

Designation date: 12/08/2013 Ramsar Site no. 2152

# Information Sheet on Ramsar Wetlands (RIS) – 2009-2014 version

Available for download from [http://www.ramsar.org/ris/key\\_ris\\_index.htm](http://www.ramsar.org/ris/key_ris_index.htm).

*Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8<sup>th</sup> Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9<sup>th</sup> Conference of the Contracting Parties (2005).*

## Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 14, 3<sup>rd</sup> edition). A 4<sup>th</sup> edition of the Handbook is in preparation and will be available in 2009.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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## 1. Name and address of the compiler of this form:

Dr. Sirikul Bunpapong  
The Office of Natural Resources and Environmental  
Policy and Planning  
60/1 PhibunWattana 7  
Phayathai Bangkok 10400  
Phone number (+66) 226 56636  
E-mail [sirikb@yahoo.com](mailto:sirikb@yahoo.com)

Dr. Anuwat Nateewathana  
3/3 Petchakasem Road, Tambol Omnoi, Amphoe Kratumban  
Samut Sakorn 74130, Thailand  
Tel (+66) 811 731151  
E-mail [anuwat007@gmail.com](mailto:anuwat007@gmail.com)

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Designation date Site Reference Number

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## 2. Date this sheet was completed:

15 March 2012

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## 3. Country:

Thailand

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## 4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Ko Kra Archipelago

Koa Kra Islands, Nakornsrithammarat Province

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or  
b) Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged:  or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or  
ii) the boundary has been extended ; or  
iii) the boundary has been restricted\*\*

and/or

If the site area has changed:

- i) the area has been measured more accurately ; or  
ii) the area has been extended ; or  
iii) the area has been reduced\*\*

\*\* **Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as: xxxx

- i) a *hard copy* (required for inclusion of site in the Ramsar List): ;  
ii) an electronic format (e.g. a JPEG or ArcView image) ;  
iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

Ko Kra Archipelago is about 53 kilometers from the mainland and comprises three small Islands, as follows: Kra Yai Island (main island, 34.13 ha), Kra Klang Island (4.55 ha) and Kra Lek Island (1.4 ha) located on 2 km south of Kra Yai island. In the North and the South of Kra Islands is the Gulf of Thailand. The morphology of the islands is rocky cliff in the north, the west and the east and in the south is sandy beach that is about 150 meters long. In the middle of Kra Yai a small mountain that is covered with tropical trees. All islands have been declared as a protected area under authority of local government.

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**8. Geographical coordinates** (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Center point at Kra Yai island: 08 23' 49" N 100 44' 13" E

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**9. General location:**

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

Ko Kra Archipelago is in the Gulf of Thailand located on the east of Pak Pa-nang Bay, Nakhon Sri Thammarat Province approximately 53 km far from main land and about 700 km south of Bangkok. Ko Kra archipelago is a group of remote islands. From Pak Nam Kanom, it is about 142 km, Talumpook Cape about 53 km and Hua Sai District about 60 km.

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**10. Elevation:** (in metres: average and/or maximum & minimum)

Average 20 m

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**11. Area:** (in hectares)

Ramsar site area is 374 ha

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**12. General overview of the site:**

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Ko Islands comprises with 3 islands and Kra Yai island is the biggest. In the central of Kra Yai Island is a mountain 80m high and covered with tropical rainforest. At the south of Kra Yai Island is a beach that originated from coral fragment and the beach length is about 150 m. In the east coast of the coral beach there is a rocky beach approximately 300 m by length. The other islands (Kra Klang Island, Kra Lek Island, and a underwater islet namely Hin Rue) are rocky shore. Ko Kra Islands including underwater islet are the rich in biodiversity especially coral community, 16 species of staghorn coral in the genus of *Acropora* were recognized in species list of hand-book records. There were 125-species of coral fishes found in this site with two new records of Butterfly fish in Thailand, namely *Chaetodon baronessa* *C. speculum*. Kra Yai Island is also an important nesting ground for-sea turtle, in the south of Thailand. There are over 30 nests of the endangered Green turtle, *Chelonia mydas* each year with approximately 3,000 turtle eggs. The critically endangered Hawksbill turtle *Eretmochelys imbricate* also nest at the site.

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**13. Ramsar Criteria:**

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

#### 14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification). 2

##### Criterion 2:

English Name	Scientific Name	IUCN Status	CITES Appendix	CMS Status	National Protection Class	Thailand Red Data
Birds						
Christmas Island Frigatebird	<i>Fregata andrewsi</i>	CR	I	-	-	CR
Chinese Egret	<i>Egretta enophotes</i>	VU	-	I	-	EN
Reptiles						
Green Turtle	<i>Chelonia mydas</i>	EN	I	I, II	-	CR
Hawksbill Turtle	<i>Eretmochelys imbricata</i>	CR	I	I, II	-	CR

##### Criterion 3:

The very unique and dominant wetland type is coral that covers about 66 ha around the Ko Kra Archipelago, including Kra Yai, Ko Krang and Ko Lek. Some 67 species of hard coral from 25 genus and 11 families were found and which is a higher diversity than any other places in the Gulf of Thailand. Examples of some species of as follows-

- Fine spined coral such as *Nontipora aequituberculata*, *M. digitata*, *M. turtlensis*
- Bottlebrush coral such as *Acropora longicyathus*
- Staghorn coral such as *Acropora intermedia*, *A. microphelma*, *A. grandis*, *A. lantistella*, *A. aculeus*
- Table coral such as *Acropora valenciennesi*, *A. Indonesia*, *A. divaricata*
- Leaf coral such as *Pavona castus*, *P. decussate*, *P. frondifera*, *P. clavus*
- Cauliflower coral such as *Pocillopora damicomis*, *P. vertucosa*
- Ring coral such as *Favia steliger*, *F. speciosa*, *F. favus*
- Honey comb coral such as *Goniastrea austrea*
- Brain coral such as *Platygyra daedeara*
- Soft coral 9 species such as *Labophytum sp.*, *Sarcophyton sp.*
- Sea fan 7 species such as *Rumphella sp.*, *Briareum sp.*
- Sponge 19 species such as *Halicol (Reintial) sp.*, *Neopetrania sp.*
- 125 species of fish were found, the dominant fish species is Pomacentridae Family. *Chartodon baronessa* and *Chetodonspeculum* that never find in Thailand before are also found here too.

Corals found only in Andaman Seas such as *Acropora longicyathus*, *Acropora nana*, *Acropora copiosa* and *Acropora exquista* can also be seen in the islands.

##### Criterion 4:

The islands are an important breeding site for the endangered Green turtle, *Chelonia mydas*, with over 30 nests and approximately 3,000 turtle eggs each year. Due to the island being a remote area then no one approach or stay there, Green turtle production still remains high in this area in terms of the number of population whereas the adjacent area had no longer maintained the population and run out of for last two decade. Coral reefs are also located in the south-east insular area of Ko Kra Yai, the are between Ko Kra Klang and Ko Kra Lek, the south-east insular area of Ko Kra Klang and around Ko Kra Lek and a underwater islet namely "Hin Rue". So Kra Yai island have just only one of the breeding area in the southern Gulf of Thailand.

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**15. Biogeography** (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

**a) biogeographic region:**

Indomalayan Realm-Indochinese rainforest

**b) biogeographic regionalisation scheme** (include reference citation):

*Udvardy, M. D. F. (1975). A classification of the biogeographical provinces of the world. IUCN Occasional Paper no. 18. Morges, Switzerland: IUCN*

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**16. Physical features of the site:**

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Ko Kra Archipelago comprises 3 Islands (Kra Yai Island, Kra Klang Island and Kra Lek Island). Kra Yai is the biggest island. Ko Kra Archipelago is made of igneous rock that comprises quartz, feldspar and dolomite. There is a small igneous rock mountain in the northern part of Kra Yai Island that is covered with tropical forest, so in the north, south and west are cliff. There are no permanent land use in the island, then soil type on the island is appropriated and the same as in tropical forest.

This island directly faces to the monsoons both the north-east and south-west monsoon. The influence of monsoon is caused to the result of rain and moisture all round year. Summer starts to the middle of April and rainy season is from May to December. The average temperature is approximately 28 degree Celsius and relative humidity is about 79% throughout the year. The average total rainfall is 1,910 mm. per year and most in November with 511 mm. There are coral reefs covered in the area of 66 ha in the water depth up to 20 m around all islands. Average salinity throughout the year is 32 ppt and pH of sea water is 8

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**17. Physical features of the catchment area:**

Describe the surface area, general geology and geomorphologic features, general soil types, and climate (including climate type).

The site is located on a peninsula in the southern part of Thailand that is influenced by monsoons from the both side of the peninsula, resulting in rainfall for most of the year and cool weather. According to climate data and statistics of Thai Meteorological Department, the climate of Ko Kra can be divided into 2 seasons as follows.

Dry season is from February to the middle of April and has no monsoon. The weather is hot and the highest temperature occurs between the end of April and beginning of May.

Rainy season is from May to October, resulting from southwest monsoon which brings hot wind and moist air from the Indian Ocean. During this period, low pressure covers the south causing high amount of rainfall. Winds and waves during August to October may be calm some days.

During November to January, Northeast monsoon prevailing over the Gulf of Thailand affects Ko Kra, causing high amount of rainfall, strong winds and high waves.

The Southwest and northeast monsoons from the Indian Ocean bring moisture to Ko Kra causing average hot temperature in dry season and warm weather in rainy season. Average annual temperature is approximately 28 degree Celsius. Minimum temperature is around 19 degree Celsius in December and January. Maximum temperature is around 33 degree Celsius in May.

Average annual relative humidity is approximately 79%. Average maximum relative humidity is 92% in October and November while minimum is 63% in July. Mean Annual rainfall is 1,910 millimeters. Average maximum rainfall is 511 millimeters in November while minimum is 35 millimeters in February.

### 18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

The corals help stabilize the shoreline, act as fish nurseries, the islands provide a shelter from storms. There are lots of small and short waterways during raining season. There are no permanent water reservoirs in the site.

### 19. Wetland Types

#### a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

**Marine/coastal:** A • B • C • D • E • F • G • H • I • J • K • Zk(a)

**Inland:** L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va •  
Vt • W • Xf • Xp • Y • Zg • Zk(b)

**Human-made:** 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

#### b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

Coral reef and sandy beach (C and E)

### 20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

This is a natural area, with no disturbance from outside. It is an important area for sea turtle hatching in Thailand.

It consists prominently of lagoon coral reef ecosystems, in addition to some of coral species (*Pocillopora damicornis*, *Montipora digitata* and *Acropora longicyatus*) that are not found elsewhere in the Gulf of Thailand. There are larger forms of coral reefs than any other area in the Gulf of Thailand.

There are 2 species of butterfly fish (*Chaetodon baronessa* and *Chaetodon speculum*) found only at Ko Kra Islands in the Gulf of Thailand.

The ecosystem services that are provided by the Ko Kra Islands are storm shelter for fishing boat. It also represents a hatching habitat for sea turtles (*Chelonia mydas* and *Eretmochelys imbricata*), nursery for fish resources and a source of tourism and recreation.

## 21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Ko Kra Yai Island has approximately 98 kinds of ferns such as *Asplenium nidus* L. and 81 kinds of flowering plants. In addition, around 10 kinds of flora have been distributed only in Ko Kra Klang and Ko Kra Lek.

Ko Kra Klang Island has approximately 14 kinds of flora, of which 11 were identified and 3 are unknown. Those identified were comprised of 2 kinds of ferns and 9 kinds of flowering plants.

Ko Kra Lek has approximately 36 kinds of flora consisting of 6 kinds of known ferns and 30 kinds of flowering plants, of which 21 are known and 9 are unknown.

## 22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Some species of staghorn coral such as *Acropora longicyathus*, *Acropora nana*, *Acropora copiosa* and *Acropora exquisita* which are found only in the Gulf of Thailand due to its good quality of sea water, and whose presence in the Gulf of Thailand has never been reported, can also be seen in Ko Kra Islands. Coral reefs of Ko Kra Archipelago cover a total area of ~66 ha of which is 42 ha around Kra Yai island, 20 ha around Kra Klang and Kra Lek island, and 4 ha is around Hin Rue.

26 kinds of birds in 22 genera of 14 families such as *Ardeola bacchus*, *Haliastur indus* and *Aerodramus fuciphagus* were found in the area. According to IUCN Red List 2005, some of those birds were declared as follows. *Fregata andrewsi* (Critically endangered). *Egretta eulophotes* (Vulnerable). *Caleoenas nicobarica* (Near Threatened). *Haliaeetus leucogaster*, *Tyto alba*, *Sterna sumatrana* are Least Concern.

One species of megabat, namely Small flying fox *Pteropus hypomelanus* which is listed as Near Threatened (NT) in ONEP 2005 (Thai Red List) was also found in this island.

7 kinds of reptiles and amphibians were found, namely *Hemidactylus frenatus*, *Mabuya multifasciata* *Ptychozoon kublii*, *Cyrtodactylus sp.*, *Dinodon septentrionale*, *Eretmochelys imbricata* (Critically endangered), *Chelonia mydas* (Endangered). According to ONEP 2005, *Eretmochelys imbricata* and *Chelonia mydas* were characterized as Critically endangered.

## 23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

Due to Ko Kra islands group of remote islands and located solitary in the area, fishermen are always recognized the area as a storm shelter during monsoon season. The fisheries around Ko Kra Islands specially for the commercial is known to be one target for many species as Yellow queenfish (*Scomberoides commersonianus*), Red snapper (*Lutjanus fulviframma*), and Cobia (*Rachycentron canadum*). The remote location and monsoon season like this island make help sustain fish resources. With proper measures that prevent over-harvesting in fisheries, the islands are a main fisheries production for this area.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box  and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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**24. Land tenure/ownership:**

a) within the Ramsar site:

Ko Kra Islands is state owned.

b) in the surrounding area:

State owned

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**25. Current land (including water) use:**

a) within the Ramsar site:

The Ko Kra Islands is in the responsibility of the Royal Thai Navy as a monitoring station and temporary base for pirate prevention. No permanent building or housing in the islands. There are tourism activities such as snorkeling and scuba diving. The Ko Kra Islands is also a monitoring and researching station for Marine turtle conservation activities by the Department of Marine and Coastal Resources(DMCR).

b) in the surroundings/catchment:

Fishery and tourism (snorkeling and scuba diving)

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**26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

a) within the Ramsar site

The factors adversely affecting the site's ecological character are as follows:

- Illegal fishing the affecting the coral reef around the islands such as blasting, and poisoning
- Rubbish from fishing activities such as fishing nets
- Anchoring in the coral reef
- Illegal over exploitation of turtle eggs.
- Tourist irresponsibility from snorkeling and scuba diving

b) in the surrounding area:

- Illegal fishing
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**27. Conservation measures taken:**



a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The site is in the responsibility of the Royal Thai Navy as a monitoring station and temporary base for pirate prevention.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

Yes, by the Department of Marine and Coastal Resources: DMCR

d) Describe any other current management practices:

Due to the national fisheries law have prohibited the trawler and commercial fishing approach with 3 km. of all coastal and island

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**28. Conservation measures proposed but not yet implemented:**

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No

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**29. Current scientific research and facilities:**

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

- The survey and research of biodiversity of Ko Kra Islands by the Department of Marine and Coastal Resources: DMCR
- The study of sea turtle population and migratory route for nesting and hatching by the Department of Marine and Coastal Resources: DMCR

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**30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:**

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

- Leaflet and website about the biodiversity in the Ko Kra Islands that produced by the Department of Marine and Coastal Resources: DMCR (<http://www.smcrc.go.th/kokra02.html>)
- Fishing house cleaning activity every year at the Ko Kra Islands that organized by the Department of Marine and Coastal Resources in cooperation with the Nakorn Srithammarat province and Tourism Authority of Thailand (TAT)

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**31. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Ko Kra Islands is an important area for marine tourism esp. scuba driving. The major spot is at the Kra Klang, Lek Island, and the north-east of the Kra Yai Island.

Tourism around Ko Kra Islands can be classified in 2 types; there are snorkeling and scuba driving. The hotspot areas are Hin Rue, Kra Lek Island and Southeast of Kra Yai Island. Ko Kra Islands is famous area for scuba driving to look big fish and beautiful coral reef.

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### 32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Territorial Jurisdiction: Royal Thai Navy

Functional Jurisdiction: Royal Thai Navy and Department of Marine and Coastal Resources

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### 33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Royal Thai Navy, 2<sup>nd</sup> Regional Office Rim Talay Road. Muang District, Songkhla Province.  
90000, Thailand.

Tel. (+667) 432 5804, (+667) 432 5805

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### 34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

1. Nathiwattana, Anuwat. *Island's Biodiversity in Thailand*. 2008. Department of Marine and Coastal Resources. Bangkok, 122p.
  2. South Marine Coastal Resources Research Center, Institute of Research and Development, 2008, *Marine and Coastal Resources in Koa Kra Islands at Nakornsrihammarat*, 114p.
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