social pressure (two items), and Escaping physical pressure (four items). Based on mean scores, the most highly rated individual items were: “to have a break from being too busy mentally” and “to experience tranquility.”

Among the various dimensions of motivation, respondents considered nature enjoyment to be the most important motive to engaging in recreation within the HINP (see Figure 8). The majority of the respondents agreed that their motives were also “to view the scenery (91.8%),” “to view the scenic beauty (89.9%),” “to be close to nature (76.4%),” and “to be in a natural setting (84.1%).”

Regarding the **Introspection** dimension, respondents disagreed that they were at the HINP “to develop personal, spiritual values (41.0%),” “to grow and develop spiritually (40.6%),” and “to learn more about myself (38.8%).” On the other hand, 38.5% of the respondents were neither agreeable nor disagreeable that they were motivated “to think about my personal values.” As for **Achievement/Stimulation**, about half of the respondents (51.7%) considered “developing my skills and abilities” the most agreeable preference/motive to recreate at the park. Similarly, 52.8% of the respondents agreed “be challenged.” About 47.5% of the respondents agreed “to improve skills.” There were two items that examined **Autonomy/Leadership**. About 40.1% of the respondents considered “to feel my independence” an important preference/motive for recreating at the park; however, 51.6% disagreed they were at the HINP “to be on my own.”

For **Equipment**, over a half (57.7%) disagreed with the statement “to talk with others about my equipment” and 40.4% disagreed that they wanted “to test and use my equipment.” Regarding **Similar People**, the majority of the respondents agreed with the statement “to be with members of my group” (79.1%), “to be with friends” (74.0%), “to be with people having similar values” (65.0), and “to be with people who have similar interests” (74.6%). **Learning** was also an important driver for respondents’ motivations. Respondents were also in agreement that they were at the HINP “to learn more about things” (62.6%), “to understand things better here” (52.3%), “to experience new and different things” (65%), and “to explore the area” (58.9%). For the **Physical Fitness** dimension, respondents (66.8%) desired “to get exercise” and 58% wanted “to improve my physical health.” **Escaping Pressures** was also examined and results suggested that respondents engaged in recreation “to give their mind a rest (74.1%) and “to have a break from being too busy mentally (71.8%). Recreationists also wanted “to experience tranquility” (77.8%), “to experience solitude” (45.6%), “to be away from crowds of people” (63.9%), and “to experience the open space” (73.4%).

Table 31: Level of agreement or disagreement with statements about motivation

	Percent			Mean	SD
	Disagree	Neutral	Agree		
Achievement / Stimulation				3.4	0.9
To develop my skills and abilities	16.3	32.0	51.7	3.4	1.1
To be challenged	20.8	26.4	52.8	3.4	1.2
To improve your skills	18.9	33.3	47.8	3.4	1.1
Autonomy / Leadership				2.9	1.0
To feel my independence	23.8	36.2	40.1	3.2	1.2
To be on my own	51.6	25.7	21.7	2.5	1.2
Equipment				2.5	1.0
To talk with others about my equipment	57.7	27.4	14.8	2.3	1.2
To test and use my equipment	40.4	24.7	34.8	2.8	1.3
Similar People				3.9	0.5
To be with members of my group	8.5	12.4	79.1	4.0	1.0
To be with friends	9.7	16.2	74.0	3.9	1.0
To be with people having similar values	14.8	20.2	65.0	3.7	1.1
To be with people who have similar interests	7.7	17.7	74.6	3.9	1.0
Learning				3.8	0.5
To learn more about things (here/there)	11.8	25.7	62.6	3.6	1.0
To understand things better here	15.1	32.6	52.3	3.4	1.0
To experience new and different things	7.7	17.2	75.0	4.0	1.0
To explore the area	3.4	10.7	58.9	4.1	0.8
Enjoy Nature				4.3	0.7
To view the scenery	2.7	5.5	91.8	4.4	0.8
To view the scenic beauty	1.0	9.1	89.8	4.5	0.7
To be close to nature	7.6	15.9	76.4	4.0	1.1
To be in a natural setting	3.3	12.6	84.1	4.2	0.8
Introspection				2.7	1.0
To develop personal, spiritual values	41.0	39.2	19.8	2.6	1.1
To grow and develop spiritually	40.6	38.4	20.9	2.6	1.2
To think about my personal values	33.5	38.5	27.9	2.8	1.2

To learn more about myself	38.8	35.4	25.9	2.8	1.2
Physical Fitness				3.8	1.8
To get exercise	14.1	19.0	66.8	3.7	1.1
To improve my physical health	14.7	26.0	58.8	3.8	3.2
Escape Personal / Social Pressure				4.1	2.1
To give my mind a rest	9.2	16.7	74.1	3.9	1.0
To have a break from being too busy mentally	7.8	19.9	71.8	4.2	3.9
Escape Physical Pressure				3.8	0.7
To experience tranquility	5.4	16.8	77.8	4.0	0.9
To experience solitude	20.6	33.9	45.6	3.4	1.1
To be away from crowds of people	13.7	9.3	63.9	3.8	1.1
To experience the open space	4.9	21.7	73.4	3.9	0.9

Note. Values are mean scores on a five point scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

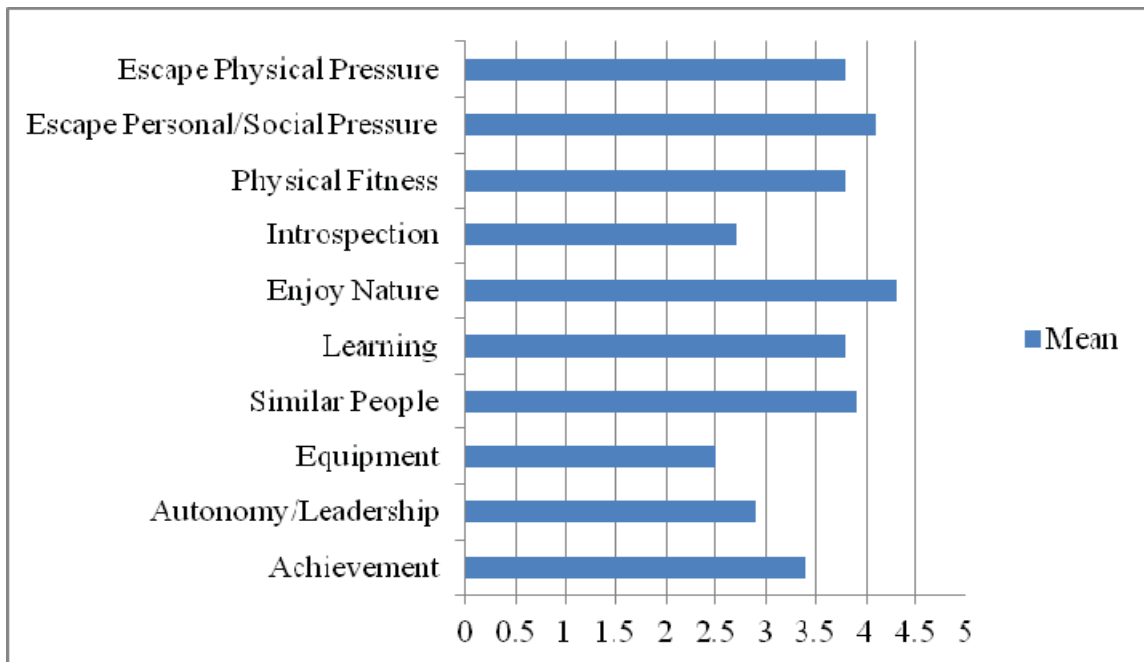


Figure 8: Average scores of respondents' reported motivations for ten dimensions of the Recreation Experience Preference scale.

Place attachment

Another section of the survey assessed “place attachment,” or in other words, the personal connections that survey respondents shared with places on HINP. Multiple-item scales were used to measure three dimensions of place attachment: 1) place identity (six items), 2) place dependence (six items), and 3) social bonding (six items) (Williams & Vaske, 2003; Kyle et al., 2005). In general, respondents did not report strong attachments to the HINP. The average outdoor recreationist neither agreed nor disagreed with statements measuring **place identity** that suggests attachment can be formed on the basis of psychological bonds that define self perception (M = 3.2). Results from the analysis of **place dependence** survey items suggested that respondents disagreed with statements measuring the relative functionality of the HINP to satisfy their needs M = (2.8). Respondents also disagreed with measures of **social bonding**, which examine the interpersonal relations that recreationists draw from to create shared meanings of the HINP (M = 2.8).

For measures of place identity, more than half (57.7%) agreed with the statement, “the area is very special to me.” Others agreed that “I identify strongly with the area” (39.0%), “I am very attached to the area” (44.5%), “Visiting this place says a lot about who I am” (35.1%), and “The area means a lot to me” (37.3%). The survey also asked about functional attachment (i.e., place dependence) to the Hinchinbrook area. A total of 46.5% of the respondents agreed that “The area is the best place for what I like to do.” However, 62.3% agreed that “The things I do at the area I would enjoy doing just as much at a similar site.” Nearly half of respondents disagreed that “Doing what I do at the area is more important to me than doing it in any other place” (41.0%) and “I wouldn't substitute any other area for doing the types of things I do here” (42.8%). A total of 43.6% of the respondents reported a neutral response to the statement, “I get more satisfaction out of visiting this place than any other.” Regarding place bonding, 6.89% agreed that “I have a lot of fond memories about this place” and 64.6% agreed that “I will bring my children to this place.” Some people disagreed that “I don't tell many people about the Hinchinbrook area” (55%), “My friends/family would be disappointed if I were to start visiting other settings and facilities” (66%) and “If I were to stop visiting the area, I would lose contact with a number of friends” (67.9%). Some neither agreed nor disagreed that “I have a special connection to the area and the people who use it” (40.6%).

Table 32: Summary of average levels of place attachment dimensions

Dimension of Place Attachment	N	Mean	Std. Deviation
Place identity	170	3.2	0.9
Place dependence	176	2.8	0.7
Place Bonding	170	2.8	0.6

Table 33: Level of agreement or disagreement with statements about place attachment

Subscale Items	Percent			Mean	SD
	Disagree	Neutral	Agree		
Place Identity				3.2	0.9
I feel the Hinchinbrook area is part of me	40.1	38.9	20.5	2.7	1.0
The Hinchinbrook area is very special to me	13.7	28.6	57.7	3.5	1.0
I identify strongly with the Hinchinbrook area	24.4	35.6	39.0	3.1	1.1
I am very attached to the Hinchinbrook area	23.6	31.9	44.5	3.3	1.0
Visiting this place says a lot about who I am	32.7	32.2	35.1	3.0	1.1
The Hinchinbrook area means a lot to me	18.1	31.3	37.3	3.3	1.0
Place Dependence				2.8	0.7
The Hinchinbrook area is the best place for what I like to do	17.5	36.1	46.5	3.3	1.0
No other place can compare to the Hinchinbrook area	31.0	41.4	27.6	2.9	1.1
I get more satisfaction out of visiting this place than any other	38.1	43.6	18.3	2.7	1.0
Doing what I do at the Hinchinbrook area is more important to me than doing it in any other place	41.0	39.2	19.0	2.6	1.0
I wouldn't substitute any other area for doing the types of things I do here	42.8	39.4	17.8	2.6	1.0

The things I do at the Hinchinbrook area I would enjoy doing just as much at a similar site*	10.0	27.8	62.3	2.4	0.8
Place Bonding				2.8	0.7
I have a lot of fond memories about this place	10.0	21.1	68.9	3.8	1.0
I have a special connection to the Hinchinbrook area and the people who use it	33.3	40.6	26.1	2.8	1.1
I don't tell many people about the Hinchinbrook area*	55.3	30.7	14.1	2.6	1.0
I will (do) bring my children to this place	11.2	24.2	64.6	3.7	1.0
My friends/family would be disappointed if I were to start visiting other settings and facilities	66.1	26.6	7.4	2.0	1.0
If I were to stop visiting the Hinchinbrook area, I would lose contact with a number of friends	67.9	15.2	16.9	2.1	1.2

Note. Values are mean scores on a scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).
 * = reverse coded

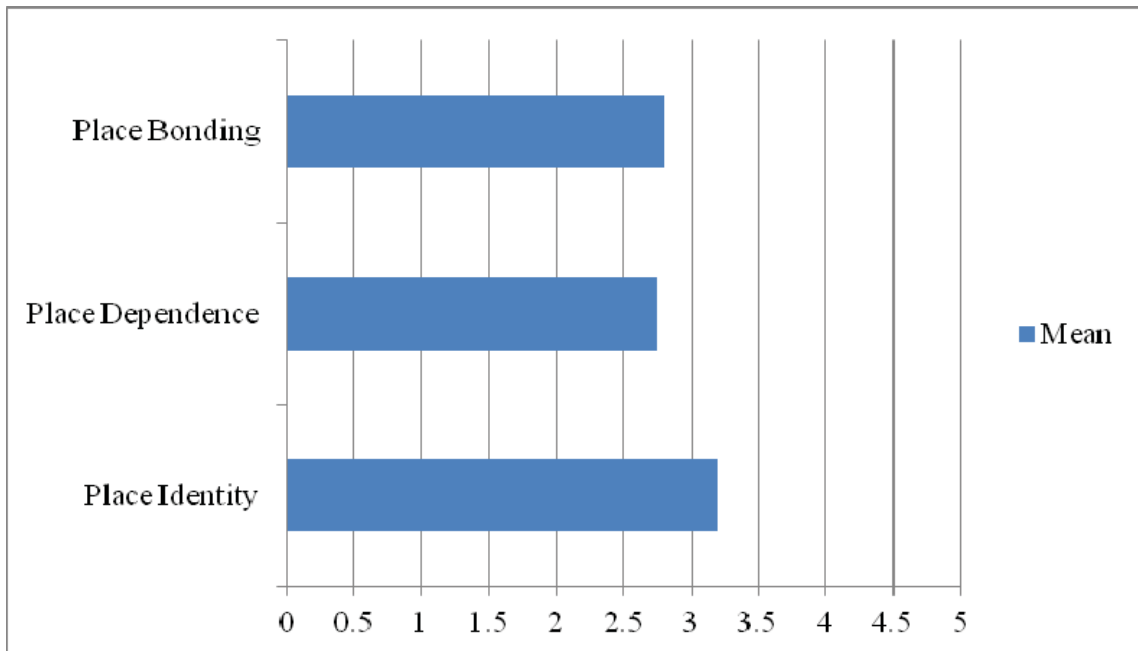


Figure 9: Average scores of respondents' reported levels of place attachment for three dimensions.

Respondents were asked to describe why they considered HINP to be important and nearly half explained that the natural beauty drew them to the area. Fishing was another common response, as were other recreational purposes.

Table 34: Summary of open-ended descriptions of why HINP was considered important

Reason of Importance	Valid Percent
Natural beauty	42.0

Fishing	17.6
Other recreational purpose	10.7
Other reasons	29.7
Total	100.0

Table 35: Comprehensive list of open-ended descriptions of why HINP was considered important

Case	Comments
1	1) world heritage site on doorstep with easy access 2) good for bringing up young children, outdoor lifestyles, open spaces 3) fishing, freshwater to outer reef all accessible 4) spearfishing 5) camping, more dog friendly sites would be nice 6) play areas and beaches.
2	An island track close to Townsville. No phone coverage.
3	All the above, history, beauty, when I first came?
4	Although to a lesser degree these days I enjoy the solitude.
5	As a catch and release” fisherman, the area provides excellent recreation for people like me. Other places where professional netters operate are much less attentive to amateur fisherman and families. The local hospitality industry is thriving on the amateur fishing industry.
6	Beautiful place where it’s possible to walk and enjoy the nature, outside of the crowd.
7	Beautiful region in Australia. I am visiting with my family for the first time and have loved every minute. It is picturesque and unique with amazing wildlife.
8	Beautiful scenery, diverse vegetation and fauna, very few other people.
9	Beautiful unspoiled wilderness. It’s a lovely spot for diversity of vegetation and land formations.
10	Beauty, peace, solitude, back to basics on the walk. Beauty and good barramundi fishing at times.
11	Because it is special and the fishing is good.
12	Because it is where I have grown up and spent my entire child hood and where I will spend the rest of my life. I know the area backwards.
13	Because of its unspoiled beauty and ruggedness, as well as its magical lighting and warm weather.
14	Because of the values listed earlier in the survey.
15	Biodiversity, beautiful, not too many people, unspoiled.
16	Compact region with rainforest and vegetation, creeks, beaches and warm weather in southern winter. We live 1800km away, so it is not somewhere we can visit often.
17	Diverse flora and fauna. Rugged “wilderness” quality.
18	Enjoy the fishing, the climate, and meeting friends here each year.
19	Fishing, sightseeing, hiking, boating, having a break, crabbing, doing things with people, scenery, connecting with family, stopping and recharging, natural beauty, nice people, remoteness, wilderness feel, biodiversity, and atmosphere.
20	Good facilities for camping, good fishing and crabbing.
21	Good place to do things with family/friend with the freshwater swimming holes. Main use is for ski training. There is calmer water up the channel and open/rougher seas

	outside. Good mix for training and nice scenery.
22	Good walk.
23	Great place to visit a beautiful secluded place that has many varieties. I have a saying that is “what makes a special place?” Answer is a place with changing scenery and Hinchinbrook has that I rate it in my top 4 hikes including Milford sound, Larapinta, and Overland Track.
24	Had a great time hiking the Thorsborne trail, I will remember it for a long time but I don't feel the Hinchinbrook area is important to me.
25	Hiking and nature.
26	Hinchinbrook is important because of fishing.
27	Hinchinbrook is important to me because it is an undisturbed natural environment, where wildlife and plants can thrive.
28	I came to this area to visit my parents and only got to the bluff by boat twelve for a few hours to fish. I will not be come back because it is too far from home.
29	I enjoy exploring the channel, fishing, bird watching, and bird photography.
30	I enjoy the natural setting and the unsoiled water ways and the fact there is no big resort.
31	I had an amazing hike there - the best I've ever had! A one-time hike, ‘cause I'm only in Australia for a holiday. Important ‘cause close to nature, pretty landscape, not crowded.
32	I had many recommendations to come and see Hinchinbrook and in addition I am traveling with a British friend so I decided to include Hinchinbrook in the itinerary.
33	I have had a holiday home at Lucinda since 1982. My family and I enjoy the relaxing lifestyle and the opportunity to fish the waters surrounding Hinchinbrook Island and of the streams and waterways that emanate from the island. The scenery, long deserted beaches, tropical rainforest, waterfalls and raggedness all combine to relax the senses and ease the pressures of everyday living and work stresses.
34	I have visited it annually, at least, and have many wonderful memories of camping with my family. My husband and I walk the Thorsborne trail annually and feel refreshed and connected and have come to love and know the track. We explore it more each time and learn more of its bird and plant life.
35	I meet and befriend like-minded people.
36	I spend five months of the year here and therefor like to see the area preserved in its natural state as much as possible.
37	I think Hinchinbrook is important to me because I love the surroundings and I love fishing.
38	I think it is a natural beauty and should be measured, don't change it.
39	I was conceived there.
40	I would love it for future generations.
41	It has beautiful sights, bush forests, and animals I wouldn't see where I live.
42	It has excellent isolated fishing creeks which provide quality barra and jack.
43	It is part of our daily life. It is how we relax and how we spend much of our leisure

	time.
44	It is a beautiful natural setting with plenty of challenges during the walks and a pleasant view at the end.
45	It is a beautiful place to visit.
46	It is a good place to go fishing and boating and the scenery is very enjoyable. It is well worth the odd trip or more to this lovely place.
47	It is a magnificent wilderness area with intrinsic spiritual value that I have been visiting for 40 years.
48	It is close and it is just a nice place to visit.
49	It is important for family holidays which center on fishing and hiking and relaxing. It is great to fish in a semi-pristine area and see the wildlife/marine life.
50	It is not yet touristy and has beautiful scenery.
51	It is one of the most beautiful places on Earth. It also provides a great place to launch my boat into the water.
52	It is simply a unique, untouched area with breathtaking nature far away from civilization. We found it very romantic and we have great respect for nature. As Sydney Siders, we enjoyed the quiet setting away from stress and other people.
53	It is the place we chose to bring our children up in. It is beautiful and we would not want to live anywhere else.
54	It provides an area to experience the wilderness, enjoy great scenery and do some good walking.
55	It was a challenge to complete the 32km hike with my 8 and 10 year old daughters. It was a lovely family experience.
56	It was beautiful and I had a fantastic experience hiking the Thorsborne Trail. Great weather, beautiful sights, not too many people, and perfect.
57	It's beautiful! A unique location. Remoteness. It's different to home.
58	It's off the beaten track, but not remote, my main reason for visiting is for the fishing. The creeks, the channel and the reef. Many different fish can be caught in the area. Great social opportunities. Great pub, golf, etc.
59	It's very nice but other places too are very nice.
60	Just a beautiful spot out my backdoor.
61	Just a great "untouched" natural place to enjoy and respect.
62	Just a place you can have fun and go ski and fish.
63	Just an amazing place to hike and enjoy the scenery.
64	Just another scenic/beautiful area to experience and undertake the recreational activities I enjoy.
65	Just arrived, still exploring, and came here because family said it was lovely. It is so far!
66	Just visiting for the week. Enjoying the area, with its beauty and marine life. Very friendly people. Will definitely come back.
67	Live here.
68	Local tranquil, wildlife biodiversity, beaches, hiking, fishing.

69	Love to go fishing.
70	My wife and I had our first trip together here. I returned 12 years later with my 8 year old son to show him the island and give him some values about nature.
71	National park, minimal impact, recreational use away from people in a natural setting with good biodiversity and aesthetic appeal, challenging walk.
72	Natural beauty, lack of crowds of people, fishing.
73	Natural scenery, solitude, many ecosystems, good management of limited number of visitors.
74	Nature, fish habitat, fishing, sun, warmth, escape for winter, no development, no people, nice scenery, people very friendly, good climate, waterways.
75	Somewhere to explore and appreciate.
76	Spectacular scenery, wilderness experience that's challenging enough to keep most people away.
77	The area is left as natural as possible and very few people, biodiversity, and plenty of wildlife to be seen!
78	The beauty place and quiet you can find on the beaches; walking the waves can give you the energy and harmony you sometimes seek for. It's not paradise but very close to it.
79	It is important that the island provide an example of pristine tropical rainforest and other types of vegetation. It also has great fauna diversity.
80	The people are friendly. Good golfing, bowling, and fishing.
81	The very best fishing spot.
82	The Caravan Park and its management make it an enjoyable place, and we can do golfing, bowling, and fishing in one area besides shopping.
83	This is my third Thorsborne trip and the second with my daughter. We enjoy the time to talk, the beauty of the place, the challenge, and the solitude.
84	This is our first visit to this area.
85	This is the second time my husband and I have done the Thorsborne trail. I enjoyed it much more this time in regards to the hiking because I was more experienced. We love the diversity of Hinchinbrook, and thanks to the clear weather, the night sky was brilliant! The advantage of being away from suburbia was the peace and quiet, and lack of street lights made the sky sparkle at night.
86	This place is an important, untouched and pristine area that provides important recreational opportunities for people.
87	This was my first visit to Hinchinbrook. I especially enjoyed the feeling of solitude as few other people where at any campsite at the same time. The night life at Mulligan Falls was a highlight, with bats screeching and calling all night, followed by a thunderous dawn chorus of birds, then goannas and butterflies all day. Beautiful!!!
88	To catch fish and crabs and spend time with my father.
89	To forget the drama and stress of normal life for a 24 hour period.
90	Unique, unspoiled area.
91	Very beautiful landscapes and views. Very quiet, only few people are coming here wild.

92	Very good fishing, weather.
93	Very polarizing questions. There are many other magnificent experiences around Australia. I can't agree with any questions here because it's difficult to compare your feelings with other places. It's a shame these questions are requiring a comparison, because you can't express easily how great the place is.
94	We enjoy the fishing here.
95	We enjoyed our visit of 10 days and came back in our same holiday for another 10 days because we like to fish and walk. The area and boat ramp is great and good quality. The fishing was fun.
96	We have just recently moved, here to explore the area better, we really love it here.

Conclusions and Management Options

Hinchinbrook Island National Park Visitor Surveys were conducted of adult visitors June-September, 2012. A total of 209 on-site and mailback survey questionnaires were collected with a response rate of 52%. Respondents' socio-demographic characteristics suggested the "average" recreationist was white, generally well-educated, from Australia, and earned high levels of average income. Trip characteristics suggested recreationists had been frequenting the area for extended periods and planned to return in the future.

Outdoor recreationists reported high levels of satisfaction through engagement in a variety of recreational activities. The motivations, environmental worldviews, and attachment to places reported herein can inform understanding of why people visit, how they are or are not environmentally oriented, and the strength of their perceived connections to the HINP. These measures of the human condition underpin environmental behavior and can be helpful to gauge attitudes toward management actions (e.g., temporary closures for resource protection and/or restoration) and the provision of high quality visitor experiences.

Particular areas of the HINP provided enriching recreational opportunities and managers might consider directing attention toward these areas. Specifically, several "hotspots" were deemed important by recreationists because they embodied Aesthetic, Biological Diversity, and Recreation qualities. The intensity and kinds of social values associated with places can serve as a guide to identify which regions are associated with human use and may warrant attention to further improve the visitor experience. An alternative approach may be for managers of the HINP to focus attention on "coldspots" that hold qualities not currently recognized by outdoor recreationists. Unrecognized resources may provide an opportunity to increase awareness of existing resources and/or distribute human use and associated impacts to less frequented settings. For example, several places on the HINP (e.g., mangrove estuaries; sea grass beds) replete with biological importance were not associated with perceived Biological Diversity value according to survey respondents. It would enhance recreational experiences and help encourage environmentally responsible behavior around fragile ecological conditions to educate the public about existing natural resources on the HINP. Managers might consider constructing interpretive boards that provide information on the importance of sea grass for the threatened dugong, as well as their sensitivity to disturbance by boats. Other interpretive messages could focus on how mangrove forests provide nursery habitats for species that support environmental preservation and the fishing industry.

Environmental interpretation was one area of improvement mentioned by respondents in their general feedback on the survey, offered anecdotally, and indicated by value types absent from important places such as the restricted access ceremonial ground on the north end of the island. It could be argued that Cultural or Therapeutic value types would have been associated with this area if respondents had a better understanding of on-site conditions and/or if more Aborigines were represented in the sample. It may be worthwhile to offer more educational interpretation to teach people about the history of the island, cultural context, geomorphology, wildlife, and/or management tactics such as controlled burning and invasive species eradication. Although there is signage about former Aboriginal presence on the island, and an informational center at one town on the mainland, more active on-site interpretation could help to boost appreciation and awareness while maintaining the wilderness-like qualities of the HINP.

An important result that emerged in our analysis was the difference in the two groups of outdoor recreationists, including individuals engaged in consumptive and non-consumptive activities. In general, consumptive users assigned values across a broader expanse than did the non-consumptive users. This may be due to the degree of access permitted within the context of various activities, in that individuals within the consumptive group primarily engaged in fishing activities that involved traveling to different destinations across bodies of water. On the other hand, the non-consumptive subgroup traveled within the bounds of the state-issued permit and primarily experienced a concentrated area. Management infrastructure (e.g., hiking and camping amenities), dense vegetation on the island, and rugged terrain may have further restricted non-consumptive users from traveling beyond the confines of established trail systems. These two groups were utilizing and/or appreciating different natural resource conditions for benefits provided by terrestrial and aquatic environments of the HINP, and can be targeted in different ways.

Considerations for Future Management

1. Utilize the results of this study to better identify the core visitor target market(s) in terms of activities, experiences, benefits and the setting attributes (either “hotspots” or “coldspots”) most desired and appropriate.
2. Continue managing to protect the natural qualities and features of the natural environment, as well as opportunities for wilderness-like experiences. These efforts will help to maintain the attraction of this resource for outdoor recreationists.
3. Current use suggests that outdoor recreationists can be considered in terms of two groups that engage in consumptive and non-consumptive activities. To be more deliberate/proactive about marketing, managers might consider designating and managing for separate educational / interpretation programs to reach each of these audiences.
4. Many respondents indicated they would like to see more on-site interpretation (e.g., trail information, directional signs, information kiosks). Managers might consider providing signs with clear messages, maps, and information about recreation opportunities and history of the area.

Acknowledgements

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Appendix I: Survey Questionnaire



Hinchinbrook Area Visitor Survey, 2011



ID _____

Date _____

Location _____

We are conducting this survey to learn more about recreationists that use Hinchinbrook Island National Park and the surrounding waters. You are one of a small number of people chosen for this study, so your opinions are important to us. All information will be kept strictly confidential. Please read each question carefully and save any additional comments for the final page.

SECTION A: TRIP CHARACTERISTICS

1. How many people (including you) are in your personal group today?
 Total number of people: _____ Adults: _____ Children: _____
2. How would you describe your personal group? (*please ✓ one*)
- | | | |
|--|--|--|
| <input type="checkbox"/> Traveling alone | <input type="checkbox"/> Friends | <input type="checkbox"/> Organized commercial tour |
| <input type="checkbox"/> Family | <input type="checkbox"/> Family and/or friends | <input type="checkbox"/> Organized fishing trip |
3. How long are you staying in this area during your visit? (*please ✓ one box & fill in blank*)
- Day use only:
 _____ → How many hours **today**? _____ hours
- Overnight use:
 _____ → How many **nights** are you staying? _____ nights
- 4a. Do you expect to return to the Hinchinbrook area on other trips in the future? (*please ✓ one*)
- Yes ➔ *please skip to question 5*
- No
- b. If you do not expect to return, please explain why not.

- 5a. Have you visited the Hinchinbrook area before? (*please ✓ one*)
- Yes
- No ➔ *please skip to question 6*
- b. Approximately how many times have you visited in the last 12 months? _____ days
- c. In what year did you make your first visit? _____
- 6a. How satisfied were you with your visit to the Hinchinbrook area? (*please circle one number*)
- 1-----2-----3-----4-----5
- Very Dissatisfied Dissatisfied Neither Satisfied
nor Dissatisfied Satisfied Very Satisfied
- b. Has your satisfaction been impacted by the effects of natural disasters (e.g., Cyclone Yasi)?
- Yes
- No
- 7a. Did you travel to Hinchinbrook Island by ferry? (*please ✓ one*)
- No ➔ *please skip to question 8*
- Yes
- b. Please list the name of the ferry operator: _____
- c. How satisfied were you with this experience? (*please circle one number*)
- 1-----2-----3-----4-----5
- Very Dissatisfied Dissatisfied Neither Satisfied
nor Dissatisfied Satisfied Very Satisfied
- 8a. Which of the following activities have you participated in or do you plan to participate in during your visit? (*please ✓ all that apply*)
- | | | |
|--|---|---|
| <input type="checkbox"/> Hiking Thorsborne Trail | <input type="checkbox"/> Camping | <input type="checkbox"/> Backpacking |
| <input type="checkbox"/> Hiking, in general | <input type="checkbox"/> Picnicking | <input type="checkbox"/> Swimming |
| <input type="checkbox"/> Kayaking | <input type="checkbox"/> Birding | <input type="checkbox"/> Wildlife viewing |
| <input type="checkbox"/> Fishing | <input type="checkbox"/> Taking photographs | <input type="checkbox"/> Other (<i>please specify</i>)
_____ |
- b. From the above list, which would you identify as your primary activity? _____

9. If you could ask management to change some things about the way they oversee Hinchinbrook Island and the surrounding waters, what would you ask them to do?

SECTION B: WHAT YOU VALUE

The following section examines the values you associate with the Hinchinbrook area.

Imagine you could allocate 100 preference points to ensure that Hinchinbrook Island and the surrounding waters kept their existing values. You might assign 100 points to one value and zero to all the others, or assign 50 to one, 25 to another and 25 to yet another. Please distribute these points in any way you would like and remember to only allocate 100 points across the value types below.

- _____ **Aesthetic value (A).** I value the Hinchinbrook area because I enjoy the scenery, sights, sounds, smells, etc.
- _____ **Biological Diversity Value (B).** I value the Hinchinbrook area because it provides a variety of fish, wildlife, plant life, etc.
- _____ **Cultural Value (C).** I value the Hinchinbrook area because it is a place for me to continue to pass down the wisdom and knowledge, traditions, and way of life of my ancestors.
- _____ **Economic Value (E).** I value the Hinchinbrook area because it provides timber, fisheries, minerals, or tourism opportunities such as outfitting and guiding.
- _____ **Future Value (F).** I value the Hinchinbrook area because it allows future generations to know and experience the Hinchinbrook area as it is now.
- _____ **Historic Value (H).** I value the Hinchinbrook area because it has places and things of natural and human history that matters to me, others, or the nation.
- _____ **Intrinsic Value (I).** I value the Hinchinbrook area in and of itself for its existence, no matter what I or others think about the Hinchinbrook area.
- _____ **Learning Value (L).** I value the Hinchinbrook area because we can learn about the environment through scientific observation or experimentation.
- _____ **Life Sustaining Value (LS).** I value the Hinchinbrook area because it helps produce, preserve, clean, and renew air, soil, and water.
- _____ **Recreation Value (R).** I value the Hinchinbrook area because it provides a place for my favorite outdoor recreation activities.
- _____ **Spiritual Value (S).** I value the Hinchinbrook area because it is a sacred, religious, or spiritually special to me or because I feel reverence and respect for nature there.
- _____ **Subsistence Value (Sub).** I value the Hinchinbrook area because it provides necessary food and supplies to sustain my life.
- _____ **Therapeutic Value (T).** I value the Hinchinbrook area because it makes me feel better, physically and/or mentally.

100 Preference Point Allocation

SECTION C: VALUE ALLOCATION

In the previous section you told us which values related to Hinchinbrook Island and the surrounding waters were important to you. Next, please identify the places that represent those values on the map.

Considering the values you identified in the previous section, which places within the Hinchinbrook area best reflect these values? Using the map below, please identify up to five places that you associate with each of the values to which you assigned preference points in the previous question. First, draw a dot with a dark colored pen to situate the value. Second, use the value abbreviations listed below to identify which value you ascribe to the dot. Finally, place a number alongside the value abbreviation. For example, if you think that two places embody recreation value (R), mark two dots on the map and write "R1" for Recreation Value associated with the first place and "R2" for Recreation Value associated with the second place. Please follow these steps for each value you associate with places in the Hinchinbrook area.



SECTION D: VISITOR EXPERIENCE

10. People have many potential reasons for engaging in outdoor recreation. We would like to know what motivated you to visit Hinchinbrook Island and/or the surrounding waters. Please indicate your level of agreement with the statements below. (Circle one number.)

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
a. To test and use my equipment	1	2	3	4	5
b. To be with people who have similar values	1	2	3	4	5
c. To be with members of my group	1	2	3	4	5
d. To view the scenic beauty	1	2	3	4	5
e. To be with people who have similar interests	1	2	3	4	5
f. To develop my skills and abilities	1	2	3	4	5
g. To learn more about things here	1	2	3	4	5
h. To understand things better here	1	2	3	4	5
i. To grow and develop spiritually	1	2	3	4	5
j. To learn more about myself	1	2	3	4	5
k. To think about my personal values	1	2	3	4	5
l. To get exercise	1	2	3	4	5
m. To give my mind a rest	1	2	3	4	5
n. To experience tranquility	1	2	3	4	5
o. To improve my physical health	1	2	3	4	5
p. To improve my skills	1	2	3	4	5
q. To explore the area	1	2	3	4	5
r. To be close to nature	1	2	3	4	5
s. To talk with others about my equipment	1	2	3	4	5
t. To be with friends	1	2	3	4	5
u. To view the scenery	1	2	3	4	5
v. To experience new and different things	1	2	3	4	5
w. To have break from being too busy mentally	1	2	3	4	5
x. To experience solitude	1	2	3	4	5
y. To experience the open space	1	2	3	4	5
z. To develop personal, spiritual values	1	2	3	4	5
aa. To be challenged	1	2	3	4	5
bb. To be in a natural setting	1	2	3	4	5
cc. To feel my independence	1	2	3	4	5
dd. To be on my own	1	2	3	4	5
ee. To be away from crowds of people	1	2	3	4	5

11. The following statements describe a range of potential feelings you could associate with Hinchinbrook Island and/or the surrounding waters. Please indicate your level of agreement with the statements below. (Circle one number.)

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
a. I feel the Hinchinbrook area is part of me	1	2	3	4	5
b. The Hinchinbrook area is very special to me	1	2	3	4	5
c. I identify strongly with the Hinchinbrook area	1	2	3	4	5
d. I am very attached to the Hinchinbrook area	1	2	3	4	5
e. Visiting this place says a lot about who I am	1	2	3	4	5
f. The Hinchinbrook area means a lot to me	1	2	3	4	5
g. The Hinchinbrook area is the best place for what I like to do	1	2	3	4	5
h. No other place can compare to the Hinchinbrook area	1	2	3	4	5
i. I get more satisfaction out of visiting this place than any other	1	2	3	4	5
j. Doing what I do at the Hinchinbrook area is more important to me than doing it in any other place	1	2	3	4	5
k. I wouldn't substitute any other area for doing the types of things I do here	1	2	3	4	5
l. The things I do at the Hinchinbrook area I would enjoy doing just as much at a similar site	1	2	3	4	5
m. I have a lot of fond memories about this place	1	2	3	4	5
n. I have a special connection to the Hinchinbrook area and the people who use it	1	2	3	4	5
o. I don't tell many people about the Hinchinbrook area	1	2	3	4	5
p. I will (do) bring my children to this place	1	2	3	4	5
q. My friends/family would be disappointed if I were to start visiting other settings and facilities	1	2	3	4	5
r. If I were to stop visiting the Hinchinbrook area, I would lose contact with a number of friends	1	2	3	4	5

12. Please use the space below to describe why the Hinchinbrook area is important to you.

13. The following statements describe a range of potential feelings associated your view of the world. Please indicate your level of agreement with the statements listed below. (Circle one number.)

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
a. We are approaching the limit of the number of people the earth can support	1	2	3	4	5
b. Humans have the right to modify the natural environment to suit their needs	1	2	3	4	5
c. When humans interfere with nature it often produces disastrous consequences	1	2	3	4	5
d. Human ingenuity will ensure that we do not make the earth unlivable	1	2	3	4	5
e. Humans are severely abusing the environment	1	2	3	4	5
f. The earth has plenty of natural resources if we just learn how to develop them	1	2	3	4	5
g. Plants and animals have as much right as humans to exist	1	2	3	4	5
h. The balance of nature is strong enough to cope with the impacts of modern industrial nations	1	2	3	4	5
i. Despite our special abilities humans are still subject to the laws of nature	1	2	3	4	5
j. The so-called “ecological crisis” facing humankind has been greatly exaggerated	1	2	3	4	5
k. The earth is like a spaceship with very limited room and resources	1	2	3	4	5
l. Humans were meant to rule over the rest of nature	1	2	3	4	5
m. The balance of nature is very delicate and easy to upset	1	2	3	4	5
n. Humans will eventually learn enough about how nature works to be able to control it	1	2	3	4	5
o. If we continue on our current course, we will soon experience a major ecological catastrophe	1	2	3	4	5

SECTION E: SOCIO-DEMOGRAPHICS

Your response to the following background questions is greatly appreciated. As always your response is voluntary. The information is used to make sure we accurately represent visitors to the Hinchinbrook area.

14. Are you ...?

- Male
- Female

15. In what year were you born? _____

16. Do you live in Australia? (*please ✓ one*)

- Yes (What is the name of your town? _____)
- No (What country do you live in? _____)

17. Were you born in Australia?

- Yes
- No (Please list your country of birth: _____)

18. Do you consider yourself to be of Aboriginal or Torres Strait Islander descent?

- Yes
- No

19. How many people live in your household (including you)?

Number of people: _____

20. What is the highest level of formal education you have completed? (*please ✓ one*)

- | | |
|--|--|
| <input type="checkbox"/> finished primary school (grades 1-7) | <input type="checkbox"/> some university / c.a.e. training |
| <input type="checkbox"/> some secondary school | <input type="checkbox"/> university / c.a.e. degree |
| <input type="checkbox"/> finished secondary school (grades 8-12) | <input type="checkbox"/> honors |
| <input type="checkbox"/> some technical or commercial / tafe | <input type="checkbox"/> masters |
| <input type="checkbox"/> finished technical or commercial / tafe | <input type="checkbox"/> Ph.D., J.D. or equivalent |

21. Would you mind telling me your household's TOTAL approximate annual income from all sources before tax? (*please ✓ one*)

- | | |
|--|---|
| <input type="checkbox"/> Less than \$20,000 | <input type="checkbox"/> \$150,000 - \$199,999 |
| <input type="checkbox"/> \$20,000 - \$49,999 | <input type="checkbox"/> \$200,000 - \$249,999 |
| <input type="checkbox"/> \$50,000 - \$99,999 | <input type="checkbox"/> \$250,000 - \$300,000 |
| <input type="checkbox"/> \$100,000 - \$149,999 | <input type="checkbox"/> greater than \$300,000 |

Thank you for helping us with this important study. If there is anything else you would like to tell us, please do so in the space below.



Institutional Review Board Approval: #2011-0227
Expiration Date: May 2012

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