MARINE MANAGMENT SUPPORT
CENTRAL WEST COAST

HUMAN USAGE MONITORING PROGRAM (HUMP):
JURIEN BAY MARINE PARK AERIAL SURVEY, OBSERVATION SURVEYS AND VISITOR QUESTIONNAIRE (EASTER 9-12 APRIL 2004)

A SUB-PROGRAM OF THE CENTRAL WEST COAST MARINE BIODIVERSITY AND CONSERVATION PROGRAM

Field Program Report: MMS/CWC/JBMP– 76/2004

A collaborative project between the Marine Conservation Branch and Moora District of CALM and Northern Agricultural Catchment Council

Part funded by the Northern Agricultural Region of the Natural Heritage Trust 2

Natural Heritage Trust
Helping Communities Helping Australia

Prepared by
T Grubba, L Butcher and K Fitzgerald

March 2004

Marine Conservation Branch
Department of Conservation and Land Management
47 Henry St.
Fremantle, Western Australia, 6160

ACKNOWLEDGEMENTS

Direction

Manager, Marine Conservation Branch (MCB) CALM - Dr. Chris Simpson
Section Leader - Marine Management Support, MCB, CALM - Nick D' Adamo

CALM Regional/District collaboration

District Manager, Moora District (MD), CALM – Keith Hockey
Marine Park Coordinator, MD, CALM – Kevin Crane
Marine Conservation Officer (Project Officer), MD, CALM – Lee Butcher
Portfolio Leader – Monitoring, MCB, CALM – Tim Grubba
Marine Conservation Officer, MCB, CALM – Kate Fitzgerald
Marine Community Monitoring Officer, MCB, CALM – Karen Wheeler
Marine Information Officer, MCB, CALM – Philip Kindleysides

Project Supervisor, MCB, CALM – Tim Grubba

Funding / Resources

This project was part funded through the Northern Agricultural Region of the Natural Heritage Trust 2 with in kind support (including personnel, equipment and logistic) provided by Marine Conservation Branch and Moora District of CALM

This report may be cited as:

Grubba T, Butcher L and Fitzgerald K. (2004). Human Usage Monitoring Program (HUMP): Jurien Bay Marine Park Aerial Survey, Observational Surveys and Visitor Questionnaire (Easter 9-12 April 2004). A sub-program of the Central West Coast Marine Biodiversity and Conservation Program. Field Program Report MMS/CWC/JBMP -76/2004. (Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry St., Fremantle, Western Australia, 6160). Unpublished report.

Copies of this report may be obtained from:

Marine Conservation Branch
Department of Conservation and Land Management
47 Henry St., Fremantle, Western Australia, 6160

Ph: (08) 9336 0118
Fx: (08) 9430 5408

TABLE OF CONTENTS

TABLES

1. INTRODUCTION

1.1 GENERAL

This field program report presents information on the first series of human usage surveys, in the Jurien Bay Marine Park (JBMP) conducted during the Easter long weekend 9 – 12 April 2004 as part of the Human Usage Monitoring Program (HUMP) JBMP. The main aim of the *HUMP JBMP* is to develop and implement a framework to collate existing and gather new quantitative and qualitative data on the types, intensity and temporal and spatial patterns of human usage in the JBMP that can be used in the management of the JBMP. A secondary aim is to determine the effectiveness of signage program that address JBMP boundaries, zoning and values (to be established in mid 2004) by identifying current visitor awareness and knowledge of the JBMP and how this changes once signs are installed.

This field survey will be coordinated by the Marine Conservation Branch (MCB) of the Department of Conservation and Land Management (CALM) (Project Supervisor: Tim Grubba) in collaboration with the Moora District Jurien Bay Office of CALM (contact: Keith Hockey). Fieldwork preparation will be coordinated by Tim Grubba with assistance from Kate Fitzgerald and Lee Butcher. The Field Team Leader will be Tim Grubba.

Field staff will include Tim Grubba, Kate Fitzgerald, and Karen Wheeler from MCB, CALM, Lee Butcher, Kevin Crane, Gina Broun and Bev Gardiner from Moora District, CALM and one CALM registered volunteers.

1.2 BACKGROUND

The Central West Coast (CWC) includes the waters from Lancelin and Dongara, which lie within a transition zone between the tropical and temperate waters of Western Australia. As a result the CWC waters has a high diversity of ecological values common to both tropical and temperate areas. The waters of the CWC provide for a wide range of opportunities for recreational (e.g. recreational fishers) and commercial (e.g. western rock lobster) activities, while the adjacent land are used for scattered residential and commercial activities. In general these activities are currently not having a major impact on CWC values but the potential for human activities to increasingly threaten CWC marine values will increase as development occurs (e.g. access roads and housing developments).

To facilitate and ensure the conservation of CWC values, through the effective management of human activities, two integrated management approaches have been initiated which include the gazettal in 2003 of representative waters between Green Head and Wedge Island as the Jurien Bay Marine Park (JBMP) and the development of a Natural Resource Management Strategy for the Northern Agricultural Region by the Northern Agricultural Catchment Council (NACC).

The JBMP is vested in the Marine Parks and Reserves Authority (MPRA) and managed by the Department of Conservation and Land Management (CALM) using an outcome-based "best practice" model of management planning and performance reporting. Under this approach CALM is required to conduct annual internal audits and facilitate triennial external audits by the MPRA. The JBMP Management Plan forms the basis for the operational management of the park and the audit process. The management plan identifies and prioritises all the Park's ecological and social values and sets for each: management objectives, trends and targets and identifies current human pressures and provides management strategies to address pressures. The audit process requires quantitative data that can be used to assess the status of values, determine whether management objectives are achieved, identify the nature and patterns of human usage, and the implementation and effectiveness of management strategies in managing these pressures.

In 2003, the Natural Heritage Trust II through it's interim regional funding program provided financial assistance ($345,000) (with support from NACC) to CALM for a program entitled "*Central West Coast Marine Biodiversity and Conservation Program*". This program comprises four linked sub-programs, which include baseline water quality monitoring, designing and implementing a marine information system, human usage monitoring, and community education and interpretation.

This project brief details the human usage sub-program entitled "*Human Usage Monitoring Framework for the Central West Coast – Jurien Bay Marine Park*", which has been allocated $88,000 by NHT2 and approximately $11,000 by CALM. The funds will be used to develop and implement a framework for the collation of existing human usage data and long-term monitoring of human usage. The quantitative data will be used to meet the management requirements of CALM, MPRA and NACC. The framework will be developed taking into

consideration existing frameworks, methodologies and programs thus avoiding replication and best use of limited resources.

Human usage data will be entered into the Marine Information System (MIS) being concurrently developed as a sub-program. The human usage data sub-program will develop add-on modules for the MIS to facilitate data entry into the MIS and the querying, analysis and presentation of data stored in the MIS

The sub-program will produce a number of documents that detail the framework which will be generically applicable to other regions in the State, in particular marine conservation reserves.

The sub-program is being driven by the Marine Conservation Branch (MCB) of CALM in partnership with the Moora District office, CALM (located in Jurien Bay) and NACC CWC. The sub-program will liaise with stakeholder groups with a vested interest in the CWC, in particular those associated with the Jurien Bay Marine Park. The sub-program will involve a component of the program's level 2/4 project officer, hosted by the Moora District. The project officer will assist in the development and implementation of the framework for the collation and collection of human usage data in the CWC with a focus on JBMP. The sub-program will involve a component the GIS project officer's time to produce products as required (e.g. spatial presentation of human usage data on maps).

1.3 OBJECTIVES: JBMP HUMAN USAGE MONITORING PROGRAM

1. To design and implement a framework to collect quantitative and qualitative data on the types, spatial patterns and temporal trends of human usage in the Jurien Bay Marine Park to meet the requirements for the management of the Park (i.e. audits, research and monitoring programs and implementation of management strategies) and the greater Central West Coast waters.
2. To develop add-on modules for the Jurien Bay Marine Park Marine Information System (concurrently being developed) to facilitate data entry, query and presentation.

1.4 OBJECTIVES: JBMP SIGNAGE PROGRAM

1. To design, produce and install a system of signs in the newly gazetted Jurien Bay Marine Park to raise community awareness of the Park boundaries, zoning system, hazards and provide education and interpretation of the Park's ecological and social values and other topics of interest.
2. To determine the effectiveness of the system of signs in increasing park user awareness of the Park boundaries, zoning system, hazards and values.

1.5 AIMS: EASTER 2004 FIELD SURVEY

The following are the objectives of the Easter 2004 field survey:

1. Collect baseline data ("snap-shot") of human usage patterns in the Jurien Bay Marine Park during a peak usage period
2. Collect baseline data on daily usage patterns at key access points in the Jurien Bay Marine Park.
3. Collect baseline data on Park usage (historic, current and future):
    a. How long been coming to the area
    b. Frequency and length of stay
    c. Areas used
    d. Type of activities
4. Collect baseline data on the Park user knowledge of:
    a. The Park, it's boundaries and zoning scheme
    b. Park ecological values
    c. Park social values
    d. Human pressures on values
    e. How these pressures can be managed
    f. Park hazards
5. Determine the source of Park user knowledge of the points identified in 3a-f.

2. SITE SELECTION AND METHODS

2.1 SECTORS AND KEY FOCAL AREAS

The Easter 2004 field survey study area includes the entire waters of the JBMP, the adjacent coastal strip and islands between Wedge in the south and Green Head in the north. Aerial surveys will cover the entire Park waters, coastal strip and islands while observation surveys and visitor questionnaires will focus on areas of high human usage and key access point to the Park (Table 1). The visitor questionnaires will be carried out at the Jurien and Cervantes Easter festivals.

To facilitate and standardise the collection of human usage data, the Park has been divided into a series of sectors and key focal areas (Appendix 1). The sectors are based on the Park's physical features (to facilitate identification of sector boundaries when in the field) and the Park's zoning system. There are 30 sectors divided into inshore and offshore sectors as defined by the island/reef chain that runs down the central part of the Park. The key focal areas include areas of high human usage, major access point to the Park and areas of special management interest (Table 1).

Table 1. Key focal areas and access points

1. Greenhead
2. South Bay
3. Fishermen Islands
4. Sandy Point
5. Sandland Island
6. North Head
7. Jurien
8. Hill River
9. Hansen Bay
10. Kangaroo Point
11. Ronsard Bay
12. Cervantes
13. Hangover Bay
14. Cavanagh Reef
15. Grey
16. Wedge

2.2 METHODS (GENERAL)

The field survey will conducted over the Easter long weekend from Friday 9 April to Monday 12 April 2004.

A total of nine people will be available for fieldwork and the availability of each person will need to be checked the week prior to the fieldwork. Table 2 presents a list of field crew and lists the roles that each could hold. Prior to surveys commencing a training session will be held to ensure that all staff are briefed on the methods to be used.

Table 2. Roles of field team members

Name	Data Recorder	Jurien and Cervantes Easter Festivals	Visitor Questionnaires	Aerial Survey
Tim Grubba	MCB	3	3	3
Kevin Crane	MD	3	3	3
Lee Butcher	MD	3	3	3
Gina Broun	MD	3	3	
Bev Gardiner	MD	3	3	
Karen Wheeler	MCB	3	3	
Kate Fitzgerald	MCB	3	3	
Camille Grubba	MCB volunteer	3	3	

2.3 AERIAL SURVEYS

2.3.1 Aircraft and equipment requirements

Small single-engine highwing aircraft such as the Cessna 172 or 188 provide an ideal platform for conducting aerial surveys in coastal waters as they can be flown at low speed (70 knots) and altitude (500 meters over non-

residential and 1000 meters over residential areas) and with the co-pilot door removed (during flight) provides ideal viewing for observers to identify, count, photograph and video tape human activities. In addition this type of plane is economical to charter at approximately $200 per hour or approximately $1,000 for a typical five-hour aerial survey. The advantages of the larger Cessna 188 is the capacity to have three observers on board and that the landing gear retracts and provides and uninterrupted view out the starboard side of the aircraft when the door is removed.

The following equipment is required for aerial surveys:

- Still camera (digital camera with a minimum resolution 4 mega pixels)
- Digital video camera with frame (tripod) to secure it to the aircraft (optional)
- Piece of foam to insulate the camera from aircraft vibration.
- Variety of cable ties and duct tape to secure frame to aircraft cabin
- Polaroid sunglasses to reduce sun glare off the water
- Communication headset for each observer to facilitate communication within the cabin when the aircraft doors are removed
- Small piece of thin foam to wrap around communication headset microphone (rubber band to secure the foam) to reduce wind noise
- Data sheets/maps

2.3.2 Flight times

The frequency of aerial surveys should follow a set regime however this is ultimately dependent on resources available. Flights should be conducted during peaks in daily usage, which in most cases in Western Australia occurs from early morning to midafternoon dependent on local sea and weather conditions. Flights conducted mid-morning are preferred as the sun glare on the water surface, which reduces visibility is at a minimum.

2.3.3 Flight pattern

The aircraft flight pattern through the Park being surveyed should allow observers to view all Park waters contained within each sector and in particular key focal areas of high human usage within sectors (Section 2.1) during the survey. The flight patterns should be determined prior to the survey and recorded on a map along with waypoint coordinates (latitude and longitude) to assist the pilot and observers in identifying the aircraft location in reference to sectors. The flight pattern should be replicated during further surveys and recorded each time a survey is conducted to ensure consistency and coverage. The aircraft altitude should be at around 500 and 1500 meters, although height can be varied to increase visibility of the survey areas and human activities. The flight pattern actually flown on any given survey is at the discretion of the pilot who may modify the flight patterns to meet safety requirements for aircraft operation.

The aircraft ordered from Perth flies up with no passengers and the aircraft door on. The aircraft lands at the Jurien Bay light aircraft strip. In Jurien the starboard door is removed and the survey team board the aircraft.

The aircraft takes off and travels to the southern boundary of the Park at Wedge Island. Once at Wedge Is the survey commences surveying the inner lagoon sectors travelling north to Green Head. Once at Green Head the outer sectors are surveyed travelling south to Wedge. Once at Wedge the coastal section is surveyed travelling north to Green Head. Once the surveys are completed the aircraft returns to Jurien and lands to let off the Jurien based survey members.

2.3.4 Personnel required and roles

A minimum of three people are required to conduct an aerial survey including the pilot and two observers (primary observer and secondary observer). Aircraft such as the Cessna 172 have the capacity to hold three passengers and the pilot. However given the small cabin size, low altitude flying, and weight limitations it is unlikely that a third observer can be accommodated. If a larger aircraft is used such as the Cessna 188 then three passengers can be accommodated.

Pilot: responsible for aircraft operations, assist observers whenever possible in site positions and flight pattern changes
Primary Observer: responsible for recording data, providing direction to the pilot (in regards to flight pattern).
Second Observer: responsible for recording data, taking photographs
Third Observer (if space): responsible for recording data, taking photographs

2.3.5 Aerial survey method

Pre-flight

The following should be carried out prior to departure:

- The starboard side passenger door should be removed from the aircraft prior to departure if conditions are suitable.
- The pilot and observers should be briefed on the survey prior to entering the aircraft.
- The observers should be securely strapped in and should each have headsets that allow them to communicate within the aircraft. The primary observer located in the co-pilot seat should pay particular attention to the lap and shoulder harnesses, as this is the only safety device securing the person within the aircraft cabin when the door is removed. Where possible (check with pilot) secure the belt clasp with duct tape to prevent the clasp being released accidentally.
- All loose items must be secured, particularly if the aircraft door has been removed for flight.
- Mount cameras securely and check to ensure that they are operational.
- The observers maybe required to wear lifejackets if the aircraft is flying below 1,000m over water (Pilot will inform). Life jackets should be put on preferably prior to takeoff and kept on for the duration of the flight.

Seating arrangements

The seating arrangements are:

- Primary observer sits in the co-pilot seat (starboard front seat).
- Secondary observer sits behind the pilot (port rear seat).
- Third observer (if present) sits behind the primary observer (starboard rear seat).

Survey

Once the aircraft is on its final approach to the start of the predetermined survey flight pattern the aircraft should slow and descend to the appropriate altitude. The primary observer should verbally announce the start of the survey. During the flight the primary observer works together with the pilot to ensure that the aircraft remains close to the predefined flight path. The primary observer should record the aircrafts actual flight path on a map.
The primary observer should record all human activities observed on the starboard side of the aircraft within a given sector on the data sheet/map (Appendix 1) using the appropriate codes (Appendix 2). The secondary observer should record all human activities observed on the port side of the aircraft within a given sector on the data sheet/map (Appendix 1) using appropriate codes (Appendix 2). If a third observer is present that person should assist the primary observer by taking notes, photographs.

In addition to recording observed human activities the observers should take photographs and video footage where appropriate. Photographs should be taken of any areas (Key focal areas) of high human usage including but not limited to mooring, and anchorages, camping area, popular beaches on the land and islands. The photographs allow for additional analysis of the usage at the sites. For example if there are too many people on a beach to be counted when flying past then a digital photographs allows the number of people to determined at a later stage. Photographs should however not replace the visual counts of the observers. Any photographs should be recorded on the data sheet/map (Appendix 1).

Where possible the flight path that looks at coastal usage should have the aircraft flying with the starboard side running adjacent to the coast, this presents a un obstructed view of coastal areas through the aircraft fuselage when the door has been removed. The secondary observer in the absence of a third observer should switch from the port rear seat to the starboard rear seat. The secondary observer should assist the primary observer with recording activities and taking digital photographs. It is important that the primary and secondary or third observer communicate clearly what data they are recording so that same activities are not recorded twice.

2.3.6 Data requirements and collection

Aerial surveys will collect data on the types and spatial distribution of a variety of human activities. The data is recorded onto a data map (Appendix 1) using a system of codes (Appendix 2). The data map should have the sector and sub-sectors marked onto it as well sufficient topographic information to allow the determination of the location of the plane and observed activities. The data map should also include notes that guide the observers to key areas where more detailed observation are required. Once a survey is completed the data is transcribed from the data map into an electronic spreadsheet (Microsoft Excel) and digitised using the GIS software “Arcview” and entered in to the Jurien Bay Marine Park Marine Information System and the original data map is appropriately archived (Section 4).

The planes flight path should also be recorded on the data map. Details of each photograph and video footage taken should also be recorded on the data map using standard codes.

Where possible digital still photographs should be taken of each significant activity that is recorded and key focal areas. Video footage can be recorded through out the flight.

Environmental conditions including weather and sea state should also be recorded (Appendix 2).

2.3.7 Safety

There is a level of risk associated with flights in small aircraft conducted at low altitude, slow speeds and over water. This can be overcome to a certain extent through the use of suitable experienced and qualified pilots and well-maintained planes. Concerns regarding safety should be addressed prior to the flight with the pilot during their pre-flight briefing and safety check. Observers should be comfortable with flying in small planes at low altitudes with potential turbulence.

There is an additional safety risk when the co-pilot door is removed for the flight and it is recommended that the following safety precautions be taken. Observers should be and remain securely fastened to their seat using four-point harness restraint system and a piece of duct tape should be placed over the clasp of the restraint system to ensure that it is not accidental released during the flight. All loose items in the aircraft cabin should be securely stowed and any loose items including video cameras, still camera and hand held GPS systems are tethered to an observer or the plane. The data sheets should be stapled together and secured to a clipboard.

2.4 OBSERVATION SURVEYS

Observation surveys are used to collect data on the types, intensity and patterns of human usage at specific site/s over a short temporal period of up to a day. The observation surveys conducted during the aerial survey will provide a means of 'ground truthing' the human usage data collected during the aerial survey. Two types of observation surveys will be conducted during the Easter field trip including:

1. Short duration observation surveys conducted over a 5-minute period at each site when observers first arrive to conduct visitor surveys (Section 2.5).
2. Full day continuous observation surveys will be conducted at three key access points to the Park, the boat ramps at Green Head, Jurien Bay and Cervantes between the hours of 5am and 7pm (dependent on resources).

2.4.1 Short duration observation surveys

Short duration observation surveys will be conducted at each site where visitor surveys are conducted. The observation survey data sheet (Appendix 3) should be completed when the observer first arrives at the site and should take no longer than 5 minutes. The observer should define and describe the survey site recording a site position (latitude and longitude) and drawing a detailed site map (with scale and notes). The map should also describe the areas of main activity.

2.4.2 Full day continuous observation surveys

Full day continuous observation surveys will be conducted at key access points to the Park including the boat ramps at Green Head, Jurien and Cervantes. Observer/s will be stationed all day (5:00am 7:00pm) at each site and will record human activities at the site throughout the day on the observation survey data sheet (Appendix 4) in 15 minute blocks. Observers should record the number of vessels launched at the boat ramps or if relevant the departing a pen. When vessels return the observer should ask the boat operator the types of activities they carried out and where they occurred, which should be recorded on data maps (Appendix 4) using the codes (Appendix 2). The boat operator should mark the location as a point for a specific site or as circle for a general area The observer/s should also record on the data sheet current weather conditions every 15 minutes.

As per the short duration observation surveys the observer should define and describe the survey site, recording a site position (latitude and longitude) and drawing a detailed site map when they first arrive at the site (Appendix 4).

A minimum of two observers is required for each site, so that the observers can establish a shift system to avoid fatigue (eg three hours of observation followed by a break). As the observer/s will be at the site all day they will need to establish a comfortable base (ie somewhere to sit, shelter, water and food) from which all activities can be observed.

When two or more observers are present, one observer should focus on the observation survey while the other observer/s should conduct visitor surveys (Section 2.6).

2.5 VISITOR QUESTIONNAIRES

Visitor questionnaires provide the means of collecting information on Park visitor knowledge of the Park its boundaries, zoning and ecological and social values and types and patterns of visitor usage. Visitor surveys will be conducted at the Jurien and Cervantes Easter festivals and at sites of high human usage and key access point to the Park over the four-day Easter long weekend including boat ramps, camping and day use sites. The questionnaires will be administered throughout the day but with an emphasis placed on morning and evening periods at camping areas when people are likely to be present. An absolute minimum of 35 completed questionnaires are required (based on two surveys being conducted during the year) (Vistat 2000 guidelines for the Collection of Visitor Information data on CALM Managed Lands and Waters).

The questionnaire (Appendix 5) consists of 29 questions that are divided into 3 sections.
Section 1: Marine Park and Zones
Section 2: Values (Australian Sea lions, seabirds, fish, seagrass/macroalgae)
Section 3: Generic questions (eg human usage)

The questionnaire will be administered by CALM staff and volunteers who will ask the respondents questions and record their answers. The questionnaire includes prompts to assist the person administering the questionnaire (e.g. which questions should be asked based on the respondents answers). The questionnaire also includes attachments to assist the respondent is answering questions. The questionnaire includes a standardised greeting, request and introduction that should be communicated to potential respondents. A briefing/training session will be held prior to going into the field to ensure that all staff and volunteers administer the questionnaire in a standardised manner without bias. Persons administering the questionnaire should be readily identifiable as being from CALM through clothing (hat and shirt with Department logos) and name badges. People administering the questionnaire should have a general understanding of the Park and be able to respond to public enquiries.

At the site to be surveyed, the person administering the questionnaire should first complete the observation survey data sheet before commencing the questionnaire. The person should then approach people at the site and introduce themselves and invite them to participate in the survey and provide a brief description of the questionnaire structure and what the data collected will be used for. The questionnaire is voluntary and the potential respondent should not be pressured into participating in the questionnaire or completing the questionnaire.

When the questionnaire has been completed the observer should thank the respondent and answer any questions that the respondent may have. The observer should offer the respondent a copy of “Your Guide to Jurien Bay Marine Park” and provide them with a token gift (a magnet and pen) as a thank you for their participation in the program.

3. PROJECT MANAGEMENT

3.1 SURVEY TEAM

The survey team will be comprised of three CALM (MCB) personnel (Tim Grubba, Karen Wheeler and Kate Fitzgerald), two CALM (Moora) personnel (Lee Butcher and Kevin Crane) and assisted by four CALM registered volunteers (Leslie Wheeler, Camille Grubba, Gina Broun and Bev Gardiner).

Tim Grubba	Project leader and Field Team Leader Marine Ecologist	Ph (w): (08) 9432 5118 Ph (h): (08) 9271 5560 Fax (08) 9430 5408 Ph (mobile): 0414 637 718
Karen Wheeler	Marine Community Monitoring Officer	Ph (w): (08) 9336 0123 Ph (h): (08) 9450 8135 Fax (08) 9430 5408 Ph (mobile): 0417 755 260
Kate Fitzgerald	Conservation Officer (Marine)	Ph (w): (08) 9336 0124 Ph (h): (08) 9383 1919 Fax: (08) 9430 5408 Ph (mobile): 0408 877 101
Lee Butcher	Conservation Officer (Marine)	Ph (w): (08) 9652 1911 Ph (h): (08) Fax: (08) 9652 1922 Ph (mobile):
Kevin Crane	Marine Park Coordinator	Ph (w): (08) 9652 1911 Ph (h): (08) Fax (08) 9652 1922 Ph (mobile):
Camille Grubba	CALM Volunteer	Ph (w): (08) 9225 0412 Ph (h): (08) 9271 5560 Fax (08) 9221 0362 Ph (mobile): 0423 028 753
Gina Broun	CALM Staff	Ph (w): (08) 9652 1911 Ph (h): (08) Fax (08) 9430 5408 Ph (mobile):
Bev Gardiner	CALM Staff	Ph (w): (08) 9652 1911 Ph (h): (08) Fax (08) Ph (mobile):

3.2 FIELD ITNERARY

Table 3. Field itinerary

Date	Day	Time	Staff involved	Activity
09/04/04	Fri	8:00 am	TGR, KWH, KFI, CGR	Leave Perth
		12:00 pm		Arrive Jurien
		1:00 pm – 3:00 pm	TGR, KWH, KFI, CGR, LBU, KCR, GBR, BGA	Briefing with all staff and volunteers
		4:00 pm – 7:00 pm	TGR, KWH, KFI, CGR, LBU, KCR	Conduct questionnaires
10/04/04	Sat	6:00 am – 10:00 am	TGR, CGR, LBU, KCR	Conduct questionnaires
		10:00 am – 11:00 am	KFI, KCR	Set up for Jurien Easter Festival display
		10:00 am – 11:00 am	KWH, LBU	Set up for Cervantes Easter Festival display
		11:00 am – 4:00 pm	KFI, KCR	Jurien Easter Festival
			TGR	Conduct questionnaires at Jurien Easter Festival
		11:00 am – 4:00 pm	KWH, LBU	Cervantes Easter Festival
			CGR	Conduct questionnaires at Cervantes Easter Festival
		5:00 pm – 6:00 pm	KFI	Pack up Jurien Easter Festival display
		5:00 pm – 6:00 pm	KWH	Pack up Cervantes Easter Festival display
		5:00 pm – 7:00 pm	TGR, CGR, LBU, KCR	Conduct questionnaires
11/04/04	Sun	7:00 am – 2:00 pm	TGR, LBU, KCR	Aerial survey
		5:00 am – 7:00 pm	KFI	Observation survey at Green Head boat ramp (All day)
		5:00 am – 7:00 pm	KWH, CGR	Observation survey at Jurien boat ramp (All day)
		5:00 am – 7:00 pm	GBR, BGA	Observation survey at Cervantes boat ramp (All day)
		5:00 pm – 7:00 pm	TGR, LBU, KCR	Conduct questionnaires
12/04/04	Mon	6:00 am – 10:00 am	TGR, CGR, LBU, KCR, KWH	Conduct questionnaires
		10:00 am – 12:00 pm	TGR, CGR, KFI, LBU, KCR, KWH	De-brief and pack up
		12:00 pm	TGR, CGR, KWH	Leave Jurien
		4:00 pm	TGR, CGR, KWH	Arrive Perth

3.3 SAFETY

Field operations shall be carried out in accordance with CALM procedures and protocols. Overall responsibility for field procedures, in respect of human usage surveys, during this field trip and the personal safety of all team members rests with the Field Team Leader –Tim Grubba.

Staff conducting observation surveys and visitor questionnaires (apart from the festivals and main usage areas) must work in groups of two and carry a mobile phone or some other form of communication.

3.4 ACCOMMODATION

The Perth based staff and volunteers will be staying at the Cervantes Pinnacles Motel (7 Aragon St Cervantes Phone: (08) 9652 7145)

3.5 COMMUNICATIONS

3.5.1 General

The field staff could have mobile phones refer to 3.1 for numbers.

3.5.2 CALM offices

Marine Conservation Branch, Fremantle: Ph (08) 9432 5100; Fax (08) 9430 5408
Moora District Office, Jurien Bay: Ph (08) 9652 1911; Fax (08) 9652 1922

3.5.3 Pilot

Gus Mobile Ph: 0419 948 435

3.6 BUDGET

Table 4. Budget reconciliation for the Human Usage Monitoring Program: Jurien Bay Marine Park, Easter, 09 – 12 April 2004.

Budget Item		CALM MCB Salary.	CALM MCB in kind operational	NHT2 Salary	NHT2 Operational	CALM JB Salary ($)	
Travel							
Vehicles	CALM MCB vehicle - $0.45/km for 2,500 km				1,125		
	Car Rental (Fremantle)				1,000		
	CALM District vehicle - $0.45/km for 1000 km				450		
	CALM District vehicle - $0.45/km for 1000 km				450		
	Aircraft				1,200		
	Subtotal				**4,225**		
Accommodation and Food							
Accommodation	3 Hotel rooms in Cervantes @ $106 per night each for 3 nights				954		
Food	5 people @ $50 per day for 4 days				1,000		
	Subtotal				**1,954**		
Staff							
Tim Grubba	4 days @ $	1,228					
Karen Wheeler	4 days @ $			942			
Kate Fitzgerald	4 days @ $			942			
Lee Butcher	4 days @ $			942			
Kevin Crane	4 days @ $					1,228	
	Subtotal	**1,228**		**2,826**		**1,228**	
Equipment							
3 x GPS units	4 days @ 20		80				
1 x Laptop Computer	4 days @ $100		400				
1 x digital video	4 days @ $150		600				
1 x digital camera	4 days @ $100		400				
	Subtotal		**1,480**				
Consumables							
Digital video tapes	2 x DVM – E60 @ $14.75				30		
Printing					500		
Other consumables					1,000		
	Subtotal				**1,580**		
	Total	**1,228**	**1,480**	**2,826**	**7,759**	**1,228**	**13,293**

3.7 EQUIPMENT

3.7.1 Video systems

CALM MCB

- Canon MV1 digital video camera with battery packs (2) and chargers (1).
- Video data sheets
- Instruction manuals
- Digital video tapes (2)
- Leads, remote control, and spares

3.7.2 Still photography

CALM MCB

- Digital still camera

3.7.3 Safety

CALM MCB

- Sunscreen

3.7.4 Information

CALM MCB

- Visitor questionnaires (200 copies)
- Visitor questionnaire attachments (20 copies)
- Observation survey data sheets (70 copies)
- Aerial survey data sheets/maps (3 copies)
- 1 laptop computer
- Set of aerial photographs
- Name badges for all staff
- Shirt and hat for all staff
- JB maps (3 copies)

3.7.5 Vehicles

CALM MCB

- Branch vehicle (2WD)
- Rental vehicle (4WD)

CALM Jurien Bay

- District vehicle (4WD)
- District vehicle (4WD)

3.7.6 Position fixing and Communications

CALM MCB

- 2 hand held Lowrance Globalmap 100 GPS units and accessories

CALM JB

- GPS

3.7.7 Miscellaneous Equipment

CALM MCB

- 20 AA batteries
- 10 clip boards
- 4 field notebooks
- 1 box of pencils
- 1 box of pens
- 1 packet of cable ties
- 1 roll of duct tape

4. DATA MANAGEMENT

4.1 FIELD PROGRAM REPORT

Hard copies of this Field Program Report will be held at three locations:

1. Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry St., Fremantle, Western Australia, 6160. Ph (08) 9336 0100 Fax (08) 9430 5408.
2. Woodvale Library, Science and Information Division, Ocean Reef Rd., Department of Conservation and Land Management, Woodvale, Western Australia, 6026. Ph (08) 9405 5100 Fax (08) 9306 1641.
3. Archived with CD ROM, Woodvale Library, Science and Information Division, Ocean Reef Rd., Department of Conservation and Land Management, Woodvale, Western Australia, 6026. Ph (08) 9405 5100 Fax (08) 9306 1641.

The Marine Conservation Branch will hold digital copies of the Field Program Report:

1. On CD-ROM [mms_7604] held onsite at the Marine Conservation Branch
2. On the MCB homepage located within the framework of the Department of Conservation and Land Management Intranet (i.e. CALMweb):
3. http://calmweb.calm.wa.gov.au/drb/ncd/mcb/rep_mms.htm#2004

4.2 DATA

Collected raw data will be:

1. Entered into electronic copies of the data sheets (Microsoft Word) database 'Streettalk\userdata@FREM.MCB@CALM' T:\current projects\mms\CWC\JBMP_HUMP\ HUMPJBMP_Survey1_03_02\ Datasheets_03_02
2. Written into a Marine Management Support Data Report and copies will be held at the same locations as for the Field Program Report.

4.3 VIDEO RECORDS

Collected mini digital video (MDV) footage will be held at two locations:

1. Video masters (MDV) to be archived at the Information Management Branch (File: 1999F000508, Box: HOLD 08), Department of Conservation and Land Management, 50 Hayman Road, Como, Western Australia.
2. MDV copies to be stored at the Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry Street, Fremantle, Western Australia.

4.4 DIGITAL PHOTOGRAPH RECORDS

All photographs taken by CALM to be stored at the Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry Street, Fremantle, Western Australia.

5. PUBLICITY/EDUCATION

A media statement will be released.

6. DISTRIBUTION LIST

Department of Conservation and Land Management
Dr. Chris Simpson, Manager, MCB, CALM
Keith Hockey, Manager, Moora District, CALM
Nick D' Adamo, Senior Oceanographer, MCB, CALM
Tim Grubba, Marine Ecologist, MCB, CALM
Karen Wheeler, Marine Community Monitoring Officer, MCB, CALM
Kate Fitzgerald, Marine Conservation Officer, MCB, CALM
Lee Butcher, Marine Conservation Officer, Moora District, CALM
Kevin Crane, Marine Park Coordinator, Moora District, CALM

APPENDIX 1

AERIAL SURVEY DATA SHEET

SITE DETAILS

Date		Time (Take off)	
Time (Land)		Total time	
Site name or description:			

SITE CONDITION: WIND, WATER, CLOUD COVER AND RAINFALL

EARLY-MORNING					
Wind	CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
Water	CALM	SLIGHT	MOD	ROUGH	V.ROUGH
Cloud Cover & Rainfall	CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

MID-MORNING				
CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
CALM	SLIGHT	MOD	ROUGH	V.ROUGH
CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

MIDDAY					
Wind	CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
Water	CALM	SLIGHT	MOD	ROUGH	V.ROUGH
Cloud Cover & Rainfall	CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

EARLY AFTERNOON				
CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
CALM	SLIGHT	MOD	ROUGH	V.ROUGH
CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

LATE AFTERNOON					
Wind	CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
Water	CALM	SLIGHT	MOD	ROUGH	V.ROUGH
Cloud Cover & Rainfall	CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

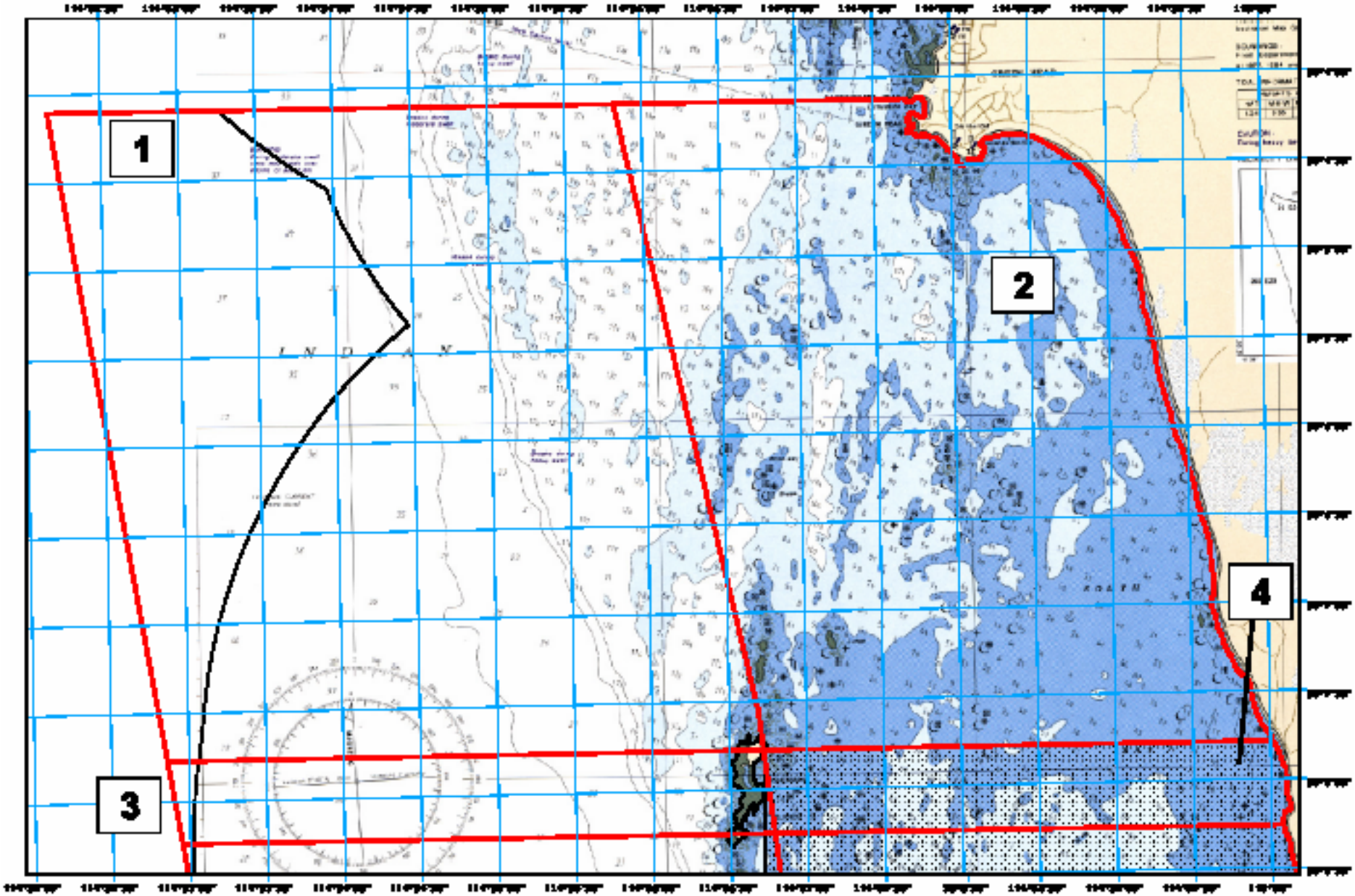
SITE USAGE (TOTAL NUMBERS) – TO BE COMPLETED POST FLIGHT

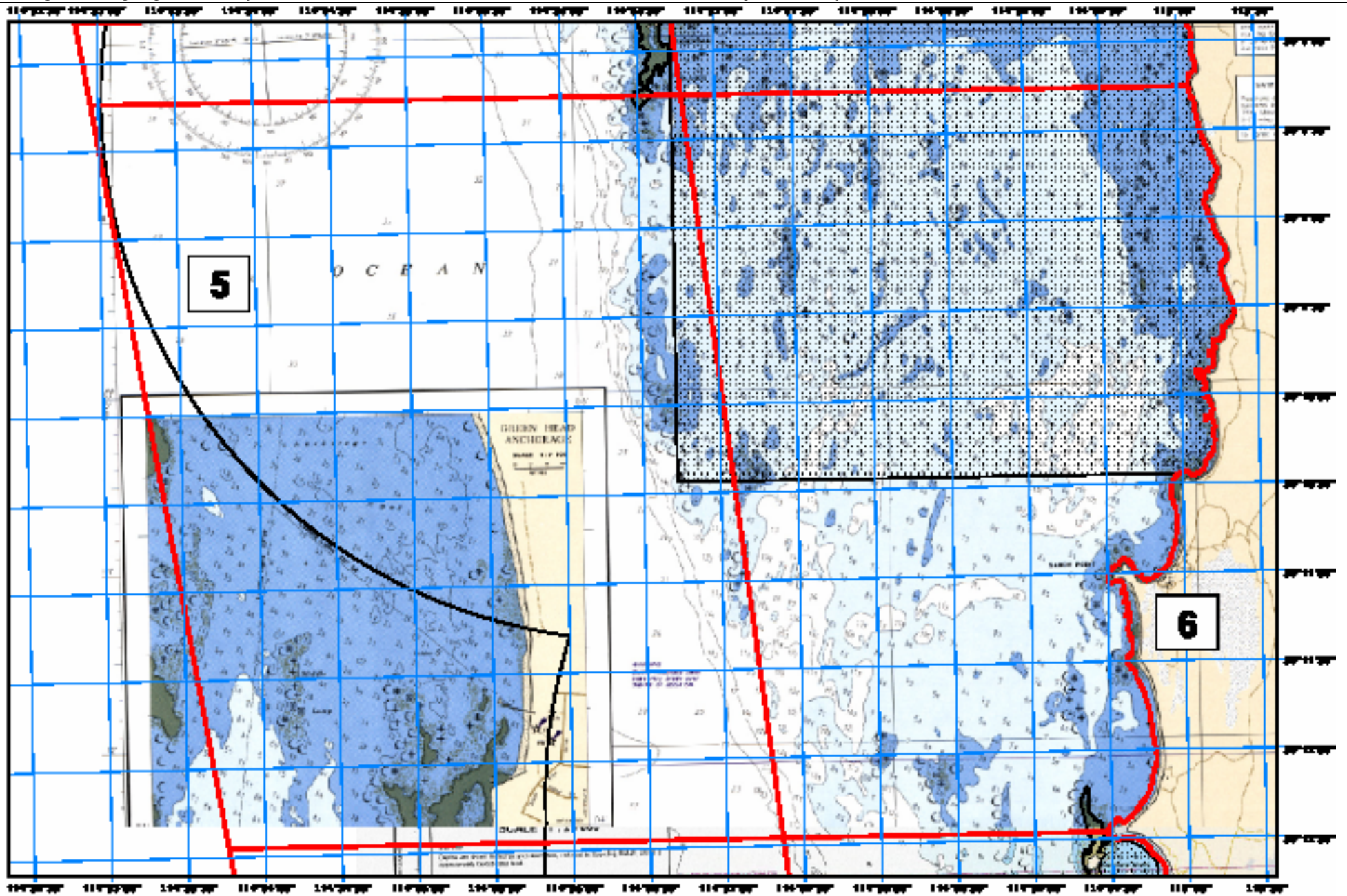
ACTIVITY	SECTOR

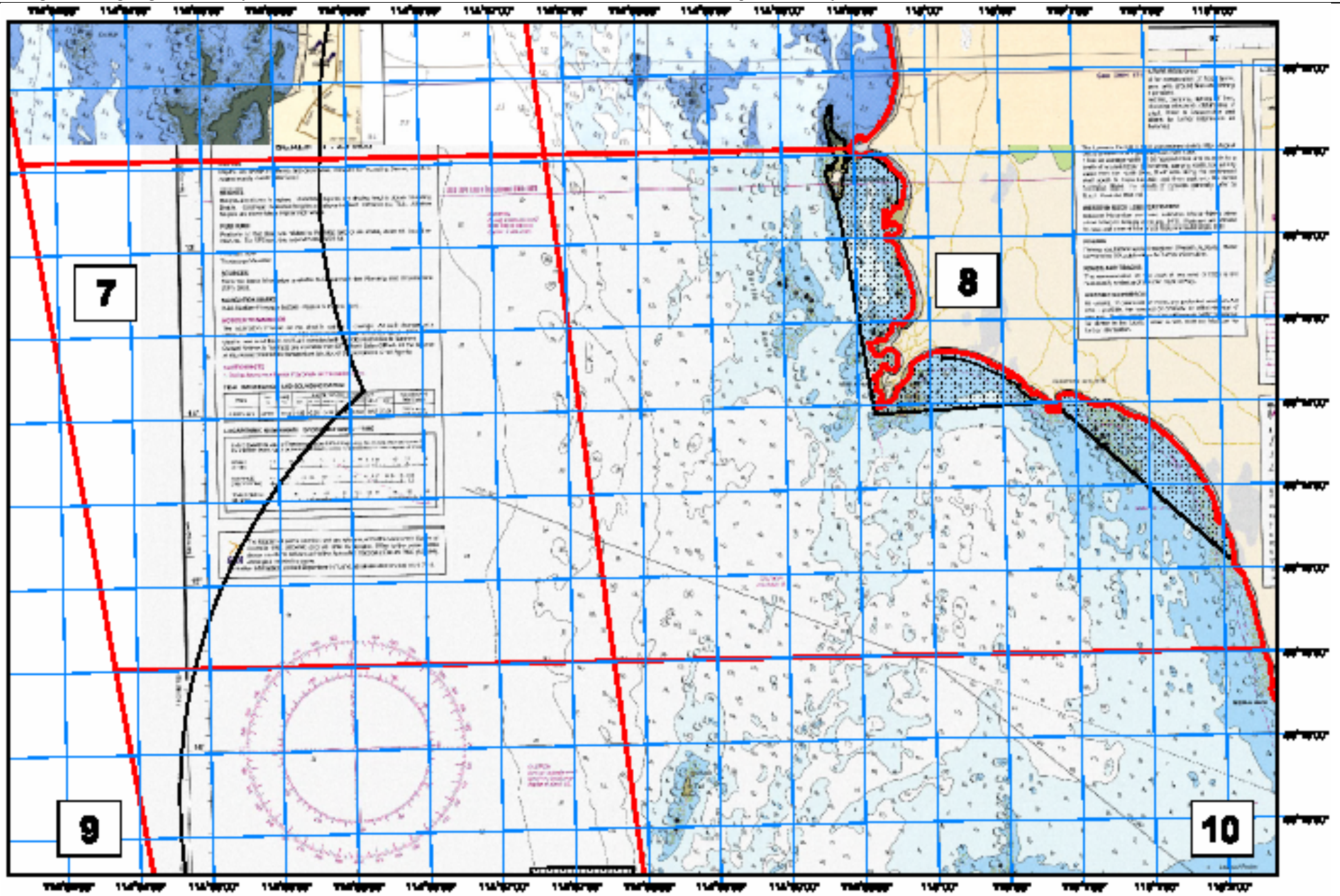
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Vehicles																														
Visitors																														
Boats																														
Boat trailers																														
Campsites																														
Beach fishing																														
Boat fishing																														
Beach activities																														
Swimming																														
Snorkelling																														
Diving																														

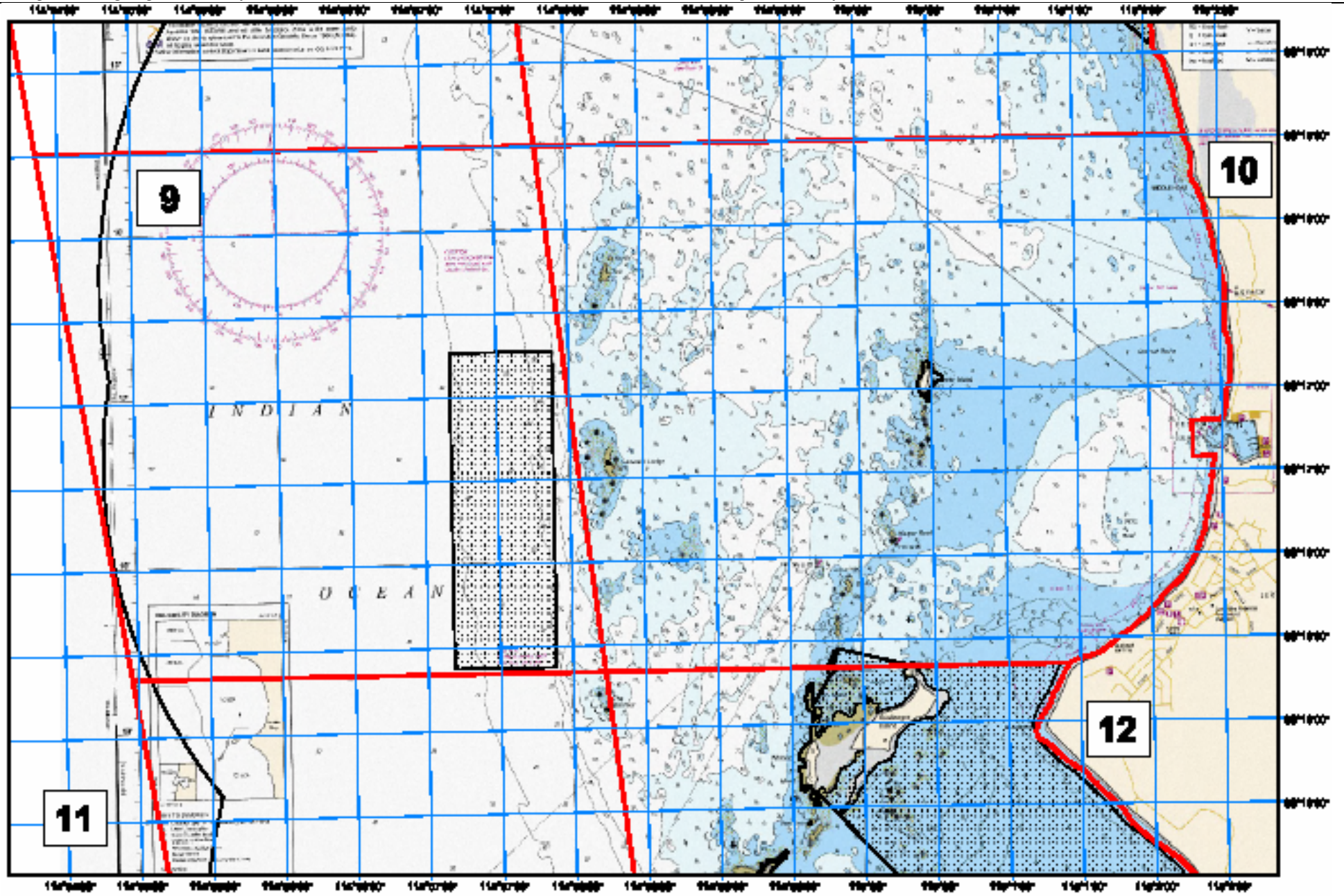
OBSERVER DETAILS

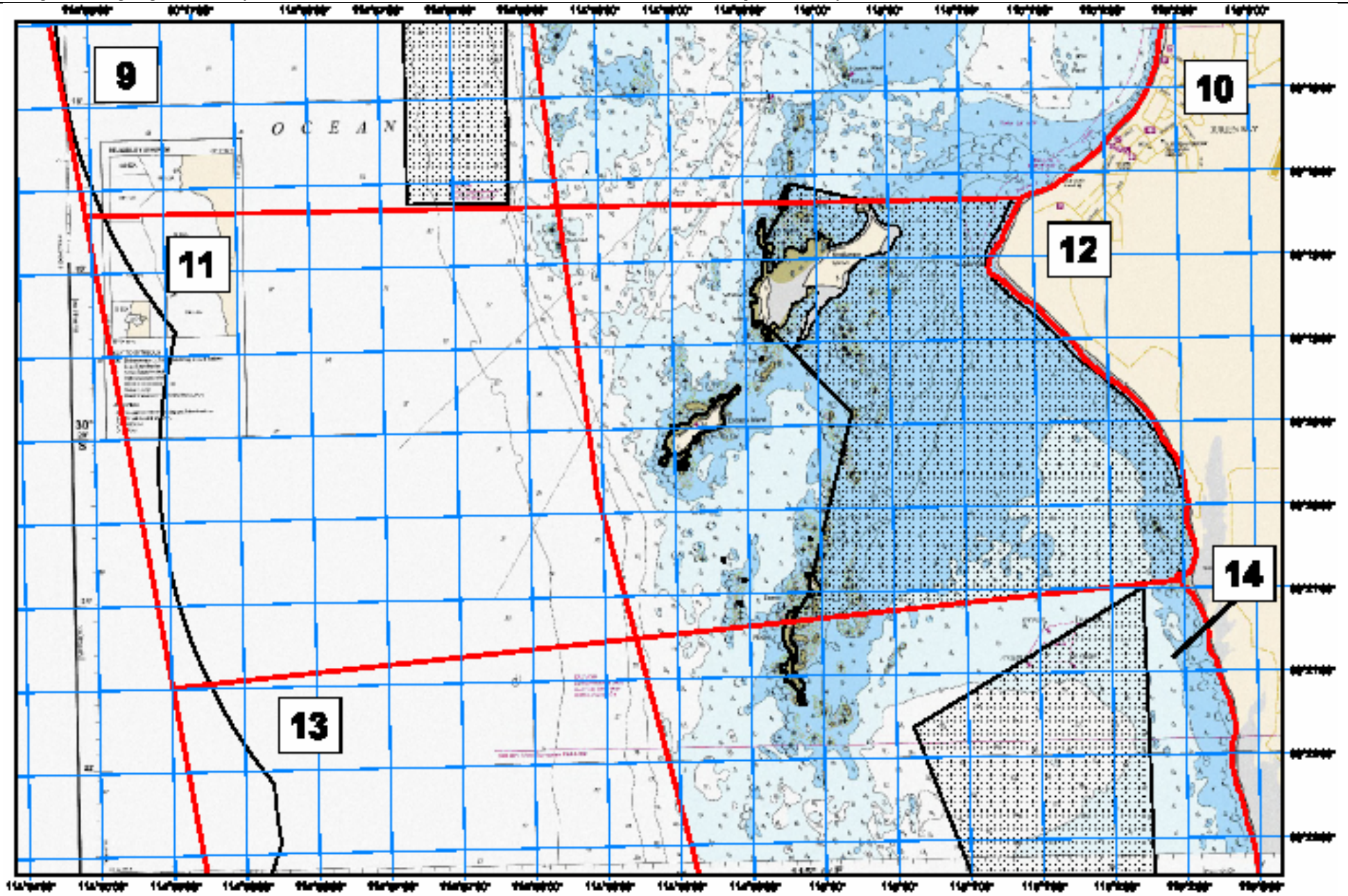
Name:	
Position	
Signature	
Date	

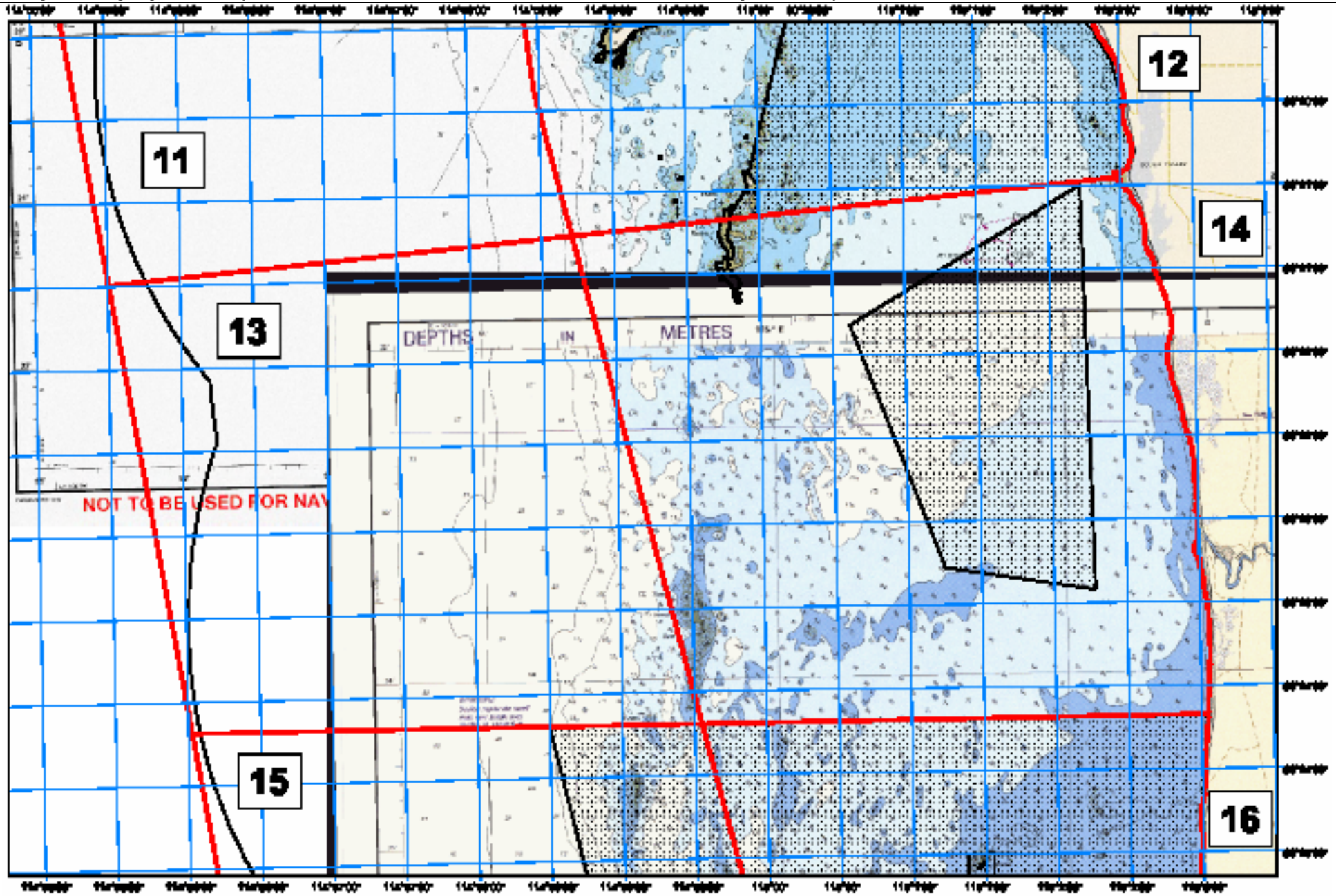

1
2
3
4
I N D I A N

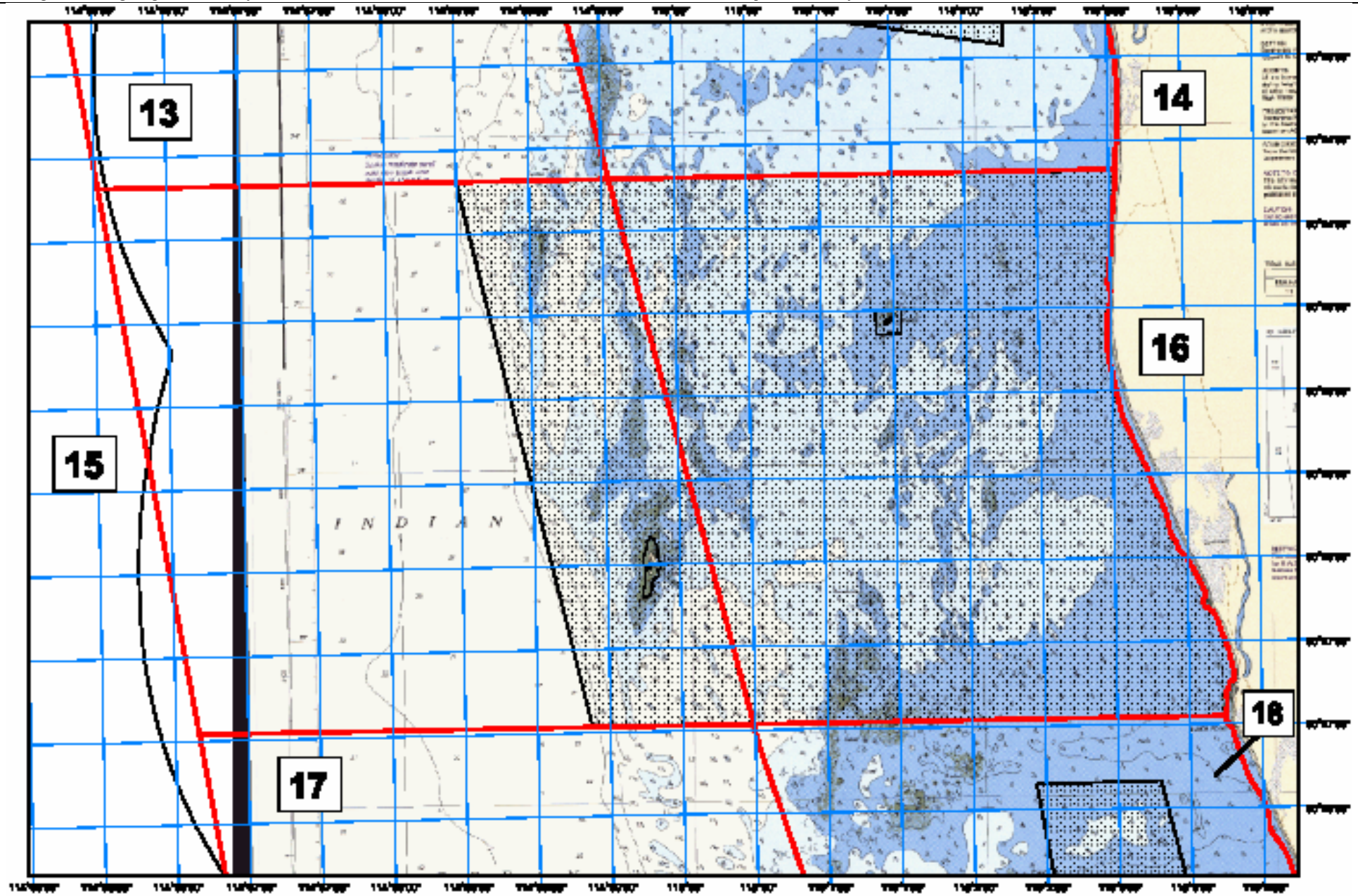

5
O C E A N
GREEN HEAD
ANCHORAGE
6

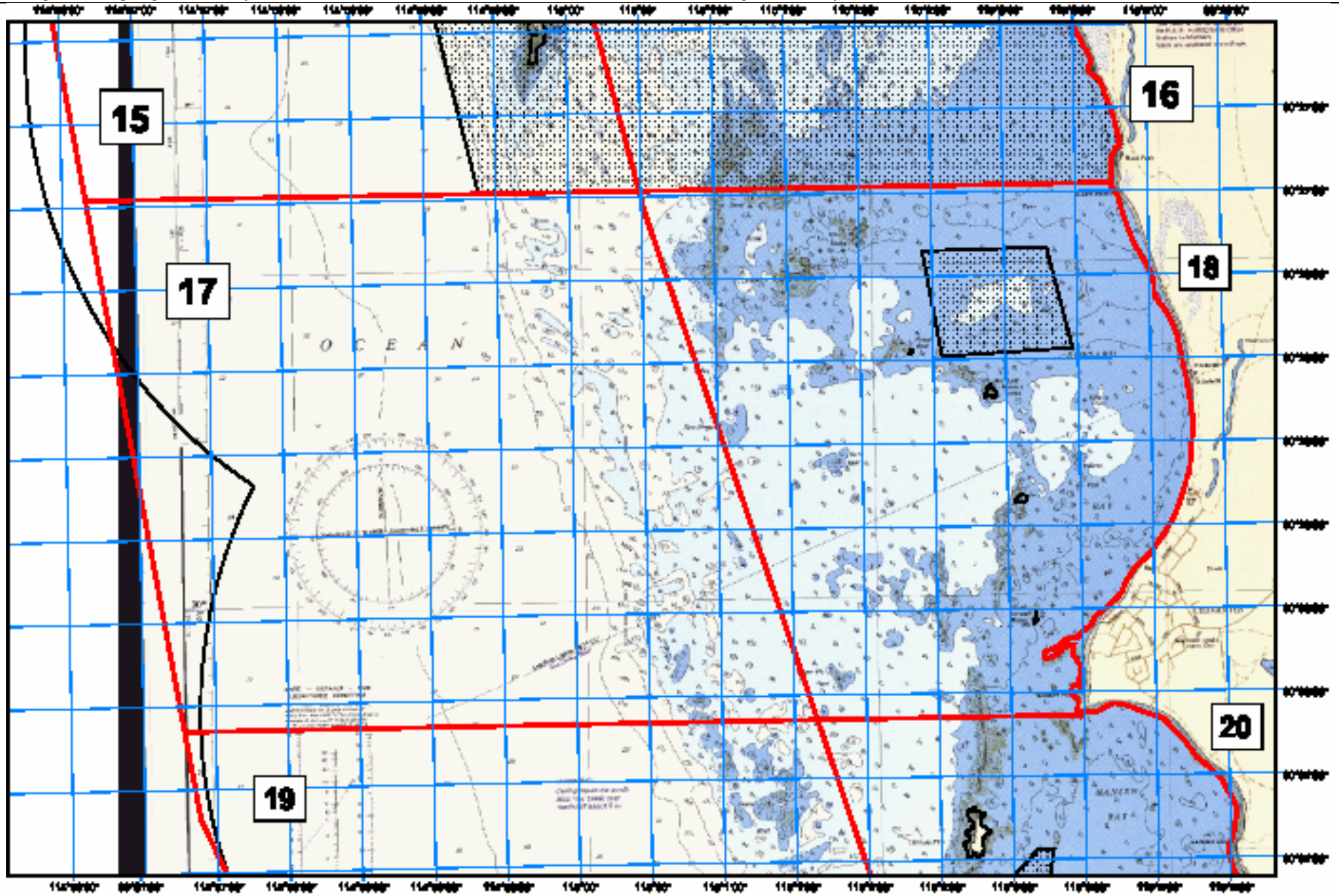

7
8
9
10

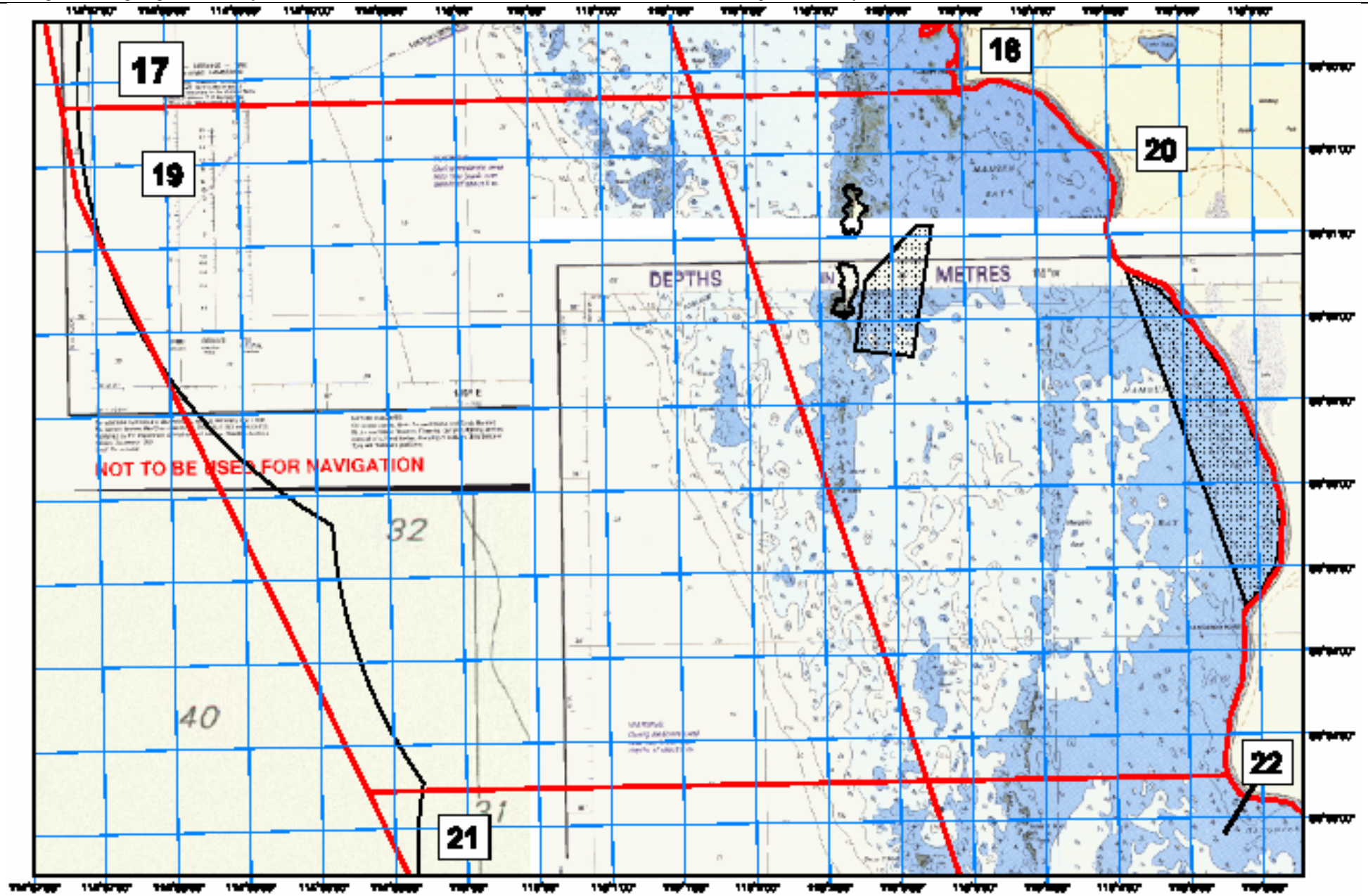

9
10
11
12
INDIAN
OCEAN

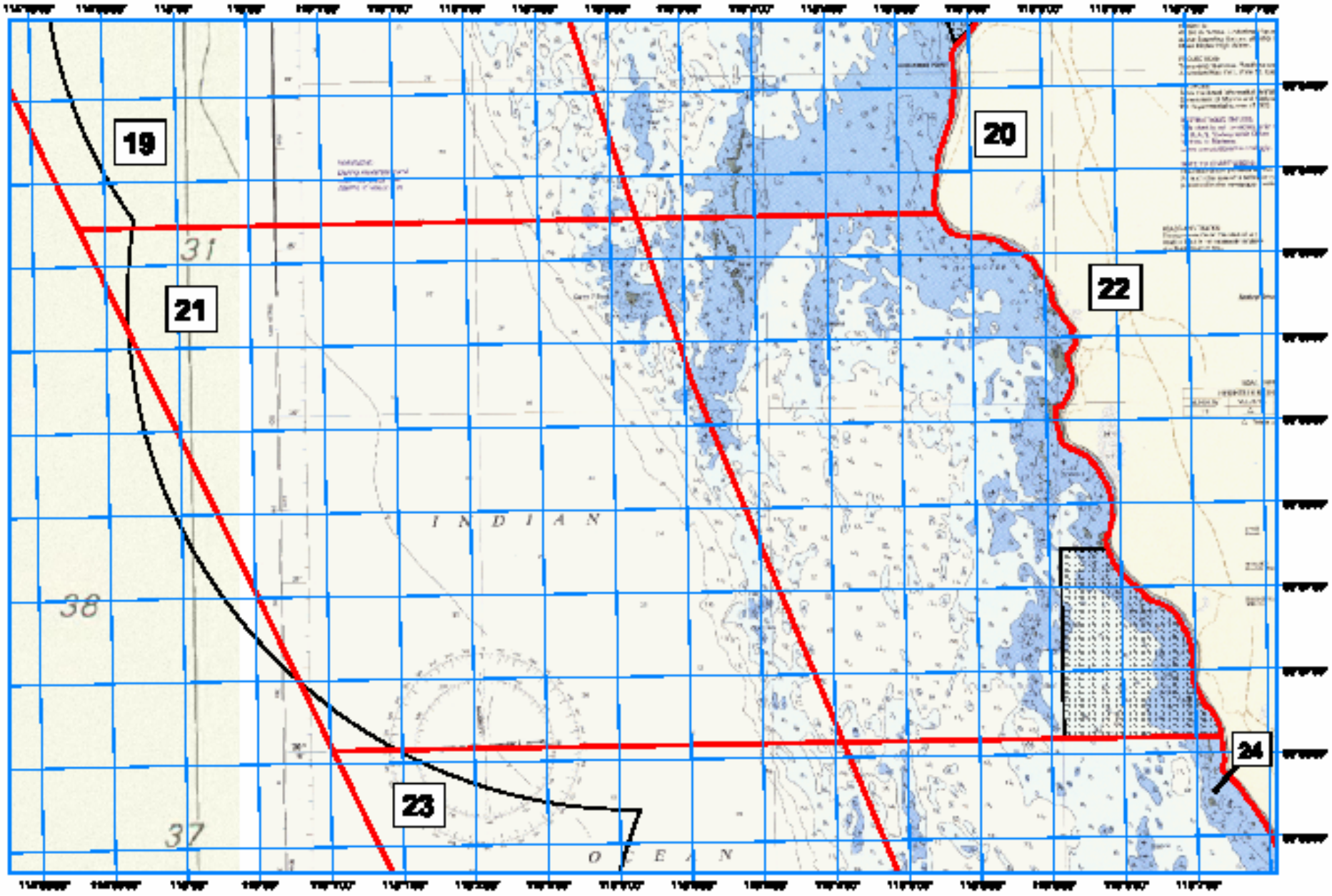

9
10
11
12
13
14
O C E A N

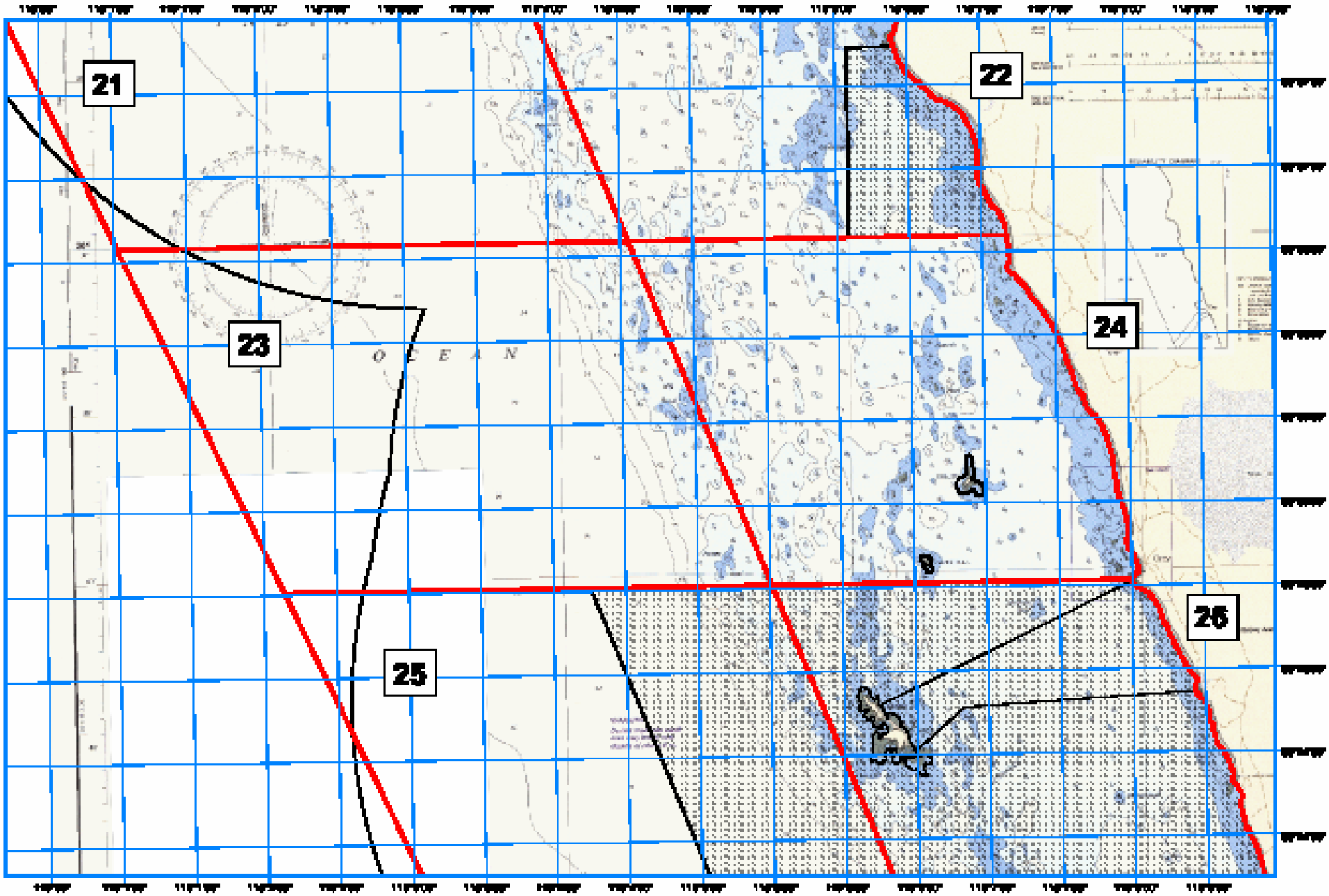

11
12
13
14
15
16
DEPTHS IN METRES
NOT TO BE USED FOR NAV

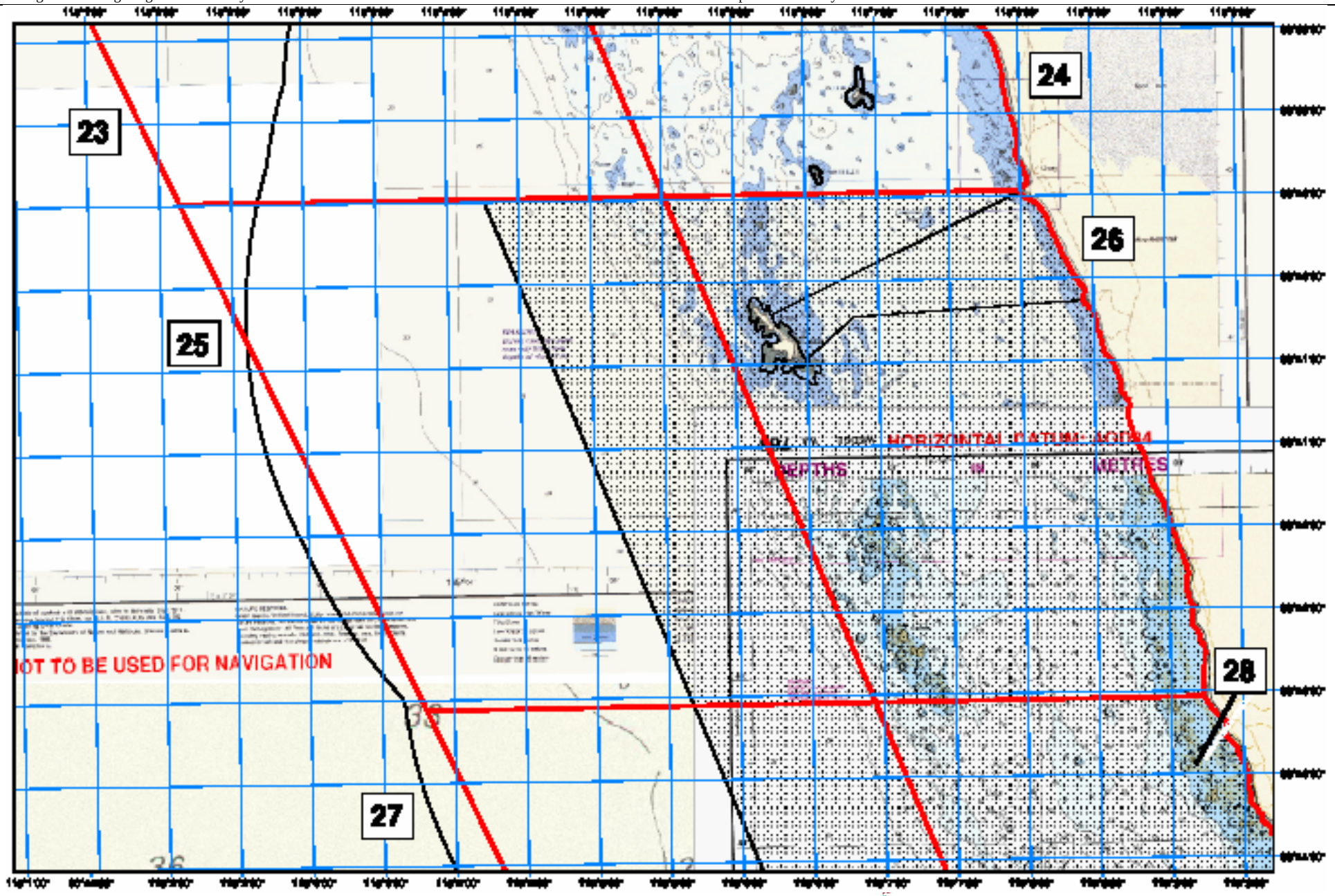

13
14
15
16
16
17
I N D I A N

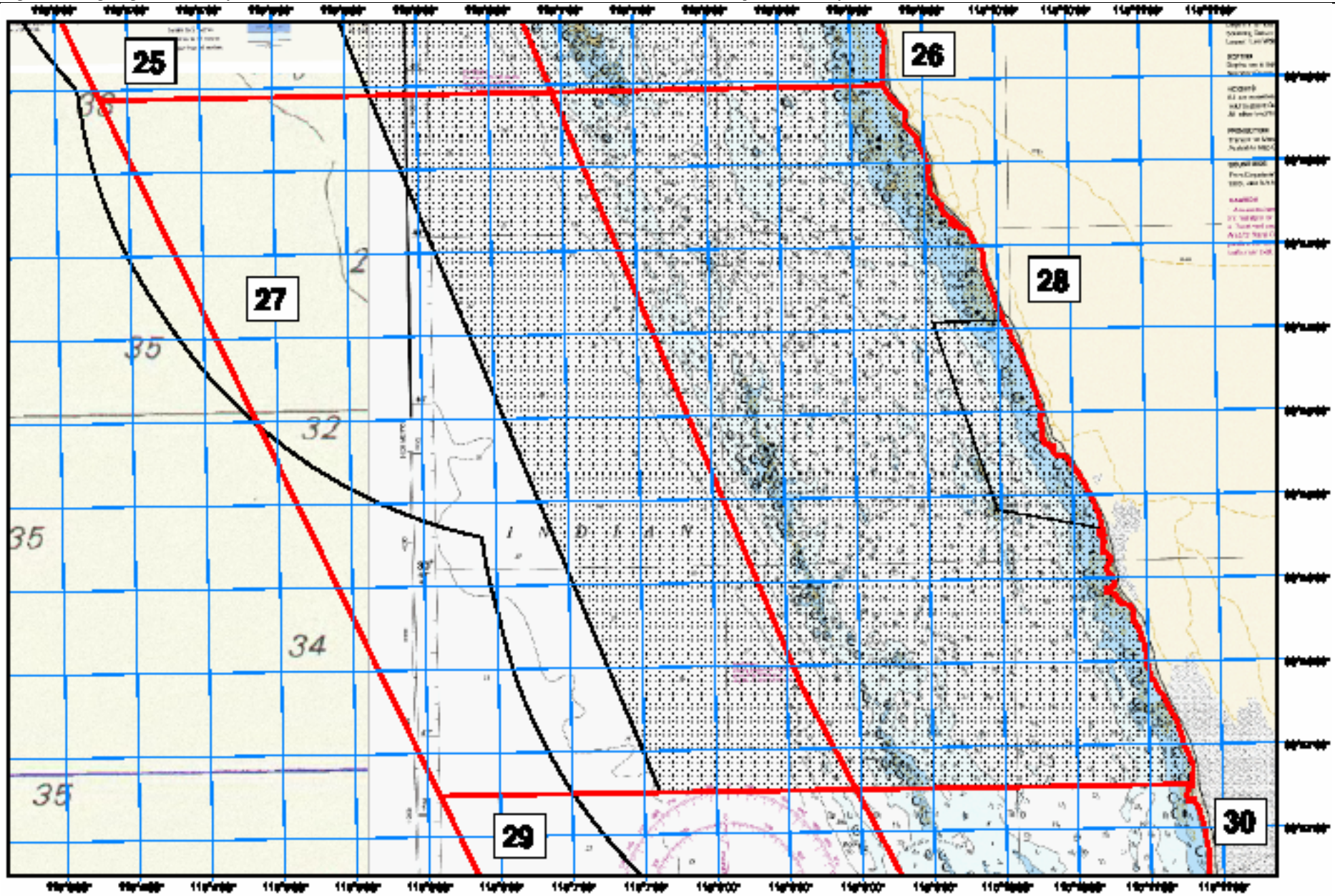

15
16
17
18
19
20
O C E A N

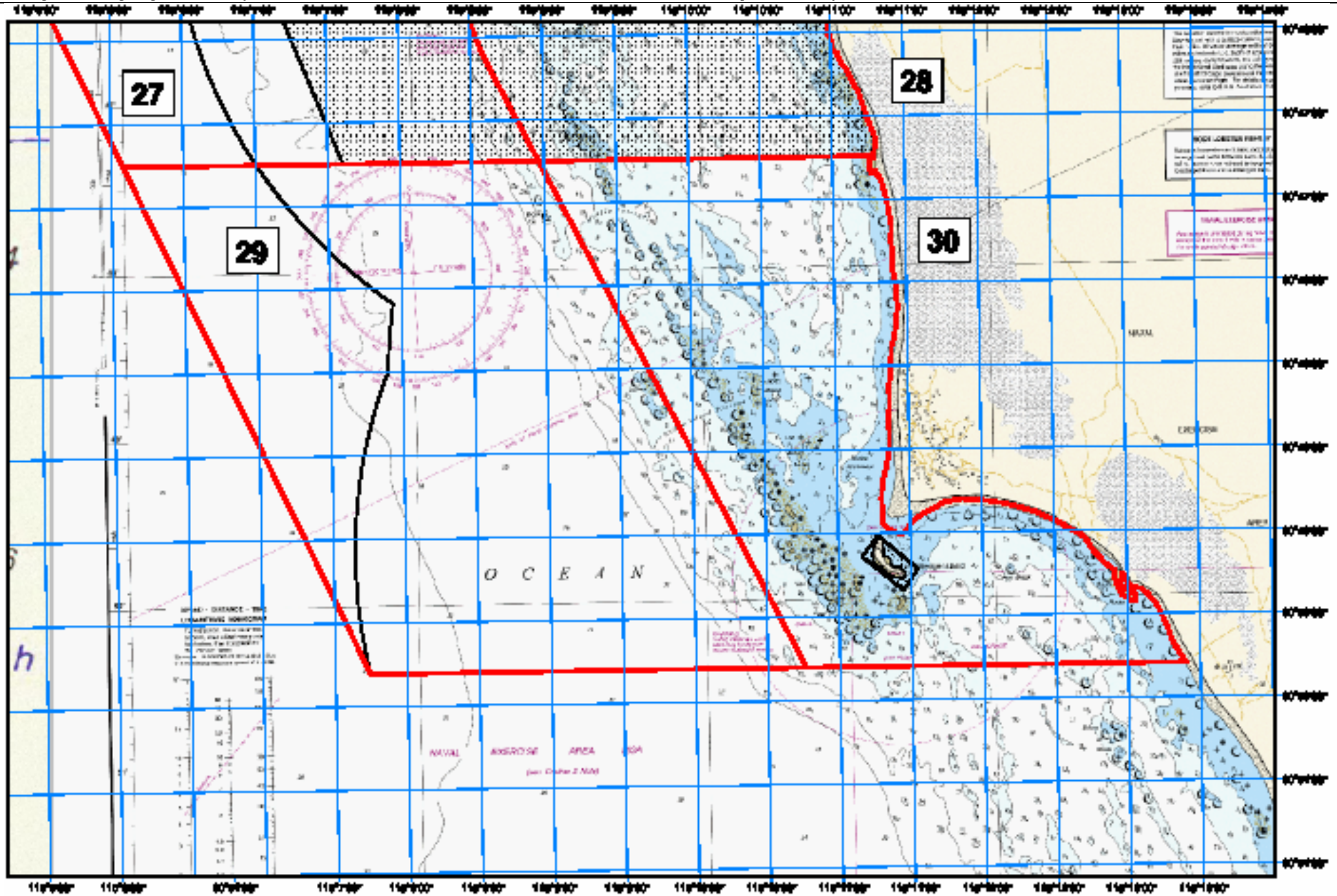

17
16
19
20
DEPTHS
METRES
NOT TO BE USED FOR NAVIGATION
32
40
21
22


19
20
21
22
23
24
31
38
37
INDIAN
OCEAN

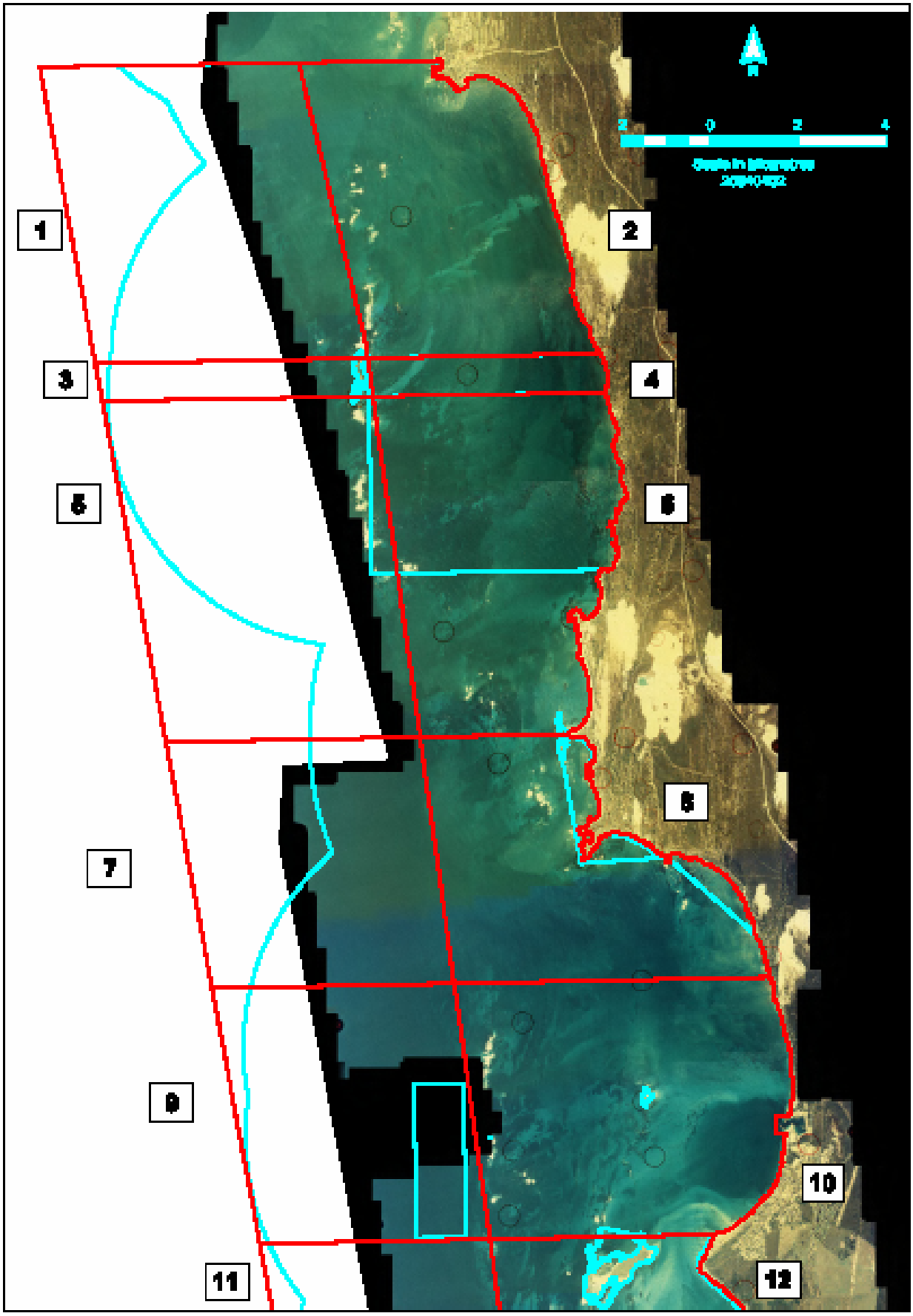

21
22
23
24
25
26
O C E A N

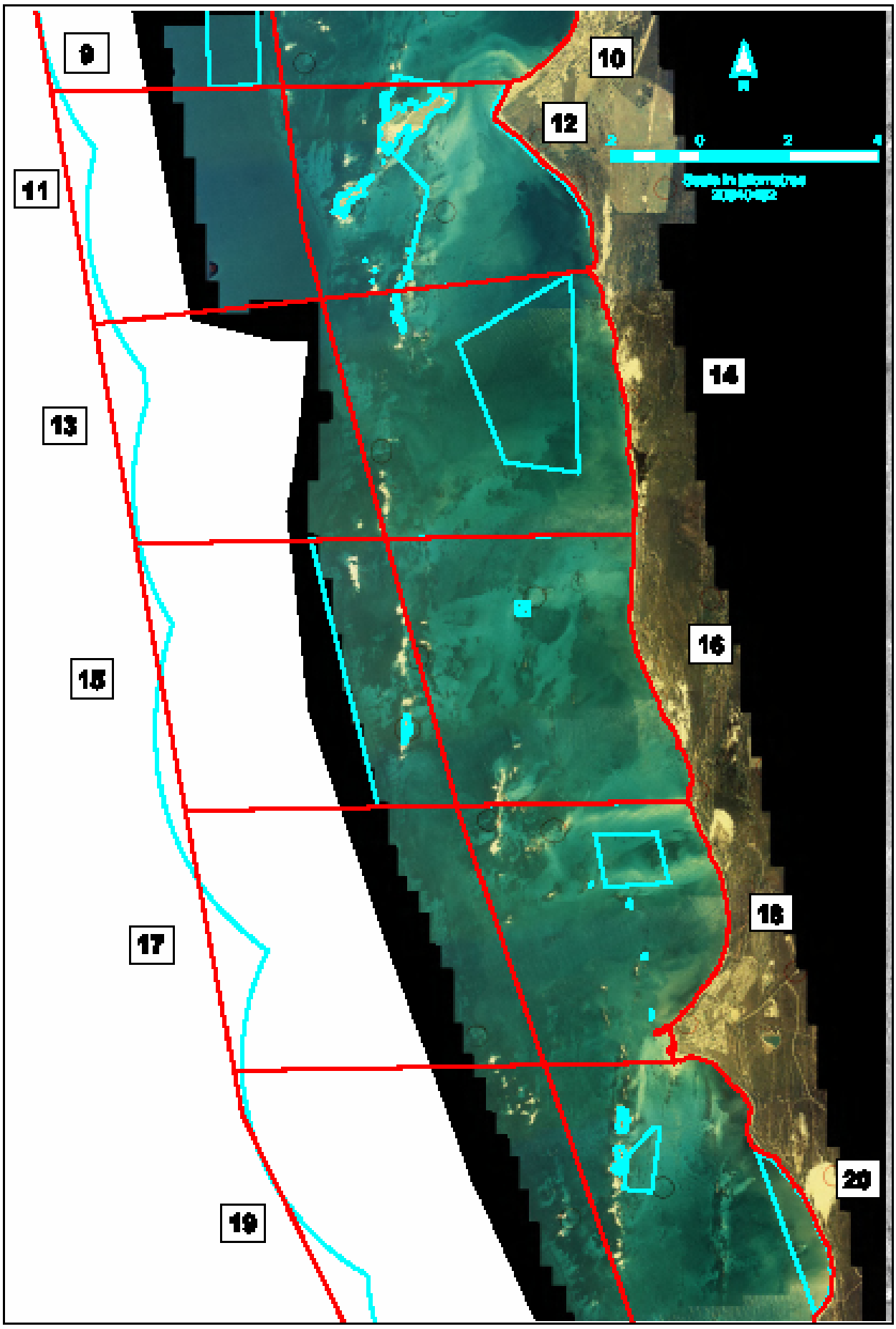

23
24
25
26
27
28
DEPTHS IN METRES
OT TO BE USED FOR NAVIGATION

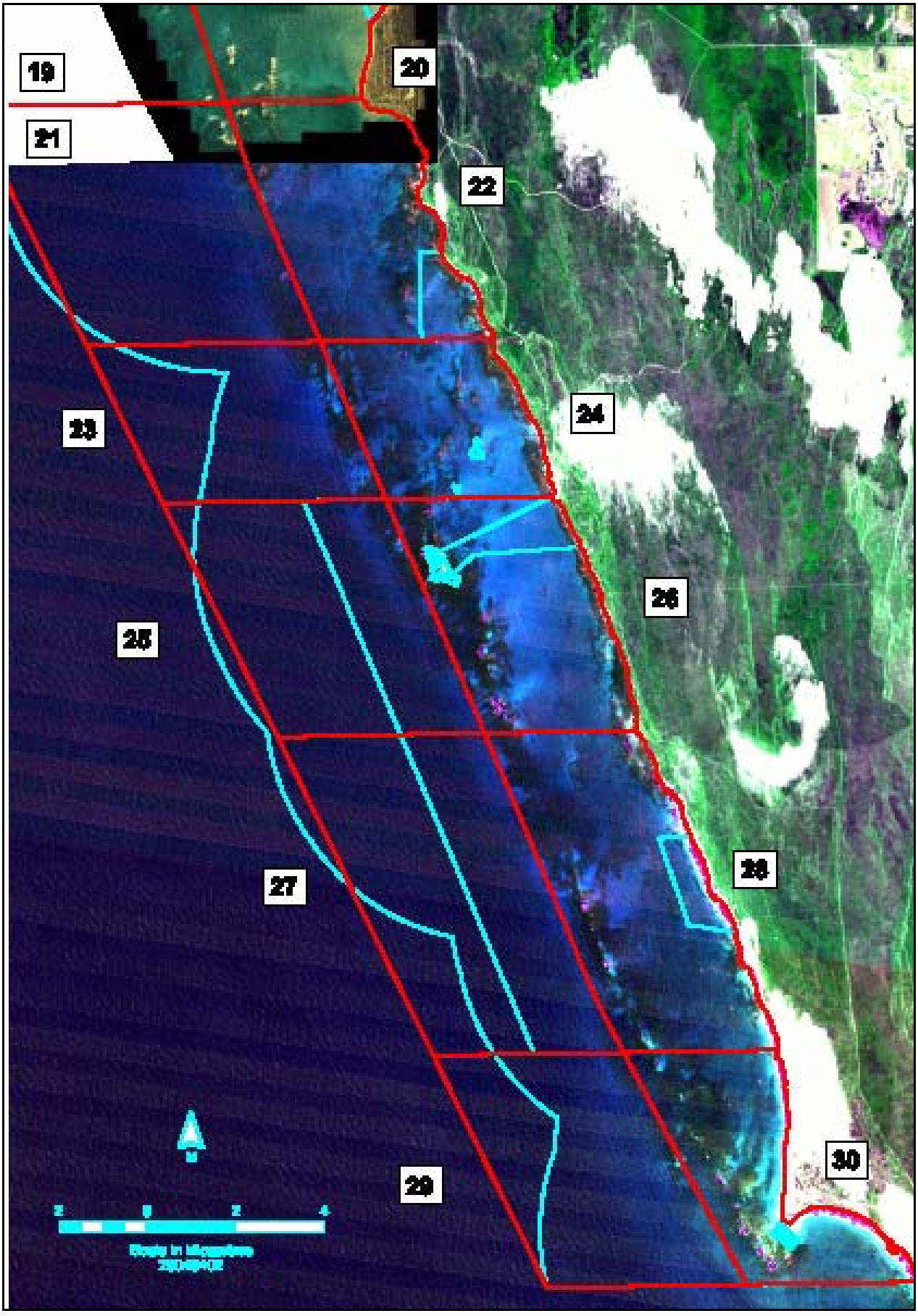

25
26
27
28
29
30
35
32
35
34
35


27
28
29
30
O C E A N

JURIEN BAY MARINE PARK SECTORS




9
10
12
11
14
13
16
15
18
17
20
19


19
20
21
22
23
24
25
26
27
28
29
30

APPENDIX 2

JBMP Aerial Survey Codes

CODE	SYMBOL	ACTIVITY
		MARINE BASED
		Rock lobster
RB		Rock lobster Boat
RP		Rock lobster pot
		Commercial
CF		Charter boat fishing
CB		Charter boat
CD		Charter boat diving
		Recreational
RF		Recreational fishing boat
RB		Recreational boat
RD		Recreational boat diving
A		Anchored
SA		Sailing
PO		Power

CODE	SYMBOL	ACTIVITY
		COASTAL
4V		4wd vehicle
2V		2wd vehicle
S		Shack
C		Camp
BG		Beach general use
BF		Beach fishing
SD		Shore based diving
SW		Swimming
SU		Surfing

Note: Number of people, vessels, vehicles recorded as number (in a circle) at each specific site.

APPENDIX 3

CENTRAL WEST COAST MARINE SURVEY

OBSERVATION SURVEY (5 MINUTE DURATION)

Note to observer undertaking survey

This section is to be completed by the observer when they first arrive at the site. The observer should spend approximately 5 minutes collecting the following information. Site usage data does not need to be collected at the Jurien or Cervantes Easter Fairs. Only one data sheet needs to be completed for each site per visit. Record details of any digital photographs or video footage. Draw a site map ('mud map') of the site being surveyed including the location of human activities and distinctive physical features.

SITE DETAILS

Date		Time (arrived)	
Time (departed)		Total time (at site)	
Site name or description:			
GPS location		S	E

SITE CONDITION: WIND, WATER, CLOUD COVER AND RAINFALL

Wind	CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
Water	CALM	SLIGHT	MOD	ROUGH	V.ROUGH
Cloud Cover & Rainfall	CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

SITE USAGE (NUMBERS)

Vehicles (2WD)		Boat launches			
Vehicles (4WD)		Beach fishing			
Visitors		Beach activities			
Boats		Swimming			
Boat trailers		Snorkelling			
Campsites					

OBSERVER DETAILS

Name:	
Position	
Signature	
Date	

SITE MAP

DIGITAL PHOTOGRAPH AND VIDEO FOOTAGE DETAILS

APPENDIX 4

CENTRAL WEST COAST MARINE SURVEY

OBSERVATION SURVEY (ALL DAY DURATION)

Note to observer undertaking survey

These forms are to be completed by the observer through out the day at the study site. Record details of any digital photographs or video footage. Draw a site map ('mud map') of the site being surveyed including the location of human activities and distinctive physical features.

SITE DETAILS

Date		Time (arrived)			
Time (departed)		Total time (at site)			
Site name or description:					
GPS location		S		W	

SITE CONDITION: WIND, WATER, CLOUD COVER AND RAINFALL

Wind	CALM 1	LIGHT 2	MOD 3	STRONG 4	GALE 5
Water	CALM	SLIGHT	MOD	ROUGH	V.ROUGH
Cloud Cover & Rainfall	CLOUD %	NIL 1	LIGHT 2	MOD 3	HEAVY 4

OBSERVER DETAILS

Name:	
Position	
Signature	
Date	

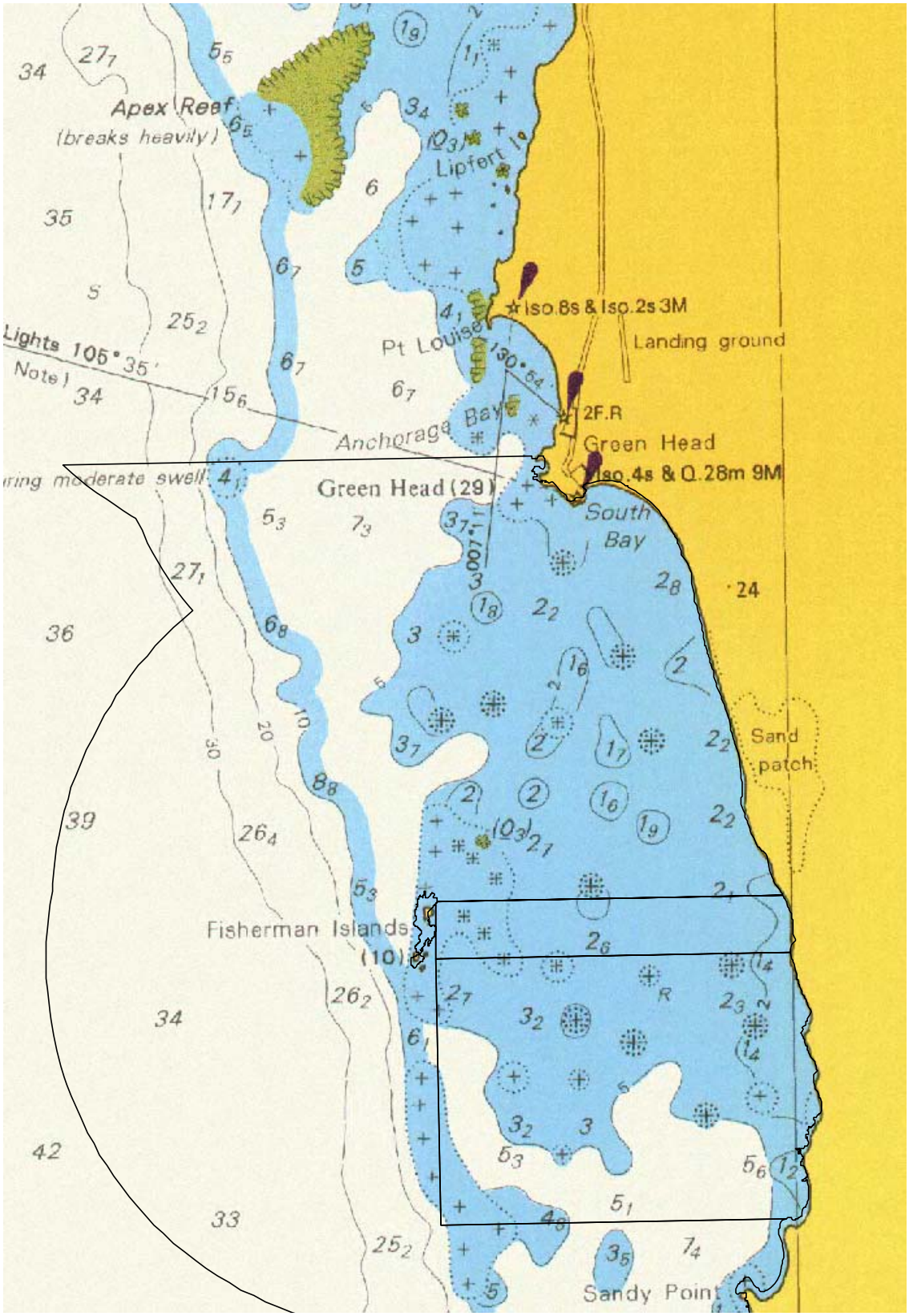
Time	Boat launches	Number of people	Boat retrieval	Vessel Activity (Fish/dive/ snorkel/ other)	Weather & Water Condition			Other activities	Comments
5:00 – 5:15									
5:15 – 5:30									
5:30 – 5:45									
5:45 – 6:00									
6:00 – 6:15									
6:15 – 6:30									
6:30 – 6:45									
6:45 – 7:00									
7:00 – 7:15									
7:15 – 7:30									
7:30 – 7:45									
7:45 – 8:00									
8:00 – 8:15									
8:15 – 8:30									
8:30 – 8:45									
8:45 – 9:00									
9:00 – 9:15									
9:15 – 9:30									
9:30 – 9:45									
9:45 – 10:00									
10:00 – 10:15									

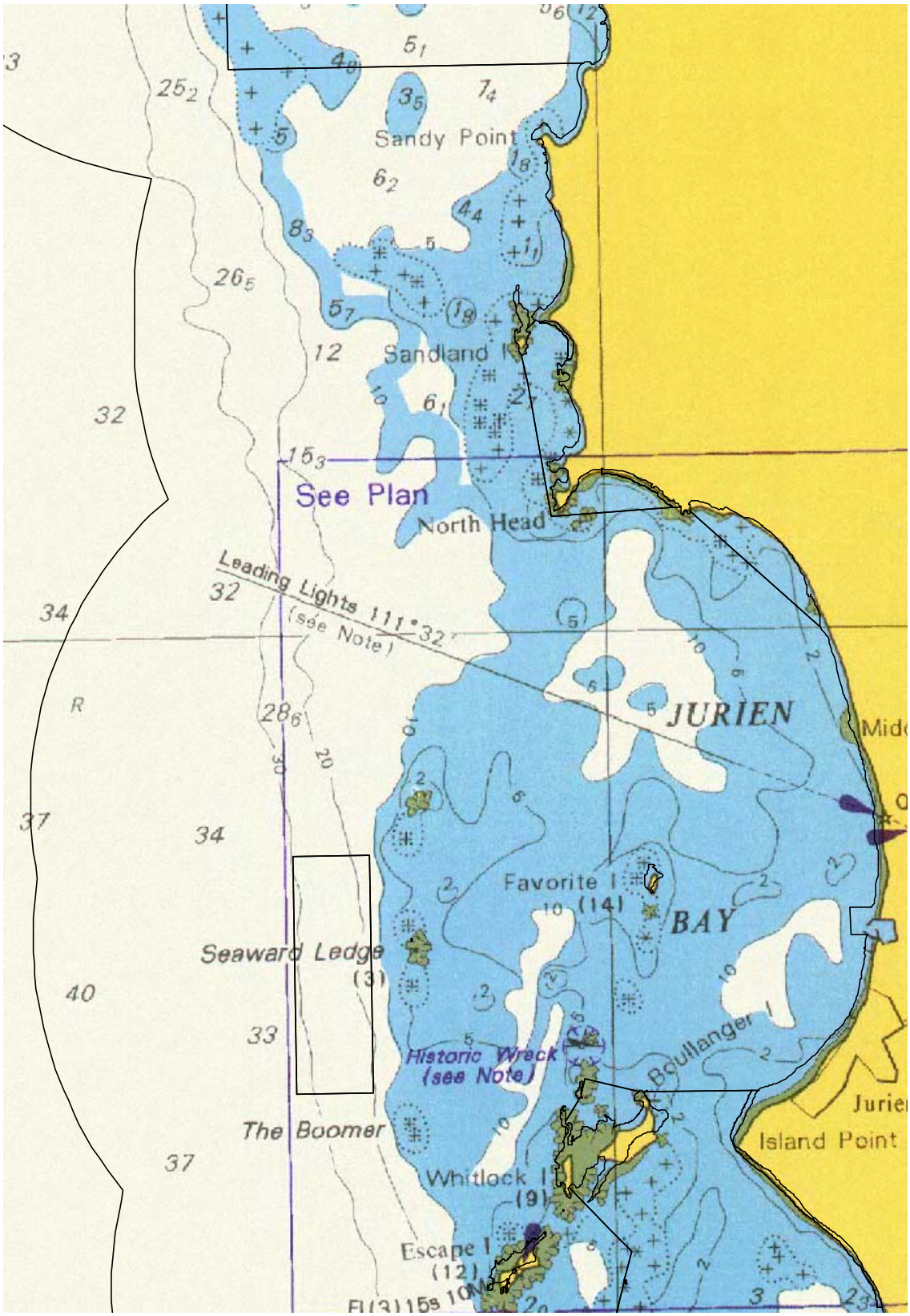
Time	Boat launches	Number of people	Boat retrieval	Fish/dive/ snorkel/ other	Weather & Water			Other activities	Comments
10:15 – 10:30									
10:30 – 10:45									
10:45 – 11:00									
11:00 – 11:15									
11:15 – 11:30									
11:30 – 11:45									
11:45 – 12:00									
12:00 – 12:15									
12:15 – 12:30									
12:30 – 12:45									
12:45 – 13:00									
13:00 – 13:15									
13:15 – 13:30									
13:30 – 13:45									
13:45 – 14:00									
14:00 – 14:15									
14:15 – 14:30									
14:30 – 14:45									
14:45 – 15:00									
15:00 – 15:15									
15:15 – 15:30									

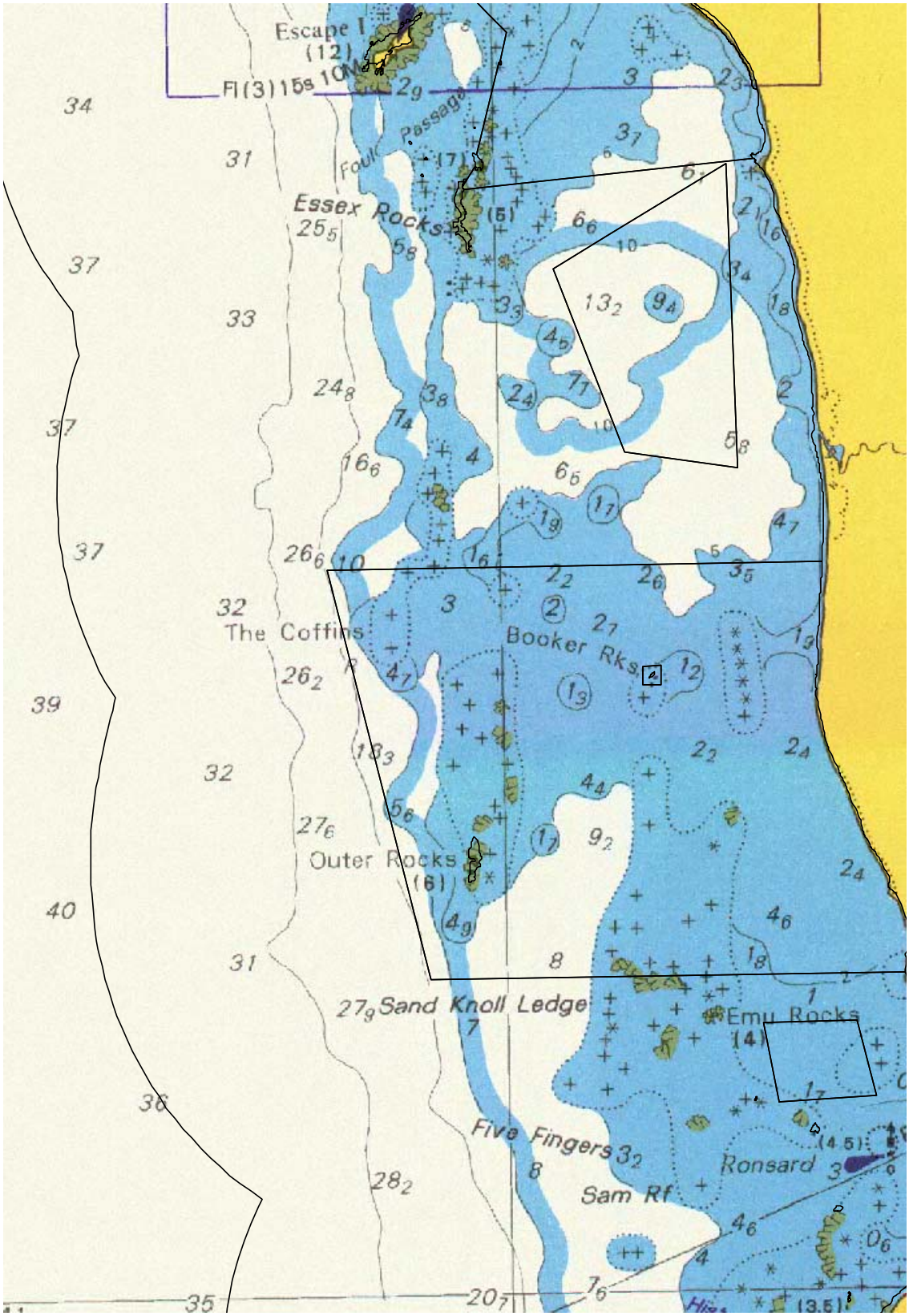
Time	Boat launches	Number of people	Boat retrieval	Fish/dive/ snorkel/ other	Weather & Water			Other activities	Comments
15:30 – 15:45									
15:45 – 16:00									
16:00 – 16:15									
16:15 – 16:30									
16:30 – 16:45									
16:45 – 17:00									
17:00 – 17:15									
17:15 – 17:30									
17:30 – 17:45									
17:45 – 18:00									
18:00 – 18:15									
18:15 – 18:30									
18:30 – 18:45									
18:45 – 19:00									
19:00 – 19:15									
19:15 – 19:30									
19:30 – 19:45									
19:45 – 20:00									

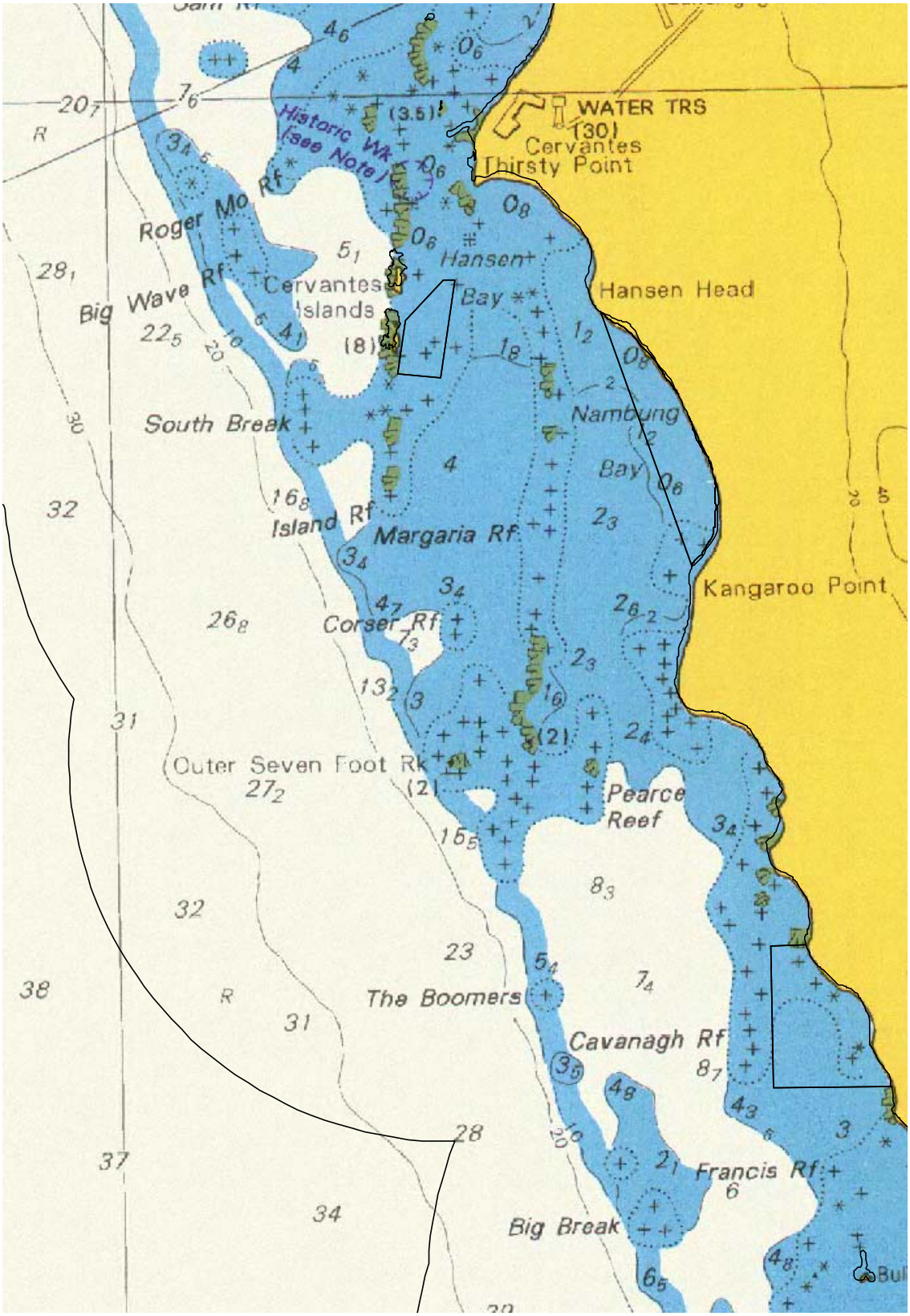
SITE MAP

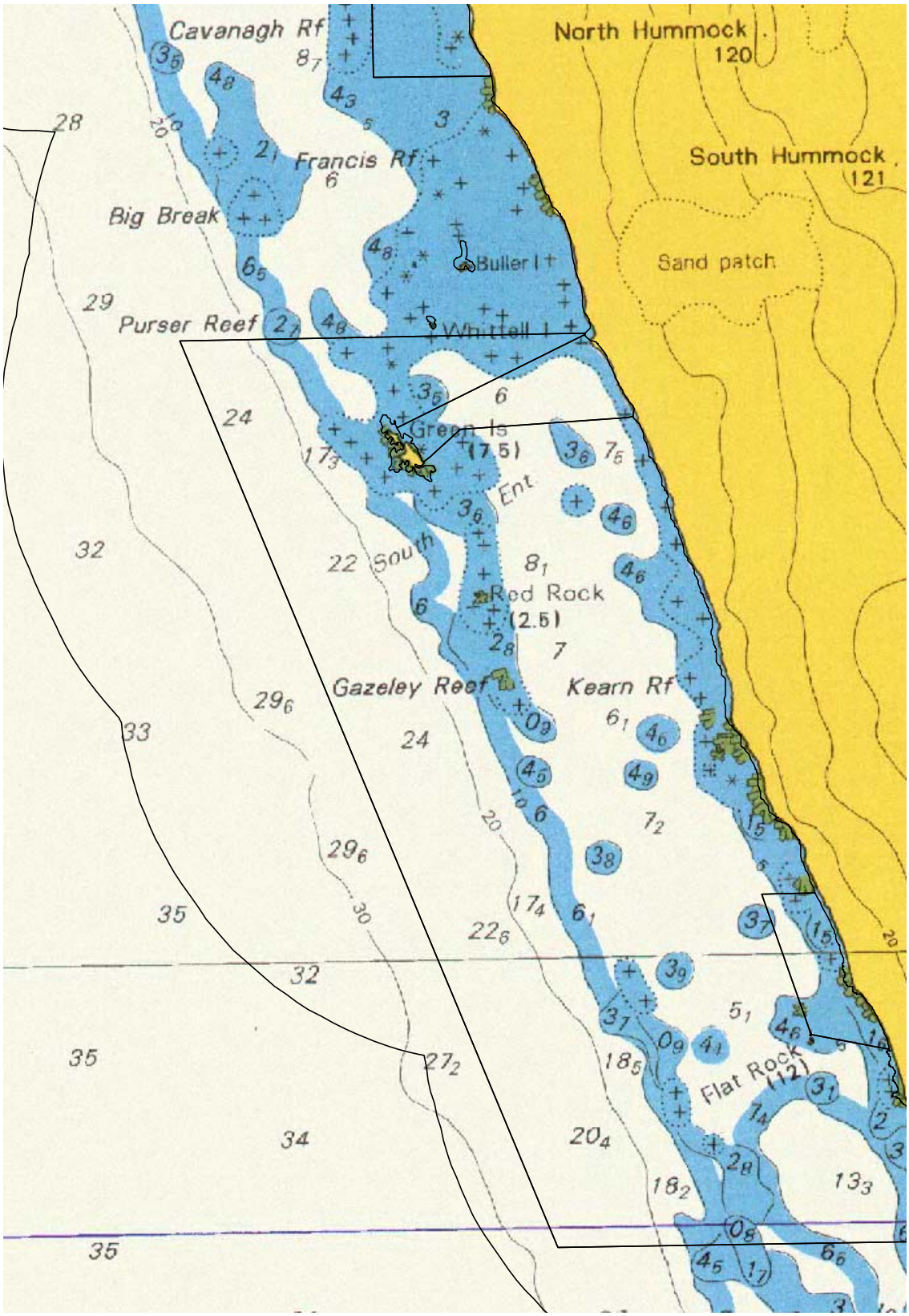
DIGITAL PHOTOGRAPH AND VIDEO FOOTAGE DETAILS

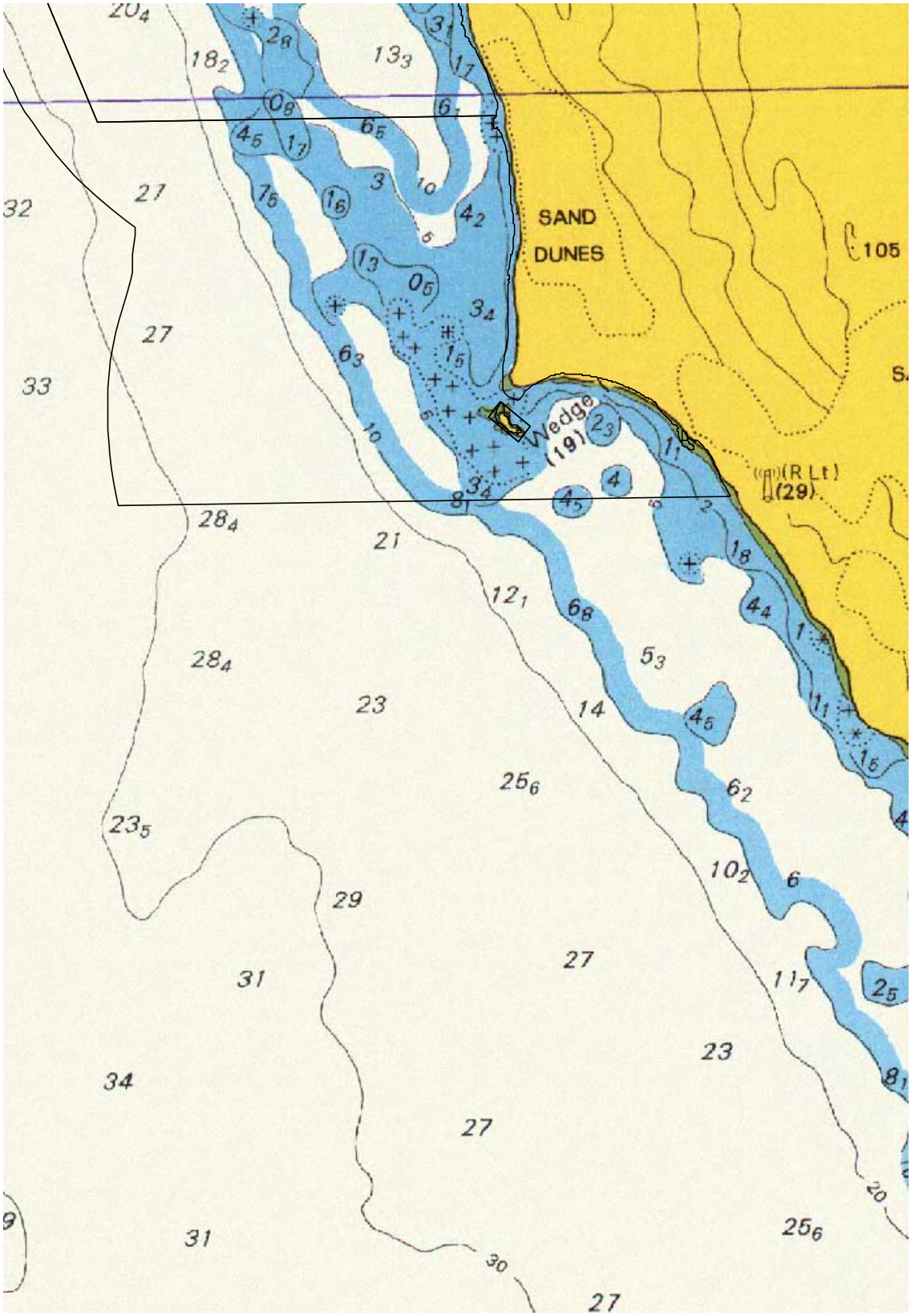

Apex Reef
(breaks heavily)
Lipfert
Iso.8s & Iso.2s 3M
Landing ground
Pt Louise
Lights 105° 35'
Note)
Anchorage Bay
2F.R
Green Head
Iso.4s & Q.28m 9M
Green Head (29)
South Bay
Sand patch
Fisherman Islands
(10)
Sandy Point


Sandy Point
Sandland I
See Plan
North Head
Leading Lights 111°32'
(see Note)
JURIEN
BAY
Favorite I
(14)
Seaward Ledge
(3)
Historic Wreck
(see Note)
Boullanger I
Island Point
The Boomer
Whitlock I
(9)
Escape I
(12)


Escape I
(12)
Fl(3)15s 10M
Fault Passage
Essex Rocks
(5)
The Coffins
Booker Rks
Outer Rocks
(6)
Sand Knoll Ledge
Emu Rocks
(4)
Five Fingers
Sam Rf
Ronsard


WATER TRS
(30)
Cervantes
Thirsty Point
Historic Wk
(see Note)
Roger Mo Rf
Cervantes
Islands
Hansen
Bay
Hansen Head
Big Wave Rf
South Break
Nambung
Bay
Island Rf
Margaria Rf
Kangaroo Point
Corser Rf
Outer Seven Foot Rk
Pearce
Reef
The Boomers
Cavanagh Rf
Francis Rf
Big Break


Cavanagh Rf
North Hummock
120
South Hummock
121
Sand patch
Francis Rf
Big Break
Buller I
Purser Reef
Whittell I
Green Is
(7.5)
Ent
South
Red Rock
(2.5)
Gazeley Reef
Kearn Rf
Flat Rock
(12)


SAND
DUNES
105
Wedge
(19)
(R Lt)
(29)

APPENDIX 5

CENTRAL WEST COAST VISITOR QUESTIONNAIRE

The survey is divided into sections with notes or prompts in the instructions column. It is important to read these prompts to cue the respondent to changes in direction or meaning of survey questions and to ensure that they are clear about the questions are asking of them. Please use these consistently.

At the fairs everyone should be targeted for inclusion in the survey including visitors and display operators. Where there is a large group of visitors at a site, the survey should be offered to each member of the group, but if this is not practical a smaller distribution will suffice.

Suggested introduction

G'day/Good Morning/Good afternoon
My name is [Name]. I work for the Department of Conservation and Land Management. We are gathering information on visitor knowledge and usage of the marine and coastal areas of this region. Could you spare 5 minutes to answer a few questions. This information can be used to help us improve the management of the area.

Please also note the following when conducting the survey:

- Keep the survey introduction brief so as to minimise bias in a visitor's response.
- An enthusiastic and appreciative manner when asking for a visitor's feedback to complete the form may increase the response rate.
- Use the term 'feedback form' rather than 'survey' when introducing the form - people generally don't like the word!
- Do not persist where a visitor does not wish to complete the form.
- A CALM name badge (or other identification) will help to reinforce your identity when greeting or approaching visitors.
- An incentive handed to the visitor with the form may increase your response rate (eg. magnet and pen).
- You may wish to have some pencils handy to offer visitors to complete the form.
- JBMP brochure

CURRENT STATUS

The zoning and fisheries notice for the Park has not been legally established. It is expected that the Minister for Environment with gazette these in the next couple of months along with the JBMP Management Plan.

CENTRAL WEST COAST MARINE SURVEY

VISITOR QUESTIONNAIRE

MARINE PARK AND SANCTUARY ZONES

	COMMENTS/INSTRUCTIONS/NOTES
1. Do you know that you are adjacent to the Jurien Bay Marine Park? Yes ☐ No ☐	
	If yes complete Question 2 ***If no go to Question 9***
	If the respondent answers "I am now" or words to that effect then a No should be recorded
2. Can you mark on this map or tell me where the northern and southern boundaries of the Marine Park are?	Show map to respondent
Northern boundary Marked on the map Yes ☐ No ☐	
Southern Boundary Marked on the map Yes ☐ No ☐	
Name	
3. How did you hear about the Marine Park?	Show list to respondent
Word of mouth/friend ☐	
TV/radio ☐	
Newspaper ☐	
Tourist bureau ☐	
Local knowledge ☐	
Don't recall ☐	
Other _____	
Map/poster ☐	
Signs (on land) ☐	
Yellow zone marker (marine) ☐	
Brochure ☐	
General knowledge ☐	
4. Do you know that the Jurien Bay Marine Park is zoned for different activities?	
Yes ☐ No ☐	
	If the respondent answers "I am now" or words to that effect then a No should be recorded
5. Can you tell me the name of one type of zone?	
No ☐	
Name:	

6. What do you think is the main purpose of a Sanctuary zone?

- None/no purpose ☐
- Biodiversity and conservation ☐
- Protect species or habitats ☐
- Refuge area ☐
- Research/baseline data ☐
- Nature appreciation sites ☐
- An area protected for future generations ☐
- Replenishment areas ☐
- Exclude fishing ☐
- Other _____

7. Can you tell me the name one of the sanctuary zones in the Jurien Bay Marine Park or can you mark it on this map.

Show map to respondent

Mark on map Yes ☐ No ☐

Name _____

8. How did you learn about the zones such as sanctuary zones?

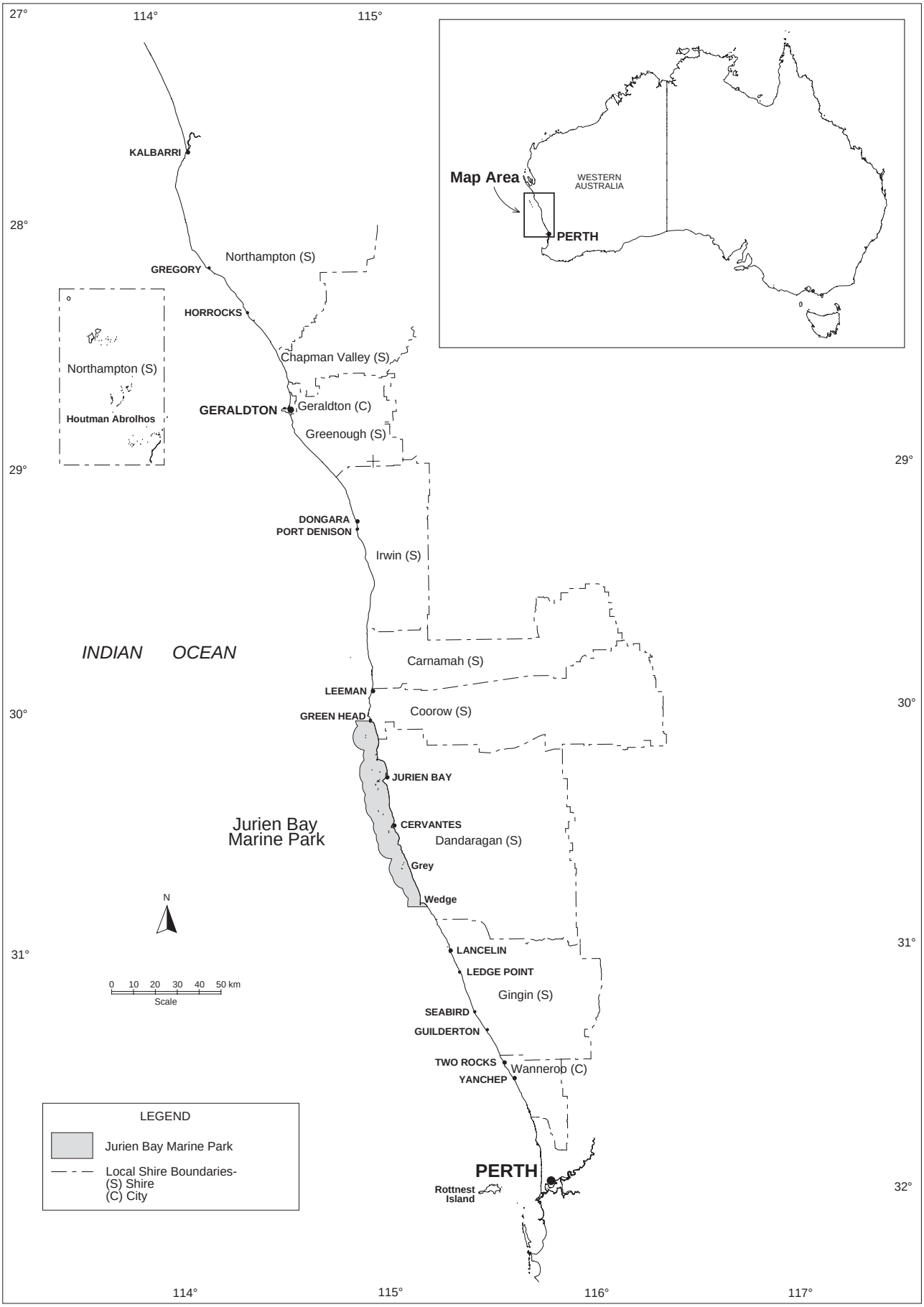
Show list to respondent

Word of mouth/friends	☐	Map/poster	☐
TV/radio	☐	Signs (on land)	☐
Newspaper	☐	Yellow zone marker (marine)	☐
Tourist bureau	☐	Brochure	☐
Local knowledge	☐	General knowledge	☐
Don't recall	☐		

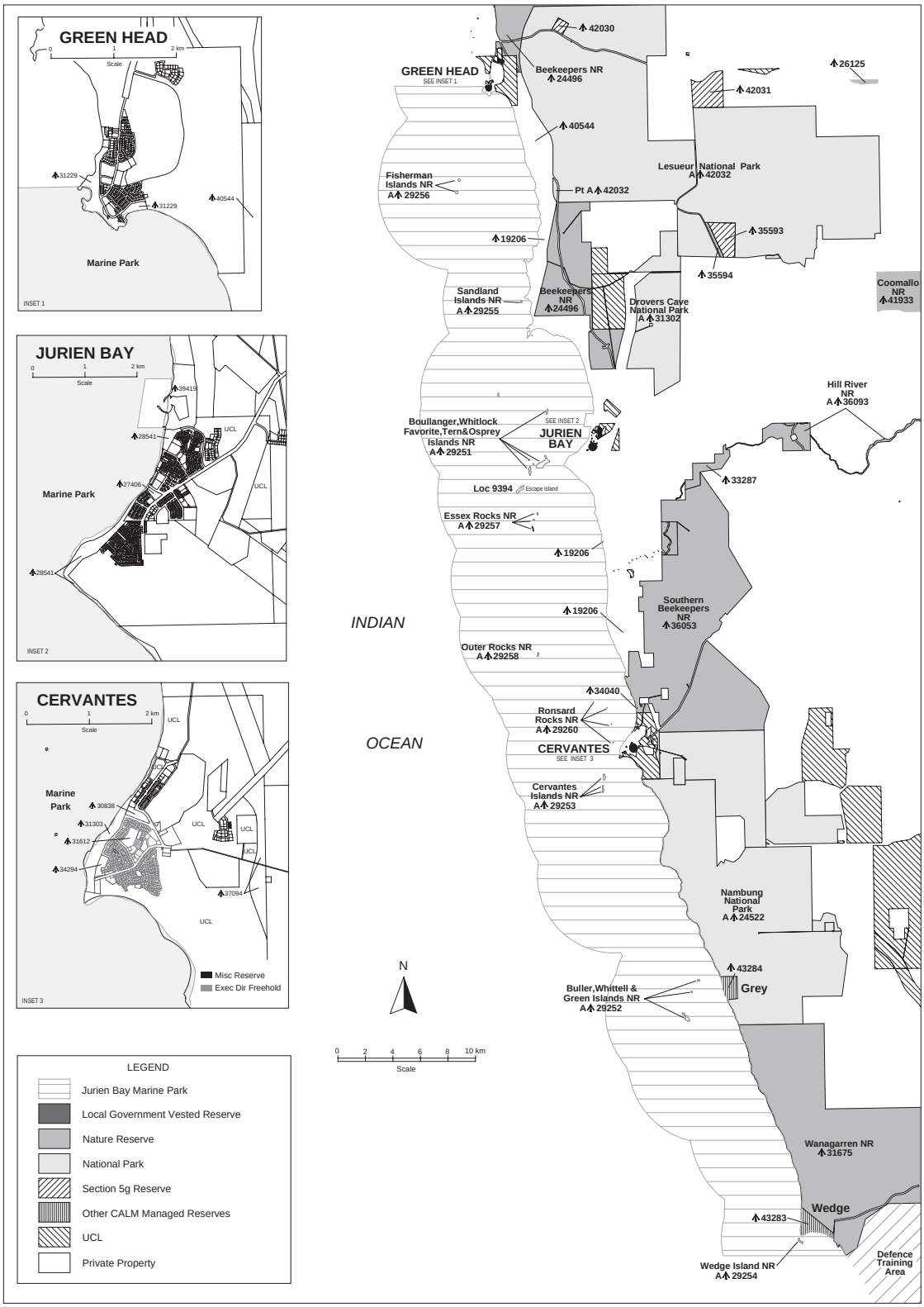
Other _____

ADDITIONAL COMMENTS

MAP


27°
114°
115°
KALBARRI
28°
GREGORY
Northampton (S)
HORROCKS
Chapman Valley (S)
Northampton (S)
Houtman Abrolhos
GERALDTON
Geraldton (C)
Greenough (S)
29°
DONGARA
PORT DENISON
Irwin (S)
INDIAN OCEAN
Carnamah (S)
LEEMAN
GREEN HEAD
Coorow (S)
30°
JURIEN BAY
Jurien Bay
Marine Park
CERVANTES
Dandaragan (S)
Grey
Wedge
N
31°
LANCELIN
LEDGE POINT
Gingin (S)
0 10 20 30 40 50 km
Scale
SEABIRD
GUILDERTON
TWO ROCKS
Wanneroo (C)
YANCHEP
LEGEND
Jurien Bay Marine Park
Local Shire Boundaries-
(S) Shire
(C) City
PERTH
Rottnest
Island
32°
114°
115°
116°
117°
Map Area
WESTERN
AUSTRALIA
PERTH

MAP


GREEN HEAD
Scale
Marine Park
INSET 1
JURIEN BAY
Scale
Marine Park
UCL
INSET 2
CERVANTES
Scale
Marine Park
UCL
Misc Reserve
Exec Dir Freehold
INSET 3
LEGEND
Jurien Bay Marine Park
Local Government Vested Reserve
Nature Reserve
National Park
Section 5g Reserve
Other CALM Managed Reserves
UCL
Private Property
INDIAN
OCEAN
N
Scale
GREEN HEAD
SEE INSET 1
Beekeepers NR 24496
Fisherman Islands NR A 29256
Lesueur National Park A 42032
Pt A 42032
Sandland Islands NR A 29255
Drovers Cave National Park A 31302
Coomallo NR 41933
Hill River NR A 36093
Boullanger,Whitlock Favorite,Tern&Osprey Islands NR A 29251
JURIEN BAY
SEE INSET 2
Loc 9394
Escape Island
Essex Rocks NR A 29257
Southern Beekeepers NR 36053
Outer Rocks NR A 29258
Ronsard Rocks NR A 29260
CERVANTES
SEE INSET 3
Cervantes Islands NR A 29253
Nambung National Park A 24522
Buller,Whittell & Green Islands NR A 29252
Grey
Wanagarren NR 31675
Wedge
Wedge Island NR A 29254
Defence Training Area

MARINE WILDLIFE

COMMENTS/INSTRUCTIONS/NOTES

9. On a sliding scale, Do you think that the near shore islands in the Park are important areas for Australian sea lions * and do you know that the near shore islands in the Park are important areas?

* Wait for response

AUSTRALIAN SEA LIONS

* Wait for response

Strongly Agree	☐	Disagree	☐
Agree	☐	Strongly Disagree	☐
Neutral	☐		

SEABIRDS

Strongly Agree	☐	Disagree	☐
Agree	☐	Strongly Disagree	☐
Neutral	☐		

10. Do you know what Australian Sea Lions use the islands for? *and do you know what seabirds use the islands for?

Show scale sheet

Australian sea lions		Seabirds	
Haul out	☐	Roosting	☐
Breeding	☐	Nesting	☐
Other:			

* Wait for response

11. On a sliding scale do you feel that Australian Sea Lions are an important value of the Park

Show scale sheet

Strongly Agree	☐	Disagree	☐
Agree	☐	Strongly Disagree	☐
Neutral	☐		

12. Are you aware that the Australian sea lion is one of the rarest seal species in the world?

Yes ☐ No ☐

If the respondent answers "I am now" or words to that effect then a No should be recorded

13. Do you land on or anchor near any of the islands in the Park?

Yes ☐ No ☐

If yes complete Question 14
If no go to Question 15

14. How often?

On a daily basis	☐	First visit	☐
Less than once a year	☐	Once a year	☐
2-5 time a year	☐	School holidays (which holidays)	☐
More than 5 times a year	☐	On a weekly basis	☐

15. On a sliding scale, do you think landing on and walking around islands might impact Australian Sea Lions? *and the same for seabirds? AUSTRALIAN SEA LIONS Strongly Agree ☐ Disagree ☐ Agree ☐ Strongly Disagree ☐ Neutral ☐ SEABIRDS Strongly Agree ☐ Disagree ☐ Agree ☐ Strongly Disagree ☐ Neutral ☐	Show scale sheet * Wait for response
16. How did you learn about Australian Sea lions/seabirds in the Park? Word of mouth/friends ☐ Signage at boat ramps ☐ Jurien Bay Brochure ☐ Internet ☐ Signage on islands ☐ Brochure ☐ Other _____	

FISH (TEMPERAL AND TROPIC) AND FISHING

COMMENTS/INSTRUCTIONS/NOTES

17. Do you know that fishing within the Park is regulated by the Department of Fisheries using size and bag limits for different fish species? Yes ☐ No ☐	If the respondent answers "I am now" or words to that effect then a No should be recorded

SEAGRASSES AND MACROALAGE ('SEAWEED')

COMMENTS/INSTRUCTIONS/NOTES

18. On a sliding scale do you think seagrass is important in the Jurien Bay Marine Park Strongly Agree ☐ Disagree ☐ Agree ☐ Strongly Disagree ☐ Neutral ☐	Show scale sheet

19. What do you think are the difference/s are between seagrass and seaweed

- Don't know ☐
- Algae red/brown/green ☐
- Seagrass has roots/rhizomes ☐
- Seagrass soft bottom ☐
- Algae hard bottom ☐
- Seagrass green ☐
- Seagrass flowering plants ☐
- Other _____

20. Why do you think seagrasses are important?

- Don't know ☐
- Food source ☐
- Habitat ☐
- Nursery areas ☐
- Bind sediments ☐
- Other _____

21. What type of human activities do you think might impact seagrasses in the Park?

- Boat anchors ☐
- Boat moorings ☐
- Propellers ☐
- Dredging ☐
- Development ☐
- Terrestrial runoff ☐
- Nutrient ☐
- Other _____

ADDITIONAL COMMENTS

GENERIC QUESTIONS

COMMENTS/INSTRUCTIONS/NOTES

22. How often do you visit the Marine Park?

On a daily basis	☐	First visit	☐
Less than once a year	☐	Once a year	☐
2-5 time a year	☐	School holidays (which holidays)	☐
More than 5 times a year	☐	On a weekly basis	☐

23. Where do you live?

Live locally	☐	WA Perth Metro region	☐
WA Country	☐	Interstate (which State)	☐
Overseas (which country)	☐		

WA, NT, SA,VIC,TAS,NSW,ACT,QLD

If yes to 'live locally' complete go to Question 26

24. Who are you here with today

Yourself	☐	A school group	☐
Friend(s)	☐	A club or organization	☐
Family	☐	A commercial tour	☐
Other			

25. Where are you staying?

Do not stay overnight	☐	Private house	☐
Rented house	☐	Caravan Park	☐
Hotel/motel	☐	Camping	☐
Shack	☐		
Other			

ADDITIONAL COMMENTS

26. What main land and water based activities do you do in the area? (tick box)

Boating	☐	Swimming	☐
Boat fishing (line)	☐	Water sports (surfing, windsurfing, kayak)	☐
Beach fishing (line)	☐	Reef walking	☐
Beach going	☐	Sightseeing	☐
Diving	☐	Wildlife viewing	☐
Spear fishing	☐	Walking/running	☐
Snorkelling	☐	Tours	☐
4WD	☐	Picnic/BBQ	☐
Camping	☐	Walking on islands	☐
Rock lobster fishing	☐		☐
Jetty fishing	☐		☐

Other _____

27. Where do you do these activities (provide map and pen)

MAP Yes ☐ No ☐

28. Would you mind telling me which age category you fall into?

under 15	☐	15-24	☐
25-39	☐	40-59	☐
60 & over	☐		☐

29. Respondents Sex.

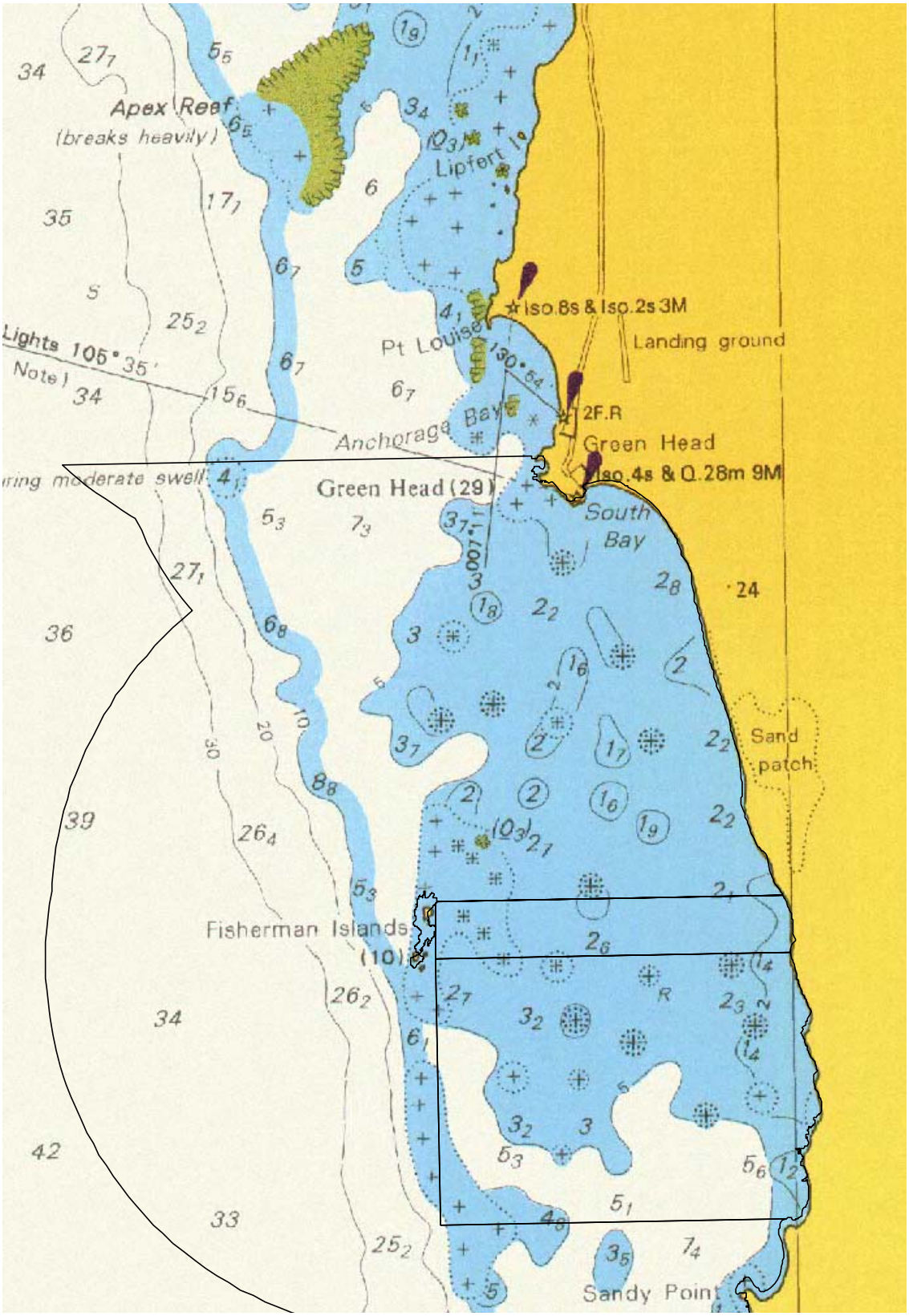
Male ☐ Female ☐

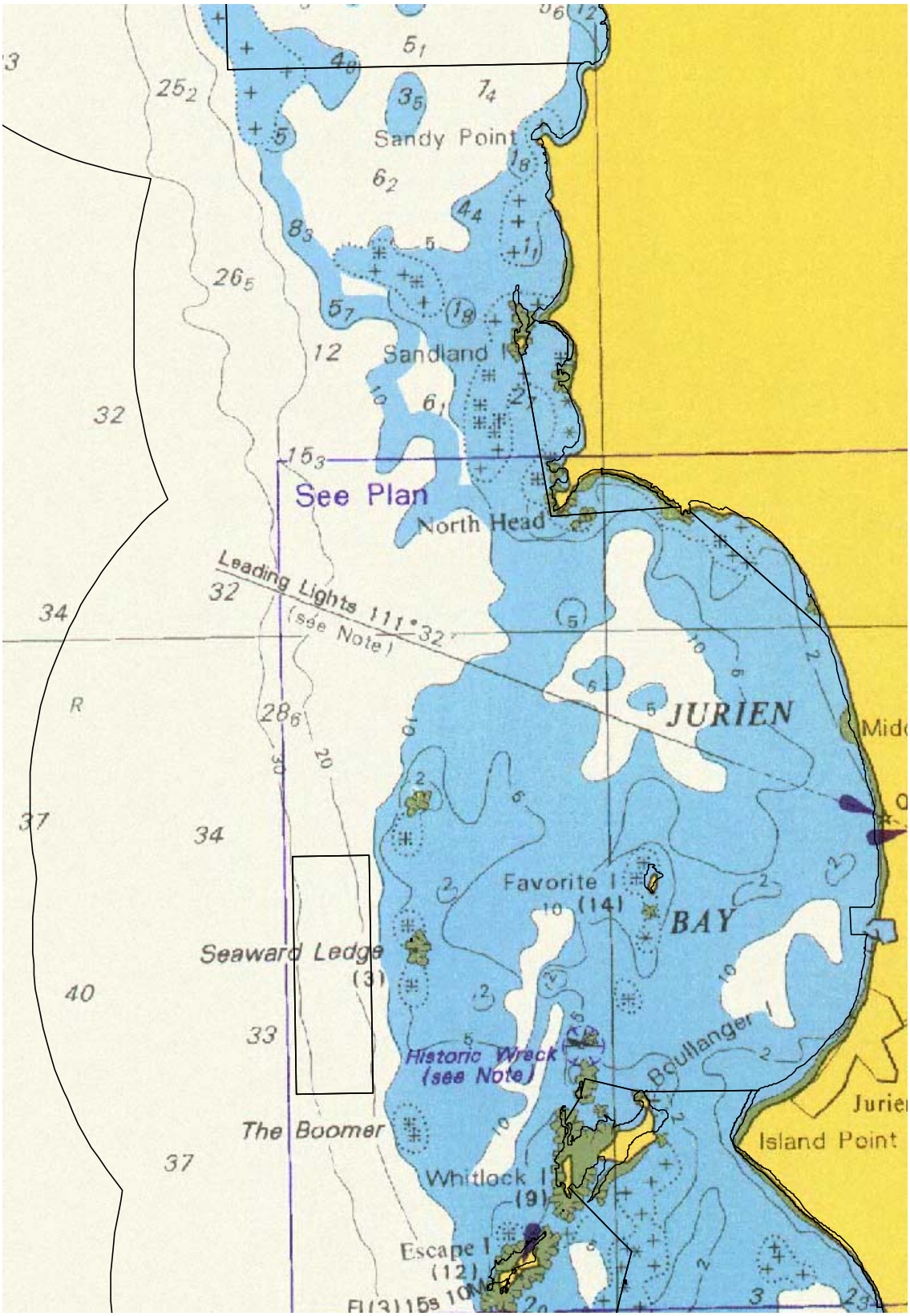
For interviewer to fill in

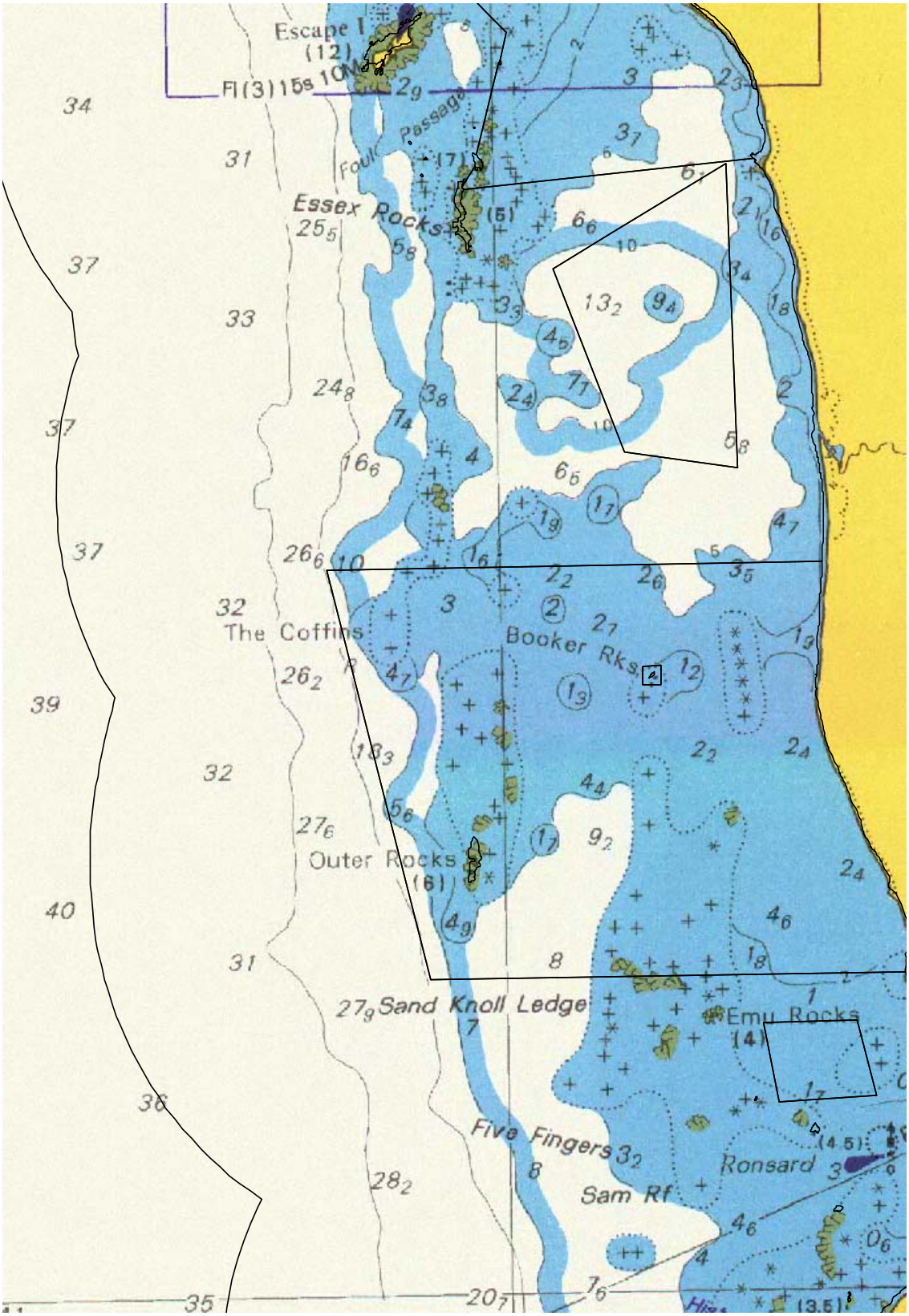
OBSERVER AND SITE DETAILS

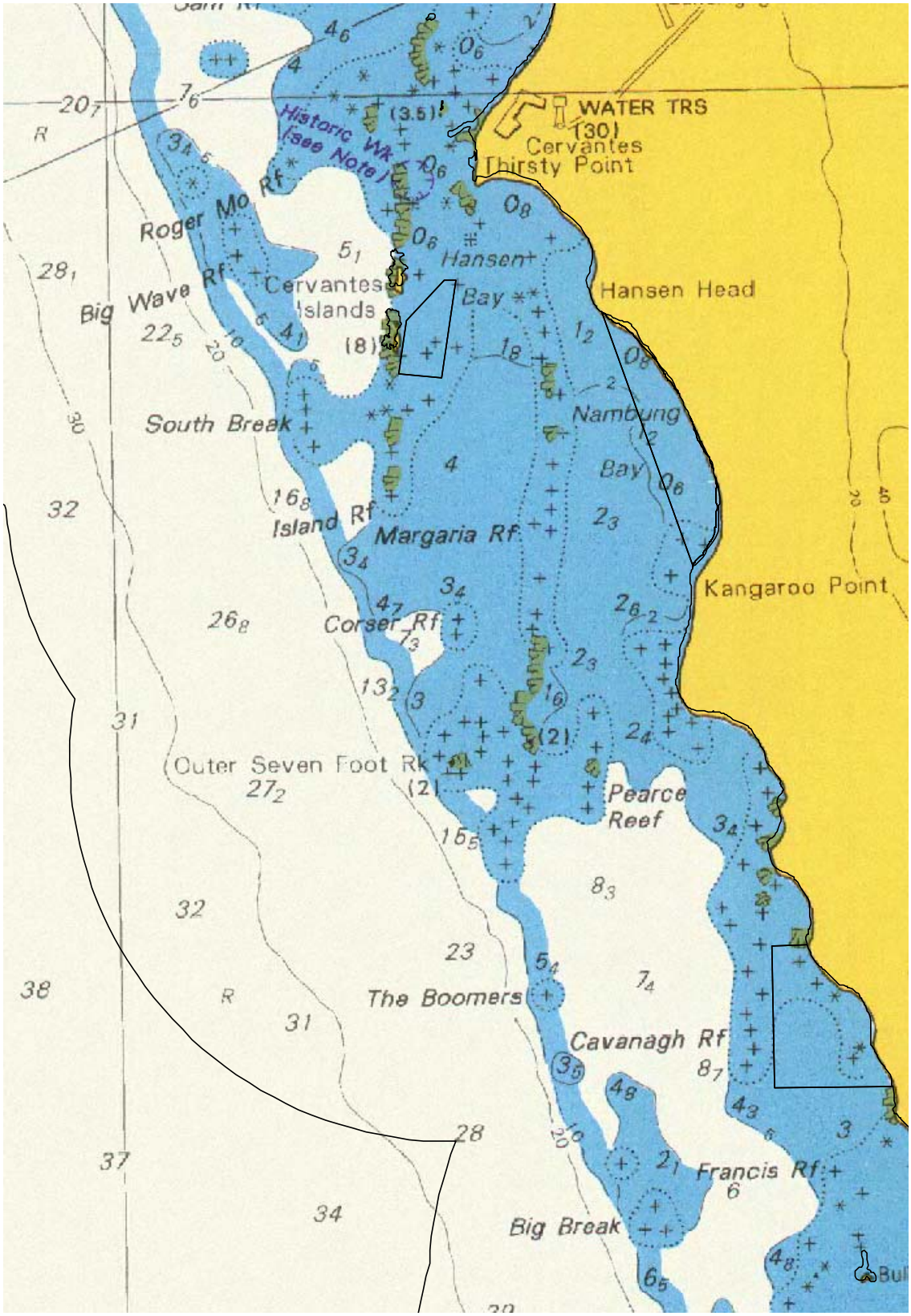
Name:	
Site	
Date	
Time	

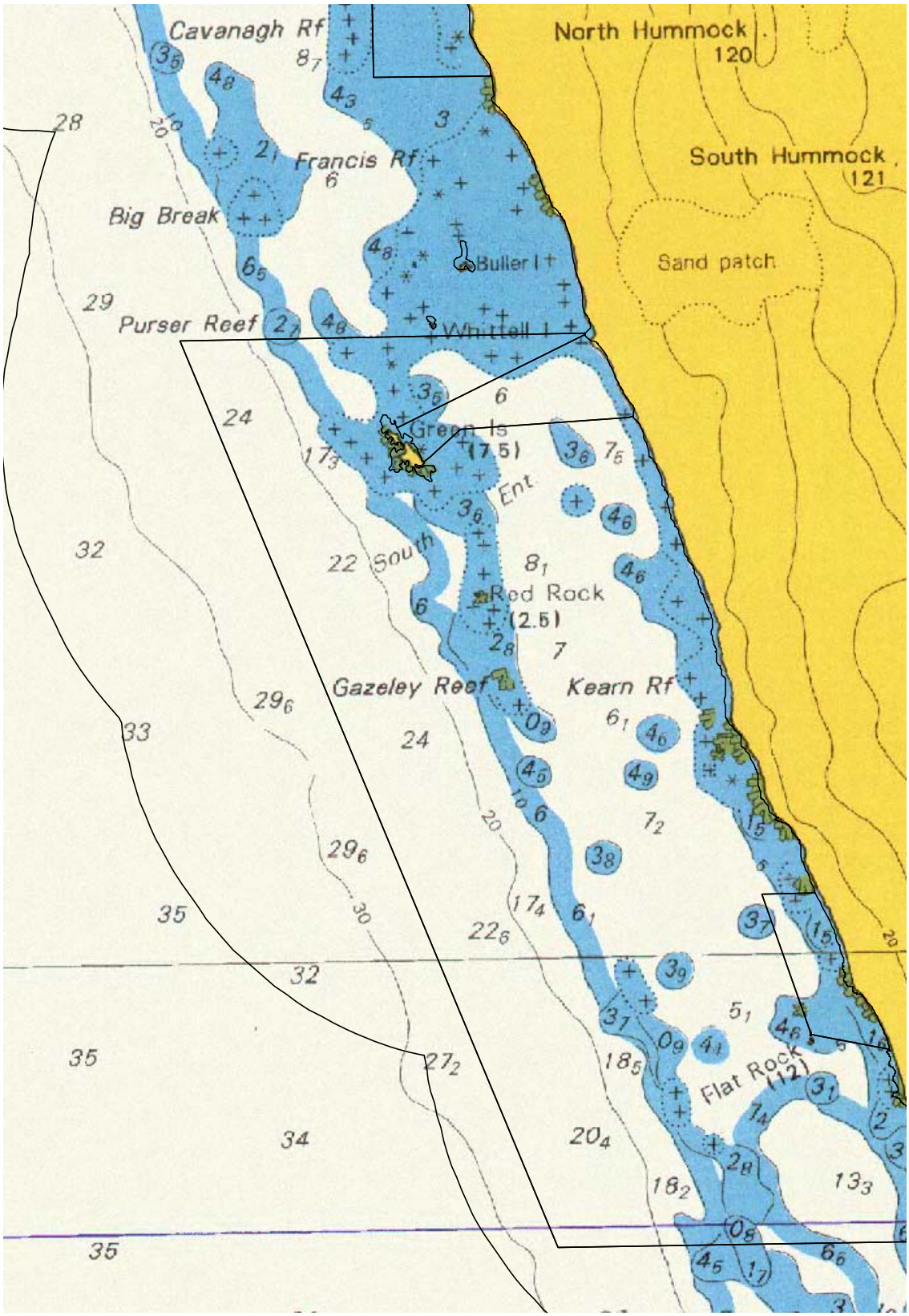
ADDITIONAL COMMENTS

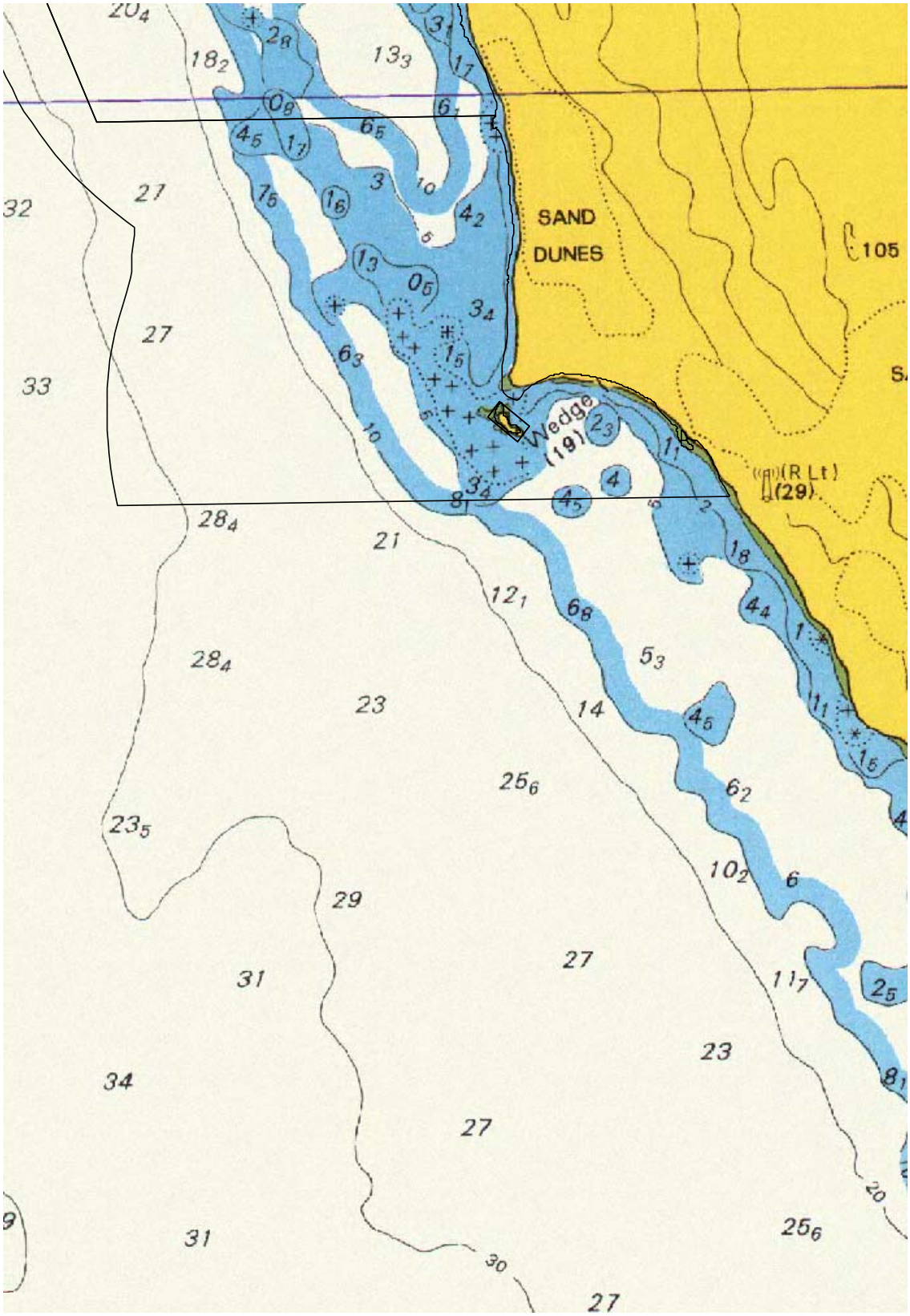

Apex Reef
(breaks heavily)
Lipfert I.
Iso.8s & Iso.2s 3M
Landing ground
Pt Louise
Lights 105°-35°
Note)
Anchorage Bay
2F.R
Green Head
Iso.4s & Q.28m 9M
ring moderate swell
Green Head (29)
South Bay
24
Sand patch
Fisherman Islands
(10)
Sandy Point


Sandy Point
Sandland I
See Plan
North Head
Leading Lights 111°32'
(see Note)
JURIEN
BAY
Favorite I
(14)
Seaward Ledge
(3)
Historic Wreck
(see Note)
Boullanger I
Island Point
The Boomer
Whitlock I
(9)
Escape I
(12)


Escape I
(12)
Fl(3)15s 10M
Foul Passage
Essex Rocks
(5)
The Coffins
Booker Rks
Outer Rocks
(6)
Sand Knoll Ledge
Emu Rocks
(4)
Five Fingers
Ronsard
Sam Rf
(4.5)
(3.5)


WATER TRS
(30)
Cervantes
Thirsty Point
Historic Wk
(see Note)
Roger Mo Rf
Cervantes
Islands
Big Wave Rf
Hansen
Bay
Hansen Head
Namburg
Bay
South Break
Island Rf
Margaria Rf
Kangaroo Point
Corser Rf
Outer Seven Foot Rk
Pearce
Reef
The Boomers
Cavanagh Rf
Francis Rf
Big Break


Cavanagh Rf
North Hummock
120
South Hummock
121
Sand patch
Francis Rf
Big Break
Buller I
Purser Reef
Whittell I
Green Is
(7.5)
Ent
South
Red Rock
(2.5)
Gazeley Reef
Kearn Rf
Flat Rock
(12)


SAND
DUNES
105
Wedge
(19)
(R Lt)
(29)