



CRED Biological Monitoring of Coral Reefs in the Kahekili Herbivore Fisheries Management Area, Maui

Identification_Information:

Citation:

Citation_Information:

Originator: Coral Reef Ecosystem Division (CRED), Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA)

Publication_Date: 20140324

Title: CRED Biological Monitoring of Coral Reefs in the Kahekili Herbivore Fisheries Management Area, Maui

Geospatial_Data_Presentation_Form: spreadsheet

Description:

Abstract:

In 2009, the state of Hawaii established the Kahekili Herbivore Fisheries Management Area (KHFMA) in West Maui. Fishing for herbivores (parrotfishes, surgeonfishes, chub, sea urchins) is prohibited within the KHFMA, as the goal is to use this form of marine management to prevent and possibly reverse shifts from coral to macroalgal domination, possibly evident on reefs at the KHFMA in recent years. The NOAA Coral Reef Conservation Program (CRCP) has provided support for NOAA Coral Reef Ecosystem Division (NOAA CRED) staff to assist Hawaii Division of Aquatic Resources (HDAR) staff with maintaining long-term biological monitoring of the KHFMA, using methods implemented in pre-closure baseline surveys in 2008 by HDAR and their partners at that time. For each survey round, approximately 80–100 survey transects are conducted within the KHFMA. Survey transects are haphazardly located, with the aim of spreading locations broadly across hardbottom areas within the KHFMA. Survey teams comprising of divers and working off a small boat were haphazardly dropped over hardbottom areas throughout the KHFMA. The divers would then swim straight down to the nearest suitable habitat (hardbottom large enough to lay a survey transect in); one of the survey divers would then tie off the starting point of the survey transect and the other recorded the transect start location using a GPS in a waterproof bag attached to a float. As much as possible, surveys were always run parallel to the shoreline running approximately northwards. Survey transects were of 25m length. One of the divers conducted fish surveys, recording the species, number and size (in 5 cm slots) of all fishes recorded within the transect ahead of the diver as they swam slowly along the transect line. Fishes larger than 15 cm total length (TL) were recorded within a 4-m wide belt centered on the diver as they laid out the 25 m transect tape. At the end of the transect, the diver would then turn around and resurvey the transect line, recording species, number and size of all fishes smaller than 15 cm TL in a 2-m wide belt centered on the transect line. The other survey diver followed the fish survey diver, and conducted a photo quadrat survey of the benthos under the transect line, and then recorded all sea urchins with a 1-m wide belt, during a return swim down the transect line. Photos were subsequently analyzed using point count image analysis software, with cover recorded to lowest possible taxonomic level (species for coral, genera for macroalgae, functional group for others (crustose coralline algae, turf, sand, other sessile invert). Surveys covered by this metadata record were gathered for the project "Scientific support for Kahekili Herbivore Fisheries Management Area, Maui" conducted by NOAA CRED, and funded by the CRCP in Fiscal Years 2010, 2011 and 2012 (FY10 Project#: 20482, FY11#:F200; FY12# F374). Surveys were completed in three 'rounds', each round being an intensive 4 day survey effort. Those rounds took place on 09/01/2009–09/04/2009, 09/13/2010–09/16/2010, 02/28/2011–03/03/2011, 9/26/2011–9/29/2011, 4/23/2012–4/26/2012, 9/24/2012–9/28/2012, 4/22/14–4/25/14 and 9/19/14–9/19/14.

Purpose:

Part of an ongoing monitoring program assessing changes in fish and benthic assemblages following creation of the Kahekili Herbivore Fisheries Management Area in Maui.

Supplemental_Information:

Maximum depth was 15 meters.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20090901

Ending_Date: 20130919

Currentness_Reference: Ground Condition

Status:

Progress: In work

Maintenance_and_Update_Frequency: Annual

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -156.69915771

East_Bounding_Coordinate: -156.6900661

North_Bounding_Coordinate: 20.95404631

South_Bounding_Coordinate: 20.91672134

Keywords:

Theme:

Theme_Keyword_Thesaurus: None
Theme_Keyword: Marine Ecosystem
Theme_Keyword: Monitoring
Theme_Keyword: Herbivory
Theme_Keyword: Coral Reef
Theme_Keyword: Reef Fishes
Theme_Keyword: Belt transect
Theme_Keyword: Marine Protected Area
Theme_Keyword: Maui

Theme:

Theme_Keyword_Thesaurus: CoRIS Discovery Thesaurus
Theme_Keyword: Numeric Data Sets > Biology

Theme:

Theme_Keyword_Thesaurus: CoRIS Theme Thesaurus
Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs
Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Algae Cover
Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Hard Coral Cover
Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Quadrat Monitoring > Photograph Analysis
Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment
Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment > Reef Fish Census > Belt Transect

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Category
Theme_Keyword: biota
Theme_Keyword: 002

Theme:

Theme_Keyword_Thesaurus: CRCP Project
Theme_Keyword: Scientific support for Kahekili Herbivore Fisheries Management Area, Maui
Theme_Keyword: 374

Place:

Place_Keyword_Thesaurus: None
Place_Keyword: Hawaii
Place_Keyword: Maui

Place:

Place_Keyword_Thesaurus: CoRIS Place Thesaurus
Place_Keyword: OCEAN BASIN > Pacific Ocean > Central Pacific Ocean > Hawaiian Islands > Maui Island > Maui Island (20N156W0004)
Place_Keyword: COUNTRY/TERRITORY > United States of America > Hawaii > Maui > Maui Island (20N156W0004)

Access_Constraints:

None

Use_Constraints:

Please cite CRED when using data. Coral Reef Ecosystem Division, Pacific Islands Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Coral Reef Ecosystem Division (CRED), Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA)

Contact_Address:

Address_Type: mailing and physical address
Address: NOAA IRC, 1845 WASP Blvd., Building 176
City: Honolulu
State_or_Province: HI
Postal_Code: 96818
Country: USA

Contact_Voice_Telephone: 808 725-5360

Contact_Facsimile_Telephone: 808 725-5429

Contact_Electronic_Mail_Address: nmfs.pic.credinfo@noaa.gov

Contact_Instructions: e-mail preferred

Data_Set_Credit:

Ivor Williams, Jill Zamzow, Coral Reef Ecosystem Division (CRED), Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA)

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Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report: Fish observations at each site were made by divers who have been trained, and met minimum standards in identifying species present at the survey locations and in estimating size of fishes in survey counts. However, all species identifications are made visually, sometimes in situations where a fish is only briefly seen. Observations, including species identification and sizing, were periodically checked during the expedition for consistency between divers, and little discrepancy was noted between divers. Data is checked after each survey trip, but there remains some possibility of typographical or other errors. Benthic cover estimates derived from analysis of photographs are dependent on image quality – although that was generally good, as photographs were taken at less than 1 m from the reef substrate and in generally clear water, using a high resolution (8 MB) digital camera. Image quality is nearly always more than sufficient for

there to be high confidence in accuracy of identification of benthic genera and functional groups

Logical_Consistency_Report:

The same methods of data collection were used at each of the sites surveyed at this location, and were conducted by the same scientists.

Completeness_Report:

The survey sites were selected using a haphazard process based on available habitat and bathymetric habitats.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report: GPS unit

Quantitative_Horizontal_Positional_Accuracy_Assessment:

Horizontal_Positional_Accuracy_Value: 1

Horizontal_Positional_Accuracy_Explanation: Instrument parameters

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report: Dive computer and SCUBA depth gauge

Quantitative_Vertical_Positional_Accuracy_Assessment:

Vertical_Positional_Accuracy_Value: 0.3

Vertical_Positional_Accuracy_Explanation: Instrument parameters

Lineage:

Process_Step:

Process_Description: Belt transect fish surveys are investigations that provide a high degree of taxonomic resolution for reef fish communities. The surveys were conducted by teams of two divers with locations haphazardly spread throughout the survey area. Transect placement was guided by: (1) a focus on hardbottom communities; (2) deploying lines along an isobath and parallel to shore.

Process_Date: Unknown

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Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Geographic:

Latitude_Resolution: 0.0001

Longitude_Resolution: 0.0001

Geographic_Coordinate_Units: Decimal degrees

Geodetic_Model:

Horizontal_Datum_Name: World Geodetic System 1984 (WGS84)

Ellipsoid_Name: Geodetic Reference System 80 (GRS80)

Semi-major_Axis: 6378137

Denominator_of_Flattening_Ratio: 298.2572236

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Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Coral Reef Ecosystem Division (CRED), Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA)

Contact_Position: Data Manager

Contact_Address:

Address_Type: mailing and physical address

Address: NOAA IRC, 1845 WASP Blvd., Building 176

City: Honolulu

State_or_Province: HI

Postal_Code: 96818

Country: USA

Contact_Voice_Telephone: 808 725-5360

Contact_Facsimile_Telephone: 808 725-5429

Contact_Electronic_Mail_Address: nmfs.pic.credinfo@noaa.gov

Contact_Instructions: e-mail preferred

Resource_Description:

Offline Data

Distribution_Liability:

While every effort has been made to ensure that these data are accurate and reliable within the limits of the current state of the art, NOAA cannot assume liability for any damages caused by errors or omissions in the data, nor as a result of the failure of the data to function on a particular system. NOAA makes no warranty, expressed or implied, nor does the fact of distribution constitute such a warranty.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: xls (Microsoft Excel worksheet) or csv (comma-separated values)

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM or email

Recording_Format: ISO 9660

Fees: None

Custom_Order_Process:

Contact CRED data management team for information

Technical_Prerequisites:

Contact CRED data management team for information

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Metadata_Reference_Information:

Metadata_Date: 20140326

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Coral Reef Ecosystem Division (CRED), Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA)

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Metadata_Standard_Name:

FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version:

FGDC-STD-001-1998

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[Metadata Details](#) [XML Metadata](#)

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