

**1.3.6 ENVIRONMENTAL CONSIDERATIONS
ON BEACH RESORT DEVELOPMENT**

1. NATIONAL PARK, WILDLIFE SANCTUARY AND OTHER PROJECTED AREA

TABLE 1-12 LIST OF THE NATIONAL PARKS AND PROPOSED DEVELOPMENT PRIORITIES IN SOUTHERN REGION

NAME	PROVINCE	EST.	AREA (ha)	DOMINANT FOREST TYPE	REMARKS	ACCESS	FACILITIES							MANAGEMENT PLAN PREPARATION
							HOTEL OR RUNNLOW	RESTAUR.	GUIDY	GUARD	PORT	SHOPS	PARKING	
1. HAT LAEM SON	RANDING PHANG-NGA	19 Aug. 1983	31,500	MOIST EVERGREEN	4,800ha(Land)	70km SANONG 150km PHUKET	80 units 40 tents Camp site	20	0	1	0	1	1	0
2. RHAC-SOK	SURAT THANI	1980	64,552			100km SURAT 120km PHUKET	Camp site	0	0	3	1	0	0	0
3. RHAC-LAMPI- HAT THAI MUANG	★ PHANG-NGA	14 Apr. 1986	7,200	MOIST EVERGREEN	MARINE PARK	50km PHUKET	30 units	0	0	1	0	0	2	0
4. NUKO SURIN	PHANG-NGA	9 July 1981	13,500	MOIST EVERGREEN	3,300ha(Land) 10,200ha(Marine)	70km KAPOEURIN (Boat)	90 units 100 tents Camp site	30P	n.a	1	0	1	0	0
5. NUKO-SIMILAN	★ PHANG-NGA	1 Sep. 1982	12,800	SEMI EVERGREEN	1,400ha(Land) 11,400ha(Marine)	70 km TAKUAPA (Boat)	99 tents	60P	0	1	0	1	0	0
6. AC PHANG-NGA	★ PHANG-NGA	29 Apr. 1981	40,000	MANGROVE	5,300ha(Land) 34,700ha(Marine)	50km PHUKET 120km SURAT	110 units 200 P	100P	0	2	1	1	0	1990
7. HAT NAI LANG	★ PHUKET	13 Jul. 1981	9,000	BEACH FOREST	2,200ha(Land) 6,800ha(Marine)	0km PHUKET	150 units 200 P 90 tents	200P	0	0	0	1	2	0
8. HAT NAPHARAT THABA-NUKO PEE PEE	★ KRABI	6 Oct. 1985	38,996	MANGROVE/ BEACH FOREST	5,400ha(Land) 32,596ha(Marine)	50km PHUKET 45km KRABI (Boat)	50 units 80 tents Camp site	100P	500	1	1	0	0	0
9. KHAC PHANOM BENJA	KRABI	9 July 1981	5,012	MOIST EVERGREEN		100km PHUKET 20km KRABI	10 units Camp site	n.a	n.a	0	0	1	3	0
10. NUKO ANGTONG	★ SURAT THANI	1980	10,200			50km SURAT 30km SAMUI	100 units 22 tents	0	100P	3	0	1	0	0
11. KHAC LUANG	★ NAKHON SI THAMMARAT	18 Dec. 1974	57,000	MOIST EVERGREEN		40km NST 80km Surat	28 units 150 tents	0	0	4	0	0	0	1990
12. KHAC PU- PHAO YA	PHATTA LUNG, TRANG	27 May 1982	69,400	MOIST EVERGREEN		350km PHUKET 150km HYA	450 units Camp site	0	0	2	0	0	1	0
13. HAT CHACMAI	TRANG	14 Oct. 1981	23,088	MANGROVE	9,366ha(Land) 13,722ha(Marine)	20km TRANG	50 units	0	n.a	0	0	0	2	0
14. TALEBAN	★	1980	10,168			80km HY 30km SATUN	n.a	n.a	n.a	3	n.a	n.a	n.a	0
15. TARUTAO	★ SATUN	19 Apr. 1974	149,000	MOIST EVERGREEN	26,000ha(Land) 123,000ha(Marine)	110km + 20km (Boat) HY	48/164 u 200P	300P	0	4	4	3	0	0
16. NUKO PHETRA	SATUN	13 Dec. 1984	49,438	MOIST EVERGREEN	2,600ha(Land) 46,838ha(Marine)	110km HY	n.a	n.a	n.a	0	n.a	n.a	n.a	0

★ 1st PRIORITY
☆ 2nd PRIORITY

Criteria: 1. Distance from 3 centers
2. Existing Service Facilities
3. Resource Feature ... Marine
4. Management Plan Preparation

Source: Assessment of National Parks, Wildlife Sanctuaries and other Res as Development in Thailand

FIG. 1-22 NATIONAL PARKS IN THAILAND

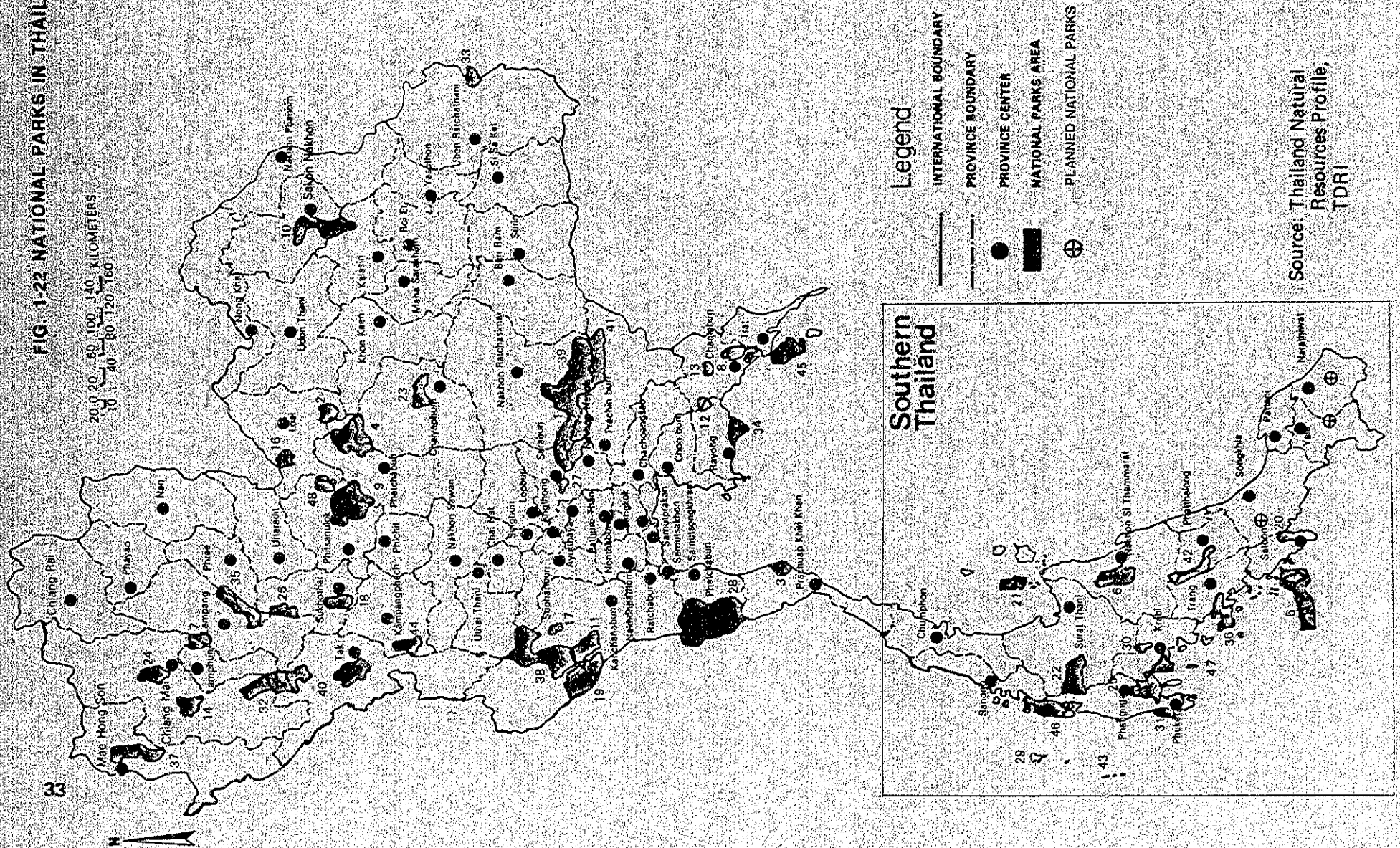
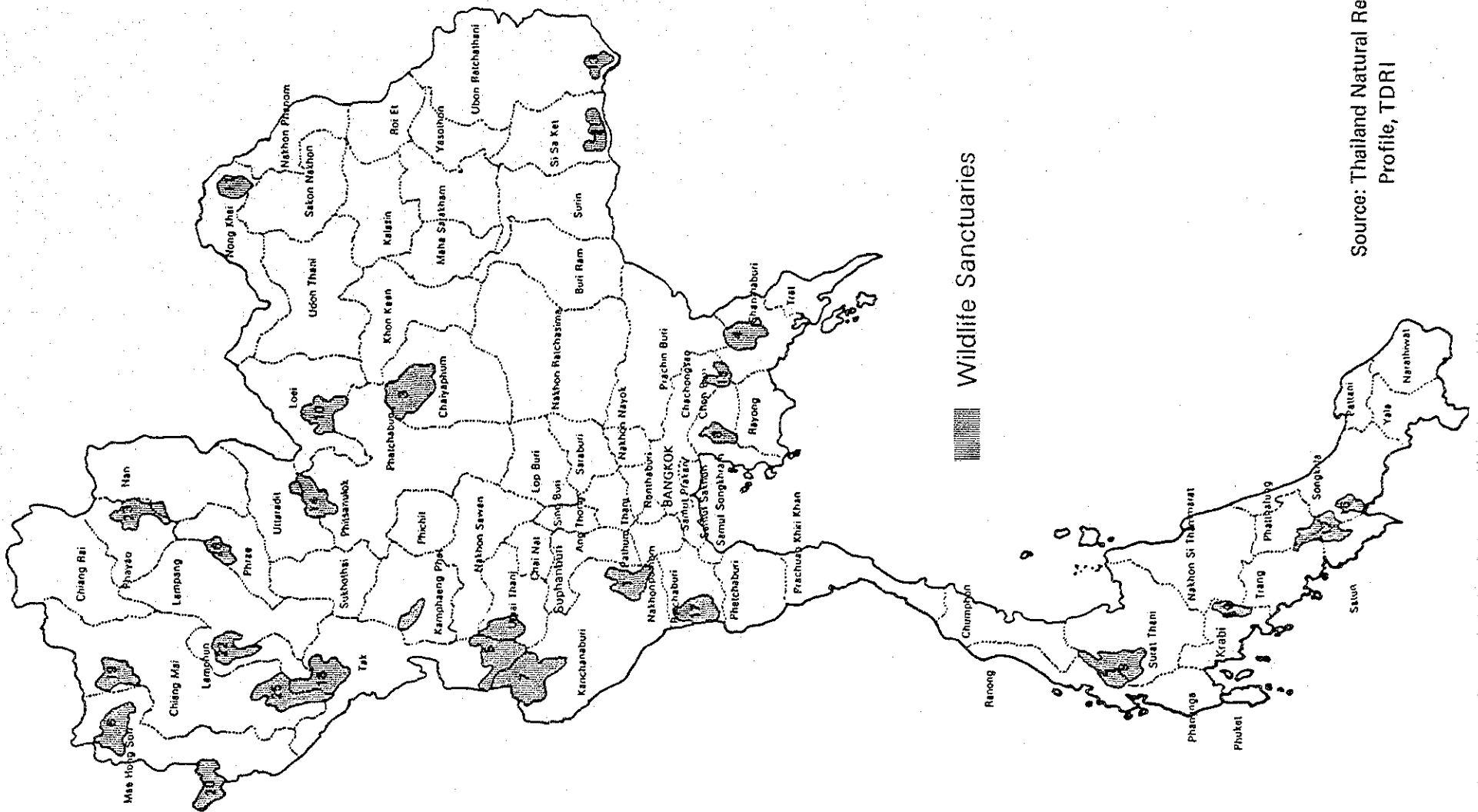


FIG. 1-23 WILDLIFE SANCTUARIES IN THAILAND



Source: Thailand Natural Resources Profile, TDRI

TABLE 1-13 LIST OF NATIONAL PARKS IN THAILAND, INCLUDING TOTAL AREA AND YEAR OF GAZETEMENT BY ROYAL DECREE

(For marine parks, the land area is given in parentheses under the total area.)

No.	Name	Province	Area (ha)	Year
1.	Khao Yai	Nakhon Nayok, Saraburi	216,863	1962
2.	Phu Kradung	Prachinburi	34,816	1962
3.	Khao Sam Roi Yod	Loei	9,808	1966
4.	Nam Nao	Prachuab Khiri Khan	96,600	1972
5.	Tarutao	Petchabun	149,000	1974
6.	Khao Luang	Satun	(26,000)	1975
7.	Doi Khuntan	Nakhon Si Thammarat	57,000	1975
8.	Nam Tok Phrii (Khao Srabapi)	Lamphun, Lamphang	25,529	1975
9.	Thung Salaeng Luang	Chanthaburi	13,450	1975
10.	Phu Phan	Phitsanulok, Petchabun	126,240	1975
11.	Erawan	Sakhon Nakhon, Kalasin	66,470	1975
12.	Khao Chamao - Khao Wong	Kanchanaburi	55,000	1975
13.	Khao Kitchakut	Rayong, Chanthaburi	8,368	1975
14.	Doi Inthanon	Chanthaburi	5,870	1977
15.	Lansang	Chiang Mai	48,240	1978
16.	Phu Rua	Tak	10,400	1979
17.	Chalerm Rattanakosin (Tham Tam Roi)	Loei	12,084	1979
18.	Ramkhamhaeng	Kanchanaburi	5,900	1980
19.	Sai Yok	Sukhothai	34,100	1980
20.	Thale Ban	Kanchanaburi	50,000	1980
21.	Mu Ko Ang Thong	Satun	10,160	1980
22.	Khao Sok	Surat Thani	10,200	1980
23.	Tad Tone	(1,800)	11,800	1980
24.	Doi Suttep-Pui	Surat Thani	64,552	1980
25.	Aow Phangnga	Chaiyaphum	21,718	1980
26.	Si Saichanalai	Chiang Mai	26,106	1981
27.	Khao Sam Lan	Phangnga	40,000	1981
28.	Kaeng Krachan	Sukhothai	21,320	1981
29.	Mu Ko Surin	Sukhothai	4,457	1981
30.	Khao Phanom Benja	Saraburi	291,500	1981
31.	Hat Nai Yang	Prachuab Khiri Khan	13,500	1981
32.	Mae Ping	Phangnga	(3,300)	1981
33.	Kaeng Tana	Krabi	5,012	1981
34.	Khao Laem Ya - Mu Ko Samet	Phuket	9,073	1981
35.	Wiang Kosai	Chiang Mai, Lamphun, Tak	(2,200)	1981
36.	Hat Chao Mai	Ubon Ratchathani	100,300	1981
37.	Nam Tok Surin	Rayong	8,000	1981
38.	Sinakarnd	Rayong	13,100	1981
39.	Thap Lan	(800)	16,000	1981
40.	Ton Krabak Yai	Phrae, Lamphang	41,000	1981
41.	Pang Sida	Trang	23,088	1981
42.	Khao Pu - Khao Ya	Mae Hong Son	39,660	1981
43.	Mu Ko Similan	Kanchanaburi	153,200	1981
44.	Khlong Lan	Nakhon Ratchasima, Prachinburi	224,000	1981
45.	Mu Ko Chang	Tak	14,900	1981
46.	Lam Son	Prachinburi	84,400	1982
47.	Hat Nopparatara - Mu Ko Pi Pi	Phatthalung, Trang	69,400	1982
48.	Phu Hin Rong Gia	Phangnga	12,800	1982
49.	Mu Ko Phetra	Phangnga	(1,400)	1982
50.	Phu Kaeo - Phu Phan Kham	Kamphaeng Phet	30,000	1982
51.	Mae Yom	Trang	65,000	1982
52.	Phu Jong Nai Yoy	Trang	(19,200)	1982
		Ranong, Phangnga	31,500	1983
		Krabi	(4,800)	1983
		Krabi	36,996	1983
		Phitsanulok, Loei	(6,400)	1984
		Satun	30,700	1984
		Satun	49,438	1984
		Udon Thani, Khon Kaen	(2,600)	1985
		Phrae, Lamphang	32,200	1985
		Ubon Ratchathani	45,475	1986
			25,443	1986

Source: Thailand Natural Resources Profile, TDRI

(contd.)

No.	Name	Province	Area (ha)	Features
32.	Laem Taloompook	Nakhon Si Thammarat	5,673	Mangroves, sandy beach, wading birds
33.	Mae Lao - Mae Sa	Chiang Mai	24,500	Mountain forest; goral, serow
34.	Nong Hua Khu	Udon Thani	11.2	Natural pond; waterfall
35.	Khao Chi On	Chonburi	368	Forest limestone mountain near temple
36.	Khao Pa Chang	Songkhla	23,500	Malaleuca forest, mountain, near shore marsh; waterfowl
37.	Thale Sap Nong Bon Kai	Chiang Rai	434	
38.	Khao Prathap Chang	Ratchaburi	206	Hill forest on limestone; cave; monkeys

Source: Wildlife Conservation Division, RFD.

TABLE 1-15 LIST OF WILDLIFE SANCTUARIES IN THAILAND WITH AREA AND YEAR OF GAZETEMENT

No.	Name	Province	Area (ha)	Year
1.	Salak Phra	Kanchanaburi	85,855	1965
2.	Khlong Nakha	Ranong	48,000	1972
3.	Phu Khieo	Chaiyaphum	156,000	1972
4.	Khao Soi Dao	Chanthaburi	74,502	1972
5.	Huai Kha Khaeng	Uthai Thani, Tak	163,100	1972
6.	Lum Nam Pai	Mae Hong Son	119,400	1972
7.	Thungyai Naresuan	Kanchanaburi, Tak	320,000	1974
8.	Khao Khieo - Khao Chormphu	Chonburi	14,470	1974
9.	Khlong Saeng	Surat Thani	115,620	1974
10.	Phu Luang	Loei	84,800	1974
11.	Phu Wua	Nong Khai	18,650	1975
12.	Khao Banthat	Phattalung, Trang, Satun, Songkhla	126,720	1977
13.	Yod Dome	Ubon Ratchathani	20,255	1977
14.	Phu Miang - Phu Thong	Phitsanulok, Uttaradit	54,500	1977
15.	Khao Ang Ru Nai	Chachoengsao	10,810	1977
16.	Ton Nga Chang	Satun, Songkhla	18,200	1978
17.	Maenam Phachi	Ratchaburi	48,931	1978
18.	Mae Tuen	Tak	117,300	1978
19.	Doi Chiang Dao	Chiang Mai	52,100	1978
20.	Salawin	Mae Hong Son	87,500	1978
21.	Khao Phanom Dong Rak	Si Sa Ket	31,600	1978
22.	Doi Pha Muang	Lampang, Lamphun	58,560	1980
23.	Doi Pha Chang	Phayao, Nan	57,675	1980
24.	Khlong Phraya	Krabi	9,500	1980
25.	Orn Koi	Chiang Mai, Tak	122,400	1983
26.	Doi Luang	Phrae	9,700	1984
27.	Khao Sanam Piang	Kampaeng Phet	10,100	1985
28.	Mae Yuam	Mae Hong Son	29,200	1986

Source: Thailand Natural Resources Profile, TDRI

TABLE 1-14 LIST OF NON-HUNTING AREAS AND THEIR MAIN FEATURES

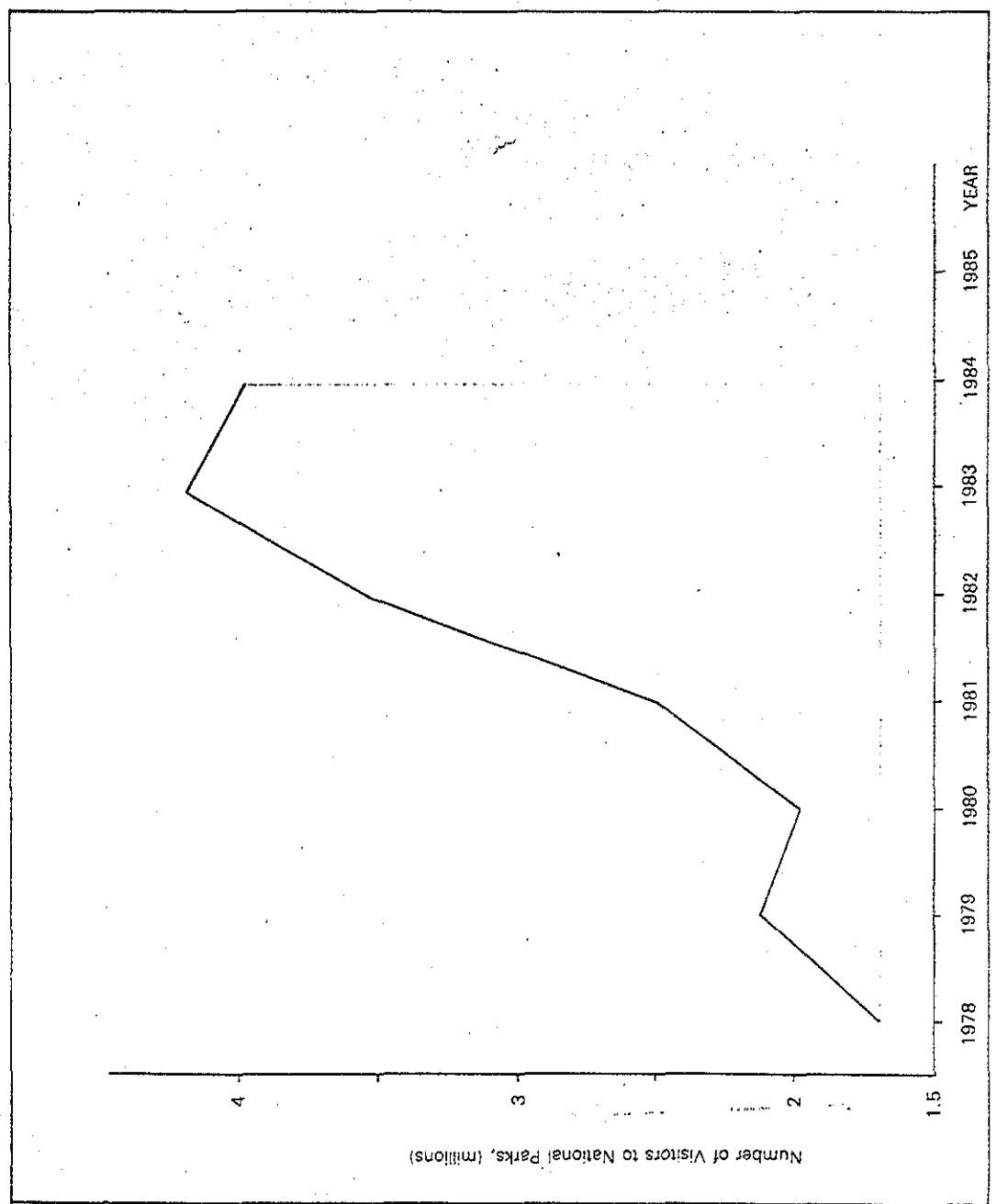
No.	Name	Province	Area (ha)	Features
1.	Thale Noi	Nakhon Si Thammarat Phattalung, Songkhla	45,000	Headwaters of Songkhla Lake; waterfowl
2.	Bung Borphet	Nakhon Sawan	21,280	Natural reservoir; waterfowl, only location for White-eyed River Martin
3.	Pa Phru	Narathiwat	16,000	Peat land forest, swamp; ducks
4.	Nong Thung Thong	Surat Thani	2,956	Marsh; waterfowl
5.	Wat Tan En	Ayutthaya	16	Herons, egrets, Indian shags, fruit bat, roost
6.	Bang Phra	Chonburi	1,856	Reservoir; waterfowl
7.	Lawa Cave - Daowadung Cave	Kanchanaburi	4,150	Bats (now in Sai Yok National Park)
8.	Doi Suthop	Chiang Mai	1,750	Forest (now in Doi Suthep National Park)
9.	Thale Sap	Songkhla, Phattalung	36,466	Brackish lake; waterfowl
10.	Khao Tha Phet	Surat Thani	463	Patch of forest near town; birds
11.	Wat Ratsathas Kravaram	Samut Sakhon	7.5	Roost for herons and shags
12.	Wat Phai Lom - Wat Amphu Wararam	Pathum Thani	11.8	Breeding colony
13.	Bung Kroeng	Kanchanaburi	51,200	Open-billed Stork
14.	Kawia - Nong Nam Sap Li Bong Islands	Trang	44,750	Reservoir, waterfowl
15.	Khao Nam Phrai	Trang	2,080	Mangrove, mud flats for waders
16.	Khao Phra Thaeo	Phuket	2,228	Limestone mountain; serow, langurs
17.	Nong Prak Phraya - Khao Raya Bangsa	Satun	2,043	Rain forest, waterfall, wildlife park
18.	Huai Chorakay Mak Reservoir	Buri Ram	620	Swamp; limestone mountain; serow waterfowl
19.	Sanam Bin Reservoir	Buri Ram	570	Waterfowl
20.	Huai Talad Reservoir	Buri Ram	709	Reservoir; rare ducks
21.	Nong Waeng	Chaiyaphum	17.5	Ducks
22.	Khao Kra Dong	Buri Ram	232	Pond; waterfowl
23.	Tam Rakang and Khao Phranon	Ratchaburi	17	Limestone cave; bats
24.	Khao Chong Prarn	Ratchaburi	12.3	Limestone cave; bats
25.	Pa Gard	Songkhla	412	Forest area in lowland
26.	Bung Khong	Nong Khai	1,382	Marsh along Maekhong River; waterfowl
27.	Bung Chawak	Suphanburi	320	Pond and marsh; waterfowl
28.	Pha Ta Pon Cave	Phitsanulok	284	Limestone cave and forest; bats
29.	Khao Yai - Khao Pha Natang	Uttaradit	2,400	Limestone cave; bats
30.	Khlong Lamcham	Trang	5,400	Small ponds; waterfowl
31.	Pa Rang kai	Pattani	25	Roost for zebra dove etc.; recreation-education area

TABLE 1-16 TEN MOST VISITED NATIONAL PARKS IN OCTOBER-SEPTEMBER 1984 SEASON

Name	Province	No. visitors
1. Erawan	Kanchanaburi	482,536
2. Doi Inthanon	Chiang Mai	330,553
3. Phiew Falls	Chanthaburi	318,769
4. Doi Suthep - Doi Pui	Chiang Mai	297,505
5. Ao Phiangnga	Phangnga	278,820
6. Khao Yai	Nakhon Nayok, Saraburi, Khorat, Prachinburi	258,803
7. Khao Lam Ya - Mu Ko Samet	Rayong	225,915
8. Sai Yok	Kanchanaburi	165,506
9. Hat Noppataithara - Mu Ko Pi Pi	Krabi	154,235
10. Khlong Lan	Kamphaeng Phet	122,160
Total, top 10		2,634,802
All other parks		1,344,692
Grand total		3,979,494

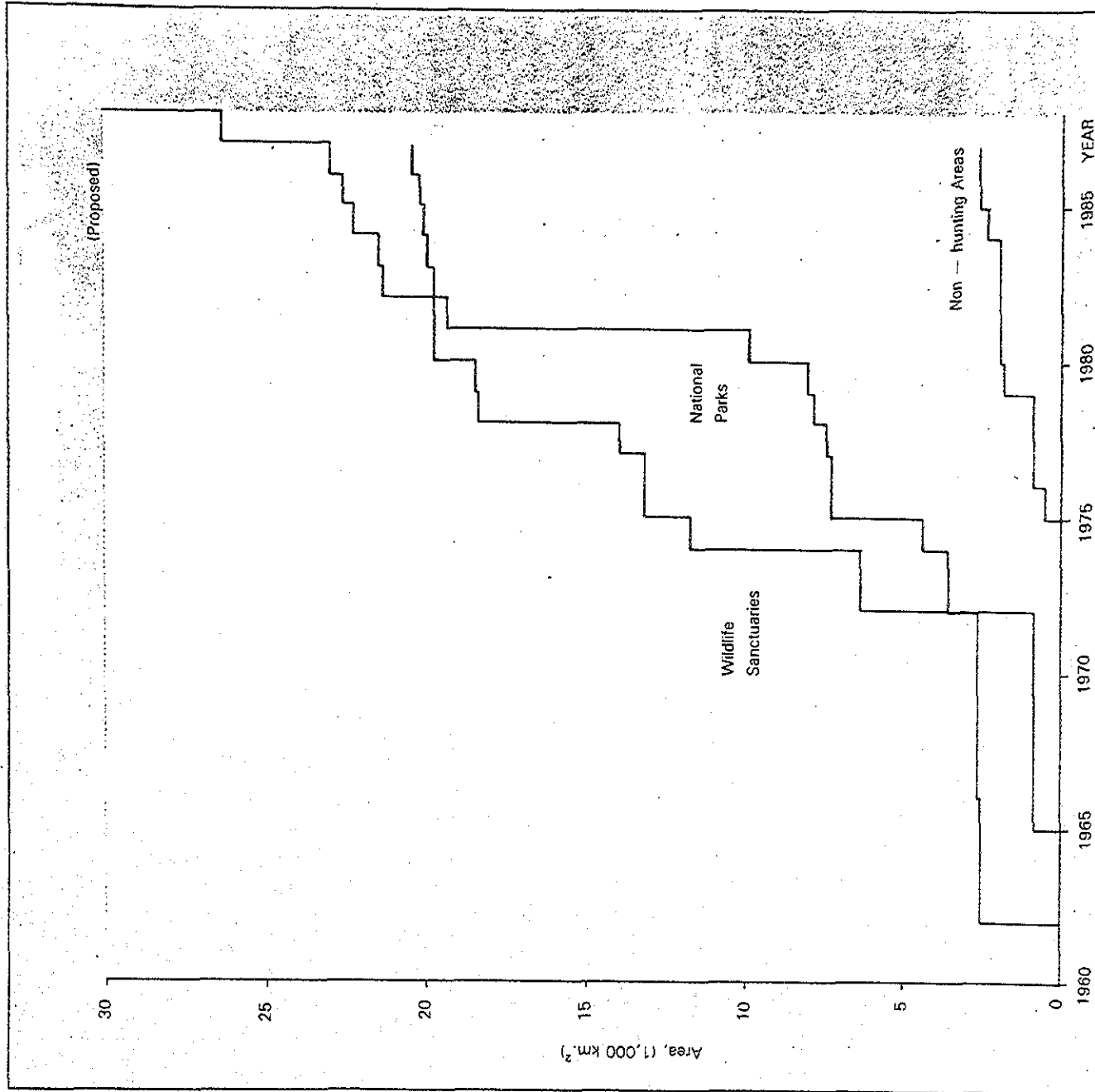
Source: National Park Division, Royal Forest Department.

FIG. 1-25 GROWTH IN ANNUAL NUMBERS OF VISITORS TO NATIONAL PARKS SINCE 1978



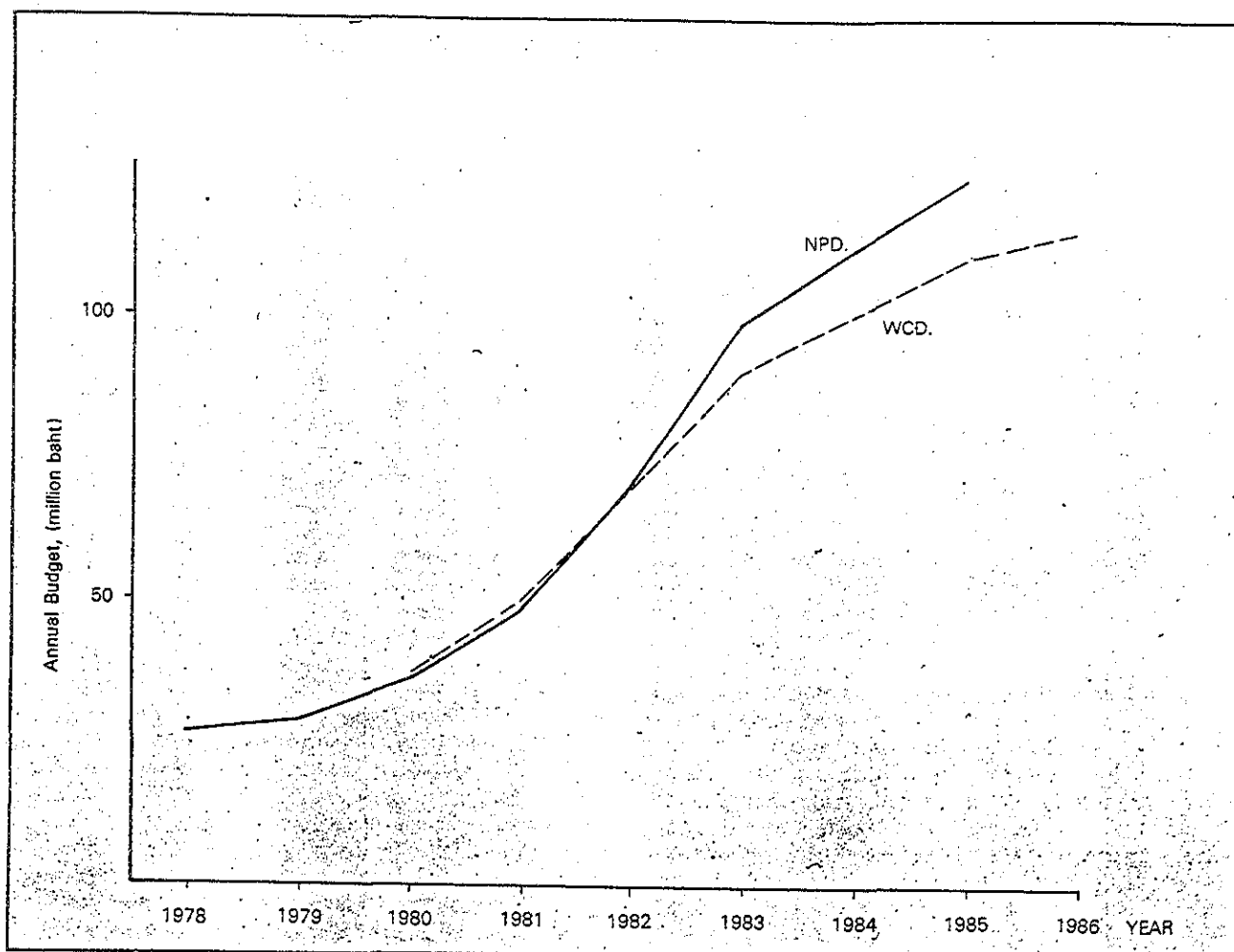
Source: Thailand Natural Resources Profile, TDRI

FIG. 1-24 THE GROWTH OF THE PROTECTED AREA SYSTEM IN THAILAND



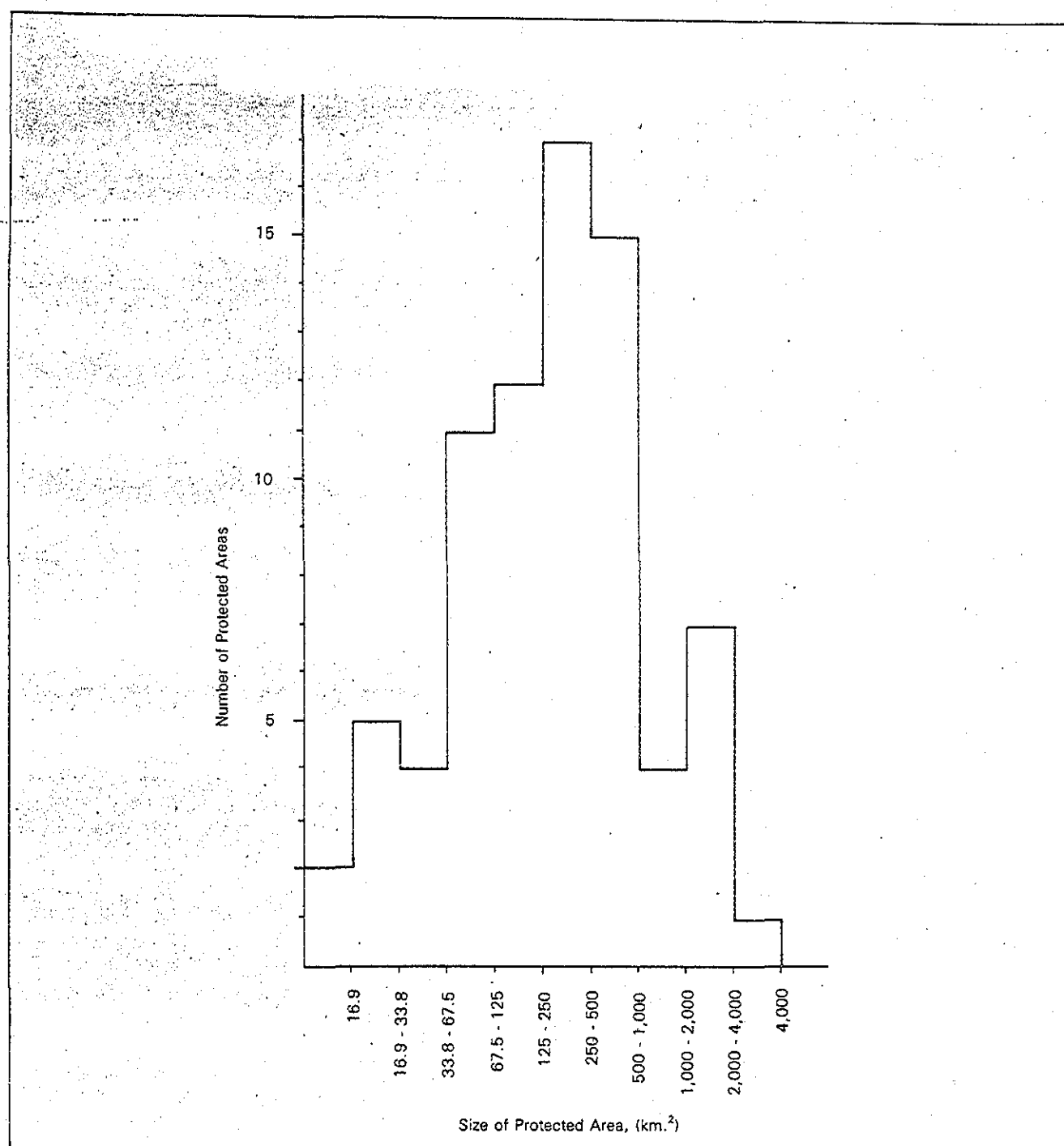
Source: Thailand Natural Resources Profile, TDRI

FIG. 1-26 GROWTH OF THE BUDGETS OF THE NATIONAL PARK DIVISION



Source: Thailand Natural Resources Profile, TDRI

FIG. 1-27 FREQUENCY DISTRIBUTION OF SIZE OF PROTECTED AREAS



Source: Thailand Natural Resources Profile, TDRI

FIG. 1-28 DISTRIBUTION OF MANGROVES IN THAILAND (Klankamsorn and Charupatt, 1982)

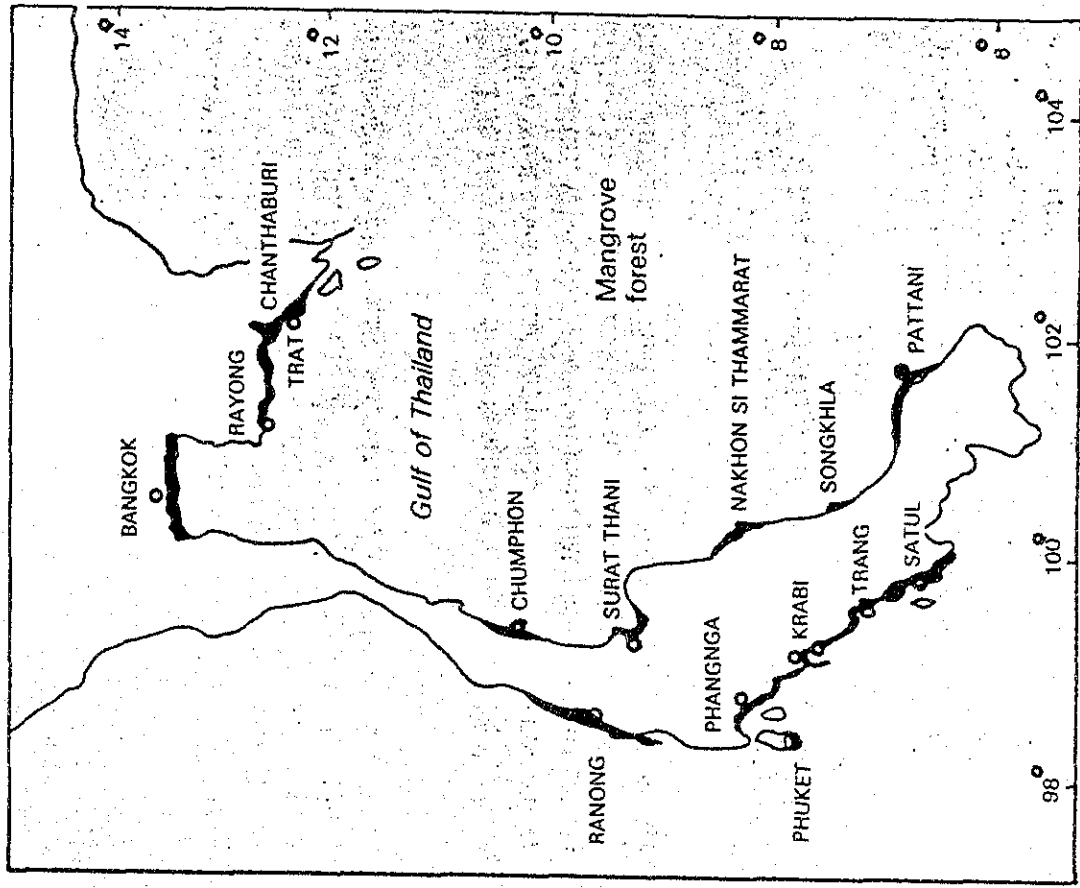


FIG. 1-29 MULTIPLE-USE MANAGEMENT OF COASTAL AREA

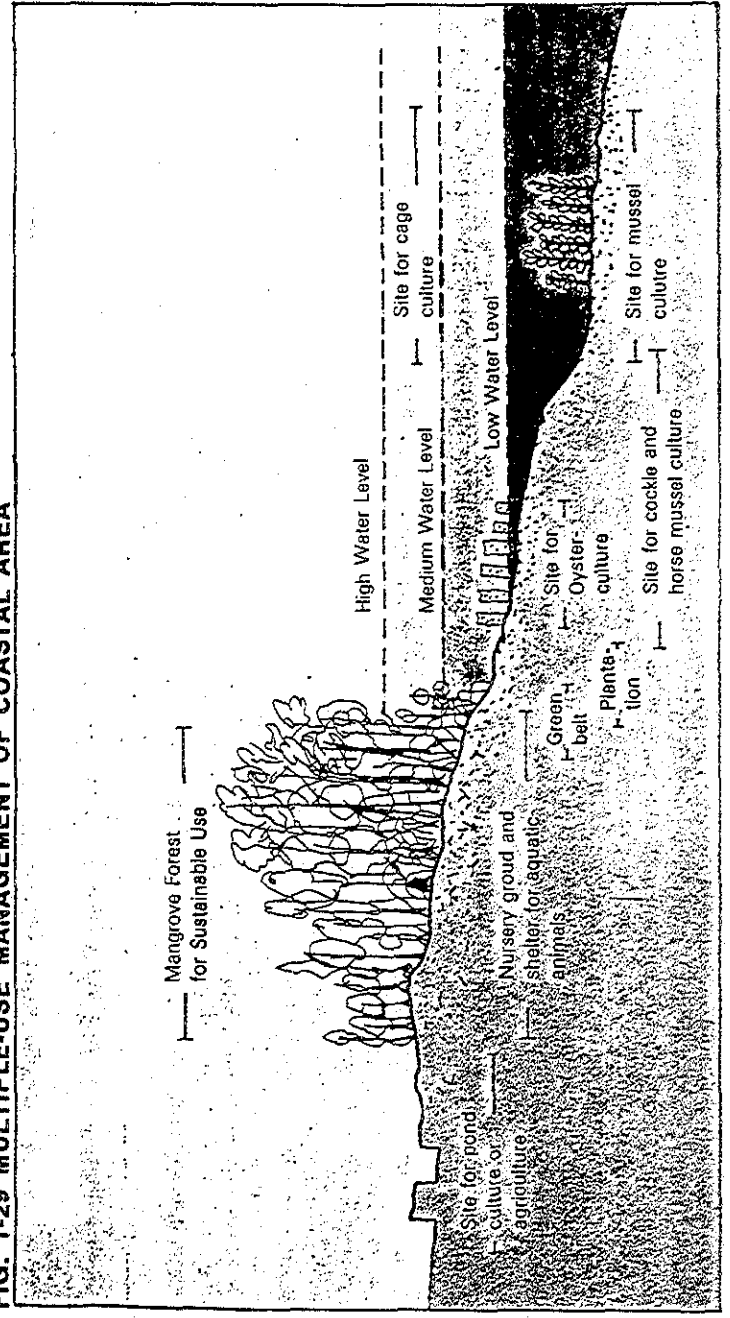


FIG. 1-30 MANGROVE FOOD WEB

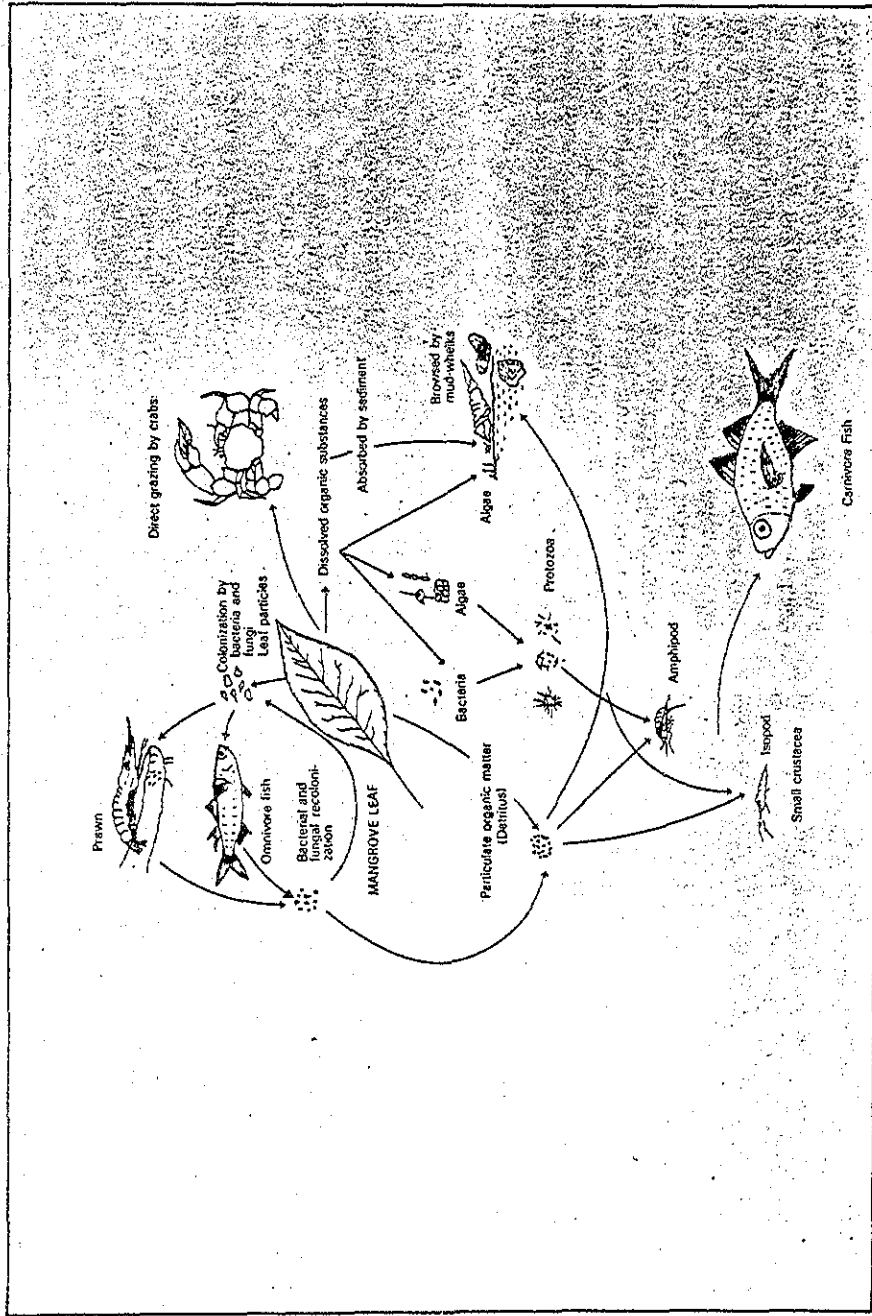
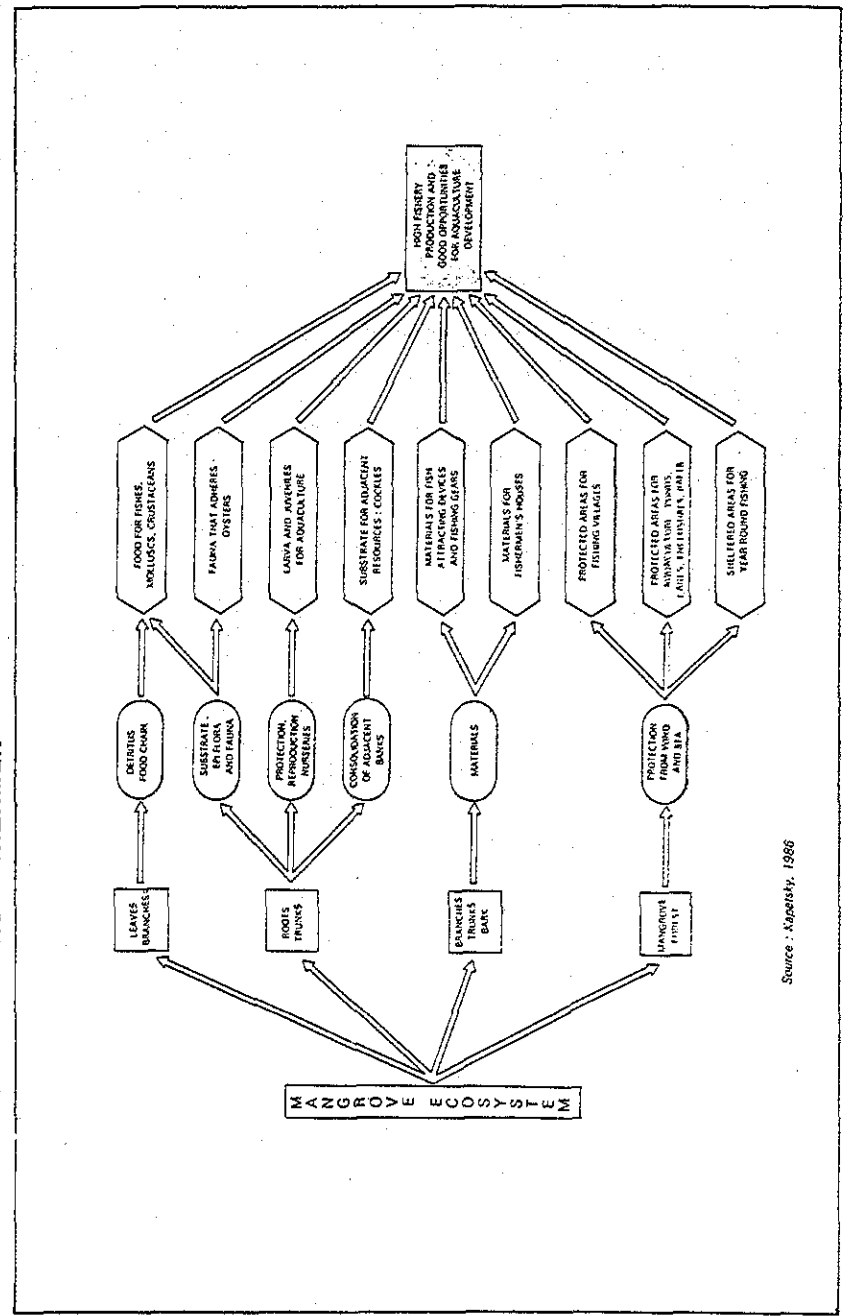


FIG. 1-31 SOME FUNCTIONAL RELATIONSHIPS OF MANGROVES WITH FISHERY RESOURCES, AQUACULTURE AND FISHERMEN

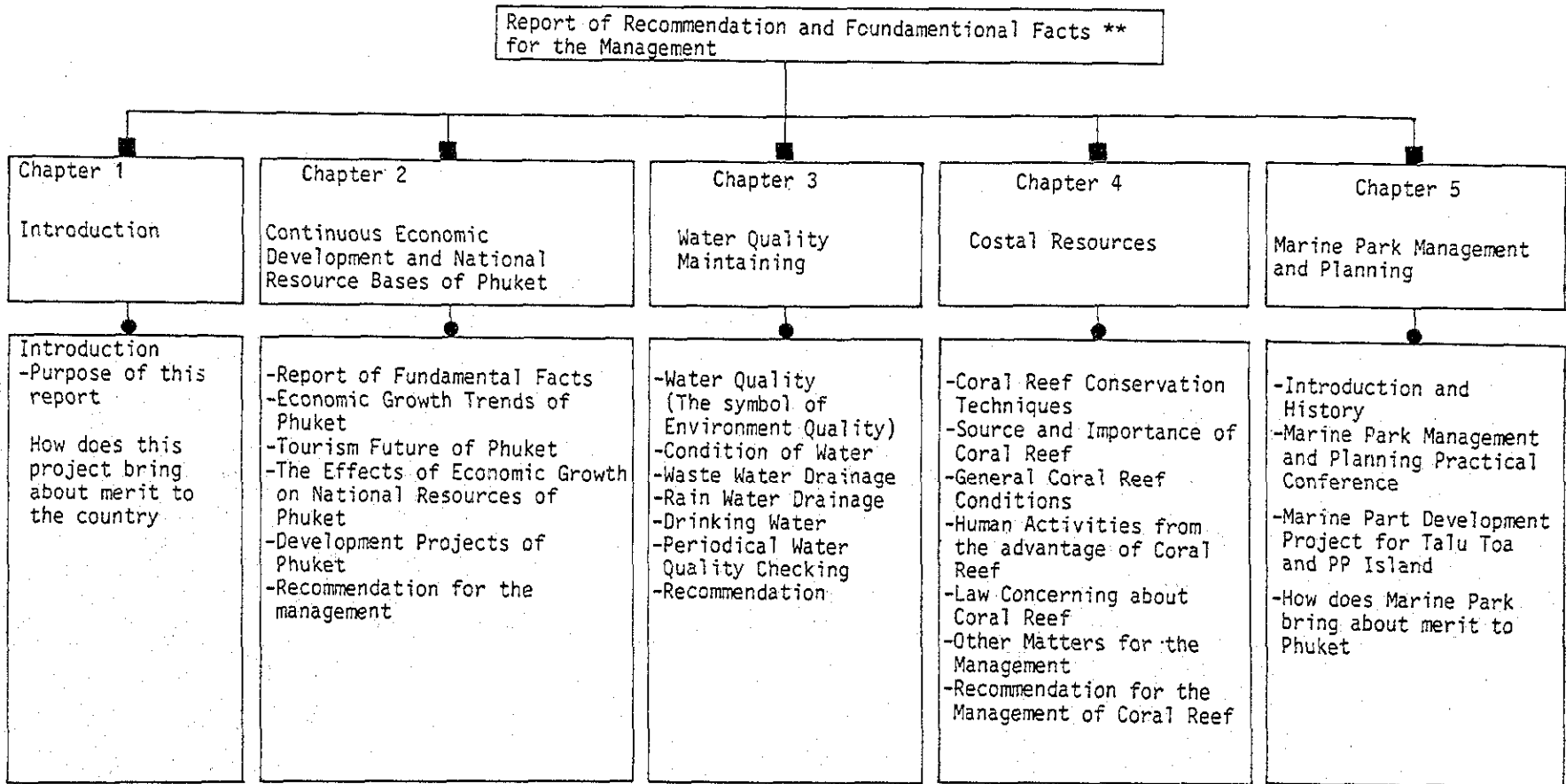


Source: Napseshy, 1986

Source: Thailand Natural Resources Profile, TDRI

2. COASTAL RESOURCES MANAGEMENT PROJECT (CRMP)

FIG. 1-32 COASTAL RESOURCES MANAGEMENT PROJECT OF PHUKET



◇ The Coastal Resource Management Plan of Phuket describes the fundamental facts and gives the management recommendation on environmental conservation. It stresses the importance of water quality control as we did in our interim report.
Source:NEB

TABLE 1-17 ENVIRONMENTAL PARAMETERS INVOLVED IN ANALYSIS OF COASTAL DEVELOPMENT PROJECTS

Environmental Parameters	Environmental Impact Assessment		Critical Issue
	Full Scale &	Preliminary	
1. Physical Resources Air resources/quality Climate Mineral resources Soils (including beach sands) Topography/geology/seismology Water quality Water quantity (hydrology)	•••••	•••••	•
2. Ecological/Biological Resources Aquatic biology Fishes Forest habitat Wildlife (terrestrial)	•••••	•••••	•
3. Human Use Values Farming irrigation Flood control/drainage Highways/streets Housing Industry Land use patterns Navigation Sewage treatment Water supply Solid waste management	•••••	•	•••••
4. Quality of Life Values Community cleanliness Cultural values Employment patterns Noise problems Population density Public health Public safety Socio-economics Aesthetics Archaeological values	•••••	•••••	•

TABLE 1-18 DOMESTIC EFFLUENT STANDARDS (DRAFT)

Parameters	Units	Domestic Effluent Standards for Community hotel- (rooms) group- (persons)			
		A (<60) A (<1C1)	B (61-300) B (101-500)	C (301-1500) C (501-2500)	D (>1500) D (>2500)
1. BOD 20 ₅	mg/l	90	60	30	20*
2. Solids	"	60	50	40	30
2.1 SS	"	0.5	0.5	0.5	0.5
2.2 Settleable S.	"	+500	+500	+500	+500**
2.3 TDS	"	4.0	3.0	1.0	0.3**
3. Sulfide	"	-	-	0.3	0.3***
4. Free Residual Chlorine	"	40	40	-	-
5. Nitrogen	"	15	15	10	10
5.1 TKN	"	25	25	-	-
5.2 ORG-N	"	-	-	-	-
5.3 NH ₃ -N	"	-	-	-	-
5.4 NO ₃ -N	"	-	-	-	-
6. pH	"	5-9	5-9	5-9	5-9
7. Oil & Grease	"	20	20	20	20

* Settled BOD (30 min).
** More than TDS of used water.
*** Maximum allowance under epidemic condition only.