Tourism Management in Surin Marine National Park, Thailand

Suchai Worachananant[1,2], R.W.(Bill) Carter[1], Marc Hockings[1], Pasinee Reopanichkul[2], Thon Thamrongnawasawat[2]

ABSTRACT

This paper analyses the management status of Surin Marine National Park (Surin), the effectiveness of existing management strategies, their adaptation to the problems occurring and the results of the adaptations. Surin is situated at the upper part of Andaman Sea, Thailand. Its reputation as the best shallow-water reef in Thailand attracts more than twenty thousand visitors per year who enjoy diving on the eight square kilometres of reef. Visitor management arrangements include a visitor fee, boat permits, specific activities management, a zoning plan and an information centre. In common with many other national parks, Surin faces management issues relating to this use and the capacity to manage it to protect valued resources. The current five year zoning plan is rigid and inflexible and makes it difficult for management to respond to changing circumstances. These problems contribute to concern for the effectiveness of tourism management. In addition, survey of visitor attitudes towards, and knowledge about, management revealed that visitors lack recognition of current management approaches. To address these issues, some changes have been made to management arrangements. A mooring buoy system has been established to better identify use areas and manage the level of use of sites. However, in the absence of a recognized study of the associated impact factors and effect of this decision, this plan may not be entirely successful. While the biogeography of Surin is well known, little is known about the visitors, their expectations or activities. More effective tourism management will require such information and its use to develop strategies to match visitor needs with marine resource characteristics while protecting the resource. Further revision of management approaches is also recommended.

KEYWORDS: Surin Marine National Park; Tourism; Coral Reef; Adaptive management

KEY LEARNINGS:

1. Tourism activities should not be considered as an unmanageable threat to the reef, because most tourists have inadequate knowledge, or do not appreciate that their activities or behaviour can cause negative impact.
2. The current zoning plan is in need of review to ensure management effectiveness.
3. A clear, identified mooring system helps reduce a major cause of tourism impact on reef communities.

BACKGROUND

Surin Marine National Park is under the administration of the Ministry of Natural Resources and Environment and has an area of 135 square kilometres. Seventy six percent of the area (102 square kilometres) is the marine component and the balance (33 square kilometres) is terrestrial. Surin consists of five islands; North Surin, South Surin, Torinla, Pachumba and Stork Islands. Two exposed pinnacles are also found, Pae and Kong pinnacles. The largest two islands, North and South Surin, are aligned in a north-south axis (Figure 1). All of the islands and exposed rocks are granitic.

[1] School of Natural and Rural System Management, University of Queensland, Australia (Corresponding author e-mail: suchai@talaythai.com)
[2] Department of Marine Science, Kasetsart University, Thailand

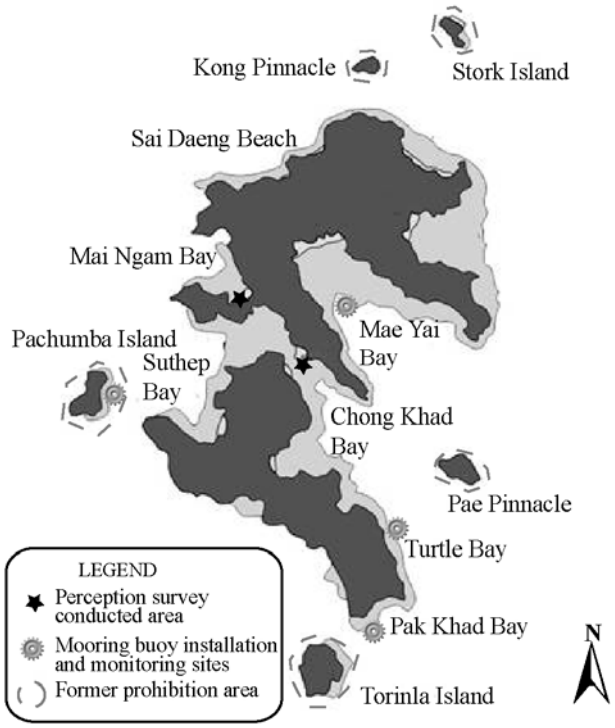

Figure 1 Map of Surin Marine National Park

Based on the most comprehensive data, including 2001 and 2004 aerial photography, Surin has been confirmed as the most diverse reef in Thailand (Saisaeng, 2002; Sittithaweepat, 2001; Thamrongnawasawat *et al.*, 1995; Worachananant, 2000). More than 260 species of fishes are found in this area, together with 33 genera of soft corals and gorgonians, 48 species of nudibranchs and 31 species of associated shrimps.

Corals, as well as other marine organisms, are also abundant in Surin. More than 68 species of coral are found in the Park (in 8 km^2). Torinla Island, the area with best reef conditions, has more than 90 percent living coral coverage.

EXISTING PROBLEMS IN SURIN

Threat to reefs

Threats to Surin reefs can be divided into two types: natural and human-related threats. There are few natural threats in Surin. Some, for example the strong waves that batter the reefs during stormy monsoons and the El Niño phenomenon that occurred in 1998, have caused deterioration of reefs in some areas, especially Mae Yai Bay. All the islands are covered with healthy forest, thus reducing the amount of sediment entering the sea.

Most researchers suggest that the major threat is from human related activities (Sittithaweepat, 2001; Thamrongnawasawat *et al.*, 1995; Worachananant, 2000). Due to the great distance from the mainland, the surrounding water is low in pollutants. Some sources of pollution were found to be the park's accommodation facilities, oil spillage from travel boats and frequently used detergents. Tourism seems to be one human-related threat that profoundly affects reefs. Most tourists lack conservation knowledge and do not take any precautions to minimise their direct and indirect effects on reef organisms.

Management issue

Currently, Surin is managing tourism impacts with a visitor register charge, boat permits, specific activities management, a short term zoning plan and an information centre. A visitor information database was created in 2001 using data gathered from the visitor register charge and boat permit records. All tourist operators are required to seek permission for activities in the park and all visitors have to pay the register fee before entering the park. This information has been used to calculate the number of visitors and number of activities carried out in the park. Surin faces most of the problems that are found in many protected areas around the world. Some of these common problems facing protected areas are a lack of resources (funding and personnel for patrolling and protection), weak enforcement of regulations, lack of relevant information for visitors and non-management related tasks undertaken by park officers (Hockings, 2002).

TOURISM MANAGEMENT

Managing tourism and recreation use of Surin is challenging. To create effective management, finding the right balance between tourist's expectations and environmental conservation is crucial. The number of visitors is increasing each year. In the first four months of the 2003-2004 season (November 2003 - January2004), visitor numbers reached 30,000. Most of the visitors wished to snorkel, but SCUBA diving is increasing in popularity. In 2004, it was estimated that at least 6,000 divers enjoyed the underwater world. Piewsawat (2002) found that 95.7% of 200 visitors to Surin surveyed expressed a desire to snorkel, and 98.1% actually did. A reason given for snorkelling being one of the most popular activities was the abundance of marine organisms. With this number of tourists and the relatively small area for diving, it is extremely difficult to reduce the reef's deterioration without effective visitor management.

Perception of visitor about management strategies

A questionnaire survey of visitor attitudes towards, and knowledge about, management of Surin Marine National Park was conducted by park staff over April and May 2004, at the Park campgrounds. Participants were selected from visitors and tour operators who stayed in Surin at that period. A total of 200 questionnaires were distributed and 128 were completed[1] (a response rate of 64 %). The survey consisted of four sections: general travel information, recreation activity, opinion and satisfaction about management, and the demographic background of visitors. Correlation between variables was used to identify difference and similarity between factors. Since the numbers of expected frequencies in some cells are very low, the G-test statistic was used to examine difference between various factors.

The survey results revealed poor understanding of management approaches by respondents. Only 6.25 % had a clear idea of the existence of management approaches and few respondents (23%) were aware of the existence of the zoning system. This lack of understanding may cause harm to the coral reef, because most (94%) of those who were unaware of the zoning scheme participated in coral damage risk activities – snorkelling, SCUBA diving, diving along the underwater trail.

While visitors are supposed to know park regulations prior to a visit or, at least, while staying in the park, few respondents (32 %) were aware of the regulations. The number of times a respondent has visited does not increase their understanding of management approaches (Table 1). This suggests that the Park's interpretation media do not provided sufficient knowledge about management approaches. However, the perception of quality of interpretation is related to visitor understanding of management approaches. The higher the perception of quality of interpretation, the greater knowledge visitors exhibited. Nevertheless, only half of the respondents realised the existence of the exhibition centre.

[1] Actually the response was 178 (89 %), however, 50 records lost during return delivery.

Table 1 Relation between various factor and knowledge of respondents about existence of each management approach

			Zoning plan			Management plan			Site plan			Law and legislation		
			Numbers[1]			Numbers[1]			Numbers[1]			Numbers[1]		
			N	A	G-value[2]	N	A	G-value[2]	N	A	G-value[2]	N	A	G-value[2]
Number of time visited		First	77	19	2.54	57	39	1.76	50	49	1.03	62	34	2.23
		Returned	21	11		18	14		18	14		25	7	
Quality of interpretation	Brochure	Good	23	12	1.92	17	18	4.10	22	13	3.74	23	12	0.50
		Average	41	11		35	17		24	28		36	16	
		Poor	34	7		23	18		22	19		28	13	
	Notice board	Good	21	13	1.10	17	17	1.37	17	17	1.87	17	17	5.54
		Average	53	14		40	27		31	36		48	19	
		Poor	24	3		18	9		20	7		22	5	
	Exhibition centre	Good	18	12	2.29	12	18	**7.94***	14	16	5.79	13	17	**9.05****
		Average	45	14		40	19		25	34		43	16	
		Poor	35	4		23	16		29	10		31	8	
Sources of information	Self interest	Apply	45	11	0.23	37	19	1.94	30	26	0.00	36	20	1.55
		Not apply	49	18		36	31		36	31		50	17	
	Information centre	Apply	83	26	1.59	68	41	**4.29***	55	54	2.15	73	36	0.34
		Not Apply	15	4		7	12		13	6		14	5	
	Mass media	Apply	63	19	**5.57***	47	35	1.03	42	40	0.77	55	27	0.25
		Not Apply	33	9		28	14		25	17		30	12	
	Websites	Apply	62	18	**3.85***	50	30	1.53	43	37	0.01	51	29	2.84
		Not Apply	25	9		17	17		18	16		27	7	
	Advertisement	Apply	91	25	2.01	65	51	**3.72**	63	53	0.70	79	37	0.01
		Not Apply	7	5		10	2		5	7		8	4	

1. Numbers indicate numbers of respondents: A = aware the existence of management approach, N = not aware the existence of management approach
2. Bold characters indicate significant value ($p < 0.05$)* and highly significant ($p < 0.01$)**

From the survey, there is low awareness of management approaches. The communication tools designed to inform about management approaches are not effective because visitors do not gain greater awareness of management approaches from the Park's interpretation program.

The exhibition centre lacks resources to develop effective and interesting exhibits. Additionally, with increasing international visitor numbers, communication remains in Thai language only. Increasing the quality and attractiveness of the exhibition centre may increase visitor understanding of park management.

Appropriateness of zoning plan

Surin has a zoning plan comprising seven zones. Coral reefs are covered by four zones: Strict Nature Reserve Zone, Recovery Zone, Outdoor Recreation Zone and General Use Zone. The Strict Nature Reserve Zone and Recovery Zone include prohibition of all activities except research; while the other two zones allow all non-destructive recreation activities (all forms of fishing are prohibited). Since the El Niño phenomenon in 1998, reefs in the General Use Zone and the Outdoor Recreation Zone, which are designated for SCUBA and skin diving, were under severe threat and some reefs were extensively damaged. Tourists, especially divers, now do not want to go to these reefs. In response, park management decided to allow recreation activities at Pachumba Island in 1999 to provided alternative site for recreation.

The decline in live coral coverage is shown in Table 2. Monitoring data are gathered through life-form intersect transects. Thirty-metre life-form transects were conducted with five transects in each sample

and 20 samples per site around Surin. Each site was monitored for the year. Data from the 20 samples were analysed by ANOVA to determine mean values of each life form and the change between years.

Table 2 Mean values of percent coverage of living coral between years 1997 – 2003

	Place	Year						
		1997	1998	1999	2000	2001	2002	2003
Recreation area	**Mai Ngam Bay**	**80**	**42**	30	22	28	35	39
	Turtle Bay	**70**	**55**	50	46	46	45	75
	Pak Khad Bay	**42**	**20**	24	48	52	50	62
	Suthep Bay	**80**	**32**	21	47	52	45	
Prohibition area	Stork Island	52	72	78	53	38	40	
	Pachumba Island	**70**	**64**	**45**	40	46	35	48
	Torinla Island	95	60	71	82	84	95	78
	Pae pinnacles	15	15	17	20	24	25	
	Kong pinnacles	13	18	22	24	27	20	

Following the demand from tourist, in 2003 the prohibition areas of Torinla Island, Stork Island and both pinnacles were opened to diving activities. That is, no area is currently prohibited from diving activity, and hence the integrity of the whole zoning plan has been lost, or at least needs revision.

Mooring system

To meet the needs of tourists and the changed zoning situation, and still achieve conservation objectives, Surin's managers have adopted a facility approach to management, using a mooring buoy strategy. Three types of buoys are provided for different activities: orange acrylic buoys for skin diving, yellow acrylic buoys for SCUBA diving and large orange metal buoys for large ship mooring. Because park regulation prohibits anchoring on the reef, all activities require the use of buoys. In addition, all buoys have a unique code and geographically positioned for future maintenance. During the storm season, all buoys are removed to prevent coral damage from rope movement and they are re-installed in the tourist season, using GPS. Currently, there are 78 moorings around Surin. A density operating system was employed with the mooring buoy system. Since each buoy is designed to carry only one boat, the limited number of buoy is also limits number of visitors. Areas with higher conservation values have fewer buoys than areas provided for recreation.

Initially, mooring buoys were provided only for long-tail boats; the main vessel used for conducting snorkelling activities. However, these buoys were unable to support large SCUBA vessels and resulted in damage to the buoy and reef beneath. In addition, since no buoys were provided specifically for SCUBA diving, crowding occurred along with conflicts of use between snorkelling and SCUBA diving groups. After the installation of buoys in 2002, designated activity areas were clarified and crowding reduced. In addition, the percent cover of branching, foliose and tabulate corals, which are more sensitive to damage by diving and related activities, increased (Table 3).

Table 3 Change of each type of coral's life form in four areas before (2002) and after (2003) installation of mooring system

Place	**Years**	**Life form[1]**					
		Encrusting	**Foliose**	**Branching**	**Massive**	**Tabulate**	**Overall living coral**
Mae Yai Bay	2002	5.7	1.35	10.4	15.8	1.75	35
	2003	6.95	4.25	13.6	17.5	2.7	45
	F- value[2]	1.11(0.299)	**13.41(0.001)**	**6.20(0.017)**	1.46(0.234)	1.47(0.233)	44.39(0)
Pachumba	2002	5.1	0.75	17.85	11.35	1.05	36
	2003	10.05	4.2	19.1	12.3	2.5	48
	F - value[2]	12.78(0.001)	**23.94(0)**	0.89(0.353)	0.41(0.528)	3.84(0.057)	76.43(0)
Pak Khad	2002	4.5	19.25	13.45	12.3	1.5	51
	2003	5.65	20.75	17.85	14.85	2.9	62
	F	0.82(0.372)	0.50(0.485)	**8.52(0.006)**	1.21(0.279)	3.64(0.064)	54.61(0)
Turtle	2002	7.15	2.1	16.1	18.7	0.95	45
	2003	14.3	6.4	23.85	25.55	4.9	75
	F- value[2]	17.59(0)	**21.65(0)**	**28.52(0)**	11.89(0.001)	**15.57(0)**	727.66(0)

1. Number shown in each year represented mean values of percent coverage
2. Significant value shown in bracket

CONCLUSION AND RECOMMENDATION

The effective collapse of the zoning plan and the lack of recognition of management approaches and regulations by users mean that the management plan for Surin, as well as day to day management, requires review. This does not mean that existing management strategies for Surin are ineffective. It does mean that circumstances have changed and that existing management emphasis may not be appropriately targeted to address these changing circumstances. Since management issues at Surin are largely user related, the importance of an effective communication program of management objectives, strategies and approaches is needed to enlist the support of users. To improve the management effort, it seems necessary to review the management plan to take into account the changed permitted use, but also to interpret and present the plan to users of the park. Of all the management approaches identified in the plan, the zoning plan is the one in urgent need of review because of the declining condition of reefs and increasing demand of visitors. Recently, Surin has applied a clarified mooring system to better identify use areas. The mooring system has the additional benefit of limiting the number of visitors in each area at any one time. Areas with higher conservation values have fewer buoys than recreation areas. Sites with mooring buoys have shown improvement in live coral coverage. However, since this research covers only one year, additional studies on the benefit of the mooring system, and the perception and behaviour of visitors on management approaches are recommended.

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