WWF for a living planet

Regional Office for
Marine, Coastal & Resources Management

Mission Report

DISCOVERY OF IRRAWADDY DOLPHIN *Orcaella brevirostris* POPULATION AND HABITAT IN KUBU RAYA WATERS, WEST KALIMANTAN: A PRELIMINARY SURVEY OF IRRAWADDY DOLPHIN IN SALT AND BRACKISH WATERS.

Photos : Syahirsyah/WWF-ID

Mission 20 – 26 October 2011

Dolphin survey team consisted of WWF Kal-Bar, BPSLP, Consultant and field assistants

Supervision :

Tri Agung Rooswadji (WWF – Freshwater National Coordinator)
Hermayani Putera (WWF – Chief of West Kalimantan Regional)
Chaerul Saleh (WWF – Species National Coordinator)

Execution :

Dr Achmad Yanuar
Albertus Tjiu, S.Hut
Dwi Suprapti DVM, MSc
Ir. Syahirsyah
Yuda Saniswan
Ismoe Widjaya

PREFACE AND ACKNOWLEDGEMENT

This report represents the very first results from WWF's analysis of Irrawaddy dolphin population abundance. More information needs to be collected using similar methods and sites in order to produce robust scientific analysis, results, and recommendations. The preliminary survey of Irrawaddy dolphin was conducted in collaborated with WWF West Kalimantan and the Regional Office for Marine, Coastal & Resources Management/ Balai Pengembangan Sumberdaya Pesisir dan Laut (BPSPL) Pontianak. It was supported by the government of West Kalimantan, including chiefs of Kubu Raya Regency and Batu Ampar sub-district, as well as the West Kalimantan agency of the Ministry of Marine and Fisheries, BPSPL Pontianak. During the field survey, we would like to thank the local people of Teluk Nibung, mainly Pak Panadi (boatman driver), Pak Rudi Mustafa, Pak Sukirman, Pak Daniel and his family for their warm hospitality to allow us to stay in their house at Teluk Nibung. Thanks also Mr Endy from the Marine & Fisheries Agency of West Kalimantan and Mr Sudarmin, a speed boat driver who transported the team. We appreciate also Mr Idham from BPSPL Pontianak and Mr Anton from WWF West Kalimantan for helping us with GIS analysis. A special thank you to Creusa Hitipeuw from WWF Marine Species for her comments and inputs on this preliminary mission report.

Jakarta, 7 November 2011.

Authors

EXECUTIVE SUMMARY

The presence of Irrawaddy dolphin *Orcaella brevirostris* (Gray 1866) population in Kubu Raya and Kayong Utara waters is previously unknown and was first sighted by WWF West Kalimantan in April 2011. To follow-up the Irrawaddy dolphin discovered in Kubu Raya waters, WWF collaborated with theRegional Office for Marine, Coastal & Resources Management/ Badan Pengembangan Sumberdaya Pesisir dan Laut (BPSPL) Pontianak to conduct a preliminary survey of their population and distribution in waterways of Batu Ampar mangrove and nypah forests, narrow straits and the coastal area of Padang Tikar island, Kubu Raya, West Kalimantan, from 20 to 26 October 2011. These sites are located some 100 km in the south of the equator within the local administratives of Kubu Raya and Kayong Utara Districts. A wooden boat, 11 m length and 2 m wide, with a 20 horsepower (hp) onboard diesel engine with an average speed of 10-12 km per hour was used during this survey.

The survey travelled 248 km and conducted 26 hours of survey time. , Several Irrawaddy dolphin were sighted in brackish waters of mangrove and the nypah islands complex, and narrow straits. A group of Indo-Pacific Humpback dolphin *Sousa chinensis* was also encountered in a narrow strait between Padang Tikar island and Maya island (Gosong China Strait). There were no open sea dolphins encountered during this survey. Local fishermen admitted that they often encountered Irrawaddy dolphin in brackish waters and mangrove and nypah channels. The local name for this species is "lumba-lumba" and locals are not familiar with the name "pesut" in Bahasa Indonesian for Irrawaddy dolphin. According to informants there were few accidental conflicts between "lumba-lumba" and local fishermen. Developing of modern charcoal industries in Padang Tikar island and Kubu Raya as well as busy boat traffic in waterways are presumed to be the main threat to the Irrawaddy dolphin population.

The preliminary survey to assess the current population size and distribution of the Irrawaddy dolphin will be continued in the future using the same methods. Given the endangered status of the species, further management action for conserving Kalimantan's Irrawaddy Dolphin is needed to protect its population and habitat in Kubu Raya and Kayong Utara, West Kalimantan.

RINGKASAN EKSEKUTIF

Keberadaan populasi Irrawaddy dolphin *Orcaella brevirostris* Gray 1866 diperairan Kubu Raya dan Kayong Utara belum diketahui sebelumnya dan pertamakali ditemukan oleh tim WWF Kalimantan Barat (Kal-Bar) pada bulan April 2011. Menindak lanjuti temuan WWF Kal-Bar ini, WWF Indonesia bekerjasama denga Badan Pengembangan Sumberdaya Pesisir dan Laut (BPSPL) Pontianak, melakukan survei awal populasi dan sebaran Irrawaddy dolphin pada tanggal 20 – 26 Oktober 2011 di sistim perairan kawasan bakau dan nipah Batu Ampar, selat-selat sempit, dan sepanjang dekat pantai Pulau Padang Tikar. Lokasi tersebut terletak di selatan garis khatulistiwa sekitar 100 km, dan berada dibawah administrasi pemerintahan Kabupaten Kubu Raya dan Kayong Utara, Propinsi Kalimantan Barat. Survei dilakukan dengan menggunakan sebuah kapal kayu penangkap ikan dengan ukuran panjang 11 m, lebar 2 m, menggunakan mesin diesel 20 hp dengan kecepatan antara 10 – 12 km per jam.

Dengan jarak survei keseluruhan 248 km, mencangkup 26 jam pengamatan selama 5 hari efektif, beberapa kelompok Irrawaddy dolphin yang muncul dipermukaan berhasil dideteksi di perairan payau hutan bakau dan nipah serta di selat-selat sempit. Satu kelompok Indo-Pacific Humpbak dolphin atau lumba-lumba putih atau lumba-lumba punggung bungkuk *Sousa chinensis* dijumpai di perairan selat sempit antara Pulau Padang Tikar dan Pulau Maya. Lumba-lumba laut lepas tidak dijumpai selama survey ini. Nelayan setempat acapkali berjumpa dengan Irrawaddy dolphin disekitar perairan payau dan kanal-kanal bakau dan nipah. Nama daerah setempat untuk spesies ini adalah “lumba-lumba” dan mereka tidak kenal dengan “pesut”, bahasa Indonesia untuk Irrawaddy dolphin. Menurut informasi setempat, sedikit kejadian konflik antara lumba-lumba dengan nelayan lokal begitu pula dengan lalu lintas speed boat dan perahu-perahu cepat lainnya. Pendirian industri modern kayu arang dan bahan baku pulp oleh perusahaan komersial dan aktifitas lalu lintas yang tinggi diperairan tersebut diduga menjadi salah satu ancaman utama populasi lumba-lumba Irrawaddy.

Survey untuk menganalisa populasi dan distribusi lumba-lumba Irrawaddy akan dilanjutkan di lokasi dan metode yang sama. Kegiatan Proyek Konservasi Lumba-Lumba Irrawaddy Kalimantan dimasa datang diperlukan untuk menyelamatkan populasi dan habitat tersisanya diperairan Kubu Raya dan Kayong Utara, Kalimantan Barat.

CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLE

1. INTRODUCTION

Mangrove estuarines, deltas, embayment, coastal area and river basins of western Kalimantan are some of the remaining habitats for River, or Irrawaddy dolphin, *Orcaella brevirostris (*Gray 1866) in Kalimantan. This species is widely distributed in tropical Hindia-Indo Pacific coastal waters of the South and Southeast Asia from India to the Phillipines and northern Australia. They are also found in Kalimantan or Borneo waters, estuarine and coastal areas i.e., Sabah, Sarawak, East and West Kalimantan (Dolar et al, 1997), as well as in Mahakam river as far as the upper river, approximately 560 km from the saltwater and delta Mahakam (Kreb, 2002).

In the most recent literature, Irrawaddy dolphin species were not recorded as present in Kubu Raya and Kayong Utara waters, West Kalimantan (Stacy and Leatherwood, 1997; Minton et al, 2011). There have been unpublished reports of two sightings of a group of this species made by the survey team of WWF Indonesia, West Kalimantan Region in Selat Sih waters, Padang Tikar and Maya Islands during Mangrove surveys in Batu Ampar, Padang Tikar Island (Kalbar Post, 2011). There is a lack of information on the status of Irrawaddy dolphins in coastal, embayment, brackish and freshwater areas. This species is strictly protected in Indonesia.

Local fishermen claimed to have observed a group of coastal dolphins, Irrawaddy dolphin *O. brevirostris* locally known as "lumba-lumba" around Muara Padang Tikar mangrove estuarine, Nuri mangrove bay, Selat Sih mangrove channels and coastal waters, Batu Ampar waters, brackish waters in mangrove and nypah waterways. This species often comes to these areas for playing/resting, foraging and feeding.

Generally, coastal and freshwater river dolphins are dependent on healthy aquatic environments that are currently being threatened by water pollution, e.g. toxins, debris and sedimentation due to terrestrial run-off caused by unsustainable land based development practices, include clear-ance of forest in the upstream for encroachment, logging and agriculture (commercial oil palm plantations). Nevertheless, in some areas, mangrove forest is still in good condition (Prasetiamartati et al, 2008) and serves as spawning, nursery, and breeding sites for fish and crustacean. Muara Padang Tikar, Selat Sih, and Nuri embayments and the surrounding area is allegedly rich with marine fish, crustaceans, and squids which are the main food sources for Irrawaddy dolphin. A majority of local people rely on fish, crustaceans, and other water and marine resources, as well as mangrove forest products for their livelihood.

The use of fish chat and fish net/traps as well as fish and shrimp corrals, and fish trawls to catch marine fish and crustaceans is commonly observed in Padang Tikar bay and Selat Sih waters. Human population in and around Muara Padang Tikar and Batu Ampar in Padang Tikar Island has been increasing and they may compete with dolphins to catch fish, squid and shrimp. The waterways of Kubu Raya also serve as river transportation routes that connect settlements such

as Pontianak to Sukadana and Ketapang. The river transportation includes motorized cannoes and speed boats, passenger ships, tug boats and cargo ships passing in the water channels that connect islets and villages. Moreover, development of a port for mangrove wood industries near Batu Ampar village and Selat Sih mangrove channels resulted in disposal of waste into the waters. Traditionally, local people cut down mangrove trees for small scale charcoal production. The charcoal products are sold to Pontianak and even export to Java and Malaysia (Local people, pers.commm, 2011).

Padang Tikar and Nuri Bays and the waters and delta around mangrove and nypah forests of Batu Ampar do not have any protection status, with the exception of protection status fpr the mangrove forest in Batu Ampar Biosphere within Forest Management Units (FMUs) mechanism (Prasetiamartati et al, 2008). Therefore, development of new protected areas that include corridors or channels among embayment, estuarine, brackish, coastal and freshwater/ rivers is needed for the protection of Irrawaddy dolphin *O. Brevirostris*. The waters around Padang Tikar Island should therefore be prioritized for protection. However, biological and ecological data for Irrawaddy dolphin as well as other aquatic species and their anthropogenic threats are needed for the design of the new protected area.

2. REVIEW OF THE STATUS OF IRRAWADDY DOLPHIN EXISTENCE IN KALIMANTAN, SARAWAK, SABAH

2.1 Irrawaddy dolphin in Sarawak

Shallow coastal waters, river delta, estuarines, and freshwater river basins in Sarawak, Brunei Darrussalam, Sabah, East and West Kalimantan are known to be occupied by Irrawaddy dolphin. However, only some areas were intensively surveyed to investigate the population size and distribution of Irrawaddy dolphin such as in Sarawak and Mahakam rivers in East Kalimantan.

Research and conservation activities conducted by University Malaysia Sarawak (UNIMAS), the Sarawak Forestry Cooperation (SFC), and The Sarawak Dolphin Project (SDP) in Kuching showed that this species is commonly found in Santubong and Damai waters notably near the shoreline and river mouths in Kuching, Sarawak. Since Irrawaddy dolphin populations are commonly found near coast and estuarine areas, this species is vulnerable to serious coastal development, habitat degradation, and by-catch. Fortunately the local government of Sarawak has formally upgraded the water areas of Santubong to be a wildlife sanctuary for freshwater and saltwater dolphins.

2.2 Irrawaddy dolphin in Mahakam river

Mahakam river is only one critical habitat for freshwater river dolphin in Kalimantan and the species is also found a long way upstream. Some areas of this river are being used by the species as their feeding site, breeding and nursery, especially in the lake of Jampang and upper deep streams. The biological and conservation status of Irrawaddy dolphin in Mahakam river has been well documented by long term and short term research and surveys (Kreb, 2004).

Recently, habitat loss and degradation in Mahakam river has become the main threat to the wild population of Irrawaddy dolphin. Seriously damage upstream has occurred through logging activities and development for agricultural and mining industries. Consequently sedimentation and mercury pollutants have entered the Mahakam river and its tributaries resulting in a shallowing of the river body and creating and unhealthy river system for the dolphins to survivie in.. Competition with human fisheries and crustaceans may also be a serious problem for Irrawaddy dolphin conservation as well as boat and river traffic which can disturb populations in the river. This species is categorized as the most endangered with population decreasing drastiscally and has been listed as Critically Endangered species (Reeves et al, 2003).

2.3 Irrawaddy dolphin in Balikpapan bay

Little information exists on the natural/life history and distribution of Irrawaddy dolphin around Balikpapan bay. RASI (Rare Aquatic Species of Indonesia) survey team has recently documented the population and distribution of Irrawaddy dolphin in brackish, mangrove, and coastal areas of Balikpapan bay (Balikpapan Bay Irrawaddy Dolphin Project, 2008). Balikpapan Bay is a migration habitat for Irrawaddy dolphin to forage for food and socializing. Unfortunately the habitat of dolphins in Balikpapan Bay is serioulsy threatened by degradation due to coastal developments. Meanwhile, most of the mangrove forests in Balikpapan Bay have been converted to fish and shrimp ponds and forests upstream have been mostly cleared for timber production. Actually, the mangrove and peat swamp forests are important water sourcesd for people in Balikpapan city. As a result a conservation area was created to protect the natural forest of swamp in Sungai Wain as a reservoir for the healthy remaining fresh-water in river system.

2.4 Irrawaddy dolphin in delta and river systems of Sesayap

The presence of Irrawaddy dolphin was initially detected by a team from Kayan Mentarang National Park authorities which unintentionally observed a school of river dolphin swimming in the Sesayap river and delta. DNA specimen analysis revealed that the haplo-type of this animal

is closer to that of the marine coastal dolphin than pure freshwater dolphin such as found in Mahakam river and closely resembles the Phillipines and Thailand dolphin specimen (Kreb and Rukmana, 2009). The distribution of Irrawaddy dolphin covered less than 90 km from the salt-water front and does not reach the upstream area of Sesayap. This species is commonly encountered in the delta in bigger groups than in the river basin. The total population of the species is estimated to be between 40 and 90 individuals depending on the water level when the survey took place (Kreb and Rukmana, 2009). During a prolonged drought season, this species migrates upstream of Malinau/Sesayap river whenmuch saltwater intrusion occurrs.

Sesayap River is degraded by sedimentation and solid debris from clearing of forests for plantations and logging upstream and this is probably the reason Irrawaddy dolphins tend to avoid the river. Tidal patterns and seasonal monsoons also influence the migration pattern of the dolphin in the delta and Sesayap River.

3. AIMS

The aim of this survey was to provide preliminary information on the presence of the Irrawaddy dolphin in; Padang Tikar Islands mangrove estuarine, Nuri mangrove bay between Maya island and Padang Tikar island, and mangrove and nypah channel waters in the down river basin of Kapuas river through direct observation and interviews. This survey will enhance our knowledge of the distribution of Irrawaddy dolphin in Kubu Raya and Kayong Utara waters, West Kalimantan.

4. LOCATIONS

Padang Tikar Island and waterways of Kubu Raya are located south of the equator, and approximately 100 km from Pontianak, West Kalimantan province. These waters are administratively under the jurisdiction of Batu Ampar Subdistrict, Kubu Raya District and border Maya Island, Kayong Utara District, West Kalimantan. There are several fishing villages in Padang Tikar Island with the highest population found in Padang Tikar and Batu Ampar villages. Both villages have ship and boat jetty ports for passenger ships traveling to and from

FIGURE 4.1. Map of survey locations in Padang Tikar Island (indicated in white arrow), Kubu Raya and Kayong Utara waters.

Pontianak or Sukadana and Ketapang. There are some small villages situated on the island which include, Teluk Nibung, Nipah Panjang, Sungai Besak, Tanjung Harapan, Telok Air, and Selasih. The majority of villagers are farmers and fishermen.

There are two major mangrove estuaries/bays in this area, namely Padang Tikar in the north and Nuri bay in the south. Nuri bay with a maximum width of 5-7 km is located between Padang Tikar Island and Maya Island, while Padang Tikar bay is between Kalimantan mainland and Padang Tikar Island. Both mangrove estuaries/bays host rich marine resources such as bone fish, squid, and shrimp resulted fish corals (*jermal*) are erected in the offshore. Crab traps are placed in the mangrove roots and on the sea floor.

There are many channels in mangrove and nypah islands between Padang Tikar Island and inland with the width ranging from just a few meters to several kilometers. As a result most of the rivers from Kapuas down?? river basin run-off into the mangrove and nypah forest waterways.

5. METHODS

5.1 Survey team

There were 9 personnel involved in the survey: one team leader and principal investigator (Dr Achmad Yanuar); 4 researchers (consultant, 2 from WWF Kalimantan Barat; one staff of the Regional Office for Marine, Coastal, and Resources Management / BPSPL, Ministry of Marine and Fisheries Agency Pontianak). One member was tasked to produce video footage to document the survey and another as photographer to take dolphin pictures. The team was assisted by local helpers who are familiar with the Padang Tikar and Batu Ampar river system as well as Irrawaddy dolphins. A detailed list of team members is provided in Appendix 1.

5.2 Local helpers

The survey was assisted by competent local helpers. The local assistants were selected from locals familiar with the Padang Tikar and Batu Ampar waterways and those who could recognize species. They were Pak Rudi Mustafa who has knowledge of the Irrawaddy dolphin and navigation, Pak Panadi, boatman, and Pak Sukirman, cook and security.

5.2 Survey

The detailed survey is attached in Appendix 2. A summary is given below.

Tuesday (18.10.2011)	: Meeting with survey team in WWF Pontianak.
Wednesday (19.10.2011)	: Continuing the meeting and training of survey methods
Thursday (20.10.2011)	: Departure to Teluk Nibung. Villagers survey .
Friday-Sunday (21 – 23.10.2011)	: Survey for dolphin in mangrove and nypah channels.
Monday (24.10.2011)	: Survey for dolphin in mangrove channels and along shoreline of Padang Tikar Island.
Tuesday (25.10.2011)	: Survey for dolphin in mangrove and nypah channels.
Wednesday (26.10.2011)	: Return to Pontianak.
Thursday (27.10.2011)	: Compilation of data and mapping of trackline and dolphin spotted.

5.3 Field survey

We selected the survey areas based on local knowledge, especially advice from Pak Rudi Mustafa who is familiar with Irrawaddy dolphins in Kubu Raya waters. Surveys were carried out from 21 to 25 October 2011 using a wooden fishing boat of 11 m in length and 2 m wide, with a 20 hp onboard diesel engine.

Transects extended less than 4 km offshore and followed channels in mangrove and nypah forest delta. Lining transects were navigated at a steady speed of 10 – 12 km per hour and investigators rotated through different positions by standing on the boat roof platform, about 2.5 m above the water. Only two investigators consistently used Nikon Binoculars 8 x 42 ATB and others scanned for dolphins with the naked eye from the boat. One investigator monitored the transect and water depth using Fish Finder Garmin 160 C screen. Bathymetric data was measured by using a censor underwater which was connected to a Fish Finder Garmin 160 C screen, whilst water salinity was measured by Hand-Held Refractometer ATAGO. The Fish Finder Garmin 160 C can also detect fish and other aquatic wildlife abundance on the bottom of the boat.

When dolphin were encountered the search effort was suspended to allow observers to identify species, group composition, plotting of position both survey tracks and sightings by hand GPS waypoint (GPS Garmin 76 CSX and GPS Garmin Asus A10), noted behaviour such as dolphin surfacings, detection mode (i.e, sighted of their head, dorsal fin, tail, water spout from the mouth, breathing out, or jumping out of the water), duration of contact in minutes, distance from boat to the first dolphin detected, and dolphin to land by using Nikon Monarch Laser 800 Range Finder. We also noted locations of tracks and sighting in accordance to local name.

Surveys were conducted from morning to noon and then in the afternoon. One team member was assigned to take video footage using a Canon digital Camcorder HDV XH-A1 with 10 x optical and 20 x digital zoom and another team member had the task of taking dolphin pictures i.e, dorsal fin, tail, and head with a Camera Canon 7D.

Sighting rates for dolphins were computed as total encounters in one day divided by distance (in km) on that day multiplied by 100 (Dolar et al., 2002).

5.4 Interviews

During the survey of Irrawaddy dolphin in Batu Ampar Mangrove and Padang Tikar Island, we carried out opportunistic and informal interviews with fishermen and villagers in Padang Tikar, Teluk Nibung, and Kerawang. Questions were asked to determine the respondent's familiarity with the Irrawaddy dolphin and other wildlife, and held in local languages of Melayu and Bahasa Indonesia. We also asked some general information about the informant status, i.e, name, age, education background, occupation, origin, etc.

FIGURE 5.2. Interviewing fishermen.

In order for the villagers to recognise species, we used several photographs of dolphins, including Irrawaddy dolphin and other aquatic and terrestrial animals to show to informants (see pictures above). Interviews took place in the fishing boat and at the house of villagers.

The provisional results of these interviews are emphasized on the current presence and absence?? of Irrawaddy dolphin in the Padang Tikar Islands coastal waters and Kubu Raya waterways of Batu Ampar, and described in the following section as follows;

Padang Tikar village

1. Interview with Mr. Iu Khiang

   Mr Iu Khiang is an old fisherman and has spent more than 30 years in the sea catching fishes, shrimps, and squids by fishing net.. He is familiar with open sea dolphins but not with the freshwater dolphin. He often encounters a school or single dolphin in the coastal waters and open sea. He described thet dolphins he sees as Bottlenosed dolphin *Tursiop aduncus* and *T. truncatus* because these dolphins have a long beak. He also described another dolphin which is the Indo-Pacific humpback dolphin *Sousa chinensis* that he called lumba-lumba babi laut (pig dolphin) or lumba-lumba putih (whitish dolphin) which he finds near the shoreline in estuaries and narrow straits.

2. Interview with Mr. Tji Fuk Hin (A Fen)

Most people living in Padang Tikar Island are fishermen and farmers. Similar to Mr. Iu Khing, this man is unfamiliar with Irrawaddy dolphin although he has often seen dolphins in the sea and coastal areas when sailing his boat . He used to trawl for fish, shrimps, and squid. Interestingly his son claimed to have seen an Irrawaddy dolphin around the mangrove and nypah channels. He described the species as having small and short dorsal fin when the animal appeared on the surface. According to him, many fishermen reported frequent sightings of dolphins in the waterways of Batu Ampar mangrove and nypah forests.

Kerawang village

1. Interview with Pak Amat

According to people of Kerawang village, lumba-lumba, or Irrawaddy dolphin are commonly found in the mangrove and nypah channels and is often sighted in groups or solitary by local people. Pak Amat has been living in Kerawang village for more than five years, and is originally from Padang Tikar village. He works as a farmer and fisherman and often goes to the sea and estuarine/ bays to catch fish, shrimp, squids and other waters resources??? by trawling and netting. He knows *lumba-lumba (*Irrawaddy dolphin) and claims to have seen this animal while fishing in brackish and coastal waters. He has observed the Irrawaddy dolphin in Simpang Lidah, water that is brackish ; Kerawang, a salt water mangrove channel which has an influx of freshwater from many streams; and in Ambarawa, Padang Tikar Island. He is concerned that the Irrawaddy dolphin should be formally protected by government and the local community.

2. Interview with Pak Herman

This man lives in Seponti Jaya village, Teluk Nibung and he works as a fisherman and farmer on occassion. He said that he has seen the Irrawaddy dolphin in Simpang Lidah waters. He beleives that the dolphin commonly inhabits these waters and and is sighted when their dorsal fin appears on the surface during the day time and you hear the sound when spouting at night.

3. Interview with Pak Irut

This old man has retired from fishing, but he is still active as a "local fish container" and chief of the local fishermen association. He believes that Kubu Raya waters are occupied by lumba-lumba including the Irrawaddy dolphin. He frequently saw lumba-lumba (Irrawaddy dolphin) at several sites such as Simpang Lidah, Pulau Empat, Simpang Empat, Teluk Simpang Tiga near Teluk Batang, Maya Island. Pak Irut is in support of the

official protection of lumba-lumba both by local people and the government and he believes that they are not harmful to people. He is proud that lumba-lumba are inhabiting their waters.

Teluk Nibung village

1. Interview with Pak Rudi Mustafa

   Pak Rudi Mustafa said he has frequently sighted Irrawaddy dolphin when sailing his boat in Batu Ampar waters and surrounds. He is a native person of Teluk Nibung. According to him, the Irrawaddy dolphin often appears in waterways of the Batu Ampar mangrove and nypah forest complex especially when the tide is rising and hits the freshwater that drains from several rivers. Teluk Sepade and Tanjung 16 waters are frequently visited by lumba-lumba when much incursion waters from sea and rivers (locally known as "konda" is one of local tidal pattern). Most fishermen see this animal when the tidal pattern is "konda" . The vegetation along the banks of channels in these areas is predominantly mangroves and nypah. Other fishermen also revealed that these waters were often visited by lumba-lumba for foraging and feeding. Pak Rudi has seen lumba-lumba in several areas such as in Tanjung 16, Teluk Sepade, Teluk Simpang Tiga between Maya Island and Padang Tikar Island and inland, Selat Sih mangrove estuarine, Selat Sih mangrove channels, Pulau Meresak, Selat Pa' Awal, Bunbun strait (between Maya Island and Padang Tikar Island), Batu Ampar Kecil, Wan Alit strait, Keluang, Kerawang, Simpang Kelabu, Simpang Sapar, Teluk Kelik, Sejenuh River, Sejenuh brackish, Selumpak, Telok Air, Cabang Yasin, and Pedara islet. Conflict between lumba-lumba and fishermen sometimes occurs when this animal gets trapped in fishing nets or trawl? but people do not kill them as they were released immediately from fishing nets.

2. Interview with Pak Syarif Hasin
   Lives in Teluk Nibung and worked as a fisherman for more than 30 years. He said he had often seen lumba-lumba in Teluk Sepade (Sepade kiri), Tanjung 16, Selat Pa' Awal, and Simpang Radak.

3. Interview with Pak Junai
   A Fishermen who lives in Teluk Nibung, he admitted to having seen lumba-lumba at Selat or Teluk Sepade, Selat Pa' Awal, Selat Wanalit, Wantai, and Kapuas River. According to Pak Junai there are two sort of lumba-lumba that he has seen in Kubu Raya, i.e, lumba-lumba hidung panjang (long nosed/beak dolphin), blue or grey darkish in body color and lumba-lumba idong pesek (snub nosed dolphin), light or pale grey in color of body. *Lumba-lumba idong pesek* is described as the Irrawaddy dolphin.

4. Interview with Pak Hamdan

   He has been living in Teluk Nibung since 1974 and his profession is fisherman and coconut farmer. He believes that lumba-lumba live in and around Padang Tikar waters. Interestingly, he can differentiate lumba-lumba or dolphins based on their distinctive shape; dolphins with a nose or long beak are called "lumba-lumba jantan (male dolphin)" whilst those without beak is "lumba-lumba betina (female dolphin)". Lumba-lumba jantan is the Bottlenosed dolphin and lumba-lumba betina is the Irrawaddy dolphin. He saw lumba-lumba betina or Irrawaddy dolphin in Tanjung 16, Sungai Dusun, Selat Bunbun, Teluk Batang, Simpang Lidah, and Gunung Terjun. He has had occassional encounters with the Irrawaddy dolphin when raining or during sunny days. He also said it is a bad weather sign when Irrawaddy dolphins surface. Also when the, Irrawaddy dolphin surfaces he believes it indicates the presence of fish and shrimps which assist the fishermen to find fish and shrimps.

6. PROVISIONAL RESULTS

6.1 Search efforts

Due to insufficient data collected from sightings of dolphins and unsystematic survey methods, the result of the survey does not reflect relative and absolute population density of the Irrawaddy dolphin. We tried to determine the population density of the Irrawaddy dolphin by direct encounters, interviews of local fishermen and mapping of tract-line transects and encounters. Indeed techniques for estimating dolphin densities are difficult to elucidate because a valid transect width is required to determine the survey or census area on the basis of perpendicular distance per survey.

Generally, surveyers and researchers of wild cetaceans experience difficulty in detecting dolphins due to shyness. It appeared that the Irrawaddy dolphin was shyer than expected, presumably because of the presence of fishermen , as well as disturbance from boats traffics. Due to disturbance dolphins will dive and move rapidly in a short distance, and surface in other sites after remaining under water for a number of minutes..

TABLE 6.1. Transect, survey efforts, and sighting rate of dolphins in Kubu Raya waters.

Day	Transect	Survey (km)	Search effort (km)	No. of dolphin group sighted	Group size	Sighting rate	Dolphin species
1	Teluk Nibung-Sg. Limau-Selat Pidik-Selat Sepade-Pula Bidara-Kuala Rada'-Gunung Terjun-Fish corral	47.7	42.4	–	–	–	–
2	Selat Sepade-Camp Kandelia-Tanjung 16-Batu Ampar Kecil-Telok Air (Batu Ampar)	30.9	30.9	2	7	6.4	Irrawaddy dolphin
3	Camp Bios-Pulau Empat-Kerawang-Pejajara-Simpang Lidah-Gosong Cina-Selat Bunbun-Nuri bay-Selasih fish corral	94.9	72.3	2	4	2.7	Irrawaddy dolphin
				1	3	1.3	Indo-Pacific humpback dolphin
4	Selat Sih mangrove channals-Sg. Besak-Maintimor-Muara Padang Tikar-Padang Tikar harbour	66.9	66.9	–	–	–	–
5	Pulau Bidara-Selat Pa' Awal-Muara Selat Pa' Awal-Batu Ampar-Teluk Nibung	77.2	46.4	1	3	2.1	Irrawaddy dolphin

In this preliminary survey we patrolled a total of 258.9 km of transects (Table 1, see also survey map Appendix 3) in five days and 26 hours . The mean observation time per sighting for Irrawaddy dolphins was 7.5 minutes. The group size of Irrawaddy dolphins was counted while sighting them for 5 – 25 minutes. In both brackish and coastal mangrove waters, the average group size encountered was 3 individuals (n=6), ranging from one to four individuals (Table 2).

Table 6.2. Group size and sighting locations.

Location	GPS	No. of group	Group size	Habitat type
Tanjung Enam Belas	S $0^0$38.384′ – E $109^0$31.293′	1	4	Brackish, mangrove-fringed islet

Batu Ampar Kecil	S $0^0$40.94′ – E $109^0$34.979′	1	3	Brackish, mangrove-fringed islet
Kerawang	S $0^0$52.194′ – E $109^0$44.882′	1	3	Narrow street, brackish
Pejajaran	S $0^0$57.449′ – E $109^0$43.939′	1	1	Narrow street, brackish
Selat Sih	S $0^0$56.627′ – E $109^0$24.813′	1	4	Mangrove bay and coastal *
Selat Pak Awal	S $0^0$37.812′ – E $109^0$27.336′	1	3	Brackish, mangrove-fringed islet

*Data was adopted from the first sighted a group of Irrawaddy dolphin by WWF West Kalimantan in April 2011

6.2 Dolphin encounters

Of aquatic mammal of dolphins present in Kubu Raya and Kayong Utara waters, we only sighted two species of dolphins in brackish waters and salt waters, namely the Irrawaddy dolphin *Orcaella brevirostris*, and Indo-Pacific Humpback dolphin *Sousa chinensis* .

Irrawaddy dolphin in Kubu Raya waters can be also found in rivers, i.e., Sejenuh river and Mendawah river, and according to local reports in, brackish waters, mangrove channels, mangrove estuarine, mangrove embayment, and near coastal around mouth rivers. In previous surveys (April and May 2011), a group of Irrawaddy dolphin was observed twicen 2 kms off the shore presumably foraging and feeding around fish and shrimp corals. In this survey we did not detect any Irrawaddy dolphins along the coast line or in Padang Tikar Bay and Nuri Bay.

A group of Indo-Pacific Humpback dolphin was sighted in a narrow street between Padang Tikar island and Maya island, Kayong Utara waters..

6.3 Other marine and terrestrial animal occurances

Aquatic animals

According to local fishermen and villagers the waters of Padang Tikar and Maya Islands, Gosong China Strait and surrounding are settled by three species of dolphins, namely Indo-Pacific Bottlenosed dolphin, *Tursiop aduncus*, locally known as lumba-lumba abu-abu or hitam, Indo-Pacific Humpbak dolphin, *S. chinensis*, known as lumba-lumba putih or lumba-lumba babi laut, and Irrawaddy dolphin, *O. brevirostris*. Also reported was the Dugong or putri duyung *Dugong dugon* near Sejenuh waters. Indeed, the Dugong prefers living in areas that support seagrass and it is reported that they inhabit areas around Maya Island and Karimata Islands. The, Irrawaddy dolphin is generally found in brackish waters and mangrove and nypah forest

channels, although this species occasionally travels offshore to search for food in Kubu Raya waters.

Previously local people reported that the Irrawaddy dolphin also occurred downstream of Kapuas and in tributaries. There are reports from local people that Irrawaddy dolphins some times surface in Kapuas river and Sejenuh river. No information is available that Irrawaddy dolphin are found in Kapuas delta.

Terrestrial animals

An endangered and endemic Bornean arboreal langur species, Proboscis monkey *Nasalis lavartus* inhabits the mangrove forests of Padang Tikar Island and Maya Island, and also is found along the river banks of Kubu Raya inland. Long tail macaque *Macaca fascicularis* is also commonly found on the island of Padang Tikar, Maya, and inland. The clouded leopard, *Neofelis nebulosa*, flat-headed cat, *Prionailurus planicep*, Malayan sun bear, *Helarctos malayanus* and wild pig, *Sus sucrofa* were eported present in Kubu Raya and Kayong Utara lowland forests including near coastal forests. Other important animals found in the Kubu Raya and Kayong Utara are Senyulong crocodile, *Tomistoma schlegelli* which is endangered and lives in freshwater rivers and swamp areas and, The Salt water crocodile, *Crocodilus porosus* is commonly found in the mangrove estuarine of Kubu Raya and Kayong Utara.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

- The population size of Irrawaddy dolphin in Kubu Raya and Kayong Utara waters is still unknown. This is due to the very limited encounters with dolphins (see Table 1) which does not allow population density to be calculated.
- Kubu Raya local name for Irrawaddy dolphin is "lumba-lumba" and local people were not familiar with "pesut" (Bahasa Indonesia for Irrawaddy dolphin). Apparently, the vernacular name of lumba-lumba in West Kalimantan is similar to a Malay term in Sarawak for Irrawaddy dolphin also called"lumba-lumba".
- Waterways in mangrove and nypah islets are important habitat for Irrawaddy dolphins especially within deep channels which provide feeding and, travelling sites. According to local fishermen, Tanjung 16, Teluk or Kuala Sepade, and Simpang Lidah are favourite sites for Irrawaddy dolphins.
- The waters in and around Padang Tikar estuarine and Batu Ampar strait are frequently used by boats . There are many speed boats passing through these waters everyday which presumably disturbs the Irrawaddy dolphin, leading to stress and illness, and even

resulting in collision associated dolphins deaths through contact with the propeller of the boat or ship.

- Uncontagious mangrove canopy forests are occasionally observed in mangrove islands and Padang Tikar island.
- There are two big pulp and charcoal companies operating in Padang Tikar island and mangrove island complex. These activities threaten the Irrawaddy dolphin's habitat as they do not follow Sustainable Forest Management and Best Practice Management standards and therefore impact on the environment, including freshwater.
- Most local people in Padang Tikar Island are fishermen and some are farmers resulting in likely unsustainable fishing in Padang Tikar Bay ,and Selat Sih inshore and offshore.
-

7.2 Recommendations and next plans

- Continue population and distribution surveys of Irrawaddy dolphin in river, brackish, mangroves and nypah channels, and mangrove coastal in Kubu Raya and Kayong Utara waters. The next survey will assess and described population abundance of Irrawaddy dolphin in hotspots and non-hotspot segments (river, brackish in mangrove and nypah channels, estuarine, and mangrove coastal bay).
- Extend survey areas into river systems such as in Kapuas , Sejenuh and Mendawa rivers.
- Provide training on dolphin surveying and monitoring for local communities, field staff rangers of BPSLP Pontianak, and local scientists on how to design and conduct surveys by vessel and interview local people.
- Investigate boat/ vessel traffic that cross Irrawaddy dolphin core areas.
- Studies on fish and crustacean abundance and diversity, and fishing gear used.
- Preserve the ecosystem of Kapuas River basin (*Saving Kapuas River*) both in the upper reaches of the river (in Heart of Borneo) and down river to save Irrawaddy dolphin habitats in Kubu Raya and Kayong Utara waters.
- Preserving the ecosystem of mangrove forests and water channels as core habitat for the Irrawaddy dolphin.
- Prevent toxic pollution from commercial industries of pulp and charcoal from entering waterways. Mangrove timber wood concessions should follow the operational standards based on the best management practice issued by International and National certifications.
- Increase public awareness about the preservation of dolphins and habitat and sustainable use of fishery resources. Study of local community livelihoods and economical resources will be undertaken for fishermen and farmers to grow the local economic sectors and improve human welfare through sustainable management of natural resources.

- Involve and engage local governments, resource managers, and stakeholders to campaign, advocate, and promote habitat conservation for Irrawaddy dolphin and other wildlife in Kubu Raya and Kayong Utara districts, West Kalimantan.
- Support public and local community awareness through conservation education programs both in primary and high schools and outreach targeting local youth clubs, fishermen, women and elder people.
- Examine nature eco-tourism potential of dolphin watching tours as a sustainable alternative livelihood, generating funds for local governments and local community in Kubu Raya and Kayong Utara, West Kalimantan.

LITERATURE CITED

Balikpapan Bay Irrawaddy Dolphin Project (2008). *Conservation and Diversity of Cetacean In and Near Balikpapan Bay, East Kalimantan, Indonesia*. Technical Report Rasi Conservation Foundation.

Beasley, I., Chooruk, S. and Piwpong, N (2002). The status of the Irrawaddy dolphin, *Orcaella brevirostri*, in Songkhla Lake, Southern Thailand. *The Raffles Bulletin of Zooloy* Supplement **10**:

Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L. and Thomas, L (2001). *Introduction to Distance Sampling: Estimating Abundance of Biological Populations*. Oxford University Press.

Dolar, M.L.L., Perrin, W., Yaptinchay, A.A.S.P., Jaaman, S.A.B.H., Santos, M.D., Alava, M.N. and Suliansa, M.S.B (1997). Preliminary investigation of marine mammal distribution, abundance and interactions with humans in the southern Sulu Sea. *Asian Marine Biology* **14**: 61-81.

Dolar, M.L.L., Perrin, W., Gaudiano, J.P., Yaptinchay, A.A.S.P. and Tan, J.M.L (2002). Preliminary report on a small estuarine population of Irrawaddy dolphin *Orcaella brevirostris* in the Philippines. *The Raffles Bulletin of Zoology* Supplement **10**: 155 – 160.

Kalbar Online, 2011. WWF temukan pesut di perairan Kubu Raya. *http://kalbar-online.com/news/metropolitan/wwf-temukan-pesut-di-perairan-kubu-raya*.

Kreb, D. 2002. Density and abundance of Irrawaddy dolphin, *Orcaella brevirostris*, in the Mahakam river of East Kalimantan, Indonesia: a comparison of survey techniques. *The Raffles Bulletin of Zoology* Supplement **10**: 85-95.

Kreb, D. 2004. Abundance of freshwater Irrawaddy dolphins in the Mahakam River in East Kalimantan, Indonesia, based on mark-recapture analysis of photo-identified individuals. *J .CETACEAN RES. MANAGE* **6(3)**: 269 – 277.

Kreb, D. and Budiona (2005). Conservation management of small core areas: key to survival of a Critically Endangered population of Irrawaddy river dolphins *Orcaella brevirostris* in Indonesia. *Oryx* **39**: 178-188.

Kreb, D. and Rukmana, D. 2009. Study of the Irrawaddy dolphin population in Sesayap river, East Kalimantan and recommendations for its conservation. Final Report July, August, November Surveys 2009. WWF Indonesia, BKSDA Kaltim, Yayasan Konservasi RASI.

Minton, G., Peter, C. and Tuen, A.A (2011). Distribution of small cetaceans in the near shore waters of Sarawak, East Malaysia. *The Raffles Bulletin of Zoology* **59(1)**: 91-100.

Prasetiamartati, B., Tai, H.S., Santoso, N., Mustikasari, R. and Syah, C (2008). Mangrove forest and charcoal production: case of Batu Ampar, West Kalimantan. *Paper Submitted for IASC 2008 Global Conference*.

Reeves, R.R., Smith, B.D., Crespo, E.A. and Notarbartolo di Sciara, G. 2003. *Dolphins, whales, and porpoise: 2002-2010 conservation action plan for the world's cetaceans*. IUCN/SCC Cetaceans Specialist Group. Gland, Switzerland, and Cambridge UK.

Smith, B.D. and Reeves, R.R (2000). Methods for Studying Freshwater Cetacenas: Survey Methods for Population Assessment of Asian River Dolphins. In: *Biology and Conservation of Freshwater Cetaceans in Asia* (R.R. Reeves, B.D. Smith, and T. Kasuya, eds). IUCN: 97-115.

Stacy, P.J. and Leatherwood, S (1997). The Irrawaddy dolphin *Orcaella brevirostris*: a summary of current knowledge and recommendations for conservation actions. *Asian. Mar. Biol* **14**: 195-214.

Thomas, L., Buckland, S.T., Rextad, E.A., Laake, J.L., Strindberg, S., Hedley, C., Bishop, J.R.B., Marques, T.A. and Burnham, K.P (2010). Distance software: design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology* **47**: 5-14.

APPENDICES

Appendix 1 – List of team member

Achmad Yanuar, MPhil & PhD Independent consultant for WWF Indonesia, Jalan Pintu Air 3 No. 55, Gandul-Cinere, Depok, West Java, Indonesia; e-mail: ay343@yahoo.com

Albertus Tjiu, S.HUT Project leader for Kapuas Hulu, WWF Kal-Bar, Jl. Akcaya I No. 9A, Pontianak, West Kalimantan 78121. Indonesia.; e-mail: albertus_1972@yahoo.com

Ir.Syahirsyah Communication coordinator for WWF Kal-Bar, Jl. Akcaya I No. 9A, Pontianak, W. Kalimantan 78121, Indonesia.; email: fivejim@yahoo.com

Dwi Suprapti, DVM, MSc Coordinator site for turtle project at Paloh, Sambas, WWF Kal-Bar, Jl. Akcaya I No. 9A, Pontianak, W. Kalimantan 78121. Indonesia.; e-mail: dwi_kh@yahoo.co.id

Ismoe Widjaya Communication assistant for WWF Kal-Bar, Jl. Akcaya I No. 9A, Pontianak, W. Kalimantan 78121, Indonesia.; email: ismoe_widjaya@yahoo.co.id

Yuda Saniswan BPSPL Pontianak Staff, Jl. Sultan Abdurrahman No. 9 Pontianak, W. Kalimantan, 78121 Indonesia.

Pak Rudi Mustafa Fisherman, Teluk Nibung, Padang Tikar, Kubu Raya, West Kalimantan.

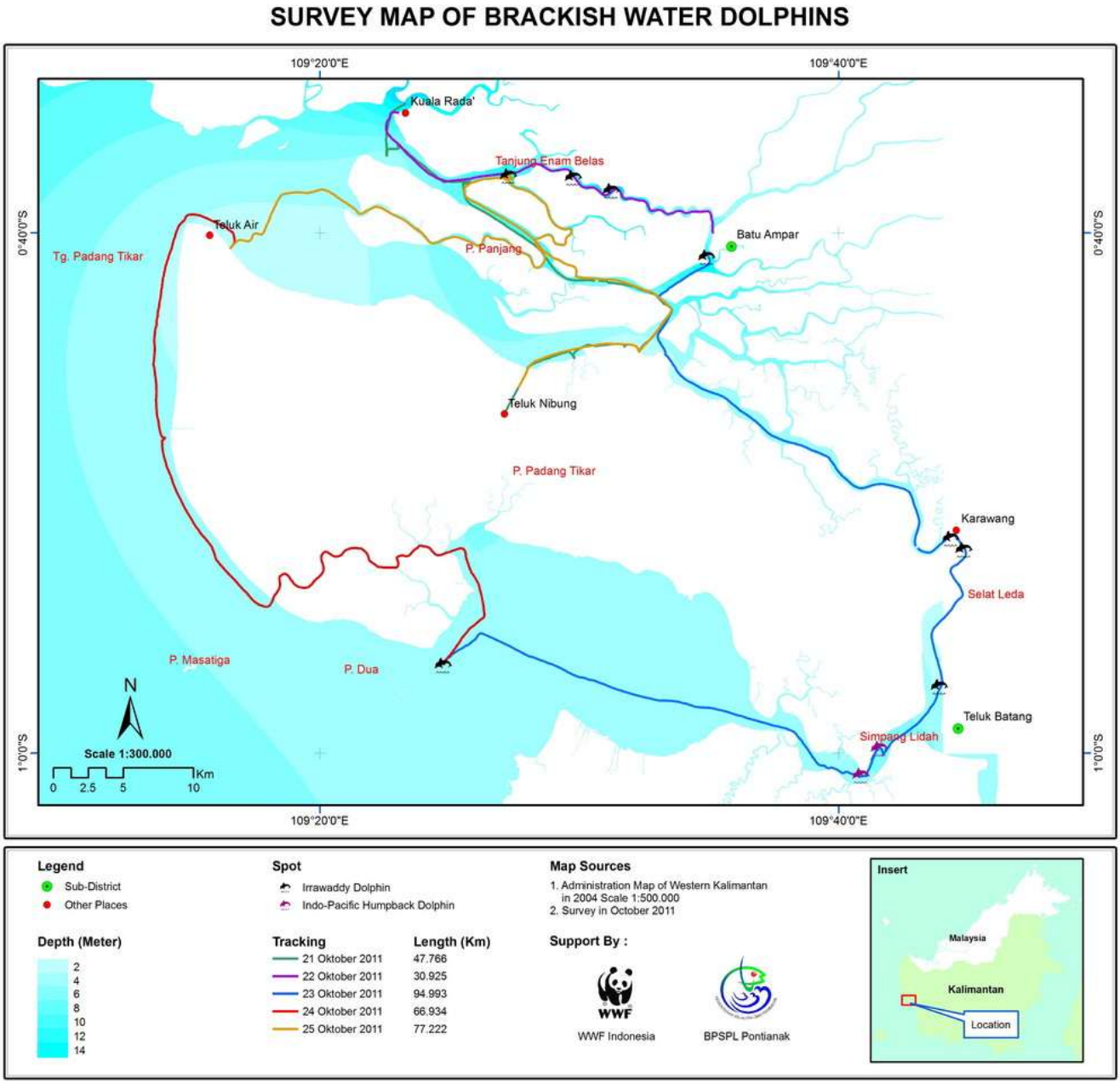
Pak Sukirman Farmer and teacher, Teluk Nibung, Padang Tikar, Kubu Raya, West Kalimantan.

Pak Panadi Fisherman (boat driver), Nipah Panjang, Padang Tikar, Kubu Raya, West Kalimantan

Appendix 2 – Survey framework

Date	Activity	Remarks
28.09.2011	Meeting with WWF-Freshwater National Coordinator; Species National Coordinator; Chief of West Kalimantan Program; and Species West Kalimantan Regional, at Atlet Century Hotel Jakarta on the planning of a preliminary Irrawaddy dolphin survey in Kubu Raya.	Achmad Yanuar (AY), Tri Agung Rooswadji (TAR), Chaerul Saleh (CS), Hermayani Putra (HP), and Albertus Tjiu (AT)
14.10.2011	Discussion with WWF-Marine and Species National Coordinator to discuss on the possibility of involving WWF Marine Division in Kalimantan Irrawaddy Dolphin Conservation Project.	WWF Jakarta. AY, CS, and Veda Santiadji (VS)
18.10.2011	Discussion with WWF Kalimantan Barat on planning a survey at Pontianak.	AY, AT, Syahirsyah (S), Dwi Suprapti (DS), and Ismoe Widjaya (IW)
19.10.2011	Discussion and training methods of survey	AY, AT, S, DS, IW, and Yuda Saniswan (YS)
20.10.2011	Departure to Teluk Nibung and over night there. Interview with villagers who have seen Irrawaddy dolphin and oceanic dolphin	AY, AT, S, DS, IW, YS
21-23.10.2011	Survey efforts of Irrawaddy dolphin in mangrove and nypah channels. Over nights at fish corrals and at river police post in Telok Air	AY, AT, S, DS, IW, YS, Rudi Mustafa (RM), Panadi (P), and Pak Sukirman (PS)
24.10.2011	Survey efforts in Selat Sih mangrove channels and shoreline of Padang Tikar Island and overnight in Padang Tikar.	AY, AT, DS, YS, RM, P
25.10.2011	Survey efforts in mangrove and nypah channels. Started from Padang Tikar and ended to Teluk Nibung.	AY, AT, DS, YS, RM, P
26.10.2011	Returned to Pontianak	WWF Pontianak office
27.10.2011	Compilation data and GIS analysis	AY, AT, DS, YS, Idham, and Anton
28.10.2011	Meeting with chief of planning of BPSLP at Pontianak	AY, DS, and Yogi Yanuar

Appendix 3 - Map of trackline survey of dolphins



Appendix 4 - Photos of survey activities

View of Batu Ampar fishing village

A jetty port for passenger ships at Padang Tikar

View of fish and shrimp corrals in Padang Tikar Mangrove Bay. The first pictures of Irrawaddy dolphins were taken by WWF-ID in surrounding fish and shrimp corrals at Selat Sih mangrove coastal and bay on April and May 2011.

View of Padang Tikar Bay, Mangrove and Nypah channels. Irrawaddy dolphins were occasionally surfacing in these waters.

Observers were scanning dolphins in mangrove channels and Padang Tikar Bay

At 10 am, two Irrawaddy dolphins *Orcaella brevirostris* surfaceds while travelling in the mangrove channel at Tanjung 16, with width of this channel of about 150 – 300 m and water around 18 to 28 m deep. This group consisted of four individuals. The colours of Irrawaddy dolphins in brackish of mangrove and nypah channels are light and pale grey.

Two Indo-Pacific Humpback dolphin *Sousa chinensis* surface, breathing out while foraging and feeding in near side of mangrove at Selat Bunbun or Gosong China Strait, a narrow strait between Padang Tikar Island and Maya Island. Two individuals have white pink colour of body and another around 300 m away was whitish in colour.

(A)

(B)

(C)

Dorsal fin (A), tail (B), and head (C) of Irrawaddy dolphin images surfaced in the surrounding fish and shrimp corrals at Selat Sih mangrove coastal (All photos: Syahirsyah/WWF-ID). A group of dolphin was sighted at 1300 hour. According to fishermen, Irrawaddy dolphin normally surface in these waters when Konda condition (a locally tidal pattern when waters were move to a lower level after high tiding). This normally occurred at between 11 am to 2 pm.