World Turtle Trust- Hawai'i Island Hawksbill Turtle Recovery Project

NOAA Fisheries Grant Final Report

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Project Goals

The objectives of the Hawai'i Island Hawksbill Turtle Recovery Project (HIHTRP) based at Hawai'i Volcanoes National Park (HAVO) were: 1) To manage and protect hawksbill sea turtle nesting habitat on the island of Hawai'i by monitoring nesting beaches and ensuring hatchlings safely reach the ocean; 2) To collect baseline data on Hawaii's nesting hawksbill population and facilitate informed management decisions; 3) To protect, restore, and manage coastal and ocean resources by controlling non-native predators and vegetation; 4) To implement several of the actions needed to achieve recovery for the hawksbill sea turtle as identified by the FWS and the NMFS 1998 Recovery Plan; 5) To assist recovery and maintenance of healthy and productive coastal and marine ecosystems that benefit society; 6) To promote public stewardship of coastal and marine ecosystems through outreach and interpretation efforts; 7) To survey coastline to identify undocumented nesting habitat.

Funding sources from 2010 to 2015 varied. For the 2015 season funding was provided in part by National Park Service (NPS) - HAVO, NMFS Pacific Islands Regional Office (PIRO), Hawai'i Pacific Parks Association (HPPA), and a donation from The World Turtle Trust (WTT).

From 2010 to 2015, 115 volunteers and 20 interns contributed to the project. During the 2015 season, project personnel consisted of a quarter- time University of Hawai'i (UH)-Pacific Cooperative Studies Unit (PCSU) project coordinator, a full- time UH- PCSU technician, 16 full-time NPS Volunteers-In-Parks (VIPs), and eight part-time volunteers. UH interns and full-time volunteers contributed varied amounts of time to the project, ranging from two to six months.

Activities

Each time a nesting turtle was observed, the times and types of nesting activities were documented. Weather, tide, moon phase, and moon presence were recorded when the turtle was initially observed. Times of crawls, digs, egg laying, covering, and returning to the ocean were also recorded. Upon heading back to the ocean, field personnel briefly restrained the turtle to check for any injuries, abnormalities, and tag numbers. If the turtle had not been previously tagged or if the tag(s) had come off, size 681 inconnel style tags (National Band and Tag Co., Newport, KY) were applied proximal of and adjacent to the first large scale on the posterior edge of the flipper. These tags were supplied by NMFS – Marine Turtle Research Program (MTRP) in Honolulu. Furthermore, if the turtle was untagged, personnel scanned her rear flippers for PIT tags (Passive Integrated Transponder) with a Biomark Pocket Reader. Standard carapace measurements were taken using calipers. Data collected was used to calculate individual remigration interval, nest-to-attempt inter-nesting interval, nest-to-nest inter-nesting interval, and carapace size.

Nest sites were marked and identified by date, turtle ID number, turtle tag numbers, observers. All dates of hatchling activity were recorded. During the hatchling emergence phase, nests were continuously monitored for signs of activity. Personnel counted hatchlings and ensured their safety to the ocean. No less than 24 hours after the main hatchling emergence, nests were excavated to inventory nest contents and rescue trapped hatchlings. Data collected was used to calculate incubation period, nest contents, clutch size, and nest success. The specimens collected from each season were shipped to the Pacific Islands Fisheries Science Center.

Nests were closely guarded throughout the season by field personnel. Small mammal live traps and Wildlife Control Supply (WCS) tube traps were baited, set, and checked twice daily while camping at sites to control mongooses (*Herpestes auropunctatus*), rats (*Rattus* sp.), and feral cats (*Felis catus*). Captured animals were humanely euthanized using carbon dioxide. This method was recommended by the American Veterinary Association's (AMVA) panel on euthanasia. The species and sex of each predator was recorded. Wire mesh nest enclosures (screens) were constructed over the nests observed at Halapē, Pōhue Bay, and Punalu'u to provide further protection from predators,

vehicles, and humans. After 45 days of incubation, nest enclosures were cut open to prevent trapping any hatchlings.

Project personnel provided extensive on-site and off-site interpretation in both formal and informal settings. Personnel provided informal learning opportunities at nesting beaches when interacting with the public. Many of these people were able to witness emergences or nest excavations while camping. The public nest excavations that occurred in 2014 and 2015 at Punalu'u were well attended with over 100 people at each event (fig. 1&2). Community outreach events attended by project personnel included UH-Hilo Ocean Day, Conservation Career Day, Hawaii Community College Earth Day and UH-Hilo Earth Day (fig. 3&4). Formal classroom events were held at Mountain View Elementary, Pahoa Elementary, and Ka'u High School. Students from the Volcano School of Arts and Sciences, Imi Pono no ka Aina program, Project Dragonfly Earth Expedition, and Hawaii Academy of Arts and Sciences participated in educational activities at Punalu'u including marine debris clean-ups. Students from the Youth-In Parks Program at Hawai'i Volcanoes National Park, Imi Pono no ka Aina program, and UH- Hilo Marine Option students participated in night monitoring at Kamehame (fig. 5&6).



Figure 1&2: Personnel conducting public nest excavations at Punalu'u in 2014 & 2015.



Figure 3&4: Personnel at community outreach events.



Figure 5&6: The Youth In Park students that participated in night monitoring at Kamehame and a nest excavated conducted with students.

Summary of results from 2010-2015

A total of 86 adult female hawksbills were observed from 2010-2015; one at 'Āwili, one at Humuhumu Point, three at Kōloa, ten at 'Āpua Point, five at Halapē, 31 at Pōhue Bay, and 36 at Kamehame (fig. 7). In 2012 turtle ID #73 was seen at both 'Āpua Point and Pōhue Bay. Forty-two of these hawksbills were newly tagged and the remaining 44 individuals were returnees tagged in previous seasons. The number of adult female hawksbills tagged on Hawai'i Island is 142 since 1991(see Appendix for tables of identification information for observed turtles from 2010-2015).



Figure7: Number of newly tagged compared to returnee hawksbills by year, 1991-2015, Hawai'i Island, HI.

A total of 255 confirmed hawksbill nests were documented on Hawai'i Island; three at Punalu'u, three at Humuhumu Point, four at Kahakahakea, six at Kōloa, ten at 'Āwili, 18 at Halapē, 34 at 'Āpua Point, 73 at Kamehame, and 104 at Pōhue Bay. Additionally, in 2010 one olive ridley nested at 'Āwili and in 2011 one green sea turtle nested at Pōhue Bay. Seven total nests were translocated between 2010 and 2015. Approximately 30,393 hatchlings safely reached the ocean from the nests over the six seasons. A total of 107 of the hawksbill nests were screened with wire mesh enclosures to protect them from predators and recreational beach users. Predator trapping has resulted in the removal of 746 total predators that includes 415 mongooses, 309 rats, and 22 cats caught amongst the sites.

2015 season results

2015 was the most successful nesting season in the history of the project. A total of 25 adult female hawksbills were observed this season; two at 'Apua Point, one at Halape, fourteen at Kamehame, and eight at Pohue Bay. Thirteen of these hawksbills were newly tagged and remaining twelve individuals were returnees tagged in previous seasons. These neophyte breeders bring the number of adult female hawksbills tagged on Hawai'i Island to 142 since 1991 (fig. 7). A total of 67 confirmed hawksbill nests were documented on Hawai'i Island; seven at 'Apua Point, 25 at Kamehame, two at Punalu'u, three at Halape, 28 at Pohue Bay, and two at Kahakahakea (fig. 8). These nests were documented by personnel observing the female laying, by probing areas of disturbed sand near adult tracks, or depressions in the sand indicating emergence activity and hatchling tracks. All of these sites have had additional tracks and digs that were found during day checks or upon arrival to the site, indicating the potential for more possible nests. Adult hawksbill tracks were also documented at Koloa, Ninole, Awili, and Pu'u Ki. A total of 28 of the nests were screened with wire mesh enclosures to protect them from predators and recreational beach users. Three nests were translocated this season. Two of the nests were at Pohue and laid within the inundation zone. The other nest translocated was a partial nest at Kamehame that was found being washed away due to high surf.



Figure 8: Nest laid by identified turtles vs. nest laid by unidentified turtles.

At Kamehame continuous coverage was inconsistent due to safety concerns involving negative public interactions at Kamehame. These interactions involved individuals that arrived at Kamehame during night monitoring, traveling on foot from Punalu^u or via all-terrain vehicles, and are suspected to be users of methamphetamine. Night monitoring would only occur if three volunteers and one or two members of the National Park Resources Management crew were available. Frequent threats from tropical storms also disrupted monitoring efforts at all locations.

Predator trapping occurred at 'Āpua Point, Halapē, Kamehame, and Pōhue Bay. The cumulative predator trapping effort consists of traps open for 209 days. The number of traps varies at each site. This effort has resulted in the removal of 146 total predators that includes 105 mongooses, 40 rats, and one cat caught amongst these sites. In addition to the standard traps, WCS

Tube Traps have been tested at all four sites. The WCS Tube Traps were found effective as a majority of the rats caught were caught in these traps.

2015 Site Summaries

'Apua Point

Monitoring started at 'Āpua Point on April 30, 2015. The first activity documented was T131 false nesting on June 6th, 2015. The last nest excavated was on November 1st, 2015. Project personnel conducted 141 monitoring nights (2324 worker nights) and 52 day checks (128 worker days) to monitor and protect the hawksbill nests at 'Āpua Point this season. Worker nights/days equal the number of monitoring nights/days multiplied by number of personnel.

Seven nests were confirmed at 'Āpua Point. Two turtles were identified; both newly tagged (ID #s 131 and 136). Numerous unobserved crawls identified by tracks, resulted in many areas being deemed as possible nests.

Turtle ID# 131 was newly tagged this season. She made nine observed crawls that resulted in three confirmed nests. Her nest-to-crawl inter-nesting interval was 18 days (n=2). Her SCL was 70.7 cm.

Turtle ID# 136 was newly tagged this season. She made five observed crawls that resulted in two confirmed nests. Her nest-to-crawl inter-nesting interval was 16 days (n=1). Her nest-to-nest inter-nesting interval was 17 days (n=1). Her SCL was 75.0 cm.

Approximately 652 hatchlings safely reached the ocean from the seven nests that were excavated this season, including 10 that were rescued by personnel during excavations. The mean incubation time was 63.4 ± 4.3 days (n=5) with a range of 56 to 67 days. Nest 6 and nest 7 were not included in incubation time totals because the nests were not observed laid and therefor the exact incubation time is unknown. The mean clutch size was 144.8 ± 26.9 eggs (n=7) with a range of 117 to 189 eggs. The mean nest success was $63.5 \pm 0.2\%$ (n=7) with a range of 43.3% to 96.9%.

Depredation was documented on one nest (N3) by project personally after observing two eggs shells and the nest's bobbers above the sand. None of the other nests were depredated. None of the seven nests were screened. Non-native predator control efforts resulted in the removal of 55 animals from the nesting area: 32 rats (28 male, four female) and 23 mongooses (16 male, seven female). Trapping effort consisted of eight traps set for 81 days.

Keauhou

Monitoring began on May 28th, 2015 and no activity was observed this season at Keauhou. Eighty-seven day checks were conducted (208 worker days). These day checks were performed by personnel that were night monitoring at 'Āpua Point and Halapē.

Halapē

Monitoring started at Halapē on May 9^{th} , 2015. The first activity documented was adult tracks observed on June 6^{th} , 2015. The last nest was excavated on October 25^{th} , 2015. Project personnel conducted 26 monitoring nights (123 worker nights) and 72 day checks (169 worker days) this season. Day checks were performed by personnel that are night monitoring at 'Āpua Point.

Three nests were confirmed at Halapē. One turtle was identified, a returnee (ID # 83). Numerous unobserved crawls identified by tracks, resulted in many areas being deemed as possible nests.

Turtle ID# 83 was originally tagged at Halapē in 2008 and this was the only other documented nesting season since then. She made two observed crawls; one crawl with no documented nesting attempts and one crawl where she false nested with no confirmed nest. Her SCL was 79.8 cm.

Approximately 483 hatchlings safely reached the ocean from the three nests that were excavated this season, including 37 that were rescued by personnel during excavations. Incubation time was unknown for these nests because they were not observed being laid. The mean clutch size

was 193.3 ± 18.5 eggs (n=3) with a range of 175 to 212 eggs. The mean nest success was $83.6 \pm 0.2\%$ (n=3) with a range of 55.7% to 97.7%.

Current non-native predator control efforts resulted in the removal of 49 animals from the nesting area: 46 mongoose (27 male, 19 female), two male rats and one male cat. Trapping effort consisted of six traps set for 27 days so far this season.

Kamehame

Monitoring began on March 18^a, 2015 which consisted of day checks. The first activity was adult tracks observed on May 14^a. The last excavation was November 10^a, 2015. Project personnel conducted 65 monitoring nights (219 worker nights) and 46 day checks (125 worker days) to monitor and protect the hawksbill nests at Kamehame. Coverage was also inconsistent this season due to safety concerns with negative public interactions at Kamehame. These interactions involved individuals that arrived at Kamehame during night monitoring, traveling on foot from Punalu^cu or via all-terrain vehicles, and are suspected to be users of methamphetamine. Night monitoring would only occur if three volunteers and one or two members of the National Park Resources Management crew were available.

Fourteen turtles were identified, six returnees (Turtle ID#s 22, 30, 39, 41, 74, 102) and eight newly tagged (Turtle ID#s 133, 134, 135, 137, 138, 140, 141, 142). Twenty-five total nests were confirmed at Kamehame this season. Nest 15 was partially washed away resulting in the remaining eggs to be translocated (Figure 9). Numerous unobserved crawls identified by tracks, resulted in many areas deemed as possible nests.



Figure 9: Project personnel translocating nest 15.

Turtle ID# 22 was originally tagged at Kamehame in 1995, returning in 1998, 2002, and 2005. She made two observed crawls that resulted in one confirmed nest. Her SCL was 77.3 cm.

Turtle ID# 30 was originally tagged at Kamehame in 1996, returning in 1999. She made four observed crawls that resulted in two confirmed nests. Her nest-to-crawl inter-nesting interval was 16 days (n=1). Her nest-to-nest inter-nesting interval was 16 days (n=1). Her SCL was 83.0 cm.

Turtle ID# 39 was originally tagged at Kamehame in 1998, returning in 2001 and 2004. She made two observed crawls that resulted in one confirmed nests. Her SCL was 82.5 cm.

Turtle ID# 41 was originally tagged at Kamehame in 1998, returning in 2003. She made three observed crawls that resulted in one confirmed nests. Her SCL was 77.5 cm.

Turtle ID# 74 was originally tagged at Kamehame in 2007, returning in 2009, 2011, and 2013. She made two observed crawls but had no documented nesting attempts. Her SCL was 76.0 cm.

Turtle ID# 102 was originally tagged at Kamehame in 20010, returning in 2013. She had one observed crawl where project personnel documented her false nesting. Her SCL was 84.0 cm.

Turtle ID# 133 was newly tagged this season. She made three observed crawls that resulted in one confirmed nest. Her SCL was 81.7 cm.

Turtle ID# 134 was newly tagged this season. She made three observed crawls with no nesting attempts documented by project personnel. Her SCL was 94.3 cm.

Turtle ID# 135 was newly tagged this season. She made two observed crawls with no nesting attempts documented by project personnel. Her SCL was 88.0 cm.

Turtle ID# 137 was newly tagged this season. She made one observed crawl with no nesting attempts documented by project personnel. Her SCL was 88.0 cm.

Turtle ID# 138 was newly tagged this season. She made one observed crawls that resulted in one confirmed nest. Her SCL was 87.5 cm.

Turtle ID# 140 was newly tagged this season. She made two observed crawls that resulted in one confirmed nest. Her SCL was 79.5 cm.

Turtle ID# 141 was newly tagged this season. She made one observed crawls that resulted in one confirmed nest. Her SCL was 78.0 cm.

Turtle ID# 142 was newly tagged this season. She made one observed crawls that resulted in one confirmed nest. Her SCL was 82.0 cm.

Approximately 1795 hatchlings safely reached the ocean from excavations of 14 nests (N4, N5, N6, N7, N10, N11, N13, N14, N17, N19, N20, N22, N23, and N24) including 135 that were rescued by personnel during excavations. The mean incubation time was 71 ± 15.5 days (n=5) with a range of 61 to 98 days. Nests 6, 7, 10, 17, 19, 20, 22, 23, and 24 are not included in incubation time totals because the nests were not observed laid and therefor the exact incubation time is unknown. The mean clutch size was 211.1 ± 80.3 eggs (n=14) with a range of 104 to 387 eggs. The mean nest success was $63.54 \pm 0.3\%$ (n=14) with a range of 14.4% to 90.4%.

There was no predation documented on these nests and they were not screened. Non-native predator control efforts resulted in the removal of 35 mongoose (28 male, seven female) from the nesting area. Trapping effort consisted of ten traps set for 23 days.

Punalu'u

Monitoring began on May 22^a 2015. The first activity was adult hawksbill tracks found on August 12^a, 2015. The last excavation was on November 1^s, 2015. Project personnel conducted 4 monitoring nights (11 worker nights) and 75 day checks (239 worker days) to monitor and protect the hawksbill nests at Punalu'u.

Two nest were confirmed at Punalu'u. The nesting individual is unknown because the nests were located after tracks and digs were observed during a day check in the morning.

Project personnel conducted a public nest excavation for both nests. This provided the public a rare opportunity to see a critically endangered species, witness conservation efforts, and learn about hawksbills (Figure 10 &11).



Figure 10&11: Project personnel performing outreach and excavating a nest at Punalu'u.

From these two nests approximately 262 hatchlings safely reached the ocean, including 58 that were rescued by project personnel during the nest excavation. The mean clutch size was $175.5 \pm$

16.3 eggs (n=2) with a range of 164 to 187 eggs. The mean nest success was $73.4 \pm 0.04\%$ (n=2) with a range of 70.0% to 76.8%.

Kōloa

On July 1th, 2015 project personal marked a potential dig site as a possible nest and July 8th, 2015 adult hawksbill tracks found on the beach. This was the only activity documented at Kōloa this season.

Fifty-eight day checks were conducted here (243 worker days). The majority of day checks were performed by personnel that are night monitoring at Punalu'u and Kamehame.

Nīnole

On August 20th, 2015 and September 10th, 2015 project personal found hawksbill tracks on this beach. This was the only activity documented at Nīnole this season.

Fifty-eight day checks were conducted here (243 worker days). The majority of day checks are performed by personnel that are night monitoring at Punalu'u and Kamehame.

Horseshoe

There was no turtle activity documented this season at Horseshoe. Project personnel have performed 58 day checks (243 worker days) at this site. The majority of day checks were performed by personnel that are night monitoring at Punalu'u and Kamehame.

Pōhue Bay

Monitoring began on May 23^{ed}, 2015 with night monitoring. The first document activity was document on May 25th when project personnel found adult hawksbill tracks found on the beach. The last nest excavation was on November 1^{ed}, 2015. Project personnel conducted 164 monitoring nights (443 worker nights) and 36 day checks (107 worker days) to monitor and protect the hawksbill nests at Pōhue Bay.

Eight nesting adults were documented here; five returnees (Turtle ID#s 77, 90, 109, 112, 119) and three newly tagged (Turtle ID#s 130, 132, 139). A total of 28 nests were confirmed. Numerous unobserved crawls identified by tracks, resulted in many possible nests. Six nests were not observed being laid, but were identified by hatchling emergences. The nesting individual, date laid, and incubation periods of these nests are unknown because they were laid during a lapse of monitoring. Two nests (N1 and N2) were translocated after personal personnel determined they were laid in the high tide zone and were in danger of washing away (fig. 12&13).



Figure 12 & 13: Translocation of N1 at Pohue Bay.

Turtle ID# 77 was originally tagged at Pōhue Bay in 2007, returning in 2010. She made four observed crawls that resulted in two confirmed nests. Her nest-to-crawl inter-nesting interval is 18 days (n=1). Her nest-to-nest inter-nesting interval is 19 days (n=1). Her SCL was 82.8 cm.

Turtle ID# 90 was originally tagged at Pōhue Bay in 2009 and this was the only other documented nesting season since then. She made five observed crawls that resulted in two confirmed nests. Her nest-to-crawl inter-nesting interval is 18 days (n=1). Her nest-to-nest internesting interval is 20 days (n=1). Her SCL was 75.0 cm.

Turtle ID# 109 was originally tagged at Pōhue Bay in 2011 and this was the only other documented nesting season since then. She made four observed crawls that resulted in four confirmed nests. Her nest-to-crawl inter-nesting interval is 20.6 days (n=3). Her nest-to-nest internesting interval is 20.6 days (n=3). Her SCL was 73.9 cm.

Turtle ID# 112 was originally tagged at Pōhue Bay in 2012 and this was the only other documented nesting season since then. She made four observed crawls that resulted in three confirmed nests. Her nest-to-crawl inter-nesting interval is 16 days (n=2). Her SCL was 82.8 cm.

Turtle ID# 119 was originally tagged at Pohue Bay in 2013 and this was the only other documented nesting season since then. She made seven observed crawls that resulted in three confirmed nests. Her nest-to-crawl inter-nesting interval is 17.5 days (n=2). Her nest-to-nest internesting interval is 19.5 days (n=2). Her SCL was 87.4 cm.

Turtle ID#130 was newly tagged this season. She made seven observed crawls that resulted in four confirmed nests. Her nest-to-crawl inter-nesting interval is 17.6 days (n=3). Her nest-to-nest inter-nesting interval is 19 days (n=3). Her SCL was 75.9 cm.

Turtle ID#132 was newly tagged this season. She made five observed crawls that resulted in one confirmed nests. Her SCL was 81.0 cm.

Turtle ID#139 was newly tagged this season (fig.14&15). She made five observed crawls that resulted in three confirmed nests. Her nest-to-crawl inter-nesting interval is 20 days (n=2). Her nest-to-nest inter-nesting interval is 20.5 days (n=1). Her SCL was 82.2 cm.



Figure 14 & 15: Turtle # 139 nesting in the daylight and returning to the ocean.

Approximately 3934 hatchlings safely reached the ocean from the 28 nests here this season, including 298 that were rescued by personnel during excavations. Project personnel had difficulty determining the exact nest contents of N3 and N19 since the egg chambers were combined with nest contents from previous seasons. The mean incubation time was 60.5 ± 5.5 days (n=21) with a range of 54 to 70 days. Nests 7, 8, 15, 16, 18, and 19 are not included in incubation time totals because they were first observed hatching and therefor the exact incubation time is unknown. The mean clutch size is 180 ± 44.5 eggs (n=26) with a range of 103 to 292 eggs. The mean nest success is 82.5 $\pm 0.2\%$ (n=26) with a range of 42.3 to 100.0%.

On July 9th, 2015 project personal found hawksbill tracks on the nearby beach, Pu'u Ki. Numerous unobserved crawls identified by tracks have been documented throughout the season. This beach is monitored via day checks by personnel camping at Pōhue Bay. Personal conducted 73 day checks (185 worker days). The twenty-eight nests that were observed being laid were screened. Non-native predator control efforts resulted in the removal of seven animals from the nesting area: one male mongoose, and six rats (3 male and 3 female). Trapping effort consisted of three traps set for 78 days. *Hāliʿipalala*

Monitoring began on May 25nd 2015. This beach was monitored via day checks by personnel camping at Pōhue Bay. There was no nesting activity documented here this season. Personal conducted 73 day checks (185 worker days).

Kahakahakea

Monitoring began on May 25nd 2015 and the first documented activity occurred on June 29th, 2015 when a possible nest depression was observed. Project personnel probed the area but the probe was unsuccessful. The last nest excavation was on October 23rd, 2015. Two nests were confirmed at Kahakahakea. The nesting individual is unknown because the nests were located after tracks and digs were observed during a day check in the morning. Additionally numerous unobserved crawls identified by tracks, resulted in many areas deemed as possible nests.

From these two nests approximately 287 hatchlings safely reached the ocean, including 6 that were rescued by project personnel during the nest excavation. The mean clutch size was 149.5 \pm 20.5 eggs (n=2) with a range of 135 to 164 eggs. The mean nest success was 93.7 \pm 0.02% (n=2) with a range of 92.6% to 94.8%.

Seventy-three day checks have been conducted (185 worker days). These day checks were performed by personnel that were night monitoring at Pohue Bay.

Humuhumu Point

Monitoring began on May 24^a 2015. This beach was monitored via day checks by personnel camping at Pōhue Bay. There was no nesting activity documented here this season. Personal conducted 54 day checks (138 worker days).

Awili Point (Road to the Sea)

Monitoring began on May 24^a 2015. The first documented activity occurred on June 12^a, 2015 when adult tracks were found. Numerous unobserved crawls identified by tracks, resulted in many areas deemed as possible nests. Project personnel conducted 54 day checks (138 worker days) at 'Āwili Point.

Appendix

Table 1. Identification information of newly tagged adult female hawksbills on Hawai'i Island, HI in2010.

Project ID#	LFF	RFF	LRF	RRF	Date Tagged	Location
101	2D20	2D21	2D22	2D23	07/17/2010	'Āpua Point
102	3D23	3D19	3D22	3D21	07/20/2010	Kamehame
103	3D66	3D25	3D26	3D67	07/23/2010	Kamehame
104	3D55	3D59	3D56	3D57	07/28/2010	Nīnole
105	3D74	3D76	3D77	3D75	10/31/2010	'Āwili Point

Table 2. Identification information of returning adult female hawksbills on Hawai'i Island, HI in 2010.

Project ID#	LFF	RFF	LRF	RRF	Year Last Observed	Location
30	B565	B566	3D28	3D29	1999	Kamehame
48	304Z	[305Z],100M	98M	99M	2004	Kōloa*
58	3D07	481X	3D09	3D08	2004	Halapē
64	85M	88M	[84M],2D15	83M	2005	Pōhue
75	1D18	1D17	1D20	1D19	2007	Halapē
77	1D64	1D65	1D66	1D67	2007	Pōhue
77	1D64	1D65	1D66	1D67	2007	Pōhue

*Turtle was tagged at Kamehame in 1999, nested at Kōloa in 2004, false nested at Kōloa in 2010 and disappeared.

[] = previous tag either fallen off or removed.

Table 3. Identification information of newly tagged adult female olive ridley on Hawai'i Island, HI in2010.

_	Project ID#	LFF	RFF	LRF	RRF	Date Tagged	Location
	OR 1	3D78	3D79	none	none	11-09-10	'Āwili Point

Table 4. Identification information of newly tagged adult female hawksbills on Hawai'i Island,	, HI in
2011.	

Project ID #	LFF	RFF	LRF	RRF	Date Tagged	Location
106	3D44	3D45	3D46	2D24	07/5/2011	'Āpua Point
107	2D61	2D62	3D35	3D37	07/23/201 1	Pōhue
108	2D42	2D41	2D43	2D44	08/12/201	'ĀpuaPoint
109	3D31	3D32	3D33	3D34	1	Pōhue

Project ID#	LFF	RFF	LRF	RRF	Year Last	Location
					Observed	
37	B-637	B-638	93-M	94-M	2005	Kamehame
63*	[96-M], 3D62	3D60	3D61	97-M	2007	Kamehame, Halapē, Punalu'u
72	8A98	8A99	445-X	447-X	2006	Pōhue
74	1D46	1D47	1D48	1D49	2009	Kamehame

Table 5.Identification information of returning adult female hawksbills on Hawai'i Island, HI in2011.

* Found dead at Punalu'u.

[] = previous tag either fallen off or removed.

Table 6. Identification information of newly tagged adult female green turtle on Hawai'i Island, HI in 2011.

Project ID #	LFF	RFF	LRF	RRF	Date Tagged	Location
GR 1	3D78	3D79	None	None	07/6/2011	Halapē, Pōhue

Table 7. Identification information of newly tagged adult female hawksbills on Hawai'i Island, HI in 2012.

Project ID#	LFF	RFF	LRF	RRF	Date Tagged	Location
111	2D64	2D65	2D66	3D38	06/15/2012	Pōhue
112	3D40	3D41	8C29	8C30	06/17/2012	Pōhue
113	3D42	8C26	no tag	no tag	06/29/2012	Pōhue
114	3D63	3D69	3D71	no tag	07/18/2012	Kamehame
115	8C31	8C35	8C33	8B34	07/19/2012	Pōhue
116	8C36	8C37	8C38	8C39	07/20/2012	Pōhue
117	3D80	3D81	3D82	3D83	07/25/2012	Kamehame
118	3D84	3D85	3D88	3D89	08/4/2012	Kamehame

 Table 8. Identification information of returning adult female hawksbills on Hawai'i Island, HI in 2012.

Project ID#	LFF	RFF	LRF	RRF	Last Year Observed	Location
14	B759	332Z	no tag	342Z	2003	Kamehame
19	B561	62D	3D86	3D87	1998	Kamehame
29	B713	B714	345Z	344Z	2006	Kamehame
42	450X	459X	460X	464X	2007	Halapē
73	8C27	8C28	485X	489X	2006	Pōhue/'Āpua

90	2D56	2D57	2D58	2D59	2009	Pōhue
103	3D24	3D25	3D26	3D27	2010	Kamehame

Table 9. Identification information of newly tagged adult female hawksbills on Hawai'i Island, HI in 2013.

Project ID#	LFF	RFF	LRF	RRF	Date Tagged	Location
119	3D92	3D93	3D94	3D95	06/01/2013	Pōhue
120	3MayD90	3D70	3D91	8C63	06/19/2013	Kamehame
121	8C64	8C65	8C75	8C74	06/24/2013	Kamehame
122	3D99	*no tag	3D98	3D100	07/13/2013	Pōhue
123	no tag	8C40	**no tag	**8C41	08/05/2013	Pōhue
124	8C72	8C74	no tag	no tag	08/8/2013	Kamehame
125	8C71	8C88	8C89	8C90	08/17/2013	Kamehame

*no tag was placed on the RFF since the flipper was swollen due to the net entanglement. **PIT tags were deployed on 8/22/13; RRF-982.000167827256, LRF-982.000.167775413

2013.						
Project ID#	LFF	RFF	LRF	RRF	Last Year Observed	Location
60	566X	486X	567X	2D45	2005	'Āpua
67	3D96	3D97	8A77	8A78	2005	Pōhue
74	1D46	1D47	1D48	1D49	2011	Kamehame
85	1D55	1D56	1D52	3D10	2008	Halapē
86	1D79	1D80	2D09	1D81	2008	Kamehame
91	2D32	2D30	2D31	2D33	2009	Kamehame
102	8C67	8C66	3D21	8C70	2010	Kamehame

 Table 10. Identification information of returning adult female hawksbills on Hawai'i Island, HI in 2013.

Table 11. Identification information of newly	v tagged adult female	e hawksbills on	Hawai'i Island,	HI
in 2014.				

Project ID#	LFF	RFF	LRF	RRF	Date Tagged	Location
126	8C62	8C76	8C81	8C82	06/9/2014	Pōhue
127	8C77	8C78	8C79	8C80	06/12/2014	Pōhue
128	8C36	8C84	9C01	9C02	07/15/2014	Pōhue
129	8C95	8C86	8C97	8C96	07/27/2014	Pōhue

LFF	RFF	LRF	RRF	Last Year Observed	Location
J-86	570X	595X	488X	2005	'Āpua
598X	599X	2D14	596X	2009	'Āpua
492X	8A39	498X	495X	2005	Humuhumu Point
85M	88M	2D15	83M	2010	Pōhue
8A20	8A18	8A34	8A17	2005	Pōhue
8A36	8A35	8A40	no tag	2006	Pōhue
2D36	2D39	2D37	no tag	2009	'Āpua
	LFF J-86 598X 492X 85M 8A20 8A36 2D36	LFFRFFJ-86570X598X599X492X8A3985M88M8A208A188A368A352D362D39	LFFRFFLRFJ-86570X595X598X599X2D14492X8A39498X85M88M2D158A208A188A348A368A358A402D362D392D37	LFFRFFLRFRRFJ-86570X595X488X598X599X2D14596X492X8A39498X495X85M88M2D1583M8A208A188A348A178A368A358A40no tag2D362D392D37no tag	LFFRFFLRFRRFLast Year ObservedJ-86570X595X488X2005598X599X2D14596X2009492X8A39498X495X200585M88M2D1583M20108A208A188A348A1720058A368A358A40no tag20062D362D392D37no tag2009

Table 12. Identification information of returning adult female hawksbills on Hawai'i Island, HI in 2014.

Table 13. Identification information of newly tagged adult female hawksbills on Hawai'i Island, HI in 2015.

Project ID#	LFF	RFF	LRF	RRF	Date Tagged	Location
130	3D18	1D83	8C06	8C07	06/5/2015	Pōhue Bay
131	8C92	8C43	8C44	8C45	06/6/2015	'Āpua Point
132	3D14	3D15	3D16	3D17	06/19/2015	Pōhue Bay
133	8C09	8C51	8C55	8C56	06/25/2015	Kamehame
134	8C52	8C54	8C94	8C60	06/26/2015	Kamehame
135	8C57	8C59	8C34	8C33	07/2/2015	Kamehame
136	8C46	8C48	8C91	8C49	07/3/2015	'Āpua Point
137	9C11	9C12	no tag	no tag	07/17/2015	Kamehame
138	9C13	9C14	no tag	no tag	07/22/2015	Kamehame
139	8C11	8C12	8C13	8C14	07/29/2015	Pōhue Bay
140	9C15	9C31	9C39	9C40	07/30/2015	Kamehame
141	9C35	9C36	no tag	no tag	08/29/2015	Kamehame
142	9C37	9C38	no tag	no tag	09/1/2015	Kamehame

Table 14. Identification information of returning adult female hawksbills on Hawai'i Island, H	[] in
2015.	

Project ID#	LFF	RFF	LRF	RRF	Last Year Observed	Location
22	B757	431X	B767	B766	2005	Kamehame
30	B565	B566	3D28	9C32	1999	Kamehame
39	415X	425X	420X	418X	2004	Kamehame
41	8C99	Q827	533X	532X	2003	Kamehame
74	1D46	1D47	1D48	1D49	2013	Kamehame

77	3D11	1D65	1D66	1D67	2010	Pōhue Bay
83	1D75	1D74	1D73	1D72	2008	Halapē
90	2D56	2D57	2D58	2D59	2009	Pōhue Bay
102	8C67	8C66	3D21	8C70	2013	Kamehame
109	8C08	3D32	3D33	8C10	2011	Pōhue Bay
112	3D40	3D41	8C29	8C30	2012	Pōhue Bay
119	3D92	3D93	3D05	3D95	2013	Pōhue Bay