DLNR - DIVISION OF AQUATIC RESOURCES

DAR Fish Tagging Information Newsletter

FREE!

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Volume II, Issue 1

NEW STATEWIDE FISH TAGGING PROJECT FOR GOATFISH

Figure 1. Tagged moana. **Photo courtesy of Kewalo Keiki Fishing Conservancy**

DAR has expanded its fish tagging program to now include all species of goatfish or "weke" that are found in Hawaiian waters. So you may be asking yourselves, "Why goatfish?"

Members of the Goatfish or Weke family are popular food fishes with about 12 species found here in Hawaii. These include species such as the kumu, moana, malu, weke 'ula, moana kea and others. Goatfish are unique from other reef fish in that they possess a pair of barbels on their chin which function as sensory organs used most importantly for finding and recognizing food buried in the sand. Almost any fisherman or diver has observed at least once, a weke probing the sand with their barbels looking for prey. Common in inshore waters, many are considered desirable food fishes supporting valuable cultural, commercial and sport fisheries in Hawai'i. The young juveniles of two species in particular, the white weke, *Mulloidichthys flavolineatus* and the red weke, *M. vanicolensis*, are known as 'oama and provide a valuable recreational fishery for local families. 'Oama are commonly found in shallow sandy areas during the late summer and are highly sought after by shoreline fishermen for consumptive use as well as bait for papio and other predators. The abundance of some of these species has changed drastically over the years raising concerns by local fishermen about the condition of Hawaii's goatfish resources today. To address this problem, one of the first steps we need to take is to find out what the current condition of Hawaii's goatfish resources are like.

Those of you that are familiar with DAR's Ulua Tagging Project know that it was instrumental with assisting DAR in gaining a lot of information, some of which was previously unknown, that helped us to understand what the current condition of the ulua and papio resources are like today. Having gained this better understanding of the ulua and papio fisheries not only makes us more aware and better fishermen, but it has also allowed DAR to determine what management strategies are working and which ones need to be updated to help us maintain this important fishery resource.

With your help, we can do this again for Hawaii's goatfish resources too. After all,who else can relay the best information possible on the goatfish resources besides avid anglers like yourselves who are indeed the experts when it comes to the goatfish or weke fishery? We are again asking for your help as volunteer anglers to help us capture, tag and release goatfish to obtain more information on each of these species. Through this cooperative effort with your assistance, our objective is to gather information on the following:

- Size distribution of fish caught and/or released by fishermen.

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- Updates on growth curve information.
- Stock distribution and abundance throughout the islands based on the numbers of fish tagged and recaptured.
- Determine movement/migration and habitat patterns of the goatfish.

Our ultimate goal of this project is to promote conservation and management of the resources while providing for the needs of recreational, commercial and subsistence fishing for the people of Hawaii.

**A Note to Potential Volunteer Anglers*

Those of you that have previously or currently are participating in any of our volunteer tagging programs are familiar with the tagging process. However, goatfish are known to be somewhat skittish and are not as hardy or tough as some of the other types of fish such as the ulua and papio when it comes to tagging them. In this respect, we are asking you to carefully read the "Instructions for Tagging Goastfish" manual in your kit and to add a container as part of your tagging equipment that is big enough to hold some sea water for the weke to rest in to minimize trauma and damage to the fish. This container can be a plastic or foam container (tray or cooler) with just enough water for the fish to swim around in. If you have a portable aerator, you can use it to aerate the water too which will help in making the fish more comfortable.

Can goatfish be tagged safely?

There were some concerns by a few fishermen that tagging goatfish may be a bit stressful for the goatfish since they are not as hardy as the ulua and papio and may not do as well in surviving the tagging process. DAR was concerned with that as well so we asked a few of our taggers to help us over the past year with a limited trial run of tagging weke to see if, in their opinion, other volunteer anglers could do it safely without badly traumatizing the fish. In addition, DAR Fishery Technicians ran some tagging studies at the Anuenue Fisheries Research Center on some captive goatfish to see how they cope and survive with the tagging process.

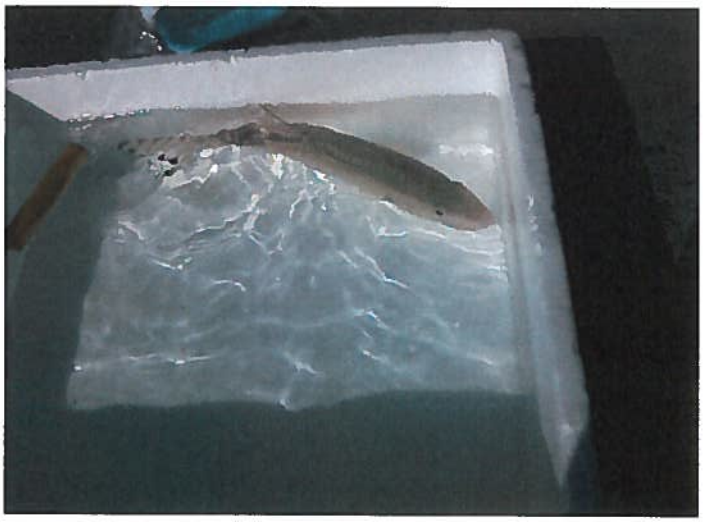


Figure 2. Tagged Obake weke resting in styrofoam container before release. **Photo courtesy of Kewalo Keiki Fishing Conservancy**

It was determined that the goatfish do well with a smaller tag that is the same size as the tag that we use for tagging moi. Through the initial trial run for tagging goatfish along the shoreline, our volunteer anglers determined that other volunteer anglers could tag goatfish safely and effectively if they allow the fish to rest and recover in a container with sea water and limit the amount of time spent for the tagging process. All of their suggestions and input have been incorporated into the Instruction manual for tagging goatfish.

We would like to thank our volunteer anglers, the Kewalo Keiki Fishing Conservancy, Mark Gonsalves, Kelvin Otaguro, Garey Lester and Wayne Dang, who have all graciously taken the time to do a trial run for us and provide their feedback on how we can move foward with everyone being able to tag the goatfish safely.

With that being said, if anyone is interested in volunteering for the Fish Tagging Project for Goatfish and would like to request a Goatfish Tagging Kit, please choose one of the following options:

1) For phone requests call (808) 587-0593.

2) Email requests may be sent to:
<fishtagging@hawaii.gov>

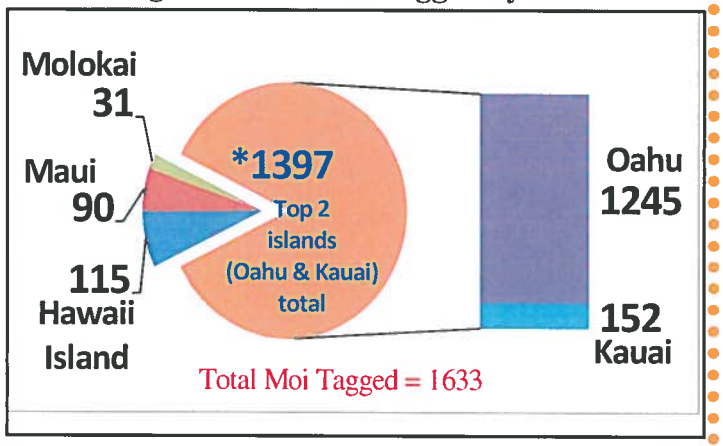
3) For mail-in requests, write down on a piece of paper your name, address, phone number and email address and mail to:

DAR Fish Tagging Project
Division of Aquatic Resources
1151 Punchbowl St., Rm. 330
Honolulu, Hawaii 96813

MOI TAGGING UPDATE

As of May 2016, we have 223 volunteer moi taggers throughout the state who have tagged a total of 1633 moi with 41 recaptures (roughly a 2.5% recapture rate). Below is a pie chart showing the numbers of moi tagged on each island so far:

Figure 3. Total Moi Tagged By Island



Recaptures are still few and far between, but the tagging data has been slowly and steadily coming in. We aren't really sure why the recaptures are pretty low. Taking stock in what we've seen so far:

1) Shoreline sampling data collected inshore of the Waikiki Diamond Head area shows that the recruitment of moilii begins to happen around June or July and peaks around November and December.

2) The moilii (2 to 3 inches in length), stay near the shoreline areas and will begin venturing a little further away from the shoreline as they reach between 4 to 10 inches in length (pala moi) (Fig. 4).

3) The larger pala moi are probably a mix of mostly hermaphrodites (male/female) with a few fully functioning females. Moi over 10 inches in length start to move even further out from the shoreline and are probably mostly females.

4) Some years the moi fishery seems to be slow (fewer fish being tagged) while other years the moi catches increase (more numbers of moi tagged).

5) Moi are able to swim across the channel between islands

6) There seems to be a relationship between total yearly rainfall (30+ inches) and an increase in commericial landings 2 years later on Oahu (Figs. 5a, 5b & 5c).

Questions still pending:

1) Are there larger moi found further offshore in deeper waters? Could this be why the tag and release data for larger moi near the shoreline consists of only less than 20% of the total fish tagged? Where are all the larger (11+ inches) moi going?

Fig.4. Moi recruitment and population frequency distribution within the WDH study site in 2006

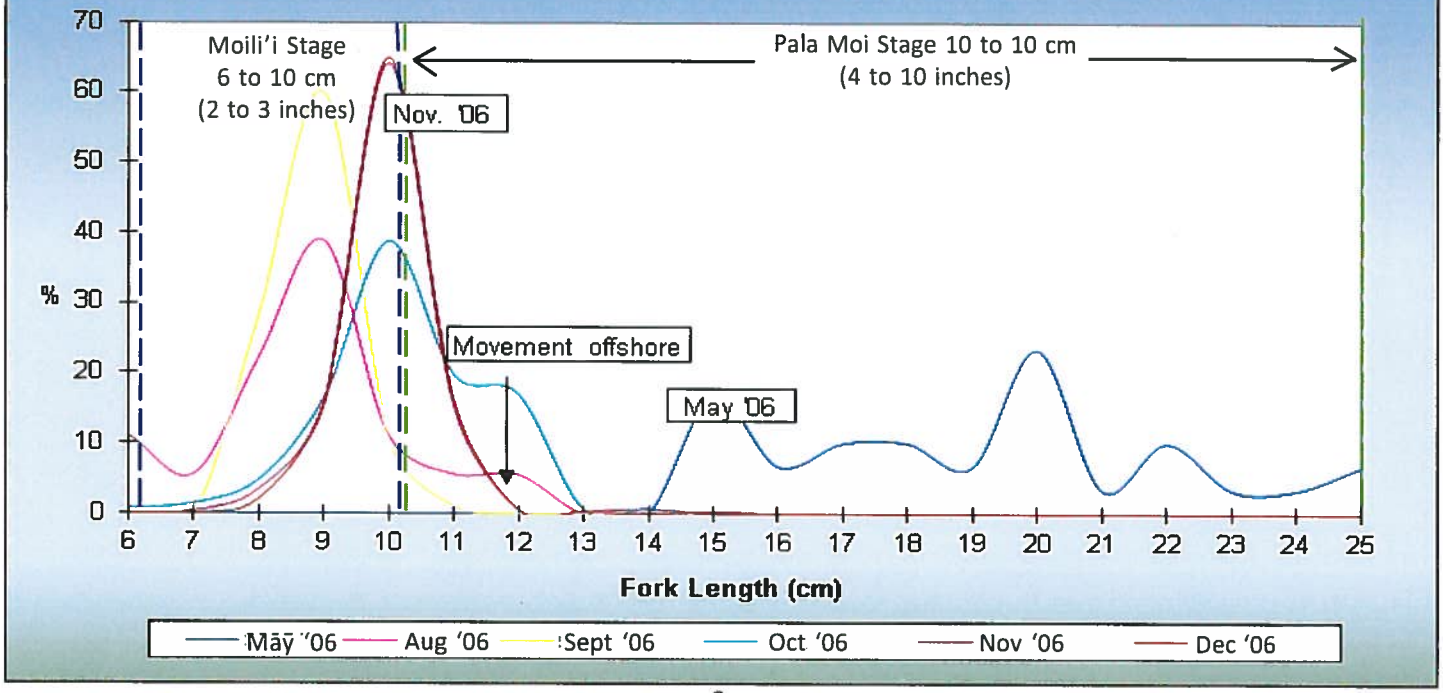
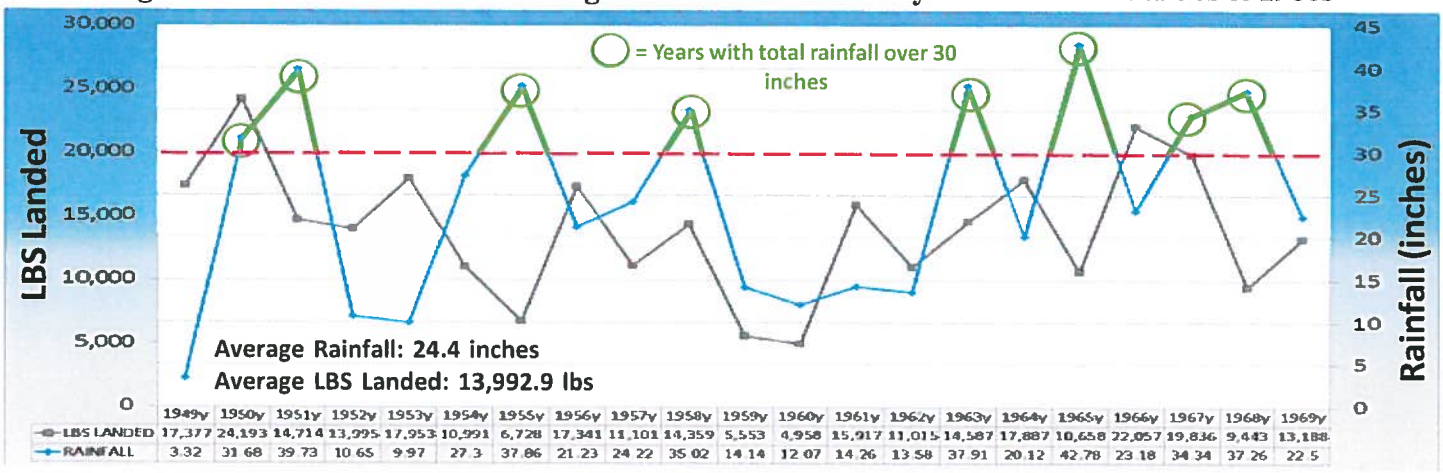
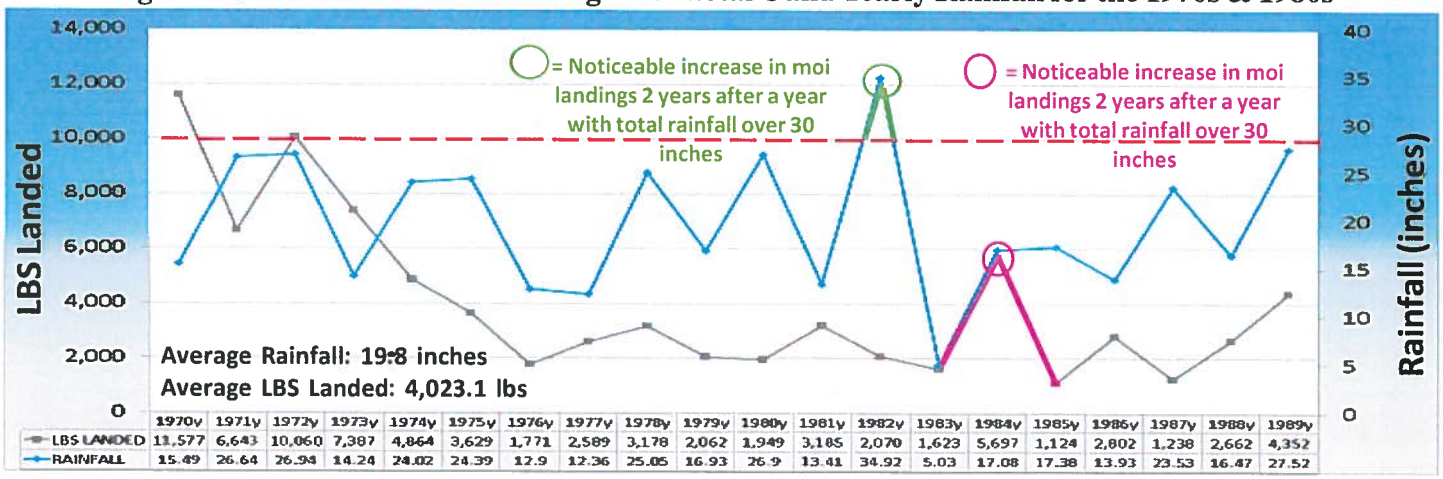


Figure 5a. Moi Commercial Landings with Total Oahu Yearly Rainfall for the 1950s & 1960s



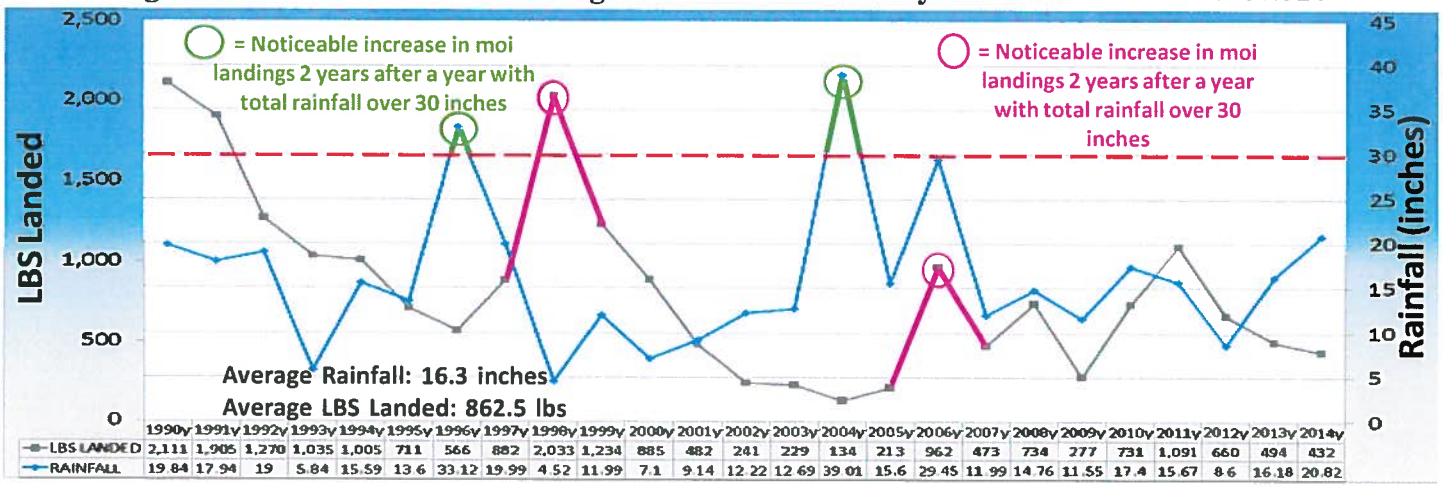
	1949y	1950y	1951y	1952y	1953y	1954y	1955y	1956y	1957y	1958y	1959y	1960y	1961y	1962y	1963y	1964y	1965y	1966y	1967y	1968y	1969y
LBS LANDED	17,377	24,193	14,714	13,995	17,953	10,991	6,728	17,341	11,101	14,359	5,553	4,958	15,917	11,015	14,587	17,887	10,658	22,057	19,836	9,443	13,188
RAINFALL	3.32	31.68	39.73	10.65	9.97	27.3	37.86	21.23	24.22	35.02	14.14	12.07	14.26	13.58	37.91	20.12	42.78	23.18	34.34	37.26	22.5

Figure 5b. Moi Commercial Landings with Total Oahu Yearly Rainfall for the 1970s & 1980s



	1970y	1971y	1972y	1973y	1974y	1975y	1976y	1977y	1978y	1979y	1980y	1981y	1982y	1983y	1984y	1985y	1986y	1987y	1988y	1989y
LBS LANDED	11,577	6,643	10,060	7,387	4,864	3,629	1,771	2,589	3,178	2,062	1,949	3,185	2,070	1,623	5,697	1,124	2,802	1,238	2,662	4,352
RAINFALL	15.49	26.64	26.94	14.24	24.02	24.39	12.9	12.36	25.05	16.93	26.9	13.41	34.92	5.03	17.08	17.38	13.93	23.53	16.47	27.52

Figure 5c. Moi Commercial Landings with Total Oahu Yearly Rainfall for the 1990s to 2014



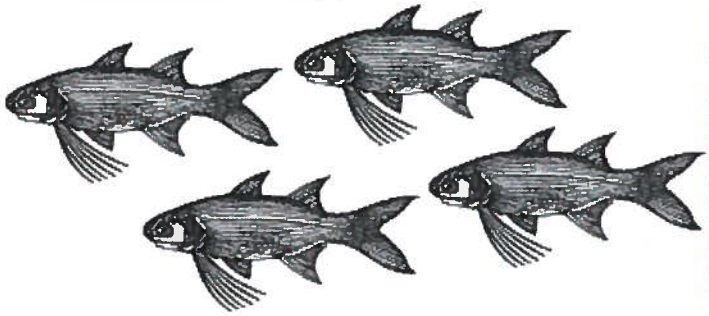
	1990y	1991y	1992y	1993y	1994y	1995y	1996y	1997y	1998y	1999y	2000y	2001y	2002y	2003y	2004y	2005y	2006y	2007y	2008y	2009y	2010y	2011y	2012y	2013y	2014y
LBS LANDED	2,111	1,905	1,270	1,035	1,005	711	566	882	2,033	1,234	885	482	241	229	134	213	962	473	734	277	731	1,091	660	494	432
RAINFALL	19.84	17.94	19	5.84	15.59	13.6	33.12	19.99	4.52	11.99	7.1	9.14	12.22	12.69	39.01	15.6	29.45	11.99	14.76	11.55	17.4	15.67	8.6	16.18	20.82

2) If there are larger moi further offshore, do they migrate inshore to breed and spawn since it is assumed that the majority of the larger moi are females and a larger portion of males seem to be found a little closer to shore?

3) Will we see population increases for moi if Oahu's rainfall increase to yearly totals of 30 inches or more mirroring what we used to see for both rainfall and the moi populations back in the 1960s?

4) Is it possible that the estuary environments mainly found on Oahu and Kauai serve as nursery grounds for the bulk of the moi fishery for the rest of the state?

5) Is the moi population in Hawaii one genetic stock that mixes between the islands or are there distinct populations between islands?



Clearly there are no easy answers to some of these questions. Some will have to stand the test of time while others depend on further information that we can obtain through continuing the tag and recapture efforts for the moi. Assistance from our volunteer anglers is always needed and deeply appreciated for all the effort they put in toward helping us with this tag and recapture study.

ULUA & PAPIO TAG RECAPTURES

Even though the DAR Ulua Tagging Project ended in June 2012, we will continue to honor all recaptures as they are reported to us. Within the last 12 months anglers have reported the following 23 recaptures: 7 kahala (all recaptured on Hawaii Island), 2 omilu (one recaptured on Oahu and one recaptured from Kauai) and 13 white ulua/papio (7 from Oahu, 5 from Hawaii Island and one from Kauai) - no channel crossers reported.

Mahalo to all of you who have reported your recaptures.

Table 1. Seven Kahala Tag Recaptures 6-13-15 to Present

	Range	Average
Fork Length Tagged	23 to 57 inches	37.83 inches
Fork Length Recaptured	38 to 60 inches	46.43 inches
Days of Freedom	1991 to 3127 days (= approx. 5.5 to 8.6 years)	2554.5 days (= approx. 7 years)

Table 2. Two Omilu Tag Recaptures 6-13-15 to Present

	Range	Average
Fork Length Tagged	9 to 9.5 inches	9.25 inches
Fork Length Recaptured	12.5 to 13.5 inches	12.875 inches
Days of Freedom	27 to 41 days	41.5 days

Table 3. Thirteen White Ulua/Papio Tag Recaptures 6-13-15 to Present

	Range	Average
Fork Length Tagged	7 to 9.5 inches	29.25 inches
Fork Length Recaptured	13.5 to 48 inches	34.79 inches
Days of Freedom	40 to 3772 days (= approx. 1.3 months to 10.3 years)	1333.44 days (= approx. 3.7 years)

Please continue to report your recaptures as the data is still important to us providing valuable information on growth and movement for these species.

REMINDERS FOR TAGGERS ...

FISH TAG RECAPTURES

If you happen to catch a tagged moi or ulua/papio, please call our recapture hotline at 832-5003 moi recaptures and 587-0593 (ulua, papio and goatfish recaptures or email us your recpture data at <fishtagging@hawaii.gov>. DAR will award each angler for each recapture with the following information:

1) WHO (angler name)
2) TAG NO (tag i.d. no.)
3) WHEN (date)
4) WHERE (locale caught)
5) TIME (time caught)
6) SIZE (fork length)
7) FISH (species)
8) KEPT OR RELEASED

DAR FISH TAGGING PROJECT VOLUNTEER

Interested in becoming a volunteer tagger for the DAR Fish Tagging Project? Call Annette Tagawa at 587-0593 or email at fishtagging@hawaii.gov.