

Hawaii Day-Use Mooring Buoy 10-Year Strategic Plan



Prepared for:

Division of Aquatic Resources
Department of Land and Natural Resources

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ACRONYMS and ABBREVIATIONS

BLNR	Board of Land and Natural Resources
DAR	Division of Aquatic Resources
DJ	Dingell Johnson
DLNR	DLNR Division of Boating and Ocean Recreation
DOCARE	DLNR Division of Conservation and Enforcement
DOT	Department of Transportation
EA	Environmental Assessment
FKNMS	Florida Keys National Marine Sanctuary
GPS	Global Positioning System
HAR	Hawaii Administrative Rules
HIRSA	Hawaii Island Resort Scuba Association
HOST	Hawaii Ocean Safety Team
LOP	Letter of Permission
MKF	Malama Kai Foundation
MLCD	Marine Life Conservation District
MRF	Maui Reef Fund
NFWF	National Fish and Wildlife Foundation
NOAA	National Oceanic and Atmospheric Administration
OHA	Office of Hawaiian Affairs
DMB PLAN	Day-Use Mooring Buoy 10-Year Strategic Management Plan
RIRLAS	Recreational Impacts Reefs Local Action Strategies
TNC	The Nature Conservancy
UH	University of Hawaii
USACOE	U.S. Army Corps of Engineers
USCG	United States Coast Guard
USFWS	U.S. Fish and Wildlife Service
WHFC	West Hawaii Fisheries Council

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Cover Photo: Jeff Leicher, Jack's Diving Locker

Executive Summary

Day-use moorings are an effective tool to help prevent coral damage from boat anchors around the world. The day-use mooring program in Hawaii began when dive operators along the Kona coast wanted to protect coral at popular dive and snorkel sites. The first moorings were installed at Molokini Island in 1988 and today through a public/private partnership there are a total 175 day-use moorings around the state with another 48 new sites pending permit.

The purpose of the Day-Use Mooring Buoy 10-Year Strategic Plan (DMB PLAN) is to provide the state with a long term strategy to install and manage day-use moorings throughout the main Hawaiian Islands. The DMB PLAN identifies potential future day-use moorings sites, recommends rule changes, program objectives and site selection criteria, identifies potentially consistent funding options, and presents cost estimates to manage the day-use mooring program. The plan document identifies other recommendations to improve the program at the beginning of each chapter and discusses rationale for each.

The DMB PLAN received public input through a series of six workshops around the state and by phone and email. A total of 524 moorings were suggested to be installed statewide over the next 10 years with 333 of those suggested for the near term (1-5 years). The number of suggested near term moorings indicates there is a significant need, as perceived by the public participants, to protect additional coral areas from anchor damage.

The current day-use mooring design uses a buoy submerged below the surface, however, surface buoys with a pickup or tagline should be considered for future day-use mooring sites as appropriate on a site-by-site basis. This would make the moorings more accessible to recreational boaters and enhance enforcement.

The DBM PLAN contains nine recommended rule changes to improve the effectiveness of the program. Currently only the moorings at Molokini Shoals Marine Life Conservation District and the original 46 moorings along the Kona coast are included in rule. It is highly recommended to include all existing legal day-use moorings in HAR rules and to create a mechanism so all new day-use moorings that are added to the system are automatically included in the rules.

Reliable and consistent funding is the greatest challenge for the day-use mooring program. Contributions and grants with volunteers donating time and equipment are currently used, however, as the number of moorings and maintenance demands increase so does the need for reliable funding. Funding the program through existing budgets is not seen as practical or achievable. Four sources are funding options are presented in the DMB PLAN. The recommended funding options include: using a portion of the commercial use fee (3% of gross revenue) paid by commercial operators to the Division of Boating and Ocean Recreation; and establishing an annual budget for management of the day-use mooring program within Division of Aquatic Resources or other designated DLNR division. It is assumed that services for inspection, maintenance and installation of moorings would be contracted out. Annual budget estimates range from nearly \$200K to over \$400K annually depending on contractor. Estimated costs do not necessarily reflect actual cost but provide the financial scope for management and implementation of the day-use mooring program.

Chapter 1 – Day-Use Mooring Buoy 10-Year Strategic Plan

The purpose of the Day-Use Mooring Buoy 10-Year Strategic Plan (DMB PLAN) is to provide the state with a long term strategy to install and manage day-use moorings buoys throughout the main Hawaiian Islands. The DMB PLAN identifies existing and future sites for day-use moorings in order to reduce/eliminate anchor damage and minimize user conflicts, and over-use. The DMB PLAN recommends a long-term strategy to manage the moorings, necessary rule changes and identifies potential reliable and consistent funding sources. Molokini Shoal Marine Life Conservation District (MLCD) and its day-use moorings are not included in the DMB PLAN because a planning process specific to that MLCD is in progress.

The primary components of the DMB PLAN include:

- ▶ Synthesis of public input gathered through statewide workshops.
- ▶ Review and recommendations for day-use mooring objectives and site selection criteria.
- ▶ Identification of potential sites for future day-use moorings.
- ▶ Development and recommendations for a permitting application process with State agencies to establish effective and efficient permitting of day-use moorings.
- ▶ Regulatory evaluation and recommendations on needed changes to improve the day-use mooring system.
- ▶ Estimation of Day-use mooring costs for program management, maintenance, and installation.
- ▶ Recommendations on sustainable funding sources for a statewide day use mooring buoy program
- ▶ Research and recommendations on the use of surface buoys

Effective planning and implementation of day use moorings have been identified as priority objectives in both the Recreational Impacts to Reefs Local Action Strategy (RIR-LAS) and the Hawaii Coral Reef Strategy. These collaborative strategies coordinated by the Division of Aquatic Resources (DAR) recognize that anchoring on or near coral reefs, especially frequent anchoring in the same general location, can cause coral destruction and long term negative impacts on the coral reef ecosystem.

Description of the Day-Use Mooring Buoy Plan Process

One of the key elements of the DMB PLAN process was to engage the public. In order to accomplish broad public engagement in the process, multiple opportunities and various methods were provided for interested parties (boaters, communities, organizations, and individuals) to provide their thoughts and input.

The public was asked to provide input into where day-use moorings might be needed and appropriate in the future. The public suggested possible sites for the near term 1-5 years and the longer term 5-10 years. Participants were also asked to suggest possible rule changes that could make the mooring program more effective, potential funding sources, and provide general comments.



A planning team was established to help provide direction for the work plan and to help coordinate between DLNR agencies. Members of the planning team can be found in APPENDIX A. The timeline for the MB PLAN process is below.

TIMELINE FOR DMB PLAN PROCESS	
Planning team established	June 2009
Contact database established	July 2009
Schedule and publicity for public workshops	June – July 2009
Public workshops conducted	August – October 2009
Additional presentations on DMB PLAN to organizations	September – November 2009
Review of the current site selection criteria	November 2009 – April 2010
Database expanded and contacts updated throughout planning process	June 2009 – December 2009
Public comments collected by phone and email	August 2009 – March 2010
Developing costs and budget	December 2009 – March 2010
Initial completion date for DMB PLAN	February 2010
Extension Requested and granted – revised completion date	April 30, 2010

Six public workshops were conducted for the islands of Hawaii, Maui, Kauai, Oahu (Windward), Oahu (Leeward), and Lanai between August and October, 2009. Handouts and information presented at the workshops can be found in the APPENDIX B.

Although the public workshops were important opportunities for interested parties to meet and provide input, they were not the only method available to engage in the process. Phone or email was considered of equal importance in providing opportunities for public involvement. A dedicated web page was provided with information about the DMB PLAN project and a dedicated phone line and email address made available for submission of comments. The dedicated communication mechanisms were published in the news release, websites, newspaper/radio, and blogs.

Prior to the workshops, the project was publicized through a joint news release from the Department of Land and Natural Resources (DLNR) and MKF and posted on the State of Hawaii DLNR Division of Boating and Ocean Recreation (DOBOR) website and distributed by DLNR to media around the state announcing the workshops and that public input was being sought for the DMB PLAN. A copy of the news release can be found in the APPENDIX C. Several media outlets covered the DMB PLAN project and workshops, including the Mike Buck Radio Show, Radio Stations on the Island of Hawaii, Maui News, Lahaina News, Honolulu Advertiser, West Hawaii Today, The Garden Island, and Honolulu Star Bulletin. Additionally on-line web and blog sites provided information about the DMB PLAN, its process, and reiterated requests for public involvement. Websites and blogs included Hawaii Reporter, Hawaii Ocean Safety Team (HOST) and others. See APPENDIX D for examples of media coverage.

A project contact database was established that included names and contact information of people and organizations around the state who had previously been involved with day-use moorings. Additional names of individuals, organizations, clubs, boaters, etc. were initially added to generate a comprehensive statewide general contact list. The contact database was a dynamic list and during the

DMB PLAN process additional names and contact information were added on an ongoing basis. Those who provided email addresses received regular updates throughout the comment gathering phase.

In addition to public workshops, additional presentations about the DMB PLAN project were conducted by MKF. Each presentation sought additional public input. The organizations that received MKF presentations included HOST, Nanakuli/Waianae Neighborhood Board Meeting, Hawaiian Islands Resort Scuba Association (HIRSA), West Hawaii Fisheries Council (WHFC), Maui Reef Fund (MRF), Hawaii Civic Club, and the Kona Kohala Chamber of Commerce.

Several meetings were held with agency officials from DLNR to provide insight and input in the DMB PLAN. The Project Coordinator and the RIRLAS Coordinator met frequently throughout the process. DAR biologists, DOBOR District Managers and participating Harbormasters were contacted individually by email and phone for their specific expertise. DLNR staff was asked to develop clear program objectives and site-selection criteria for a DLNR-managed day-use mooring system and to provide feedback on suggested future day-use mooring sites. A draft document with objectives and site selection criteria was also sent to all contacts in the contact database seeking their input. See the APPENDIX E for a copy of the draft document.

Chapter 2 – Day-Use Mooring Buoy History

Day-use moorings are an effective tool to help prevent coral damage from boat anchors around the world. Such locations as Bonaire-Netherland Antilles, Belize, Cayman Islands, Australia, British Virgin Islands, Palau, Papua New Guinea, and Florida have been using day-use moorings for many years. Although the specific technology may differ, the positive impact on coral reefs is seen throughout.

Bonaire, which is part of the Netherland Antilles in the Caribbean, was one of the first countries/islands to recognize that damage from boat anchors was destructive to their reefs and established some of the first day-use moorings in the world. In 1979 all the water surrounding the island country was designated a marine park and 40 permanent day-use moorings were installed by filling 55 gallon drums with concrete connected to each other by rebar. Today, the technology has advanced using stainless steel pins to anchor moorings to the ocean floor eliminating potential damage from barrels moving during a storm.

Florida was the first state and leader in the United States to employ the use of day-use moorings in the Florida Keys National Marine Sanctuary (FKNMS). John Halas, and others, developed a technique to embed a stainless steel pin in ancient limestone reefs which established the first day-use moorings in 1981. There are over 800 day-use moorings that have been deployed and are in use throughout the FKNMS today. Moorings are first come, first served open to the public and anchoring is allowed near mooring sites.

The Cayman Islands, in the Caribbean, established day-use moorings in 1986 around all their islands using technology adapted from the 'Halas Method'. Although boats are allowed to anchor in areas without a mooring, it is an offence to anchor and damage any corals. The moorings are free of charge and have rules similar to those currently existing in Hawaii.

Australia's Great Barrier Reef Marine Park is one the largest areas in the world where day-use moorings are used as a management tool. The Great Barrier Marine Park Authority has extensive experience

with policy and management of moorings under their authority. Both privately owned and public moorings are used to prevent anchor damage to coral in the park. Private moorings are allowed only under specific conditions, e.g. "where there is a demonstrated need for regular or guaranteed access to a particular location by a particular user or group of users, primarily for reef appreciation and presentation purposes (for example, at a preferred dive site)." Typically, private moorings are requested by a commercial operator that uses only one or a couple of sites. Public moorings are installed where "there is a demonstrated need to prevent damage caused by anchors while continuing to provide for equitable public access." Commercial operators in these areas are allowed to use public moorings on a 'first come, first served' basis. The park therefore has two different purposes for moorings: to facilitate a user or group of users; and for public access while protecting coral from anchor damage. Policies and rules for use of moorings in the park are wide-ranging and a thorough review of the authority's publication ("Policies on Moorings in the Great Barrier Reef Marine Park") which can be found in the APPENDIX F is recommended. It should be noted that unlike Hawaii where the majority of day-use moorings are found in common areas of state waters, the park manages a marine protected area with its own jurisdictional authority. Most areas of the park do not allow any extraction consequently reducing or eliminating some potential user conflicts.

Hawaii's Day-Use Mooring Buoy Program

Hawaii's day-use mooring buoy program began when dive operators along the Kona coast became aware of day-use moorings being developed in Florida to protect coral from anchor damage. If reducing the frequent dropping of anchors could help protect coral reefs at popular dive sites, it would be good for Hawaii's coral reefs and good for the dive industry. It was seen as a win – win if the technology could work in Hawaii. The dive operators, led by Jack's Diving Locker, began discussing the possibility with others and sought to find support to do experiments in Hawaii.

In 1985 George Wilkins from the University of Hawaii's Institute of Geophysics and UH Sea Grant contacted John Halas in Florida on behalf of the dive operators. From this initial discussion about the possibility of adapting the Halas technology to Hawaiian reefs, and after consultation in 1986 between UH Sea Grant, UH Hawaii Institute of Geophysics and Kona dive operators, a plan was made to try to adapt the 'Halas method' to Hawaii's primarily basalt substrate.

By 1987 the technology had been successfully adapted to Hawaii's substrate but not without challenges. Hawaii's basalt is different than the coral limestone substrate in Florida and it was necessary to test different anchoring methods. The type of hole drilled in Florida for the stainless steel pins was a 'core' hole with a large diameter that works well in the porous coral substrate. In Hawaii with its basalt it was found that a much smaller diameter hole worked better. Initially an epoxy was used to anchor the stainless steel pins as in Florida, but experience proved it to be inadequate in Hawaii. A fast setting cement mix made for marine water was tried and found to be a very effective pin anchoring adhesive. QuickCrete type cement is used today as the preferred adhesive. After the technical challenges had been overcome the day-use mooring technology was ready for installation in Hawaiian reefs, with one exception; the necessary state/federal permits.

Permitting was a challenge for the program due to confusion about agency jurisdiction, but later in 1988 experimental moorings were installed on the Kona coast and a total of 30 moorings were installed at Molokini Island under an executive emergency order by Bill Paty, then Chair of the Board of Land and Natural Resources (BLNR).

In 1989 a total of 46 day-use moorings were installed along the Kona coast by volunteer dive operators with verbal approval from DOT-Harbors Division. An after-the-fact permit was supported by Bill Paty and approved subsequent to a BLNR decision.

Malama Kai Foundation was established in 1991 and a donation of \$10K from the rock group Grateful Dead provided the first 'outside' funds to begin the day-use mooring program.

The day-use mooring program began with the Boating Branch within the Department of Transportation-Harbors Division. When the Boating Branch was transferred to DLNR in 1991 to become its Division of Boating and Ocean Recreation, the day-use mooring program was transferred as an integral part. DOBOR currently is the division with authority for the day-use mooring program.

In 1995, Chapter 13-257, Hawaii Administrative Rules (HAR), entitled "Day Use Mooring Rules" were adopted and included moorings at Molokini Island and the original 46 moorings off the Kona Coast. Day-use moorings are open to the public on a first come, first served basis.

That same year a general permit was issued to DOBOR by the US Army Corps of Engineers (USACE) for 277 day-use moorings. MKF and its partners were designated by DOBOR as the group to install the moorings. Not all of the permitted moorings were installed within the permit time period due to lack of funding and volunteer availability. Of the 277 permitted, 165 moorings were installed by volunteers over the five year permitted time period.

In 1998 the state legislature passed Act 306, (HRS Chapter 188F) regarding the establishment of the West Hawaii Regional Management Area that required a day-use mooring system along the Kona Coast. HRS Chapter 188F-3, F-4 contains language regarding day-use moorings (See APPENDIX G). The legislature also appropriated limited funds to the DOBOR to pay for mooring buoy hardware, including buoys, line, cable, shackles, and anchor bolts. Although there was initial funding provided through the legislation, DOBOR did not spend all the money. Currently there is no consistent state funding of the day-use mooring program, and DOBOR does not include the program in their annual budget.

In 2005 additional mooring sites were identified by commercial dive and snorkel operators working with MKF (and supported by a NFWF grant) which led to DOBOR submitting another USACE permit application for 15 day-use moorings (five each on the Island of Hawaii, Maui, and Kauai). That same year, a Letter of Permission (LOP) approving installation was issued by the USACE. Volunteers installed moorings on the Island of Hawaii and Maui, but the five moorings permitted for Kauai at Nualolo Kai did not get installed within the permitted time period.

Also in 2005 a manual entitled "Hawaii Day-Use Mooring Buoy System Background, Site Selection Criteria, Installation, and Maintenance Procedures Manual" was published by MKF to help standardize procedures for the statewide system (see APPENDIX H). Training sessions were conducted on Maui using the manual. The manual was updated in 2009 to include revised protocols established by DAR.

Since 2005, day-use mooring guidebooks have been published for the Island of Hawaii and Maui County through additional NFWF grants to MKF. The guidebooks provide information on how to locate day-use moorings and properly use them as well as highlights of the marine environment at each site.

After twenty years, the frequent use of the day-use moorings by commercial scuba and snorkeling operators is an indicator of the day-use mooring program's success in reducing the number of anchors dropped on coral reefs daily. The program has continued to grow through the years with volunteers donating their time and boats to maintain existing moorings and install new ones after permits have been acquired.

Because of the grass roots nature of the program, there has not been consistent documentation of volunteer effort. However MKF estimates that over one thousand volunteer hours and boat time worth thousands of dollars have been donated in support of the program. Without this volunteer effort the day use mooring program would not have been possible and certainly not where it is today.

Today there are 175 legal day-use moorings installed statewide. A list of all the permitted and installed moorings is found in the APPENDIX I. During the development of this DMB PLAN participants noted that some of the original moorings are no longer in use due to either the stainless steel pins having been pulled from the substrate (typically because of incorrect use of a mooring) or no mooring tackle being present (chain, mooring line, buoy).

On February 4th, 2010 DOBOR submitted a permit application for an additional 48 day-use mooring sites statewide to the US Army Corps of Engineers (USACE). Note that the USACE lists 50 moorings which include moorings to provide a bow and stern system at two locations. A list of installed moorings and locations pending permit can be found in APPENDIX J. The permit application is still in process awaiting approval by the USACE.

Chapter 3 – Day-Use Mooring Design and Materials

There are two types of day-use moorings used in Hawaii, the stainless steel pin "Hawaiian Eye" (pin) and the manta ray (manta) mooring as approved by the USACE in the LOP permit issued January 27, 2005. The two different mooring types are needed because of different substrata where day-use moorings are installed.

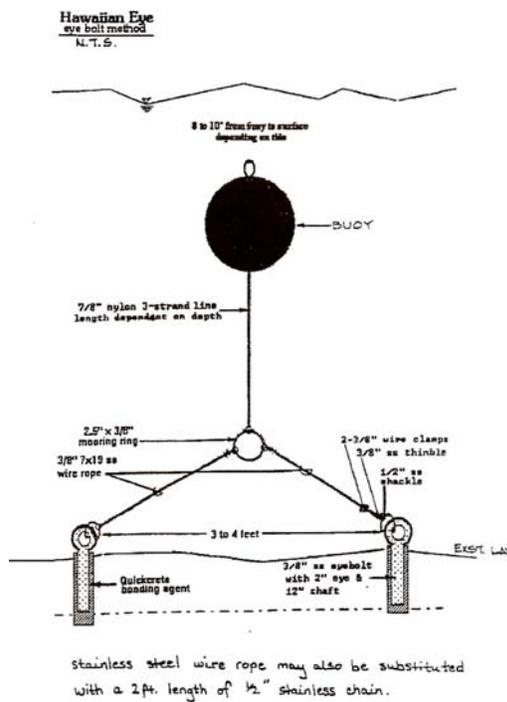
The pin mooring is a modified Halas-type mooring used in a hard bottom basalt substrate. Each pin day-use mooring consists of two stainless steel eyebolts cemented into a hole drilled into the sea floor. A line attached to a sub-surface float is shackled to a chain or stainless wire bridle attached to the eyebolts.

The manta system consists of a utility anchor attached to an anchor rod that is driven under the sea bottom in clay, sand, gravel, broken bedrock, and coral rubble. A thimble eye nut is screwed into the end of the anchor rod for attachment of the buoy line. Installation of the manta system does little environmental damage to the surrounding sea bed. Installation time varies with sea bottom characteristics but in most cases the manta can be installed in less time than a pin mooring.

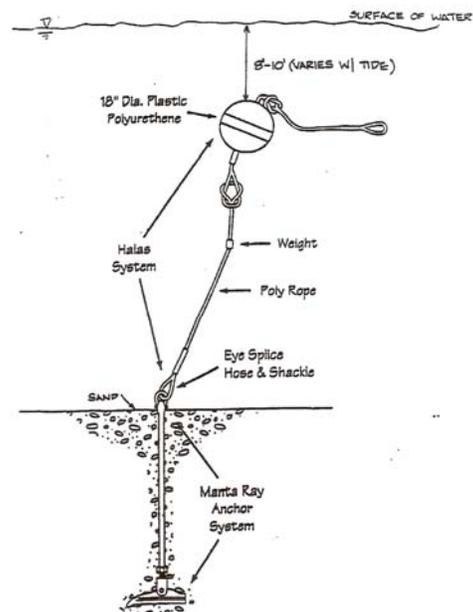
Materials used for both pin and manta day-use moorings include:

1. 2' stainless steel (S.S.) Chain or Cable (minimum 3/8")
2. 7/8" Nylon Line (3 Strand)
3. 3/4" S.S. Thimbles
4. Tape, Cable Ties, Scissors for splicing line
5. 5/8" S.S. Shackles (if cable is used)
6. 5/8" S.S. Shackles (if chain is used)
7. S.S. Seizing Wire
8. 18" Reaving Buoy (Hole through Center)
9. Fire Hose for chafing gear

Current design and materials are shown below for a pin mooring and a manta mooring. The USACE approved design and materials are considered to be minimum standard size.



Pin Mooring Design



Manta Mooring Design

Chapter 4 – Day-Use Mooring Objectives and Site Selection Criteria

Review and further development of the current site selection criteria was conducted during the DMB PLAN process. Current criteria used for day-use moorings can be found in APPENDIX K. DLNR staff including DAR biologists, DOBOR district managers and harbor masters, and the public, was asked to provide their thoughts on appropriate objectives for the day-use mooring program and criterion for site selection.

General recommendation:

Create a working group consisting of Native Hawaiians, commercial operators, recreational boaters, fishers and other stakeholders to develop appropriate cultural and social criteria to help guide and inform the site selection process.

How such criteria are applied will depend on individual site assessments and recreation thresholds as defined by larger planning processes. While we recognize cultural and social criteria are essential, we recognize that developing such criteria deserves careful and thoughtful consideration. For example, appropriate social and cultural site selection criteria should understand how installation of moorings impact spatial and temporal distribution of recreational boaters and commercial operators who use moorings and with what frequency and intensity, and how moorings impact other extractive and non-extractive activities. A day-use mooring plan should not be considered ready for implementation until social and cultural criteria for site selection are developed.

Recommendations for program objectives:

Boating activity as used in these objectives is defined as the use of a motorized vessel, excluding thrill craft, for recreational activities including, but not limited to diving, snorkeling, and wildlife viewing.

Hawaii Day-Use Moorings are a management tool to:

1. Minimize to the greatest extent possible anchor damage to coral reefs and other near shore ecosystems.
2. Manage density of boating activity.
 - a. Managing density is important to help ensure biological impacts of recreational activities remain sustainable, to prevent crowding from deteriorating the experience of users, and for boating and human safety.
3. Manage location of boating activity.
 - a. As the number of boats in the state increases, placing day-use moorings in appropriate recreation areas with minimal or no conflicting use may help to encourage use by new boaters.
4. Help avoid or reduce conflicts between ocean users.
 - a. In selecting day-use mooring sites it is important to consider all users of the place in order to avoid or minimize conflicts between users and to help ensure that the moorings themselves do not become a hazard or a nuisance.
5. Improve public access to marine recreation opportunities.
 - a. Day-use moorings should be accessible and available for general public use.
6. Be consistent with present and future marine use and coastal plans approved by the State or Counties.

Recommendations for site selection criteria

These recommendations were developed during the plan process but participation was limited. It is recommended that DLNR, especially DAR biologists, do a further review with additional input of the site selection criteria and modify as appropriate.

Day-use moorings shall be installed:

In sand, rubble, firm rock, large boulders whenever possible and not in coral.

In depths less than 85 feet whenever possible.

(Current exceptions are Molokini Island within the no-take subzone and the site of the Corsair on Oahu.)

So that the density of day-use moorings minimizes biological and social impacts of the moorings and their users.

(Spacing of day-use moorings will be determined by site-specific plans or on a system-wide basis when reliable biological data is available.)

In areas with large seasonal surf only if DLNR staff, or others designated by DLNR, remove mooring tackle (line and buoys) in winter and re-attach in the spring.

(This will help avoid conflict with surfing activity and protect mooring tackle from damage.)

At appropriate sites and in a manner that will minimize or avoid impacts to protected species.

Chapter 5 –Potential Future Day-Use Moorings

One of the primary goals of the DMB PLAN was for ocean users and communities to provide their suggestions for appropriate day-use moorings in the future. Suggestions were received at the statewide workshops and through phone and email directly to MKF. The basic criteria described to participants who suggested possible day-use mooring sites was to think about the locations where boating and anchor activity is currently happening on a regular basis. This criterion was used for both the near term (1-5 years) and long term (5-10 years) sites. Additionally suggestions that anticipate boating and anchoring usage in the future were considered for the long term.

There were 67 people that attended the public workshops and an additional 24 people provided comments via email. Of the total 91 participants in the DMB PLAN approximately 48% represented commercial dive and snorkel operators, 7% resource managers, and 44% were recreational boaters, fishers, or community organizations. It should be noted that not all participants provided input into future day-use mooring sites. Most of the suggested mooring sites were collected at the statewide workshops.

This information collected provided a comprehensive 'wish list' of day-use moorings for the state. It was not within the scope of this DMB PLAN to qualify each suggested mooring site for its appropriateness based on program objectives and site selection criteria. A further in-depth assessment of each suggested location, the number of moorings, and further community evaluation will need to be completed prior to including any site in a future USACE permit application.

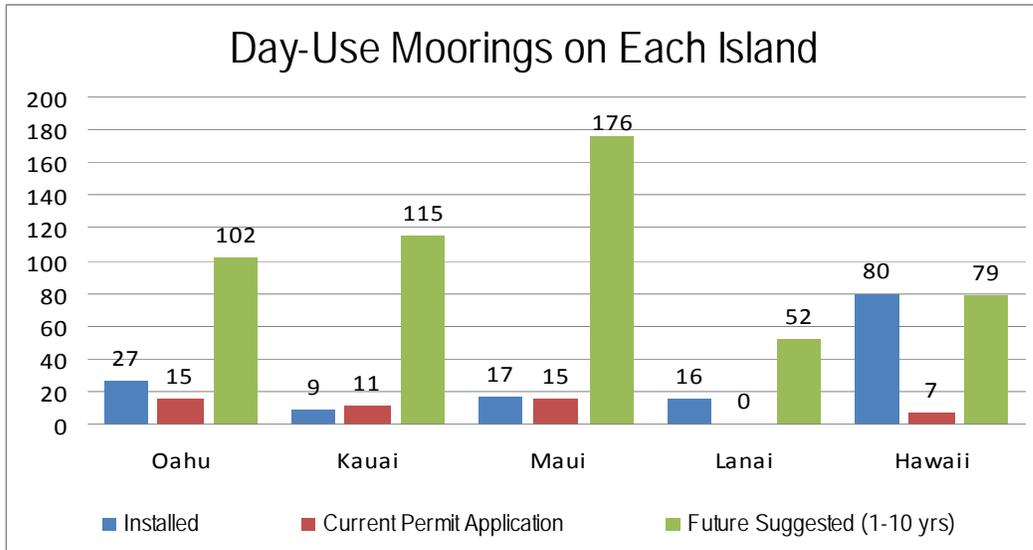
Summary of stakeholder input

A total of 524 moorings have been suggested to be installed statewide over the next 10 years with 333 of the total suggested for the near term (1-5 years). If all the suggested moorings were permitted and installed for the near term, it would nearly double the number of existing day-use moorings in the state today. The number of near term suggested moorings indicates there is a significant need, as perceived by the public participants, to protect additional coral areas from anchor damage

The number of suggested day-use moorings differed on each island depending on the perceived need for additional moorings and boating activity levels. It is important to note that input represents only the perspective of those who participated in the DMB PLAN process. Stakeholder participation may have had an impact on the geographic distribution of requested sites and low participation from some regions could account for some gaps and managers should be prepared to receive further requests. The table and graph below show the aggregate numbers of suggested moorings by term and island. The complete listing of each suggested day-use mooring site by island showing general location and site nickname is found in the APPENDIX L. A breakdown of numbers of suggested day-use moorings by island for the near term and long term is below:

Suggested Day-Use Moorings by Island - Next 10 Years			
Island	Near Term (1-5 years)	Long Term (5-10 years)	Total
Hawai'i	60	19	79
Maui	126	50	176
Kaua'i	69	46	115
Lana'i	38	14	52
O'ahu	40	62	102
TOTAL	333	191	524

Island Distribution of Day-Use Moorings Suggested by Public for Next 10 Years



Island Distribution of Current, Planned & Suggested Future Day-Use Moorings

Prioritization of mooring buoy sites

An attempt to prioritize sites on each island was part of the DMB PLAN process. The list of suggested day-use moorings was sent to DLNR staff and ocean users on each island where moorings had been suggested with instructions to provide their thoughts on the top ten priority sites. From the feedback received a top ten priority site list was developed for each island. The prioritization lists include only sites (site nicknames) and not the number of moorings at each site. It should be noted that there was no general agreement among all participants on site priorities. The tables below represent a best effort to prioritize the top ten sites on each island where new day-use moorings should be considered for installation first. It is recommended that each suggested site be evaluated and priorities revisited and refined at that time with additional input from the public and state/federal agencies.

Top Ten Priority Sites By Island continues on next page

Top Ten Priority Sites by Island

Hawaii Island

HAWAII ISLAND PRIORITY DAY-USE MOORING SITES		
Island	General Location	Site Nickname
Hawaii	Keauhou	Sheraton Keauhou Manta Village
Hawaii	North of Kona Airport	Pu ukala Point/Nancy's /Vito's Reef
Hawaii	Old Airport Kona	East of Sharkfin Rock Mooring
Hawaii	Waikoloa	North of Anaehoomalu Bay in front of Hilton
Hawaii	North of Kona Airport	First Cove past Hoover's/Unualoha Point
Hawaii	Waikoloa	Anaehoomalu Bay
Hawaii	Kohala Coast	Between Crystal Cove and Waiakaailo Bay
Hawaii	Kula Pa aki	The Hive
Hawaii	Waikoloa	Front of Mauna Lani Bay Hotel
Hawaii	North Kona Paradise	Pinnacles, Three Rooms, Lion's Den
Hawaii	North Kona, Kona Village	Directly in Front of Hotel

O'ahu

OAHU PRIORITY DAY-USE MOORING SITES		
Island	General Location	Site Nickname
Oahu	Maunalua Bay	Turtle Canyon
Oahu	Waikiki	Kewell Pipe
Oahu	Maunalua Bay	Koko Crater
Oahu	Waikiki	Nautilus Reef
Oahu	North Shore	Pupukea
Oahu	Waianae	Turtles 1 and 2
Oahu	Waikiki	San Pedro
Oahu	Waianae	Makaha
Oahu	Maunalua Bay	Kawaihoa Point
Oahu	Waikiki	100 Ft Hole

Top Ten Priority Sites by Island

Lanai

LANAI PRIORITY DAY-USE MOORING SITES		
Island	General Location	Site Nickname
Lanai	East Lanai	Turtle Haven
Lanai	East Lanai	Twin Palm
Lanai	East Lanai	Club Lanai
Lanai	East Lanai	Keomoku Pt
Lanai	South Lanai	Sergeant Minor
Lanai	South Lanai	Oscar's Reef
Lanai	South Lanai	Armchair
Lanai	South Lanai	Outside Manele Harbor
Lanai	South West Lanai	Barge Harbor
Lanai	Lanai	Manele Bay

Maui

MAUI PRIORITY DAY-USE MOORING SITES		
Island	General Location	Site Nickname
Maui	Olowalu	Coconuts
Maui	Olowalu	Coconuts to Pinnacles
Maui	Honolua Bay	Honolua Bay
Maui	Cliffhouse	Cliffhouse
Maui	Kapalua	Haweia Point
Maui	Mala	Graveyard
Maui	Mala Wharf	Mala Pier
Maui	Mokuleia	Slaughterhouse
Maui	South Maui	La Perouse
Maui	Maui Prince	Off Maui Prince

Top Ten Priority Sites by Island

Kauai

KAUAI PRIORITY DAY-USE MOORING SITES		
Island	General Location	Site Nickname
Kauai	Na Pali	Makole
Kauai	Na Pali	Milolii
Kauai	Na Pali	Kaumakani
Kauai	Lehua Rock	Fish Bowls
Kauai	Lehua Rock	Super Highways
Kauai	Lehua Rock	Vertical Awareness
Kauai	Lehua Rock	Stairways
Kauai	Lehua Rock	Mano Cave
Kauai	North Shore	Anini-Outside Reef
Kauai	North Shore	Tunnels

Specific data needed for the assessment of suggested sites include Global Positioning System (GPS) coordinates, depth, bottom substrate, and mooring type (pin or manta). Some of the suggested sites have information on depth, bottom substrate and mooring type but not all participants included this information with their input. The planning process placed greater emphasis on identifying potential sites in the near term because these sites were seen as having the greatest immediate need to protect coral from anchor damage. Many of the suggested mooring sites are located in areas where day-use moorings currently exist or are near existing day-use mooring sites.

Chapter 6 – Inspection, Maintenance, Installation

Proper inspection, maintenance and installation of day-use moorings are critically important elements of an effective and successful long-term day-use mooring program. The MKF, its partners and volunteers around the state, are currently performing these functions to a degree, however there is not regular monitoring and maintenance. Currently, there is no centralized oversight or support for maintenance, inspections or installations of day-use moorings in Hawaii.

Recommendations:

1. DLNR should collaborate with existing organizations and individuals currently involved in training programs to establish a standardized monitoring and maintenance program incorporating procedures outlined in the published MKF manual (see below) and existing databases run by MKF and its partner the Maui Reef Fund.
2. DLNR should contract services for regular inspection, maintenance, and installation of day-use moorings.

The Hawaii Day-Use Mooring Buoy System Background, Site Selection Criteria, Installation, and Maintenance Procedures Manual was created to help ensure that inspection, maintenance and installation functions are properly carried out using standardized methods by people who have received training in each of the functions. The manual is used by MKF when volunteer divers are trained and each is provided a copy for future reference.



Inspections of day-use mooring tackle and mooring maintenance, which can range from cleaning the buoy and tackle to a full replacement, is currently done by those who use the moorings. Most of the maintenance is done by commercial dive and snorkel operators who want to ensure the mooring will safely hold their vessels. It is important to note, however, that a limited number of operators and volunteers take on the bulk of work and often perform repairs for other users.

Day-use moorings along the Kona coast and offshore of Maui and Lanai are typically inspected and maintained as part of program organized by MKF and Maui Reef Fund. These islands have trained volunteers who routinely inspect and maintain the moorings. The same volunteers are also trained for installing new day-use moorings. Maui County and Kona have established organizations which help coordinate the maintenance and installation efforts. Oahu and Kauai lack a central organizational structure in which to coordinate maintenance and installation functions. On these islands maintenance and installation is done on a more ad hoc basis mostly by dive and snorkel operators.

While many of the day-use moorings around the state are well maintained, there are some that have lacked the proper maintenance and need to be repaired. Some moorings no longer have stainless steel pins, which have been pulled out, others lack any mooring tackle and are not used, and others need replacement of mooring tackle parts. Feedback received during the DMB PLAN process indicated that most of these moorings that are in need of maintenance and repair are found on Kauai and Oahu.

In order to have the statewide system of day-use moorings effectively maintained there was general agreement among DMB PLAN participants that this function should be contracted out to an entity or entities. Contracting the necessary day-use mooring services would clearly identify who has responsibility and accountability for this important function. One of the drawbacks of having volunteers freely conduct the maintenance is that it is difficult and costly for volunteers to find the time and vessels to perform regular maintenance at their own expense. Typically volunteer services and equipment are donated with no reimbursement of expenses. It is also necessary to ensure that approved mooring tackle is used and proper maintenance procedures are followed. As stated previously there is no centralized oversight for maintenance, inspections or installations. Contracting these services would provide the ability to ensure that proper maintenance methods and approved mooring tackle is consistently used on all day-use



moorings statewide. This would also help users know who to report problems to, avoiding confusion about responsibility.

Chapter 7 – Permitting of Day-Use Moorings

Acquiring the necessary USACE permits for new day-use moorings in a timely manner has been a challenge for the statewide program. The primary challenges have included the identification and evaluation of appropriate new day-use mooring sites, coordination within DLNR, and follow up with USACE once the permit application has been submitted. These challenges have resulted in an inefficient process and lead to great frustration on the part of those who use day-use moorings.

Recommendations:

1. DLNR evaluate which division is best suited to lead the permitting process. Clearly establish one division within DLNR as the authorized lead for the permitting process. Preferably the same division that is responsible for managing the day-use mooring program.
 - a. Appoint a person within the lead division with responsibility and accountability for interdivision communication and development of the USACE permit application.
2. Establish protocols for the process of developing and submitting a USACE permit application for additional day-use moorings. Recommended protocols are shown below.
3. Bring together appropriate state and federal agencies for a discussion of the day-use mooring permitting process with a goal to develop an integrated process that will improve interagency communication, facilitate each agencies information requirements, and expedite the permitting process.

Discussion and rationale for recommendations

Recommendation #1: Within DLNR the day-use mooring program and permitting process crosses jurisdictional boundaries between divisions. DOBOR currently is the lead division within DLNR and has responsibility for the permitting process. There currently is a lack of accountability within DOBOR for the day-use mooring program. Internal communication with other divisions and with decision making has been uneven and does not have a coordinated or integrated approach. Meetings with division administrators of DOBOR and DAR during the plan development were productive, however, additional discussion is needed, especially with the recent changes with DAR personnel to determine the best approach and lead division for the program. Note that the lack of adequate funding is a challenge for any division tasked with management of the day-use mooring program.

Recommendation #2: Currently there is no formalized permit process established by DLNR. Previous permit applications were a collaborative effort between MKF and its partners, DOBOR and DAR. Establishing permit protocols would enhance the efficiency of the permit process. Highlights of a recommended process for selecting appropriate day-use moorings sites and acquiring a USACE permit are provided below.

The recommended process should be reviewed by the appropriate state and federal agencies and improved as needed.

1. DLNR reviews priority sites from the DMB PLAN to be considered for immediate action and evaluates site appropriateness using site-selection criteria.
2. DLNR hosts public meetings on all islands where day-use moorings are being considered.
3. Conduct an outreach effort to region-specific stakeholders including community groups, fishers, surfers, and others to identify unanticipated complications and address stakeholders' questions and concerns.
4. Generate a list of potential day-use mooring sites for inclusion in a USACE permit application.
5. Review the list of mooring sites a second time by DAR and DOBOR including site surveys to determine critical information such as bottom substrate, depth, and exact GPS coordinates.
6. Generate a final list of potential day-use moorings sites.
7. DLNR completes and submits a USACE permit application.
8. DLNR also submits an application to the Hawaii Coastal Zone Management Program for a Federal Consistency Review
9. USACE determines the appropriate permit process for the application and submits a letter to all reviewing agencies, individuals or groups. The extent of agency review and timeline varies depending on the permit process used.
10. Typically there are questions raised by reviewing agencies and individuals. Lead division in DLNR to provide timely responses to USACE.
11. If approved, the USACE will provide a permit for the installation of new moorings to DLNR.
12. If DLNR is contracting a third party to complete installation, a Special Activity Permit application must be submitted to DAR. It is recommended that DAR investigate the possibility of a blanket permit that could apply to any approved work performed by a mooring installation and maintenance contractor.

Recommendation #3: There have been several reasons why the permitting process takes a significant amount of time. One reason is personnel changes at state and federal agencies. Although the day-use mooring program has a well established history and has received several state and federal permits, personnel changes have made it necessary to continually provide information on the basics of the program to those newly involved with permitting day-use moorings. This has resulted in delays in moving the permit process along on a timely basis.

When the day-use mooring program first began an interagency meeting was conducted and led by DLNR. This meeting provided an opportunity to educate each state or federal agency about the day-use mooring program. It also provided the opportunity for agencies to discuss their information needs and best communication methods which proved to be an effective way to determine and implement an efficient permitting process.

Essentially the permitting process is determined by the USACE depending on the number of moorings included in the permit application. According to the USACE a large number of moorings may require a general permit application involving extensive agency review and requires significant time. A letter of permission (LOP) has been used for a smaller number of moorings and although it includes state and federal agency review, the number of agencies is smaller and timeline shorter than with other permit processes.

It should be noted that the environmental assessment (EA) of a statewide system of day-use moorings conducted by DLNR in 1994 may be out-of-date. This should be an important topic of discussion during the interagency meeting to determine if a new EA might be required.

Chapter 8 – Surface vs. Submerged Buoys

The question of surface vs. submerged mooring buoys was raised frequently during the DMB PLAN process. Currently, a majority of day-use mooring sites are located in shallow near-shore areas and use a submerged buoy, typically about 10 feet below the surface. The buoys are below the draft of smaller vessels using these areas and are not considered a hazard to navigation. Surface buoys would clearly mark the location of day-use moorings making them easier to find for all boaters and easier for DOCARE to enforce regulations. DLNR should consider each individual site to evaluate its appropriateness for surface or sub-surface buoy.

Recommendations:

1. Surface moorings (which could indicate maximum vessel size) should be installed in MLCDs statewide.
2. A surface buoy with a pickup or tagline should be considered for future day-use mooring sites as appropriate. A pickup or tagline is a line with one end attached to the submerged buoy and the other end attached to a small surface buoy.
 - a. Evaluation of the use of surface buoys should be conducted on a site-by-site basis. The evaluation process should include discussions with all potential boaters and communities in the area (fishers, recreational boaters, commercial boaters, etc). Careful evaluation of benefits and liabilities at a given site are important to the successful use of surface buoys.

Analysis of Surface Buoys in Hawaii

Currently boaters locate the submerged mooring buoys by using GPS coordinates and/or by triangulation using marks on land. GPS works well for most commercial dive/snorkel operators who usually have GPS systems (built in or hand held). Smaller boats that lack GPS who use day-use moorings frequently keep logs with landmarks recorded. Either way, most commercial boat operators know how to find the day-use mooring sites. Using submerged buoys means that someone on the vessel must swim down with a line attached to the boat and thread the line through the eye of the mooring buoy, then surface and pass the line to someone aboard the vessel and secure to a cleat. This works well for commercial vessels, which tend to have crew on board trained in freediving techniques, but does not work well for some recreational boaters. Recreational boaters may, or may not, have someone capable of snorkel diving down to the mooring buoy and may, or may not, have someone onboard available to secure the mooring line to the vessel.

If the day-use mooring system is to provide the maximum coral protection from anchor damage, greater use of day-use moorings for recreational vessels, as well as commercial vessels is needed. Surface buoys clearly mark the location of day-use moorings making it easier to find for all boaters. This would increase mooring use and reduce the need for anchoring.

Surface buoys are used in the Florida Keys National Marine Sanctuary and are clearly marked so that all boaters, commercial and recreational, can easily find and use them. The main difference between the sanctuary areas in Florida and the waters of Hawaii is primarily that sanctuary areas in Florida have a clearly marked boundary, which is shown on charts and is commonly known among boaters. Boaters expect to find surface moorings in the sanctuary and maneuver their vessels around them accordingly. Hawaii's moorings are typically located in near shore open water, not found on charts, and most are not in areas with defined boundaries with exceptions being those moorings within MLCDs which have established boundaries.

Personnel from the Aids to Navigation section of the United States Coast Guard (USCG) District 14 in Honolulu indicated there are no regulations that disallow surface buoys. Several considerations must be evaluated to ensure that any surface buoy does not interfere with boaters and become a hazard to navigation. The most obvious is that the day-use moorings are not located within a shipping channel or at the entrance to a boat harbor or boat ramp. Another consideration is the traffic density, where there are a numerous boats using an area or transiting through the area, such as offshore Waikiki.



There are many day-use mooring sites that could be considered a 'destination' with little transiting boat traffic. These areas may be good candidate sites for the use of surface buoys. As an example, surface buoys have been used successfully for some day-use moorings in the North Kohala area near Kawaihae Harbor on the Island of Hawaii. MLCDs, especially those like Molokini Crater with clear geographic boundaries, are good candidates for surface moorings because they have established and relatively well-known limits and typically do not have fast-moving vessel traffic. Because they are areas of high biological value, any mooring activity in MLCDs should be consistent with area management plans.

A significant benefit to surface buoys would be the enhanced ability of DLNR-Division of Conservation and Resource Enforcement (DOCARE) to enforce day-use mooring rules and provide an opportunity to monitor and evaluate mooring usage from shore. A drawback to surface buoys, however, is the potential for vandalism or theft. If

either occurs it would increase the cost of maintenance and render some moorings unusable until new buoys are attached. This could potentially increase anchoring activity and prove contra to the primary goal of coral protection.

Not all locations are appropriate for a tagline and surface buoy, however, if each potential site is evaluated with broad public input to ensure that the buoys would not be a hazard to navigation or create user conflicts, surface buoys would promote greater use of day-use moorings by recreational boaters. Greater usage of day-use moorings will increase the protection of coral from anchor damage. The evaluation should be done prior to submitting an USACOE permit application.

Ultimately an evaluation and decision regarding the use of surface buoys will be done by the USCG through the USACE permit process. Each site or day-use mooring zone would be evaluated on a site-by-site basis. Future USACE permit applications could request permits for sites with submerged buoys and other sites with surface buoys.

Chapter 9 – Day-Use Mooring Rules

The current rules for use of a day-use moorings were reviewed as part of the DMB PLAN process. Additional input was gathered from the public and DLNR staff regarding possible rule changes or additional rules that may be needed to make the program more effective. Input was sought as a standard component of the statewide workshops, on the MKF website, and in email communications using the statewide contact list. The current rules for use of day-use moorings are in Hawaii Administrative Rules (HAR) Title 13, DLNR Subtitle 11, and DOBOR Subtitle 257 entitled “Day Use Mooring Rules” and found in the APPENDIX M. As mentioned previously, this DMB PLAN does not include the day-use moorings at Molokini Island.

Recommendations for rule changes:

1. §13-257-5 Day use mooring buoy installation. Increase the minimum standard for size of mooring materials as described below in this chapter.
2. Revise the methodology for identifying and numbering day-use moorings. Create zones with labels indicating island and zone and number moorings sequentially within each zone. See example below in this chapter.

Recommendations for new rules:

3. Include all existing legal day-use moorings in HAR rules. Create a mechanism whereby all new day-use moorings added to the system are automatically covered by rule.
4. No rafting of boats on a single mooring. There may be exceptions in some areas but subject to approval by DLNR.
5. Only boats or other watercraft that drop anchors shall use day-use moorings. Other craft such as kayaks with no anchor shall not use a day-use mooring unless in an emergency.
6. All buoys shall be clearly marked to identify it as a legal day-use mooring.
7. No day-use moorings shall be altered, modified or changed in any way.
8. Day-use moorings are open to the public including commercial and non-commercial craft, on a first come, first served basis.
9. DAR should implement an administrative penalty for day-use mooring rule violations. Violators should receive a ticket with a similar fee schedule as other DLNR administrative sanctions such as those imposed for late fishing reports.

Recommendations that the following rules remain in force:

§13-257-2 Day use mooring permit. An owner of vessel using a day use mooring established under this chapter shall not be required to apply for a day use mooring permit from the department, except as otherwise provided in this chapter. Any use of a state day use mooring shall be at the sole risk of the owner or operator of the vessel using the mooring.

§13-257-3 Time limit. (a) The time limit for use of a day use mooring buoy by any one vessel shall not exceed two and one half hours when another vessel is waiting for the use of that mooring buoy, except as provided by section.

The question of shortening the time limit for use of day-use mooring with another vessel waiting was discussed at most workshops with no general agreement among users. Most commercial operators wanted the 2.5 hour time limit to remain in effect.

§13-257-3 Time limit (b) Overnight mooring is prohibited except in case of emergency or by enforcement or rescue craft.

The idea that day-use moorings should be used for overnight moorings was submitted at more than one of the island workshops. To safely moor a boat overnight may require different materials, installation methods, and mooring tackle than currently used. Such use would also require additional rules to manage use. At this time we do not recommend overnight mooring of vessels on day-use moorings.

An exception to no overnight mooring should be considered for live-aboard dive vessels that are currently using day-using moorings overnight at specific sites. A 24-hour watch is mandated by USCG rules on the vessels to ensure safety at mooring.

§13-257-4 Anchoring restrictions. Anchoring is prohibited within one hundred yards of any day use mooring buoy, except as otherwise provided in these rules. Anchoring elsewhere in a day use mooring zone is permitted in areas of sand, rock, or rubble bottom types where no live corals exist.

Although there was significant discussion at public workshops about this rule, it not only helps to protect coral from anchor damage, it establishes a safety zone between vessels and helps protects people in the water near a moored vessel. This rule also allows for some limits on intensity of recreational use and implements a de facto single entry point, further limiting potential damage to resources from recreational use.

Discussion and rationale for proposed rule changes and new rules

Recommendation #1: The number of larger vessels used by commercial dive and snorkel operators is increasing and expected to continue increasing in the future. Initially, the mooring design included only one single stainless steel pin suitable for small boats. The design was changed years ago to include two stainless steel pins connected by chain or stainless wire. This design made the moorings stronger and suitable for larger boats and for small vessels in rough conditions. Today, especially on the Kona Coast and areas on Maui, there are even larger vessels using the moorings. In order to safely accommodate these larger vessels, the mooring tackle (chain, mooring line, shackles, and buoy) needs to more heavy duty.

The current mooring design using two stainless steel pins and two mantas has proven to be an effective and safe design and no change is recommended. Material used in mooring tackle, however, has evolved over time as more information is learned and adaptive management practices have been used to increase the size of mooring materials. Vessel size has increased over the years as has the size of

mooring materials actually being used. The approved minimum standards, however, have not been changed since the day-use mooring program began.

It should be noted that vessel size as it relates to the appropriate size of mooring tackle is somewhat arbitrary because vessel size is not the only reason to have heavy duty mooring tackle. Vessel design and windage play an important role in the amount of stress placed on a mooring. Vessels such as catamarans can place increased stress on a mooring and vessels with significant windage may need heavier tackle.

In addition to larger vessels, there are other issues that increasing the size of mooring materials will address. Unfortunately not all boaters use prudent seamanship and may tie up to a mooring inappropriately. It is important to allow enough bowline scope to reduce the force and allow the mooring to absorb stress on the line (more scope also makes the boat 'ride' more comfortably on a mooring).

Recommendations for new minimum standards for mooring materials are shown below.

Minimum Standards for Mooring Materials	
Current	Recommended
3/8" stainless steel (S.S.) Chain or Cable	1/2" Galvanized Chain
7/8" Nylon Line (3 Strand)	1" Nylon Line (3 Strand)
3/4" stainless steel thimbles	7/8" Stainless steel thimbles
5/8" stainless steel shackles	5/8" galvanized shackles
18" reeving buoy (hole through center)	18" reeving buoy (hole through center)
Nylon line through buoy with fire hose chafe guard	1/2" galvanized chain through buoy

Recommendation #2: The numbering system used in the current rules in which moorings are numbered sequentially, e.g. DM01, DM02 along a coast line does not easily fit a statewide system and makes it more difficult to number if additional moorings are added e.g. DM01a. We recommend a method of creating mooring zones specific to each island. Using the zoning method and creating a separate numbering scheme within each zone would facilitate the addition of moorings within that zone. As an example on Oahu Maunalua Bay would be one zone (say OA), Mamala Bay another (OB), Ewa to Barbers Pt., Waianae coast (OC), etc. Within each zone the moorings are numbered for that zone (OA1, OA2, etc.). That way you can add or subtract within a given zone and not have to renumber for an entire island. So for Hawaii Island the zones would be HA, HB, etc. Maui MA, MB, etc.... This system also allows easy tracking for where a buoy may be missing or in need of repair by the zone it is in.

Recommendation #3: Currently only day-use moorings installed at Molokini Shoal Marine Life Conservation District and the original 46 moorings installed along the Kona Coast are included in Hawaii

Administrative Rules Chapter 13-257. It is not possible to properly manage or enforce rules of the extensive statewide system of moorings if they are not included in HAR rules. We strongly recommend that all of the existing legal (175) moorings be included in HAR rules. Additionally a mechanism needs to be created so that as day-use moorings are added to the system, they are automatically covered in HAR. An automatic inclusion mechanism for new moorings would eliminate the need to propose separate HAR changes that are cumbersome and time-consuming. Chapter 13-257 HAR already includes specific sections reserved for each island's day-use mooring sites throughout the main Hawaiian Islands.

Recommendation #4: Rafting of boats is when one boat is attached to a day-use mooring and another boat is attached to a line from the first boat, both using the same mooring. While rafting allows for more boats to use the area without dropping anchor and is generally acceptable with good seamanship and safety of snorkelers/divers in the water, we do not recommend the practice of rafting on day-use moorings. Rafting can increase the risk of potential boat collisions and safety of snorkelers or divers in the water. It can also increase the risk of damage to the mooring itself. Some exceptions at specific locations or during certain events may be acceptable but only with prior approval of DLNR. It would be better to install additional day-use moorings in areas where typical daily boat usage is greater than the number of available moorings.

Recommendation #5: Public input was received that there are times when watercraft with no anchors, such as kayaks use a day-use mooring. These types of watercraft typically do not anchor and their use of a day-use mooring may cause other boats to anchor rather than use a mooring. We recommend that only boats and water craft with an anchor use day-use moorings.

Recommendation #6: Input was received that legal day-use moorings lack any markings and consequently it is difficult for enforcement to know whether a mooring is a legal day-use mooring or one that was installed illegally without proper permits. To remedy this and improve enforcement of illegal moorings we recommend that a standard for marking buoys be established e.g. bright colored tape or symbol affixed to the mooring buoy, that will allow a legal day-use mooring to be clearly identified.

Recommendation #7: There have been instances where mooring tackle has been changed or additional tackle added to better suit a specific vessel. This practice undermines the effort to standardize all day-use moorings and can lead to an attitude of those altering the mooring that it has some proprietary rights. If additional materials are added to an existing mooring they may cause environmental damage or may cause the mooring to pose a safety risk.

Recommendation #8: The moorings being open to the public including commercial and recreational boaters has been a standard of the day-use mooring program. After a review of the existing rules it was found that this important foundational component of day-use moorings was not stated in current HAR and should be included.

Recommendation# 9: Users who violate the day-use mooring rules infringe on other boater's ability to use the moorings and may damage a mooring. If enforcement is to be effective appropriate fines ought to be a tool for officers in the field to ticket any user caught violating the rules. DLNR should also considering imposing stronger sanctions for serial offenders.

Recommended guidelines

Not all procedures for use of day-use moorings can clearly be developed into an enforceable rule and others need the flexibility to adapt as needed without new rule making. Following are recommended guidelines that enhance the safety of using day-use moorings and can significantly reduce the maintenance effort. These should be distributed to all boaters upon receipt of a harbor permit or small boat ramp permit.

1. Procedures should be followed for maintenance and installation of day-use moorings as described in the manual entitled *Day-Use Mooring Criteria, Installation and Maintenance Manual*.

It is important that all maintenance and installation of day-use moorings be done in a standardized manner to ensure the integrity of each mooring and the statewide system. Adaptive management is key with the manual being a dynamic document. Review of the manual is recommended every five years with revisions as needed to improve best practices.

2. Day-use moorings should not be used during storms or in heavy weather or swells. It is difficult to set a specific standard of sea conditions because there are some locations available that provide shelter from storm or dangerous sea conditions. It should be remembered that day-use moorings are strong and durable, but not indestructible. They were developed for use in relatively calm sea conditions.
2. Do not back down on moorings. When anchoring, a frequent boating practice is to back down by putting the vessel's engine in reverse. This provides tension on the anchor line and helps secure the anchor. This procedure on a day-use mooring is not appropriate because it puts unnecessary pressure and stress on the mooring and can damage, weaken or destroy it.
3. Typically, mooring failure is caused by the lack of prudent seamanship where a boater will tie up to a mooring with little or no scope. Boaters should NOT tie up directly above a mooring. Allowing sufficient scope reduces stress on the mooring thus extending its useful life and helping to ensure that the mooring is safe for the next boater. A 5:1 ratio of length of scope to length of vessel is a general guideline that helps maintain safety. There are some day-use mooring sites relatively close to shore, especially along the Kona coast, a shorter scope is needed in these areas to ensure vessel safety.
4. Use prudent seamanship and be 'gentle' to moorings. Take caution and use good seamanship to slowly approach and tie up to a mooring. Avoid excessive use of throttle and make an extra effort to be gentle. Treat moorings well and they will last longer.

It should be noted that not all rules fit all locations and needs. We recommend that specific rule exceptions and/or additional rules be considered for areas where conflicts with others may occur and a balance is needed between protecting coral from anchor damage and other public use, e.g. fishing. We recognize this makes enforcement more difficult and recommend consultation with DOCARE before additional rules or exceptions are granted.

Chapter 10 – Sustainable Funding

A majority of those who participated in public meetings and provided input agree that the current method of program funding through grants and donations is not sufficient to effectively implement and manage the day-use mooring program that consists of 175 moorings currently, nor the projected needs for future installations. Due to inconsistent management, there is no comprehensive database with the current status of installed moorings, but reports suggest many are in need of repair or maintenance. The significant number of installed moorings combined with a perceived need to add over 300 moorings in the next five years brings the near term need for moorings to over 500 statewide. Program funding needs will be significant and realistically beyond the scope of the current funding mechanisms.

Recommendations:

There were several funding options for the day-use mooring program identified during the DMB PLAN process. Identifying a single funding source to provide sustainable and reliable funding for the day-use mooring program proved a significant challenge. Below are funding recommendations in order of priority for consideration by DLNR. Funding for all elements of the program may come from more than one funding source.

1. A portion of the commercial permit fees (3% of gross revenue) paid to DOBOR by commercial operations should be allocated on an annual basis to help fund the day-use mooring program.
2. Establish an annual budget for the day-use mooring program within DAR to manage the program. The program and annual budget, including personnel, installation and maintenance, and other programmatic costs, should be included in the DLNR budget on an ongoing basis.
3. Grants such as the Dingell Johnson Fund utilized by DAR and the Recreational Boating Safety Grant funded through the USCG to DOBOR should be thoroughly evaluated for day-use mooring program applicability.
4. User fees from boaters using day-use moorings including commercial and recreational boaters.

There was no general agreement from participants regarding funding sources. A complete list of all participant funding suggestions is found in the APPENDIX N. Each of the funding options is discussed below.

Discussion and rationale for recommendations:

Recommendation #1: The commercial ocean recreation companies that use State harbors are assessed a 3% of gross revenue fee paid to DOBOR as a commercial use fee. The commercial ocean recreation industry includes operators providing scuba diving and snorkeling activities who are collectively the primary users of day-use moorings. Healthy coral reef ecosystems are intrinsic and critical to the financial health of the ocean recreation industry. Efforts to protect coral reefs at sites used by commercial operators thus help protect the economic viability of the industry. We recommend that a portion of the commercial use fee be used for the management and implementation of the day-use

mooring program. This action may require HAR changes and/or legislative approval. It is important to note that commercial operators that originate in private marina do not pay this fee and are not permitted by DLNR although many of them are also frequent users of day-use moorings. If these operators are ever covered by DLNR permit, the agency should consider equitable fees to support the day-use mooring program.

Recommendation #2: Protecting coral reefs from anchor damage in Hawaii is a public service and in the best interest of all residents and visitors. Protecting Hawaii's natural resources including the state's coral reefs is the responsibility of DLNR. DAR is the division within DLNR with the mandate and authority to implement marine resource protective measures.

The mission of the Division of Aquatic Resources is to manage, conserve and restore the state's unique aquatic resources and ecosystems for present and future generations. The DAR manages the state's aquatic resources and ecosystems through programs in commercial fisheries and resource enhancement; aquatic resources protection, habitat enhancement, and education; and recreational fisheries. Major program areas include projects to manage or enhance fisheries for long-term sustainability of the resources, protect and restore the aquatic environment, protect native and resident aquatic species and their habitat, and provide facilities and opportunities for recreational fishing.

Clearly the mission of the day-use mooring program is aligned and compatible with DAR's mission. For the reasons stated, we recommend that DAR include the day-use mooring program as one of its programs and include the cost of program management and implementation in its annual budget. Funding the program through the existing DAR budget is not seen as practical or achievable, especially in the current economic climate. A DAR program budget will need to be included in the administration package submitted to the 2011 state legislature. It is recognized that this it is not a simple process and has significant challenges. If DLNR is to be successful in its mission and the day-use mooring program fully realized, we believe this is the best approach for long term success.

Recommendation #3: Federal grants such as the Dingell Johnson Fund (DJ) and Recreational Boating Safety Grant are currently available to DLNR and there may be an opportunity to access funding for the day-use mooring program from one or both grant funds. A thorough evaluation of these programs is necessary to know if the day-use mooring program fit the criteria mandated by each grant fund. It should be noted that neither fund is necessarily reliable as they can change from year to year and not guaranteed on a long term basis. Grant funds may not a good long term funding option, but may help support initial start-up costs. One of the challenges with federal grant funds is the need for state match. The DJ fund requires a state matching amount. Although there are no state funds available for match, the DJ fund does accept in-kind matching from the states. This can include staff time and other in-kind resources provided by the state.

Recommendation #4: There were several suggestions from the public regarding user fees to be levied on those who use day-use moorings. There was general agreement among participants in the DMB PLAN that any user fees should go into a special fund dedicated to the support of the day-use mooring program and not into the general fund. User fees to commercial operators, recreational boaters, visitors, or combination of all should be considered. User fees could provide a mechanism in which to gather information on mooring use so that management practices might be improved. While it makes

sense to levy a fee on the users who benefit most from day-use moorings, there are significant challenges to its implementation. Some of the challenges are:

- User fees are difficult to assess equitably. While commercial dive and snorkel operators are known to use day-use moorings, there are recreational boaters who use them as well and not all commercial or recreational boaters use the moorings.
- Applying fees to groups who do not use day-use moorings would generate significant resistance and could be considered a tax, rather than a fee. There is no administrative procedure to levy a tax. All taxes must be approved by the legislature.
- User fees could only be applied after going through an administrative rule making process and would face significant public opposition, especially in the current economic conditions.
- If user fees were deemed acceptable and applied, it would be a challenge getting approval to put the collected fees in an existing special fund that would guarantee their use only for the day-use mooring program. Further, if a new special fund was to be created, it would have to be established by the legislature. These challenges are significant with no assurance of success.
- Without “no anchoring” zones, boat operators may decide not to use the day-use moorings and drop anchors instead.

Other sources for funding may be available but are not considered sustainable.

- Settlement fees or fines collected from coral damage events.
- Where a coral mitigation plan is needed due to a planned development, such as harbor dredging, the day-use mooring program could be considered suitable mitigation.

Other areas in the United States and in other parts of the world use different mechanisms and funding sources. Two examples are provided below to illustrate how other areas fund day-use mooring programs.

- In Florida the Florida Keys National Marine Sanctuary’s day-use mooring program is funded through the sanctuary’s annual budget. It includes funds for management, maintenance and installation of all moorings. Funding through the national marine sanctuary in Hawaii is not possible. The Hawaiian Island Humpback Whale National Marine Sanctuary is a one species sanctuary designed only to protect the Humpback Whale. They have no authority to implement programs that protect coral reefs but are currently going through a management plan review process that could change their authority.
- Australia’s Great Barrier Reef National Park has private moorings whereby a specific business or group of users pays for exclusive use of the mooring. Exclusive use of a marine area in Hawaii waters would receive significant public opposition and may require a lease from DLNR. Privately funded exclusive moorings may be an option within an MLCD. The park also has public moorings that ‘may be funded on a user-pays basis’ but to our knowledge this has not been implemented and the day-use mooring program is funded through the park authority’s annual budget.

Chapter 11 – Community Involvement

Community involvement is becoming an increasingly important component in the day-use mooring program. Since day-use moorings were first installed, there has been a growing awareness among ocean users and the broader community about the program. Comments submitted throughout the DMB PLAN development indicate that the potential for user conflicts in the near shore waters is increasing.

Recommendations:

1. Broad community input, including but not limited to, Native Hawaiian groups and fishers, should be sought and input received in the early phase of identifying and selecting appropriate day-use mooring sites.

Although commercial dive and snorkel operators are the primary users of day-use moorings, a greater effort is needed to reach other users. Some islands have organizations in place that provide a forum for commercial operators using day-use moorings, particularly the Island of Hawaii (MKF, Big Island Reef Fund, and UH Sea Grant) and Maui (Maui Reef Fund). The other main Hawaiian Islands do not have organizations that bring the commercial operators together. The statewide HIRSA organization has the potential to bring dive and snorkel operators together for discussions on day-use moorings.

There is an increasing need to reach out to a broader community, especially fishers and recreational boaters who historically have not been primary users of day-use moorings. Fishers and ocean tourism operators share the desire to protect Hawaii's coral reefs and both user groups know it is in their best interests to have healthy reef ecosystems. Although there is common ground, the activities of fishing and dive/snorkel tourism are sometimes seen in conflict with each other.

Obtaining input from fishers is especially important during the site selection and evaluation phase so that any potential user conflicts can be identified early in the process. As an example, fishers along the Waianae Coast are particularly concerned with the growing number of commercial operators using the near shore reefs for diving and snorkeling and their potential impact on fishing activity. In some of the areas used by local fishers there is a perception that day-use moorings will conflict with their long established fishing practices. Potential conflicts with established fishers in this area are exacerbated by the increased number of commercial dive or snorkel boats from Ko`Olina Marina and the perceived increase from the new marina planned by Haseko for the Hoakalei resort development. The recent DOBOR permit application that included four day-use moorings sited off Kahe Point, Oahu were perceived to conflict with akule fishing, providing a good example of potential conflicts created by or illuminated by the day-use mooring program.

Additional input should be sought from other groups and communities as well, including the surfing communities, canoe clubs, and community organizations. Although these groups are not typically users of day-use moorings they may have valuable input regarding other ocean users in the same area where moorings exist.

Native Hawaiian groups should also be consulted especially in the early site selection process to provide input on any potential sites that may have cultural or traditional significance that ought to be considered before site selection is finalized.

Chapter 12 – Outreach and Education

Recommendations:

1. Develop and implement a comprehensive outreach and education effort to increase public awareness and knowledge of day-use moorings.
2. Create and publish day-use mooring guidebooks for Kauai and Oahu.
3. Maintain a current website that includes all mooring locations, administrative rules, and use instructions.

Discussion and rationale for recommendations:

Recommendation #1: In order for a day-use mooring buoy program to succeed, the public must be well informed and feel positive about the program. We discovered through many hours of outreach that well informed users of the day-use moorings are very passionate about the program and protecting coral reefs. Conversely, we discovered there was a lot of misinformation regarding the day-use mooring buoy program and how it works. Greater outreach awareness and informative education to the entire public would benefit all involved. A successful program should include an outreach and education component to increase ocean users' awareness about how to use day-use moorings as well as the coral protection purpose of the program.

There are potentially thousands of recreational boaters that do not know public day-use moorings exist in Hawaiian waters, and if they do know the moorings are available they may not understand the importance of the moorings as a coral reef protection tool. Outreach is needed to educate recreational boaters about day-use moorings and how to locate them. Additionally, many of the recreational boaters that know there are moorings for use may not have the equipment needed to find them or know which landmarks to use.

A significant effort in finding ways to increase public awareness, education, and outreach regarding day-use moorings is needed to support the day-use mooring program. A comprehensive outreach and education plan properly implemented will likely increase the usage numbers and program success, ultimately providing increased long-term protection for Hawaii's coral reefs. Following are suggested means by which to accomplish this;

- Day-use mooring packets including GPS location of all moorings, administrative rules, and instructions for use provided at all vessel registration or permitting venues.
- Day-use mooring buoy guidebooks on each island.
- Day-use mooring public service announcements on local radio and television stations.
- Informative brochures designed and distributed at local DLNR offices, dive shops and marine/boating supply stores.
- Signage at local harbors.
- Articles in dive/boating/tourist publications/magazines.
- General information phone number regarding the usage, rules, and how to find locations of day-use moorings.

- Specific GPS card that users could purchase that listed all statewide locations of the day-use moorings.
- Website dedicated to day-use moorings to provide location, how to, and rule information.

With increased awareness and education of day-use moorings, there should be an increase in boaters using the moorings and a decrease in the number of anchors dropped on Hawaii's coral reefs.

Recommendation #2: There are currently no day-use mooring guidebooks for Kauai or Oahu. One of the most user-friendly public services that can be provided to the public is a hardcopy guidebook of locations of day-use moorings. In March 2005 MKF published a day-use mooring buoy guidebook for the Kona coast on the Island of Hawaii entitled "Dive West Hawaii Using Day-Use Moorings". In December 2009 MKF, as part of a grant from National Fish and Wildlife Foundation, published an additional day-use mooring buoy guidebook for Maui County entitled "Maui County Day-Use Moorings" (which includes Maui, Molokini and Lanai day-use moorings). Guidebooks are available from MKF and the Maui Reef Fund.

The guidebooks provide essential information about how to locate the day-use moorings as well as having other important information about the dive and snorkel sites. For example, in the Maui County guidebook there are chapters regarding general information about the day-use mooring buoy program, buoy diagrams, practices for proper use, and mooring rules, in addition to site descriptions and locations of the day-use moorings. These guidebooks are an excellent resource and it is our recommendation that each island should have a day-use mooring buoy guidebook available to the public. Guidebooks help ensure that day-use moorings are used properly and help with the long term success of the program.

Recommendation #3: A current website is an easily accessible and relatively inexpensive tool for information sharing. A website would be useful not only for boaters, but also other stakeholders who are interested in the program. This could also be a venue for vetting proposed sites and for posting relevant information about pending permits.

Chapter 13 – Enforcement and other Issues

Enforcement is a critical element in the success of the day-use mooring program. As noted earlier, only moorings at Molokini Shoals MCLD and the original 46 moorings along the Kona coast are included in HAR. In addition to enforcement there are other elements of the program that should be addressed to improve the program, e.g. environmental and social carrying capacity.

Recommendations:

1. Increase enforcement effort to discourage installation and use of illegal moorings.
 - a. Include removal of illegal moorings once a fully operational legal system of day-use moorings is established.
2. Review of proposed DMB PLAN rules by DOCARE for input and enforceability.

3. Consider environmental and social carrying capacity for existing and new sites where day-use mooring usage is significant.

Discussion and rationale for recommendations:

Recommendation #1: Repeatedly, there were concerns raised over the increasing number of illegal moorings that have been installed without proper permitting authority and without approved materials. Some illegal moorings use concrete, engine blocks, and other anchoring methods and were installed with a disregard to coral resources and are actually damaging coral. In order to encourage open participation, information regarding the locations and/or types of illegal moorings was not gathered and is not within the scope of the DMB PLAN.

Some of the illegal moorings have been installed by well-meaning individuals who are frustrated with the pace for approving appropriate day-use mooring sites and obtaining the proper permits. Many of these illegal moorings serve a similar purpose as do approved day-use moorings by protecting coral from anchor damage. These well-meaning individuals rationalize that it is better to protect coral with an illegal mooring than witness coral destruction from anchors while the site selection and permitting process grinds slowly forward. However, these illegal moorings are not necessarily available for public use, cannot be monitored, and are not necessarily serving the good of the resource and the public.

DLNR has not pursued discovery and removal of illegal moorings because of limited resources and because the agency recognizes that the alternative to these moorings is anchoring. However, if the state is to establish and manage an effective system, illegal moorings must be addressed.

Enforcement is a constant problem for many DLNR programs because of limited capacity and vast areas to monitor. Not all islands have boats regularly available to DOCARE officers and the limited number of officers themselves makes regular marine patrols impractical. As mentioned, not all existing day-use moorings are included in DOBOR HAR and therefore they are not subject to proper enforcement. This presents an increased challenge for DOCARE officers who need to know which moorings are enforceable and which ones are not.

Recommendation #2: DOCARE has not had an opportunity to review and vet the proposed rules changes for enforceability. Before any new rules are adopted, it is highly recommended that DOCARE review proposed rules and provide comments, especially on the enforceability of rules.

Recommendation #3: Environmental and social carrying capacities are increasingly important to the day-use mooring program as increasing numbers of people are using the same sites. Day-use moorings are tools that help provide for the sustainability of a coral reef at popular dive and snorkel sites. It does not serve the day-use mooring program, commercial operations, or recreational boaters to have increasing numbers of people with accumulated negative impacts that over time degrade our coral reefs. It also does not serve these stakeholders to have large numbers of people that negatively impact on the social character of experiencing Hawaii's underwater world. Environmental and social carrying capacity studies would help address these issues and should include input from users and other stakeholder groups as well as biologists. It is not in the scope of the day-use mooring program to provide spatial plans, but capacity should be considered in siting of moorings and all sites selected for a permit application should be consistent with any available site-specific management plans.

Potential Impacts on Endangered Species and other Marine Life

Potential impacts on marine life, especially species list under the Endangered Species Act, are important considerations for day-use mooring design and locations.

To date, there have been no known entanglements or injury to species covered by the Endangered Species Act by day-use moorings. Green sea turtles are frequently seen at day-use moorings sites and Hawaiian monk seals that frequent the shallow near shore waters are sometimes seen. By protecting coral from anchor damage, day-use moorings help protect the habitat for turtles and other marine animals. Moorings also decrease the likelihood that anchors may drop unexpectedly on animals that may be resting on the reef. Humpback whales have been seen occasionally near mooring sites, but typically are in deeper waters and there are no documented or reported direct interactions between marine mammals and moorings.

There have been two known instances of a manta ray being entangled in a mooring line; one instance on the Island of Hawaii and the other at Molokini Island. The incident near Kona involved a line from a swim-course marker buoy put in by an individual, but it was not a day-use mooring. The day-use mooring entanglement at Molokini involved a slack tagline that had been improperly added by an unknown party to the day-use mooring buoy setup. In addition, the mooring buoy on that particular day-use mooring was smaller than the recommended size resulting in less tension in the line. A mooring line that is not taut could contribute to the animal becoming entangled. Properly installed day-use moorings using appropriate size line and mooring buoy 18" or larger will keep the mooring taut making it more difficult for manta rays or other animals to be entangled. Consideration for manta ray safety should be included in the site selection process. Taglines at sites where manta rays frequent may not be appropriate.

Given the long term history of day-use moorings and the limited number of wildlife interactions, it can be concluded that day-use moorings do not pose a significant threat to marine life. However, any marine life harm that might be attributed to day-use moorings should be reported to DAR and investigated. Should marine life impacts become a growing concern, DLNR should address this concern in updates to the installation and maintenance manual and site-selection criteria.

Do Day-Use Moorings Increase Use of Area?

The answer to the question of whether day-use moorings fill existing needs for boats currently anchoring in an area or promote increased use of an area is not known. Unfortunately, there has been no monitoring of recreation activity or of day-use mooring use to provide these data needed to supply the answer. Currently there is no mechanism requires boaters to report usage. Several years ago the Marine Options Program at the University of Hawaii tried to assess day-use mooring usage by sending out questionnaires to dive shops. The effort was not successful because data was insufficient. While some operators reported their quarterly usage there was a general lack of response.

If day-use moorings are sited properly, boating and anchoring are already occurring there on a regular basis, and the moorings should fit the current boating activity level and the need to prevent anchoring and potential coral damage. If boating and anchoring activity increases at a site additional day-use moorings should be considered. It is not the intent of today's day-use mooring program to install moorings in areas where there is currently little or no boating and anchoring activity. Typically divers

and dive operators chose their dive sites because of what they can find and see at each site, not because there is a day-use mooring there. Each dive site has an underwater attraction that makes that site desirable for diving e.g., some sites feature turtles or rays, others have interesting formations, others offer calm shallow water good for teaching and novice divers, etc.

Underutilized dive sites might be a candidate for a day-use mooring which might have the potential to relieve some of the more popular heavily used dive sites or to reduce user conflict in multi-use areas. There are no studies to determine if operators would change their dive site preferences and an evaluation of this concept would not be possible unless there was a mechanism to track usage.

Data on day-use moorings use can be used to help evaluate the need for additional moorings and/or help inform managers regarding social and biological carrying capacity questions. Although a long term monitoring program is recommended, it is not practical until other areas of the day-use mooring are implemented and a mechanism to collect user data is determined.

There is an increasing concern regarding human activities on coral reefs and their potential impacts to the ecosystem. While usage data and numbers of people using an area would be very beneficial, it is not the only indicator of potential impacts. Studies should also be conducted on human behavior around and on coral reefs to fully inform good management decisions.

Chapter 14 – Estimated Costs and Pro Forma Budget

In order to estimate costs and develop a pro forma budget there are many assumptions which are identified in the budget details. The pro forma budget assumes that DLNR would have responsibility and oversight of the day-use mooring program, but that operational functions, such as inspection, maintenance, and installation of day-use moorings would be contracted out. Because of state laws, DLNR staff are not permitting to perform the underwater activities necessary to install moorings.

Two options are presented for the contracting of services and each option is detailed below with estimated costs. Option 1 is the preferred option. Option 2 is presented as an alternative option.

Option 1: Contract with a commercial diving company. This is the preferred option which would provide the best reliability for scheduling and execution of mooring inspection and maintenance and installation of new moorings.

Option 2: Contract with an NGO to work in partnership with the recreational dive industry. This option assumes that the recreational dive industry utilizes its exemption to federal and state occupational safety regulations for its SCUBA diving activities. The NGO would provide oversight and statewide coordination working in partnership with the recreational dive industry.

Additional assumptions are identified in the pro forma budget options. As with any pro forma budget costs are estimates only and do not necessarily reflect actual cost but provide a relative basis by which to better understand the financial scope of management and implementation of a day-use mooring program.

The estimated annual budgets are done for the first five years of the program. Estimated budgets for years 5 through 10 are not provided because material and labor costs will probably change and the

number of new installations will decrease. In the last 5 years of the 10 Year DMB PLAN, the installation of new day-use moorings will decline significantly, but the effort to maintain a greater number of moorings increases. This may reduce the overall annual estimated budget, but probably not by a significant amount. For cost estimation purposes we have used the same annual estimated budget costs for all 10 years. Any other method would need assumptions on assumptions and thereby not be very useful. Again, the purpose of the pro forma budget is to provide a sense of the financial scope for the day-use mooring program.

Given the assumptions presented below the total estimated annual budgets for the day-use mooring program for the two options described above are:

Contracted to commercial diving contractor = \$ 480,013 annually
Contracted to NGO-recreational dive industry = \$ 266,657 annually

Total cost over the next 10 years (assuming annual budgets above) is:

:

Contracted to commercial diving contractor = \$4,800,130
Contracted to NGO-recreational dive industry = \$2,666,570

The primary reason for the difference in cost between the NGO-recreational dive industry and a commercial diving contractor is that the recreational dive industry is not subject to federal or state occupational safety regulations that are applied to commercial diving contractors which raises cost. Additionally commercial diving contractors have much higher overhead expenses (larger work vessels, high paid workers, etc) and reasonable profit. The NGO-recreational dive industry option has lower overhead cost, discounted rates, and no profit expected.

Commercial Diving Contractor Option - Estimated Annual Budget

Cost estimates for the commercial dive contractor came from discussions with one of the larger commercial marine and diving services company in Hawaii. Costs would vary between contractors and there was no bidding competition which could result in cost savings.

Assumptions:

- DAR biologist site survey = \$1700 / day / two moorings
 - ½ day per mooring, boat, crew, and fuel = \$1200 per day – two mooring surveys per day
 - Two staff @ \$250 each/day=\$500/day total
 - Daily trips needed to survey 70 moorings = 35 trips
- Full Time Day-Use Mooring Manager = \$60,000 with fringe and overhead
 - Duties include: site vetting, community meetings, permit prep, database maintenance, website updates, contractor oversight and management, contract prep and management,
- Contractor for maintenance of existing moorings and installation of new moorings.
 - Estimated costs are from a well established commercial marine company
 - Estimates are considered to be very rough
 - Duties include periodic reports with maintenance and installation data

- Boat, fuel, divers per day = \$20,000
- Daily trips needed to install 70 moorings = 9 trips
- Additional trips/year for maintenance = 5 trips
- Website design = \$7,000
- Travel – 4 R/T, one person, each quarter (4) = 16 R/T
 - Estimated cost per round trip airfare and car rental = \$200/trip
- Education materials, handouts, maps, etc. = \$1,000

Commercial Diving Contractor Estimated Annual Budget			
Item	QTY	Cost	Total
Materials for standard moorings per year - new	53	539	\$ 28,567
Materials for Manta moorings per year - new	17	919	\$ 15,623
DAR biologist site survey	35	1,700	\$ 59,500
Full Time Day-Use Mooring Manager			\$ 60,000
Contractor, inspect, maintain, install (daily trips)	14	20,000	\$ 280,000
Material cost for maintenance (full replacement)	57	439	\$ 25,023
website design first year only			\$ 7,000
Website hosting			\$ 100
Travel expenses	16	200	\$ 3,200
Education materials, handouts, maps			\$ 1,000
TOTAL ESTIMATED ANNUAL BUDGET			\$ 480,013

NGO-Recreational Dive Industry Option - Estimated Annual Budget

The budget in this option includes costs for labor and boats as opposed to the current volunteer effort with labor and boats donated in support of the program. The estimated cost of labor and boats is at a discounted rate from actual rates. The discounted cost estimate was established through discussion with recreational dive operators. Although the dive operators that participate in the day-use mooring program under this budget option do not make a profit, out-of-pocket expenses are covered to a large extent.

Assumptions:

- NGO has capital outlay of \$50,000 to purchase three underwater drills. The capital costs are not included in the annual operating budget.
 - The cost to purchase an underwater hydraulic drill and all needed components, including the power unit, fluids, hoses, couplers, etc. is estimated at \$13,000+ per drill. Capital expense to purchase drills (3) and all related equipment is estimated at \$50,000.
- Maintenance and replacement parts for drills = \$5000 per year
- NGO would purchase and warehouse mooring materials with recreational dive operators
- Maintenance and Installation database record would be maintained by NGO and partners
- Moorings (new) statewide estimated for the next 5 years = 333 total

- Moorings (new) statewide to be installed each year over the next 5 years = 67 per year
- Estimated statewide number of manta moorings = 25% of total or 17 per year
- Estimated statewide number of pin moorings = 75% of total or 50 per year
- Estimated cost of boat, captain, crew (2 divers), fuel = \$1200 per day (this is minimum crew)
- Number of new moorings installed per day = 3
- Number of daily trips needed to install 67 moorings = 22
- Mooring maintenance done once per year- inspect and maintain = 8 / day
- Existing moorings = 223 (175 + 48 additional)
- Number of full day trips needed to inspect and maintain 223 moorings = 28
- Materials for mooring maintenance:
 - Full replacement of parts (excluding anchors) = 25% of total or 56/yr
 - Cost per full mooring replacement = \$439/mooring
- Maintenance and new install could be done on the same trip- in this budget separate trips are used
- NGO Administration:
 - Overall management, database maintenance, community outreach, permit assistance, grant writing, and website updates = \$40,000
- Travel – 4 R/T, one person, each quarter (4) = 16 R/T
- Estimated cost per round trip airfare and car rental = \$250/trip
- Education materials, handouts, maps, etc. = \$1,000
- DAR associated cost for site surveys = \$59,500
- DLNR Staff for contractor oversight and planning (1/2 time) = \$30,000

NGO – RECREATIONAL DIVE INDUSTRY ESTIMATED ANNUAL BUDGET			
Item	QTY	Cost	Total
Materials for standard moorings per year – new	50	539	\$ 26,950
Materials for Manta moorings per year – new	17	919	\$ 15,623
Administration and Management			\$ 40,000
Inspection and Maintenance of existing moorings (daily trips)	28	1200	\$ 33,600
Material cost for maintenance (full replacement)	56	439	\$ 24,584
Installation of 70 moorings (daily trips)	22	1200	\$ 26,400
Maintenance and part for underwater drills			\$ 5,000
Travel expenses	16	250	\$ 4,000
Education materials, handouts, maps			\$ 1,000
DAR biologist site survey	35	1700	\$ 59,500
DLNR Staff – contractor oversight and planning (1/2 time)			\$ 30,000
TOTAL ESTIMATED ANNUAL BUDGET			\$ 266,657

There should be a reduction in program costs in the long term when the number of new installations decrease and the system costs are primarily used for maintenance.

Chapter 15 – Implementation of the 10-Year Strategic Management Plan

It is intended that DLNR will eventually assume all management and implementation responsibilities for the day-use mooring buoy statewide program. The current economic slump and other changes needed within DLNR make a complete hand-over of the program from volunteers and NGOs to DLNR unfeasible in the immediate future. This DMB PLAN was not developed with the expectation that DLNR would have the ability to immediately and fully implement all elements of the day-use mooring plan. The ability to implement the DMB PLAN is largely dependent on sufficient funding and adequate staffing. Realistically, the program will grow only as these key elements become available.

In order for DLNR to properly prepare and manage the day-use mooring program an implementation outline is presented below for consideration.

1. DLNR determines which Division is best equipped to manage the mooring program
 - a. This will be determined based on Division priorities, staff capacity, and expertise
 - b. If the managing Division will need support and/or cooperation from other Divisions, necessary agreements and/or MOA's should be signed by Administrators before proceeding
2. Managing Division tasks staff member with capacity to take on coordination within DLNR
 - a. The Division establishes a key group of multi-division staff who will be convened to make decisions regarding program management
 - b. The Division establishes a chain for decision making
3. DLNR determines minimum capacity of the program
 - a. The cost needs of the program are somewhat scalable depending on how many new moorings are installed each year
 - b. The absolute minimum DLNR should consider must include monitoring and maintaining all installed and permitting moorings, maintaining a database of moorings, and an external outreach program to distribute locations, rules, and instructions for use
 - c. DLNR will investigate all legal issues and statutory authorities related to moorings
4. DLNR identifies sufficient funding and staff capacity for selected Division to manage the program at the minimum capacity
 - a. It will be critical to complete legal research prior to this point so that potential funding mechanisms are fully understood
 - b. DLNR must evaluate funding options in the DMB PLAN and decide which options to pursue
 - c. Managing Division evaluates potential grant funds to fill immediate needs
 - i. Staff time needed to obtain and manage grant funds should be thoroughly considered
 - ii. Needed match must be identified prior to submitting applications for grant funds
 - d. Managing Division meets with NGOs and appropriate partners to identify opportunities to fill immediate program needs not immediately supported by DLNR
 - e. Selected funding mechanism (may be several that change over time) is implemented
5. All involved Divisions (DAR, DOBOR, DOCARE) select appropriate rule packet and submit any necessary changes to BLNR

- a. Criteria for site-selection will be finalized and adopted within managing Division
 - b. Process for vetting sites prior to permit application will be finalized and adopted within managing Division
6. Managing Division drafts 5 year work plan for day-use mooring program considering funding and staff capacity
- a. All involved Divisions and multi-Division group should agree on work plan
 - b. NGO partners and stakeholders provide feedback on work plan and suggest partner opportunities
 - c. Work plan should make clear what staff positions are responsible for supporting each element of the program. Ideally, one person will be the lead for the program, but it is likely that several individuals will need to provide support
 - d. Final program adoption work plan is implemented