Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:
Baited Remote Underwater Video Station (BRUVS) Surveys of Fish in the Hawaiian Archipelago from 2012 to 2014

1.2. Summary description of the data:
A type of remote video system used by NOAA's Ecosystem Sciences Division (ESD) at the Pacific Islands Fisheries Science Center (PIFSC) is the baited remote underwater video station (BRUVS). The BRUVS was developed and several have been used widely by Euan Harvey, PhD, and colleagues at the University of Western Australia and the Australia Institute of Marine Science. BRUVS are similar to existing BotCam technology, but are more suitable for deployment on coral reef systems because they are smaller, lighter, and can be deployed closer to the substrate. Supported by the NOAA Coral Reef Ecosystem Program (CRCP), ESD uses BRUVS to conduct fish surveys to depths of ~100 m.

Each BRUVS uses high-definition video cameras mounted 0.7 m apart on a base bar that is inwardly converged at 8°, set up as a stereo-video system. The video images from the cameras are subsequently analyzed to identify fish species and to determine fish sizes. The use of bait attracts a wide diversity of fish species into the field of view of the cameras, but ESD is also experimenting with unbaited deployments.

The data provided in this data set—including fish species, counts, and lengths—were generated from the analysis of video footage from BRUVS surveys conducted during PIFSC missions in the Main Hawaiian Islands (MHI) in September 2012 and November 2013, and the Northwestern Hawaiian Islands (NWHI) in May and September 2014. Targeted fishes for measurement in the MHI included: all large-bodied predatory species, including sharks (Carcharhinidae), jacks (Carangidae), snappers (Lutjanidae), and the Hawaiian grouper (Cephalopholis argus. Select parrotfishes (Scarinae), goatfishes, chubs (Kyphosidae), and surgeonfishes (Acanthuridae) were also identified by PIFSC as species of interest. Targeted fishes for measurement in the NWHI included: all large-bodied predatory species, including sharks (Carcharhinidae), jacks (Carangidae), and the snapper Aprion virescens.

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:
2012-09-01 to 2012-10-02, 2014-09-12 to 2014-09-27, 2013-11-05 to 2013-11-07, 2014-05-25 to 2014-05-28

1.5. Actual or planned geographic coverage of the data:
W: -177.47898, E: -166.15501, N: 28.26606, S: 23.62825
Northwestern Hawaiian Islands (NWHI): French Frigate Shoals, Lisianski, Pearl and Hermes, Midway

W: -158.2776, E: -156.05632, N: 21.65475, S: 20.57363
Main Hawaiian Islands (MHI): Oahu, Maui, Molokai, Lanai

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Table (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)
Instrument: Sony Handycam
Platform: BRUVS

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
Annette M DesRochers

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:

2.4. E-mail address:
annette.desrochers@noaa.gov

2.5. Phone number:
(808)725-5461

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of

the data produced by their Program. Please indicate the responsible party below.

3.1. Name:
Jacob M Asher

3.2. Title:
Data Steward

4. Resources
Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?
Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):
Unknown

5. Data Lineage and Quality
NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible
(describe or provide URL of description):
Lineage Statement:
The count and size of reef fish observed on BRUVS surveys are manually logged by a video analyst.

Process Steps:
- Each setup for a BRUV survey uses high-definition video cameras mounted 0.7 m apart on a base bar that is inwardly converged at 8°.
- All BRUVS, consisting of paired Sony handycams, are calibrated using CAL software (www.seagis.com.au; Seager 2008) according to well-published protocols (Harvey and Shortis 1998; Shortis and Harvey 1998) before and after each data collection effort. (Citation: M.R. Shortis, E.S. Harvey, "Design and calibration of an underwater stereo-video system for the monitoring of marine fauna populations", International Archives of Photogrammetry and Remote Sensing, vol. 32, pp. 792-9, 1998)
- Following post-cruise video concatenation and conversion using the program Xilisoft, stereo-video files are reviewed with species annotated to the lowest possible taxonomic level using the program EventMeasure-Stereo (Seager 2008). (Citation: J.W. Seager, seagis cal and Photomeasures stereo photogrametric calibration and analysis software, seagis Pty Ltd, 2008.)
- The MaxN metric is used as the basis for abundance estimation (Ellis and Demartini 1995; Willis and Babcock 2000a; Willis, Millar et al. 2000b), with fork-length measurements obtained for a subset of target species at the time of MaxN.

All species annotations are reviewed prior to analysis to ensure proper identifications, with quality control completed by one analyst to retain consistency across samples (Wilson, Graham et al. 2007).   MHI Analysis: Analysts attempted to measure all fish within the MaxN by moving the video forward or backwards so they were not obstructed by other fish or benthos and close to the camera. Fork length measurements were only possible for fishes within the full field of view of each BRUV deployment, which are collected at the time of MaxN for each respective BRUV drop. E.g. any sightings at the time of MaxN, which recorded only part of the head/body, were not able to be measured. Finally, particularly for smaller fishes, fork-length measurements at the time of MaxN were not taken if sizing precision or root-mean-square rules were exceeded.   NWHI Analysis: Length-based frequencies between predator groups were compared against the MHI. Fork lengths for groups other than the targeted species were not collected. (Citation: Wilson, S. K., N. A. J. Graham, and N. V. C. Polunin. 2007. Appraisal of visual assessments of habitat complexity and benthic composition on coral reefs. Marine Biology 151: 1069–1076)
- All EventMeasure output .txt files are compiled into a .csv file, and imported into PRIMER Version 7.0.11 with PERMANOVA+ extensions or R-Studio for subsequent analysis.

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):
All BRUV deployments, consisting of paired Sony handycams, are calibrated using CAL software (www.seagis.com.au; Seager 2008) according to well-published protocols (Harvey and Shortis 1998; Shortis and Harvey 1998) before and after each data collection effort.

Following completion of BRUVS deployments, all video footage is converted from MT2S to AVI format using the program Xilisoft, followed by the annotation of stereo-video imagery with EventMeasure videographic software (www.seagis.com.au) (Seager 2008). Species are identified to their lowest possible taxonomic level, with relative abundance recorded as MaxN measures. MaxN, defined as "the maximum number of fish belonging to each species present in the field of view of the cameras at one time" (Priede, Ragley et al. 1994; Willis and Babcock 2000a; Willis, Millar et al. 2000b; Cappo, Harvey et al. 2003; Cappo, Speare et al. 2004) is a conservative abundance measure that avoids repeated counts of the same targets.

All species annotations are completed by videographic analysts who have completed species ID tests with a minimum of 90% passing score. Following the completion of video archive processing, identifications are QA/QC'd by a second analyst in order to ensure identification accuracy.

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?
Yes

6.1.1. If metadata are non-existent or non-compliant, please explain:

6.2. Name of organization or facility providing metadata hosting:
NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:
https://www.fisheries.noaa.gov/inport/item/25248

6.4. Process for producing and maintaining metadata
(describe or provide URL of description):
Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?
Yes

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:
NOAA National Centers for Environmental Information (NCEI)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:
https://accession.nodc.noaa.gov/0169370
https://accession.nodc.noaa.gov/0169370
https://accession.nodc.noaa.gov/0169370
https://accession.nodc.noaa.gov/0169370
https://accession.nodc.noaa.gov/0169370
https://accession.nodc.noaa.gov/0169370

7.3. Data access methods or services offered:
Data can be accessed online via the NOAA National Centers for Environmental
Information (NCEI) Ocean Archive.

7.4. Approximate delay between data collection and dissemination:
Unknown

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection
The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)
NCEI_MD

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Pacific Islands Fisheries Science Center - Honolulu, HI

8.3. Approximate delay between data collection and submission to an archive facility:
Unknown

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection
NOAA IRC and NOAA Fisheries ITS resources and assets.

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.