



Annual Report: 2020 Fall Bottomfish Fishery-Independent Survey in Hawai'i

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U.S. DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration National Marine Fisheries Service Pacific Islands Fisheries Science Center

NOAA Technical Memorandum NMFS-PIFSC-125 https://doi.org/10.25923/mb72-4g30

May 2022

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NOAA Technical Memorandum NMFS-PIFSC-125

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Recommended citation

Richards BL, Smith SG, Ault JS. 2022. Annual report: 2020 fall bottomfish fishery-independent survey in Hawai'i. NOAA Technical Memorandum NOAA-TM-PIFSC-125, 31 p. doi:10.25923/mb72-4g30

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Executive Summary

The Bottomfish Fishery-Independent Survey in Hawai'i (BFISH) provides robust estimates of size-structured population abundance and biomass for the main Hawaiian Islands Deep-7 bottomfish complex. These survey data complement and enhance the stock assessment process conducted by the Pacific Islands Fisheries Science Center (PIFSC).

The 2020 BFISH survey comprised 500 primary sampling units (PSUs) across the 8 main Hawaiian Islands. Two sampling gears, cooperative research hook-and-line fishing and stereo camera systems, were deployed at depths ranging from 75 to 400 m from August 15 to November 15, 2020.

In the 2020 BFISH survey, ehu was the most abundant species of the Deep-7 complex, followed by 'ōpakapaka and kalekale. 'Ōpakapaka had the highest estimated exploited stock biomass, followed by ehu and kalekale. 'Ōpakapaka, ehu, and onaga were the three main design species. The estimated stock biomass of 'ōpakapaka and ehu was approximately 2.335 and 1.945 million lb, respectively. Onaga stock biomass was about 0.739 million lb. Coefficients of variation (CV%) for exploited stock biomass for ehu and 'ōpakapaka were 17.91 to 32.25, respectively.

To improve overall precision of BFISH surveys, future research will focus on the following:

(1) Increase the number of primary sampling units (PSUs) to optimize future sampling efforts with respect to the number of PSUs required to achieve the desired coefficient of variation (CV) for biomass estimates.

(2) Target sample allocations to better reflect species' depth preferences.

(3) Invest in technological innovations that better define the unit area sampled and which can increase the depth range of the MOUSS camera system.

(4) Develop methods to improve empirical estimates of the effective sampling area of the MOUSS camera system.

Introduction

Commercial and recreational fishing are important to the economy and culture of Hawai'i (Haight et al. 1993). The Hawaiian deep-slope (100–400 m) fishery consists of 7 high-value bottomfish species (i.e., 6 snappers and one grouper), hereafter referred to as the Deep 7 (Figure 1) (Western Pacific Regional Fishery Management Council 2010), that account for more than 50% of the total insular commercial catch (Western Pacific Regional Fishery Management Council 2010).

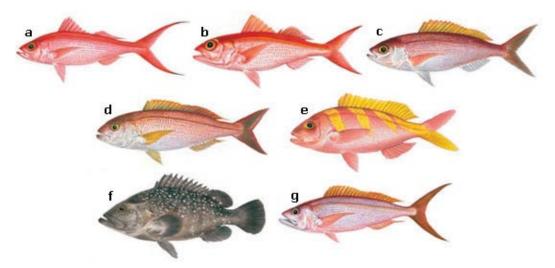


Figure 1. The main Hawaiian Islands "Deep-7" bottomfish complex: (a) Onaga (*Etelis coruscans*), (b) Ehu (*Etelis carbunculus*), (c) Kalekale (*Pristipomoides sieboldii*), (d) 'Ōpakapaka (*Pristipomoides filamentosus*), (e) Gindai (*Pristipomoides zonatus*), (f) Hapu'upu'u (*Hyporthodus quernus*), and (g) Lehi (*Aphareus rutilans*). Artwork by Les Hata (Hawai'i DAR/DLNR).

Under the Magnuson-Stevens Fishery Conservation and Management Act (United States Congress, 2007), the National Oceanic and Atmospheric Administration (NOAA) Pacific Islands Fisheries Science Center (PIFSC) is responsible for conducting stock assessments of the Deep-7 complex. These assessments determine stock status from which the Western Pacific Regional Fishery Management Council (WPRFMC) recommends annual fishery catch limits.

The conventional stock assessment process requires reliable time-series of catches, fishing effort, and life history demographics to estimate stock abundance trends and evaluate sustainability benchmarks (Quinn and Deriso 1999; Haddon 2011). Until recently, stock assessments for the main Hawaiian Islands Deep-7 bottomfish complex (Brodziak et al. 2014) relied on trends in fishery-dependent catch per unit effort (CPUE). However, fishery-dependent CPUE abundance index can be biased due to nonrandom spatiotemporal distribution of fishing effort and gears, imposed length and catch regulations, market forces, and fisher behavior (Hilborn and Walters 1992; Maunder and Punt 2004; Ault et al. 2014).

PIFSC has continually strived to improve data used in the Deep-7 stock assessments. In 2016 PIFSC implemented a multi-gear Bottomfish Fishery-Independent Survey in Hawaii (BFISH)

(Richards et al. 2016). There are several key advantages of fishery-independent surveys: (1) they employ formal experimental designs; (2) they control the distribution of fishing effort and gears; (3) they are less influenced by market forces; and, (4) they obtain similar stock size-structured abundance data as fishery-dependent catch sampling programs, but they do so with greater statistical rigor (Ault et al. 1999; Smith et al. 2011). Fishery-independent surveys can be designed to estimate absolute population abundance, thus providing an important independent estimate of stock abundance for use in stock assessment.

The BFISH survey, long a priority for PIFSC (Mace et al. 2001; Ralston et al. 2004), was developed and implemented from 2011 through 2015 using a series of pilot gear calibration studies in the Maui-Nui island region (Richards et al. 2016). The BFISH survey became operational in 2016. Data from the initial full BFISH 2016 survey, included estimates of absolute size-structured abundance and biomass (Ault et al. 2018) that were incorporated into the 2018 benchmark Deep-7 bottomfish stock assessment for the main Hawaiian islands (Langseth et al. 2018). In this report we present results from the fall BFISH 2020 survey.

Methods

The BFISH survey employs a stratified-random sampling design conducted throughout the 8 main Hawaiian islands using 2 gear types: (1) hook-and-line research fishing parallel to what is used in the commercial fishery; and (2) remote drop MOUSS stereo-video cameras (Richards et al. 2016; Amin et al. 2017). The BFISH domain encompasses all main 8 Hawaiian Island mapped bottomfish habitats from 75 to 400 m from the Big Island of Hawai'i to the island of Ni'ihau, extending about 600 km and comprising 23,613 500 × 500 m primary sampling units (PSUs) (Figure 2).

A standard research fishing sample consisted of 30 min of active hook-line fishing within a PSU by 1 vessel using 2 lines, each with 4 hooks and 2 bait types (i.e., squid and fish) (Richards et al. 2016). Every fish captured was identified to species, and fork length (FL) was measured to the nearest cm. All Deep-7 individuals were retained and transferred to the PIFSC Fisheries Research and Monitoring Division (FRMD) Life History Program (LHP) for age, growth, sexual maturity, and genetic studies.

For stationary cameras, within each PSU, 2 randomized replicate 15-min deployments were conducted (Richards et al. 2016). In-situ footage was analyzed to generate species-level counts by the MaxN method (Cappo et al. 2006), and measured (FL) to the nearest mm. Replicate counts were averaged for a given sample unit.

The fall BFISH 2020 was conducted from August 15 through November 15, 2020 (Figure 3). Research fishing by the Pacific Islands Fisheries Group (PIFG) sampled 453 PSUs throughout the survey domain from August 15 to November 15, 2019 (Appendix A). Camera operations at 47 PSUs were conducted by PIFG on October 8–13, 2020, around the island of Oahu and Penguin Banks (Figure 3). The restricted camera sampling was due to the COVID-19 pandemic, which required that cameras were deployed from a cooperative research fishing vessel rather than the NOAA Ship *Oscar Elton Sette*. Without a NOAA camera technician aboard, the vessel offloaded cameras to Oahu-based technicians at the end of each day for data download and refitting.

The fall BFISH 2020 employed an updated stratification scheme that involved 24 strata dependent on three principal environmental characteristics: (1) depths; (2) seafloor hardness; and, (3) benthic habitat complexity. The details of the strata and substrata delineation are provided in Table 1 and Table 2. Depths and seafloor hardness were obtained from 5-m resolution multi-beam bathymetry (Hawaii Mapping Research Group 2016) and associated backscatter (Richards et al. 2019). Habitat complexity was defined using arc chord ratio (ACR) values derived from the multi-beam bathymetry.

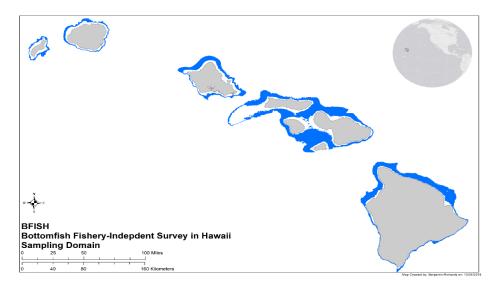


Figure 2. The spatial domain of the Deep-7 bottomfish survey (blue-shaded region) extending from Ni'ihau in the northwest to the island of Hawai'i in the southeast.

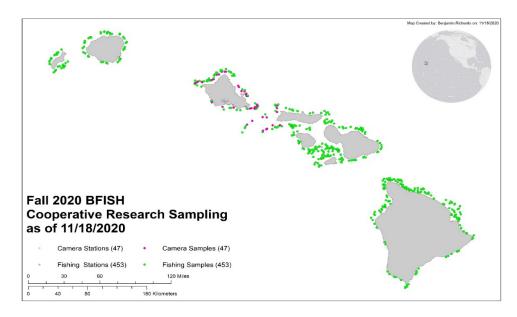


Figure 3. Map of BFISH 2020 sampling locations by gear type. Research fishing operations (green circles) that extended from the big island of Hawai'i in the southeast to Ni'ihau in the northwest. Camera operations (pink circles) were restricted to the island of Oahu and Penguin Banks.

Stratum		Substrata		Island PSU Allocation					
	Depth	<u>Complexity</u>	Hardness	Niʻihau	Kaua i	Oahu	Maui Nui	Big Island	Grand Total
S01	D1	MA1 or MA2	HB1 or HB2 or HB3	2	2	2	2	2	10
S02	D1	MA3	HB1	2	2	2	2	2	10
S03	D1	MA3	HB2		2	2	2	2	8
S04	D1	MA3	HB3			2	2	2	6
S05	D2	MA1	HB1 or HB2	2	2	2	14	4	24
S06	D2	MA1	HB3		2	2	2	2	8
S07	D2	MA2	HB1	2	2	2	8	3	17
S08	D2	MA2	HB2			2	3	3	8
S09	D2	MA2	HB3		2	2	2	2	8
S10	D2	MA3	HB1	2	4	7	39	31	83
S11	D2	MA3	HB2		2	3	8	6	19
S12	D2	MA3	HB3	2	2	2	2	2	10
S13	D3	MA1 or MA2	HB1 or HB2 or HB3		2	2	2	2	8
S14	D3	MA3	HB1	2	2	2	7	3	16
S15	D3	MA3	HB2			2	3	2	7
S16	D3	MA3	HB3	2	2	2 2	3	5	14
S17	D4	MA1 or MA2	HB1 or HB2	2	2	2	2	2	10
S18	D4	MA1	HB3				2	2	4
S19	D4	MA2	HB3			2	6	2	10
S20	D4	MA3	HB1	2	3	7	26	19	57
S21	D4	MA3	HB2	2	2	4	8	5	21
S22	D4	MA3	HB3	4	5	22	35	24	90
S23	D5	MA1 or MA2	HB1 or HB2 or HB3		2	2	2	2	8
S24	D5	MA3	HB1 or HB2 or HB3	2	2	8	13	19	44
		Grand Total		28	44	85	195	148	500

Table 1. Island-based allocation of PSUs based on the BFISH 2020 24-strata samplingdesign.

Table 2. Habitat-based substrata used for the fall BFISH 2020 sampling design.

Depth Substrata	Median Depth (m)	Complexity Substrata	Median ACR	Hardness Substrata	% of PSU px Above Multibeam Backscatter Value 136
D1	≥ 75 & < 110	MA1	< 4	HB1	< 0.24
D2	≥ 110 & < 170	MA2	≥4&<9	HB2	≥ 0.24 & < 0.46
D3	≥ 170 & <220	MA3	≥9	HB3	≥ 0.46
D4	≥ 200 & < 330				
D5	≥ 330 & < 400				

Sampling was optimally allocated amongst the twenty-four (24) survey strata following a Neyman scheme (Cochran 1977). Allocation was carried out in two steps. First, an optimal allocation was determined for each of the three design species (ehu, 'ōpakapaka, onaga). These species-specific allocations were then overlapped to create an optimal composite allocation for the overall survey, including strata common to all species while also incorporating strata important to any one of the three design species. PSUs within strata were randomly selected without replacement from a discrete uniform probability distribution to ensure an equal probability of selection (Law and Kelton 2000). The *effective survey sample size* is the number of PSUs sampled within the preferred depth range for a given species. Domain mapping and survey sample site selection were conducted using ArcGIS (ESRI Inc. 2017) and R (R Development Core Team 2020).

Gears were allocated to PSUs based on a combination of gear-specific depth, logistical constraints as well as regulatory restrictions (e.g., camera samples were preferentially allocated

to areas where fishing is usually restricted). The MOUSS camera system has a depth limit of 250 m (Amin et al. 2017).

A two-stage generalized linear model regression was used to calibrate the relative fishing power of hook-line to camera gears based on comparative gear experiments (Robson 1961; Richards et al. 2016).

Population abundance and biomass estimation for Deep-7 species followed standard protocols for stratified random statistical sampling designs (Cochran 1977; Ault et al. 1999; Lohr 2010; Smith et al. 2011; Ault et al. 2018). The number of fish either caught (fishing) or seen (cameras) per unit sample area searched (i.e., density) was the principal metric used to develop the sampling design.

Estimation of population biomass *B* entailed expanding the mean biomass per unit \overline{U}_B to the full survey frame following equation (1) (Ault et al. 2018), where, A_i is the area of a grid cell sample unit, a_i is the effective sampling area of the camera gear, and *G* is the number of grid cells in the survey domain. Mean biomass per sample unit was obtained by converting length to weight of each individual fish via an allometric weight-length function, and then summing the weights for all observed fish by species. Allometric functions were developed for each Deep-7 species using paired weight-length observations collected in the Hawaiian Islands by PIFSC scientists. All computations were carried out using the R software package (R Development Core Team 2020).

$$B = \overline{U}_B \frac{A_i}{a_i} G \tag{1}$$

Results

The fall BFISH 2020 comprised 500 primary sampling units (PSUs) selected under the stratifiedrandom experimental design. A total of 558 Deep-7 individuals, including 322 ehu, 71 'ōpakapaka, and 59 onaga were captured, along with 307 bycatch individuals (Table 3).

Table 3. Numbers (n) of individual fish (Deep 7 and other species) caught during fall BFISH 2020 research fishing operations. Full list gives all species caught over all survey years.

Species Code	Common Name	Scientific Name	n	
Deep 7			558	
ETCA	Ehu	Etelis carbunculus	322	
PRFI	ʻŌpakapaka	Pristipomoides filamentosus	71	
ETCO	Onaga	Etelis coruscans	59	
PRZO	Gindai	Pristipomoides zonatus	54	
PRSI	Kalekale	Pristipomoides sieboldii	32	
HYQU	Hapuʻupuʻu	Hyporthodus quernus	9	
APRU	Lehi	Aphareus rutilans	1	
non-Deep 7			307	
SQMI	Green eye shark	Green eye shark Squalus hawaiiensis		
SEDU	Kahala	Seriola dumerili	50	
POBE	Deep-sea Moi	Polymixia berndti	13	
APVI	Uku	Aprion virescens	11	
POMA	Hogo	Pontinus macrocephalus	8	
BOAL	Table Boss	Bodianus albotaeniatus	5	
LUKA	Ta'ape	Lutjanus kasmira	4	

n	Common Name Scientific Name		Species Code
3	Balistid sp.	Triggerfish sp.	TRIG
3	Caprodon unicolor	Hawaiian Sunrise Perch	CAUN
3 3 3 2	Tetraodontid sp.	Puffer sp.	PUFF
3	Aphareus furca	Waha Nui Aphareus furca	
2	Gymnothorax sp.	Moray eel	GYSP
2	Carcharhinus sp.	Reef Shark	SHAR
2	Erythrocles scintillans	Golden Kale	ERSC
2	Carcharhinus sp.	Shark (misc.)	SHAR
2 2 2	Pleuronectiformes sp.	Flounder	FLOU
2	Eumegistus illustris	Monchong	EUIL
2	Cookeolus japonicus	Aweoweo	COJA
1	Chrionema chryseres	Green-spotted duckbill	CHCH
1	Trachinocephalus myops	Lizard fish	TRMY
1	Sphyraena helleri	Kawelea	SPHE
1	Caranx melampygus	'Omilu	CAME
1	Caranx ignobilis	Ulua	CAIG
1	Acanthurus dussumieri	Palani	ACDU
1	Elagatis bipinnulata	Kamanu	ELBI
1	Caranx sp.	Papio	CASP
1	Octopus sp.	Tako	OCSP
1	Pseudocaranx cheilio	Butaguchi	PSDE
1	Mulloidichthys pfluegeri	Weke Ula	MUPF
1	Erythrocles scintillans	Golden Kale	ERSC
1	Polymixia berndti	Deep-sea Moi	POBE
1	Carcharhinus melanopterus	Shark (Black tip)	CAML
1	Tetraodontinae sp.	Balloonfish	PORC
1	Parupeneus multifasciatus	Moana	PAMU
865	1 0	Grand Total	

A total of 311 Deep-7 individuals were observed by the MOUSS camera system. Kalekale was the most abundant (n = 240), followed by onaga (n = 49) and 'ōpakapaka and ehu (n = 11 for both). Accurate length measurements were obtainable for all 558 Deep-7 individuals captured during research fishing operations and for 140 of the 311 fishes observed by the MOUSS camera system (Table 4).

Table 4. Numbers (n) and sizes (cm FL) of Deep-7 species caught during research fishing
operations or observed (MaxN) by MOUSS camera during the fall BFISH 2020 survey.

]	RESEARCI	H FISHING	Ĵ		Ν	IOUSS CA	MERA		
			Fork Ler	ngth (cm)					Fork Len	gth (cm)	
Species	n	Min	Mean	Max	SD	MaxN	measured	Min	Mean	Max	SD
Ehu	322	12.0	32.1	60.0	8.6	11	11	34.8	41.1	52.1	5.2
Gindai	54	18.5	33.9	43.0	5.0	6	6	15.3	22.9	34.4	8.6
Hapu'upu'u	9	52.0	66.4	78.0	8.6	1	1	69.9	69.9	69.9	-
Kalekale	42	19.2	34.1	46.0	5.3	240	71	6.2	16.4	36.7	11.7
Lehi	1	51.0	51.0	51.0	-	4	4	62.1	65.4	71.9	4.4
Onaga	59	17.5	39.5	87.0	14.5	49	47	16.7	46.9	73.1	12.2
ʻŌpakapaka	71	18.0	37.2	63.0	11.5	11	11	34.8	41.1	52.1	5.2
TOTAL Deep 7	558					311	140				

Kalekale had the largest absolute abundance estimate, followed by ehu and 'ōpakapaka (Table 5). 'Ōpakapaka had the greatest exploited stock biomass, followed by ehu and kalekale. The estimated population biomass of 'ōpakapaka and onaga was approximately 1.059 and 0.335 million kg, respectively. Ehu stock biomass was about 0.882 million kg. Coefficients of variation (CV%) for exploited stock biomass were 17.9 and 32.2 for ehu and 'ōpakapaka, the two main design species.

Table 5. Fall BFISH 2020 survey statistics: catch per unit effort (CPUE), and estimated
exploited species stock abundance and biomass (fishing and camera gears combined).

Species	CPUE	SE	Abundance	SE	Biomass (kg)	SE	CV (%)
Ehu	0.3797	0.0680	936,341	167,740.1	882,078.0	151,840.1	17.9
Gindai	0.0694	0.0167	171,151	41,151.8	174,479.1	45,378.2	24.0
Hapu'upu'u	0.0141	0.0053	34,655	13,050.7	212,322.2	85,781.1	37.7
Kalekale	0.4152	0.1383	1,024,052	341,018.9	781,899.5	248,643.1	33.3
Lehi	0.0035	0.0025	8,751	6,281.4	23,624.2	16,357.7	71.8
Onaga	0.0762	0.0193	188,001	47,576.4	335,385.6	99,570.5	25.3
ʻŌpakapaka	0.2796	0.0902	689,596	222,374.6	1,059,126.4	291,476.4	32.2
TOTAL					3,468,915.0	435,243.3	

Trends in exploited stock relative biomass varied among the species with few significant differences among years (Table 6, Figure 4, and Figure 5) and little change in species-specific size distributions (Figure 6). Survey precision ranged from a CV of 17.9% for ehu to 37.7% for hapu'upu'u, with CVs of 32.2% and 25.3% for 'ōpakapaka and onaga, respectively (Table 5, Figure 7). The principal conclusion to be drawn are that the year-to-year variance in biomass estimates is decreasing (likely due to refinement of the experimental design), within-year variance is decreasing, and overall survey precision is increasing. Additionally, the composition of the Deep-7 bottomfish community in terms of stock biomass is generally equally balanced between the 3 design species.

Table 6. Exploited phase abundance and biomass indices from the 2016–2020 BFISH
surveys.

		No. of		CPUE,	number	CPUE, bi	omass (kg)	Abundance	(number)	Biomas	s (kg)
Species	Year	Strata	n	Mean	SE	Mean	SE	Total	SE	Total	SE
Ehu	2016	9	319	0.3821	0.0711	0.3728	0.0737	942,393	175,428	919,452	181,683
Ehu	2017	9	449	0.3145	0.0901	0.3496	0.1020	775,717	222,139	862,203	251,494
Ehu	2018	9	437	0.2198	0.0565	0.2508	0.0721	541,935	139,395	618,476	177,760
Ehu	2019	9	470	0.3848	0.0683	0.3938	0.0769	948,935	168,360	971,152	189,688
Ehu	2020	24	499	0.3797	0.0680	0.3577	0.0616	936,341	167,740	882,078	151,840
Gindai	2016	9	326	0.0213	0.0072	0.0209	0.0076	52,590	17,855	51,604	18,835
Gindai	2017	9	448	0.0132	0.0043	0.0137	0.0044	32,508	10,489	33,816	10,847
Gindai	2018	9	441	0.0118	0.0050	0.0128	0.0052	29,186	12,215	31,641	12,907
Gindai	2019	9	475	0.0212	0.0063	0.0227	0.0078	52,354	15,459	55,896	19,149
Gindai	2020	24	499	0.0694	0.0167	0.0707	0.0184	171,151	41,152	174,479	45,378
Hapuʻupuʻu	2016	9	327	0.0067	0.0040	0.0556	0.0330	16,507	9,918	137,132	81,386
Hapu'upu'u	2017	9	447	0.0070	0.0028	0.0389	0.0173	17,240	6,938	95,833	42,768
Hapu'upu'u	2018	9	441	0.0198	0.0082	0.1018	0.0408	48,949	20,183	251,133	100,586
Hapu'upu'u	2019	9	475	0.0047	0.0026	0.0226	0.0119	11,607	6,433	55,660	29,226
Hapu'upu'u	2020	24	499	0.0141	0.0053	0.0861	0.0348	34,655	13,051	212,322	85,781
Kalekale	2016	9	319	0.1636	0.0459	0.1500	0.0435	403,394	113,100	369,934	107,307
Kalekale	2017	9	441	0.5378	0.1088	0.4653	0.0948	1,326,264	268,416	1,147,403	233,870
Kalekale	2018	9	440	0.2534	0.0706	0.2301	0.0638	624,930	174,137	567,353	157,460
Kalekale	2019	9	475	0.2306	0.0824	0.2007	0.0742	568,660	203,191	495,057	182,942

		No. of		CPUE,	number	CPUE, bi	omass (kg)	Abundance	(number)	Bioma	iss (kg)
Species	Year	Strata	n	Mean	SE	Mean	SE	Total	SE	Total	SE
Kalekale	2020	24	499	0.4152	0.1383	0.3171	0.1008	1,024,052	341,019	781,899	248,643
Lehi	2016	9	325	0.0185	0.0123	0.0690	0.0514	45,733	30,332	170,059	126,670
Lehi	2017	9	444	0.0285	0.0158	0.0746	0.0441	70,270	38,934	184,039	108,741
Lehi	2018	9	438	0.0181	0.0137	0.0561	0.0425	44,580	33,811	138,280	104,872
Lehi	2019	9	475	0.0033	0.0020	0.0130	0.0084	8,110	4,936	32,018	20,629
Lehi	2020	24	499	0.0035	0.0025	0.0096	0.0066	8,751	6,281	23,624	16,358
Onaga	2016	9	326	0.0728	0.0269	0.1830	0.0872	179,630	66,349	451,310	214,947
Onaga	2017	9	444	0.1720	0.0594	0.4290	0.1599	424,187	146,603	1,057,903	394,391
Onaga	2018	9	441	0.0665	0.0244	0.1654	0.0701	164,059	60,274	408,004	172,812
Onaga	2019	9	475	0.0509	0.0230	0.2163	0.1049	125,554	56,670	533,442	258,800
Onaga	2020	24	499	0.0762	0.0193	0.1360	0.0404	188,001	47,576	335,386	99,570
ʻŌpakapaka	2016	9	319	0.6877	0.2293	1.5231	0.5297	1,695,941	565,522	3,756,272	1,306,338
'Ōpakapaka	2017	9	438	0.4057	0.0901	0.8600	0.1659	1,000,451	222,237	2,120,883	409,208
'Ōpakapaka	2018	9	436	0.2435	0.0715	0.5633	0.1579	600,414	176,402	1,389,282	389,363
'Ōpakapaka	2019	9	472	0.2730	0.0627	0.5984	0.1454	673,334	154,681	1,475,671	358,653
ʻŌpakapaka	2020	24	499	0.2796	0.0902	0.4295	0.1182	689,596	222,375	1,059,126	291,476
Deep 7	2016	9								5,855,762	1,349,173
Deep 7	2017	9								5,502,080	674,323
Deep 7	2018	9								3,404,169	509,060
Deep 7	2019	9								3,618,897	516,435
Deep 7	2020	24								3,468,915	435,243

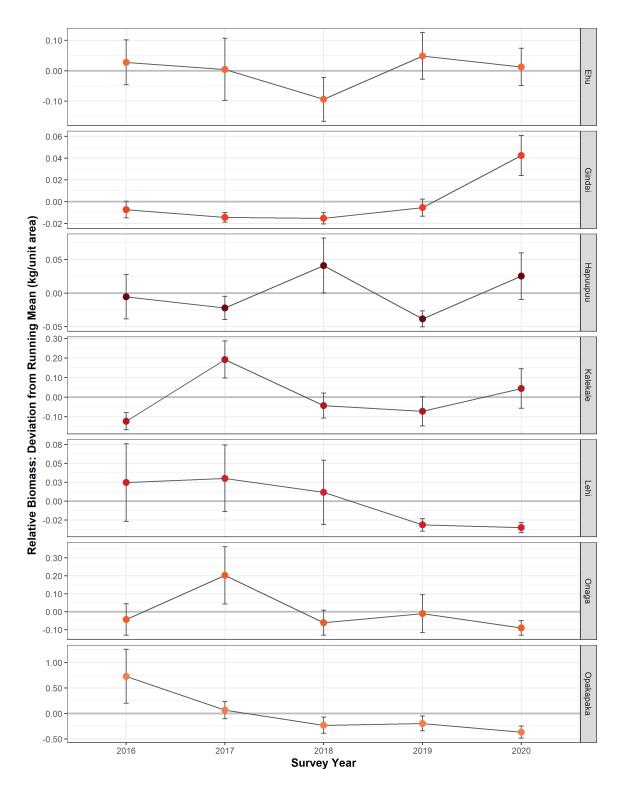


Figure 4. Annual Deep-7 relative biomass (± 1 SE) by species in the exploited phase (> 29 cm), relative to the 5-year running mean (horizontal gray line). High 2016 'ōpakapaka biomass was due to unusual catch of several individuals in low slope, soft-bottom habitats, which greatly affected design-based estimates.

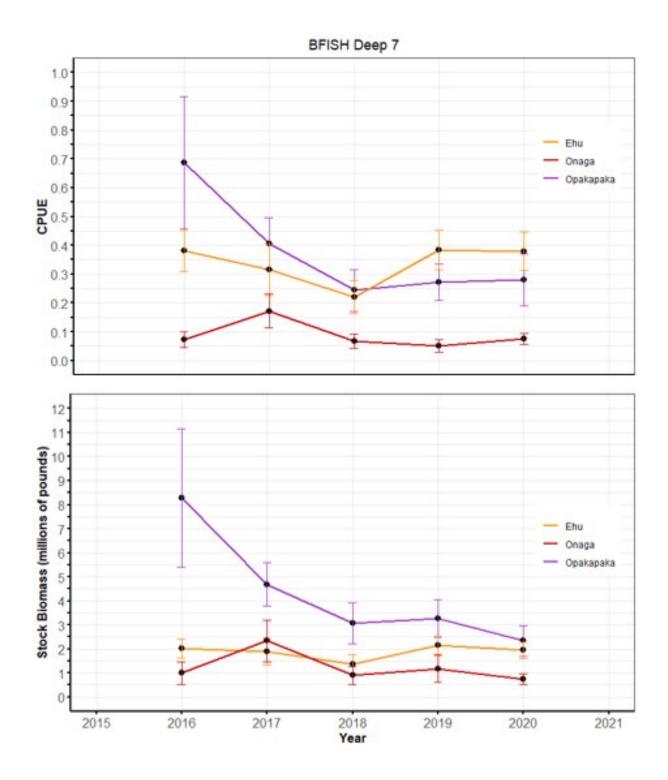


Figure 5. Annual survey estimates for three design species: (A) stock density (CPUE ± 1 SE); and, (B) stock biomass (± 1 SE).

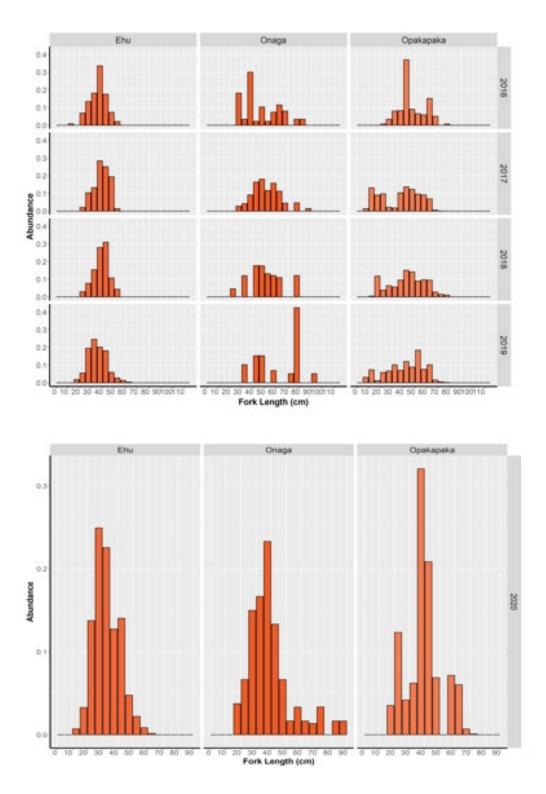


Figure 6. Length frequencies for 'ōpakapaka, onaga, and ehu from the 2016–2019 & 2020 BFISH surveys based on combined research fishing and MOUSS camera data. Exploited phase is >29 cm.

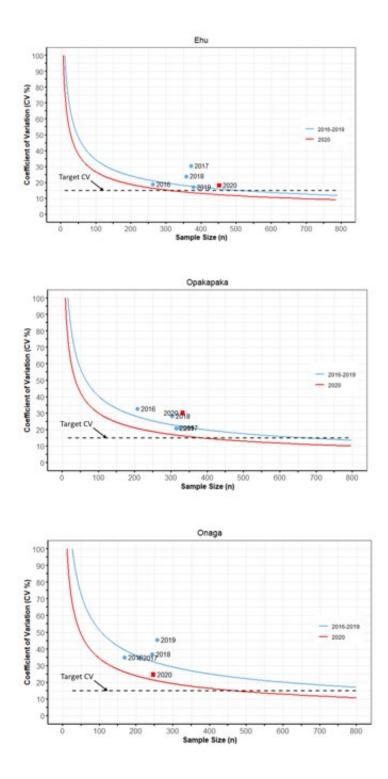


Figure 7. Yearly species-specific survey performance (CV of population density) vs. effective sample size with optimal Neyman curves for the three BFISH design species (ehu, 'ōpakapaka, onaga) and two survey periods (2016–2019 & 2020). The 2020 24-strata design (orange curve) shows marked improvement over the 2016–2019 9-strata design (blue curve). Target CV of 15% is indicated by the dashed horizontal line.

Discussion

The fall 2020 BFISH mission marks the 5-year anniversary of the operational bottomfish survey in Hawai'i, the first survey in Hawai'i designed expressly to provide fishery-independent estimates of size-structured abundance and biomass for use in Deep-7 bottomfish stock assessments (Langseth et al., 2018; Ault et al., 2018). Over the years, the cooperative research and public-private partnership between the Pacific Islands Fisheries Science Center, the Pacific Islands Fisheries Group, the University of Miami Rosenstiel School of Marine and Atmospheric Science, Kendall Enterprises, and Lynker Technologies has developed into a longstanding and robust partnership, culminating in a successful 2020 survey, despite the COVID-19 pandemic. The 2020 BFISH was the first survey in which all gears—fishing and cameras—were fielded entirely by cooperative research fishers, without direct field support by PIFSC staff or NOAA Research Vessels.

The 2020 estimated an exploited Deep-7 biomass of 3,468.92 mt (7.65 million lb) suggests that the 2020 annual catch limit of 492,000 lb allocated by the WPRFMC represents approximately 6% of the exploited stock biomass. While there have been some fluctuations in Deep-7 biomass over the 2016–2020 survey years, trends in the principal fishery species ('ōpakapaka and onaga) have been relatively stable (Figure 4). Recent declines in 'ōpakapaka and onaga are noteworthy, but may be due to changes in, and imperfect allocation within, the newly developed 24-level stratification. Continued declines in 2021 survey estimates could be cause for concern. Likewise, the marked increase in estimated gindai and hapu'upu'u biomass may be due to increased sampling within strata preferred by these species. As mentioned in earlier reports, the markedly higher 'ōpakapaka biomass in 2016 was inflated by two instances in which 'ōpakapaka were caught by research fishers in soft-bottom low-relief habitats. Because of the prevalence of this habitat type within the survey domain, these few instances had a substantial effect on our domain-level estimates.

The BFISH survey sampling design is focused on 'ōpakapaka, ehu, and onaga with a goal of achieving a 15% CV. Since 2016, survey performance has ranged from of 16% to 30% CV for these species. The fall 2020 BFISH achieved a CV of 32.2% for 'ōpakapaka, 25.3% for onaga, and 17.9% for ehu (Table 5, Figure 7). The evolution from a 9- to 24-level stratification has greatly improved optimal survey precision, evidenced by the leftward and downward movement of the Neyman curve shown in Figure 7. Under the 9-level stratification used from 2016 to 2019, 508, 669, and 999 primary sampling units would be needed to achieve a 15% CV for ehu, 'ōpakapaka, and onaga, respectively. Under the 24-level stratification developed for 2020, this drops to 310, 385, and 467; a species-specific savings of 197–532 samples per year (Table 7). As the Neyman curves for the 24-level stratification are improved from the 9-factor stratification, the deviation between the Neyman curve and the 2020 precision point for 'ōpakapaka (Figure 7) is likely due to a misallocation of samples, or to misclassification of PSUs based on imperfect mapping data.

Table 7. Comparison of number of primary sampling units (PSUs) required to achieve 15% CV for each of the design species under the 9- and 24-level stratifications used in the 2016–2019 and 2020 BFISH surveys, respectively.

	PSU need	ed to achieve 15% C	V
Species	9 Strata	24 Strata	Δ
Ehu	508	310	197
ʻŌpakapaka	669	385	283
Onaga	999	467	532

To improve overall accuracy and precision of BFISH surveys, future research should focus on refining estimates of the effective sampling area of the MOUSS camera system through empirical field experiments. At present, this remains the greatest liability to survey and provides the greatest source of uncertainty for the biomass estimates provided for the stock assessment. Additionally, effort should be made to (1) continue to refine PSU metrics of habitat complexity (e.g., bottom hardness, rugosity, etc.); (2) invest in technological innovations to extend the visual depth range of the MOUSS camera to cover the full depth range of the stock. This could be conducted through artificial lighting systems that do not produce behavioral responses in the test subjects or through improved low-light sensitivity.

Acknowledgements

This work greatly benefited from the support and strategic insights of Michael Seki, Sam Pooley, Gerard DiNardo, Annie Yau, Felipe Carvalho, and T. Todd Jones of PIFSC, Clay Tam of the Pacific Island Fisheries Group, and Forest O'Neill and Elizabeth Tarquin from Lynker Technologies, Inc. Others contributing to these efforts include: Ruhul Amin, James Barlow, Christopher Demarke, Rory Driskell, Alexa Gonzalez, Louise Guiseffi, Hoku Johnson, Kyle Koyanagi, Dianna Miller, William Misa, Justin Ossolinski, Russell Reardon, Audrey Rollo, Jessica Schem, Noriko Shoji, Jeremy Taylor, and Chad Yoshinaga of the PIFSC Science Operations Division; Kelli-Ann Bliss, David McVay, Kristin Raja, and Laura Rock from the NOAA Office of Marine and Aviation Operations; Jacob Asher from the PIFSC Ecosystem Sciences Division; Emily Contreras, Ryan Nichols, and Joseph O'Malley from PIFSC Fisheries Research and Monitoring Division; John Bravender, Leigh Anne Eaton, and Genki Kino from the National Weather Service; and Catherine Geweke and Alton Smith of the Division of Aquatic Resources at the Hawai'i Department of Land and Natural Resources. The authors also wish to thank the officers and crew of the NOAA Ship Oscar Elton Sette and the PIFG Cooperative Research captains Mike Abe, Nathan Abe, Kevin Awa, Kevin DeSilva, Eddie Ebisui, Jon Moribe, Roy Morioka, Layne Nakagawa, and Miles Togioka and observers Nathan Abe, Dennis Colon, Eddie Ebisui, Robert Moffitt, Kent Onaka, Brealand Tam, Bryce Whittaker, and Reno Young for their assistance with field survey efforts.

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Literature Cited

Amin R, Richards BL, Misa WFXE, Taylor JC, Miller DR, Rollo A, Demarke C, Singh H, Young GC, Childress J, et al. 2017. The Modular Optical Underwater Survey System. Sensors. 17:1–14. doi:10.3390/s17102309.

Ault JS, Diaz GA, Smith SG, Luo J, Serafy JE. 1999. An Efficient Sampling Survey Design to Estimate Pink Shrimp Population Abundance in Biscayne Bay, Florida. N. Am. J. Fish. Manag. 19:696–712. doi:https://doi.org/10.1577/1548-8675(1999)019<0696:AESSDT>2.0.CO;2.

Ault JS, Smith SG, Browder JA, Nuttle W, Franklin EC, Luo J, DiNardo GT, Bohnsack JA. 2014. Indicators for assessing the ecological dynamics and sustainability of southern Florida's coral reef and coastal fisheries. Ecol. Indic. 44:164–172.

Ault JS, Smith SG, Richards BL, Yau AJ, Langseth BJ, O'Malley JM, Boggs CH, Seki MP, DiNardo GT. 2018. Towards fishery-independent biomass estimation for Hawaiian Islands deepwater snappers. Fish. Res. 208:321–328. doi:10.1016/j.fishres.2018.08.012.

Brodziak J, Yau A, O'Malley J, Andrews A, Humphreys R, DeMartini E, Pan M, Parke M, Fletcher E. 2014. Stock Assessment Update for the Main Hawaiian Islands Deep7 Bottomfish Complex Through 2013 With projected Annual Catch Limits Through 2016. PIFSC Administrative Report. NMFS-PIFSC-42. doi:http://dx.doi.org/10.7289/V5T151M8.

Cappo M, Harvey ES, Shortis MR. 2006. Counting and measuring fish with baited video techniques – an overview. In: Cutting-Edge Technologies in Fish and Fisheries Science. (Australian Society for Fish Biology). p. 101–114.

Cochran WG. 1977. Sampling Techniques. NY, NY: John Wiley and Sons.

ESRI Inc. 2017. ArcGIS Desktop. ESRI Inc. http://www.esri.com.

Haddon M. 2011. Modelling and Quantitative Methods in Fisheries. Chapman and Hall/CRC. [accessed 2021 Aug 27]. https://www.taylorfrancis.com/books/9781439894170.

Haight WR, Kobayashi DR, Kawamoto KE. 1993. Biology and management of deepwater snappers of the Hawaiian Archipelago. Mar. Fish. Rev. 55:20–27.

Hawaii Mapping Research Group. 2016. Main Hawaiian Islands Multibeam Bathymetry Synthesis. [accessed 2021 Aug 25]. http://www.soest.hawaii.edu/HMRG/multibeam/bathymetry.php.

Hilborn R, Walters CJ. 1992. Quantitative Fisheries Stock Assessment: Choice, Dynamics and Uncertainty. Boston/Dordrecht/London: Kluwer Academic Publishers (books.google.com).

Langseth B, Syslo J, Yau A, Kapur M, Brodziak, Jon K. T. 2018. Stock assessment for the main Hawaiian Islands Deep 7 bottomfish complex in 2018, with catch projections through 2022. Honolulu, HI Report No.: NMFS-PIFSC-69. [accessed 2019 Mar 8].

ftp://ftp.library.noaa.gov/noaa_documents.lib/NMFS/PIFSC/TM_NMFS_PIFSC/NOAA_Tech_ Memo_PIFSC_69.pdf.

Law AM, Kelton WD. 2000. Building valid, credible, and appropriately detailed simulation models. Simulation Modeling and Analysis 3rd ed Singapore: McGraw-Hill.:264–291.

Lohr SL. 2010. Sampling: design and analysis. Boston: Brooks/Cole.

Mace PM, Bartoo NW, Hollowed AB, Kleiber P, Methot RD, Murawski SA, Powers JE, Scott GP. 2001. Marine Fisheries Stock Assessment Improvement Plan. Report of the National Marine Fisheries Service National Task Force for Improving Fish Stock Assessments.

Maunder MN, Punt AE. 2004. Standardizing catch and effort data: a review of recent approaches. Fish. Res. 70:141–159.

Quinn TJ, Deriso RB. 1999. Quantitative fish dynamics. New York: Oxford University Press. [accessed 2018 Sep 28]. http://public.eblib.com/choice/publicfullrecord.aspx?p=430433.

R Development Core Team. 2020. R: A Language and Environment for Statistical Computing. https://cran.r-project.org.

Ralston S, Cox S, Labelle M, Mees C. 2004. Bottomfish Stock Assessment Workshop – Final Report.

Richards BL, Smith JR, Smith SG, Ault JS, Kelley CD, Moriwake VN. 2019. Development and Use of a Novel Main Hawaiian Islands Bathymetric and Backscatter Synthesis in a Stratified Fishery-Independent Bottomfish Survey. NOAA technical memorandum NMFS-PIFSC ; 87. doi:10.25923/bh8v-0184. [accessed 2019 Sep 13].

ftp://ftp.library.noaa.gov/noaa_documents.lib/NMFS/PIFSC/TM_NMFS_PIFSC/NOAA_Tech_ Memo_PIFSC_87.pdf.

Richards BL, Smith, Steven G., Ault JS, DiNardo GT, Kobayashi DR, Domokos R, Anderson J, Taylor JC, Misa W, Giuseffi L, et al. 2016. Design and implementation of a bottomfish fishery-independent survey in the main Hawaiian Islands. Honolulu, HI NMFS-PIFSC Report No.: 53. https://doi.org/10.7289/V5/TM-PIFSC-67.

Robson D. 1961. Estimation of the relative fishing power of individual ships.

Smith SG, Ault JS, Bohnsack JA, Harper DE, Luo J, McClellan DB. 2011. Multispecies survey design for assessing reef-fish stocks, spatially explicit management performance, and ecosystem condition. Fish. Res. 109:25–41. doi:10.1016/j.fishres.2011.01.012.

Western Pacific Regional Fishery Management Council. 2010. Bottomfish Fisheries in the Hawaii Archipelago.

Appendix A: Primary Sampling Units (PSUs) Sampled by Hook-and-Line Fishing Gear During the Fall 2020 BFISH with Location, Stratum, and Vessel

SAMPLE DATE	Island	PSU	lat deg	lon deg	STRATA 2020	VESSEL	GEAR
<u>9/12/2020</u>	Maui Nui	19111	N20° 53.796'	W157° 6.767'	S22	ALICE	Fishing
9/12/2020	Maui Nui	17702	N20° 49.677'	W157° 1.919'	S20	ALICE	Fishing
9/12/2020	Maui Nui	17416	N20° 49.077 N20° 48.587'	W157° 1.357'	S20	ALICE	Fishing
9/12/2020		17410		W157° 1.069'	S20	ALICE	
	Maui Nui		N20° 48.583'				Fishing
9/12/2020	Maui Nui	17489	N20° 48.848'	W157° 0.489' W157° 1.371'	S10	ALICE	Fishing
9/12/2020	Maui Nui	17073	N20° 47.503'		S20	ALICE	Fishing
9/12/2020	Maui Nui	15398	N20° 43.406'	W156° 58.544'	S10	ALICE	Fishing
9/12/2020	Maui Nui	15140	N20° 42.850'	W156° 57.400'	S10	ALICE	Fishing
9/28/2020	Oahu	37086	N21° 30.177'	W157° 43.078'	#N/A	ALICE	Fishing
9/28/2020	Oahu	37147	N21° 30.735'	W157° 45.100'	S20	ALICE	Fishing
9/28/2020	Oahu	36468	N21° 25.826'	W157° 41.090'	S20	ALICE	Fishing
8/26/2020	Oahu	40202	N21° 45.745'	W158° 0.637'	S22	EBISUI III	Fishing
8/26/2020	Oahu	40201	N21° 45.747'	W158° 0.928'	S22	EBISUI III	Fishing
8/26/2020	Oahu	40318	N21° 46.290'	W158° 1.214'	S22	EBISUI III	Fishing
8/26/2020	Oahu	40077	N21° 45.210'	W158° 1.802'	S16	EBISUI III	Fishing
8/26/2020	Oahu	39808	N21° 44.142'	W158° 4.710'	S21	EBISUI III	Fishing
8/26/2020	Oahu	39873	N21° 44.417'	W158° 5.288'	S22	EBISUI III	Fishing
8/26/2020	Oahu	39679	N21° 43.603'	W158° 5.293'	S22	EBISUI III	Fishing
8/26/2020	Oahu	39502	N21° 42.797'	W158° 6.458'	S22	EBISUI III	Fishing
8/26/2020	Oahu	39335	N21° 41.987'	W158° 7.043'	S22	EBISUI III	Fishing
8/26/2020	Oahu	38941	N21° 39.820'	W158° 7.346'	S14	EBISUI III	Fishing
8/27/2020	Oahu	38614	N21° 38.205'	W158° 9.385'	S20	EBISUI III	Fishing
8/27/2020	Oahu	38880	N21° 39.568'	W158° 11.117'	S24	EBISUI III	Fishing
8/27/2020	Oahu	38530	N21° 37.939'	W158° 10.546'	S22	EBISUI III	Fishing
8/27/2020	Oahu	38527	N21° 37.944'	W158° 11.416'	S22	EBISUI III	Fishing
8/27/2020	Oahu	38603	N21° 38.220'	W158° 12.574'	S24	EBISUI III	Fishing
8/27/2020	Oahu	38359	N21° 37.407'	W158° 12.578'	S22	EBISUI III	Fishing
8/27/2020	Oahu	38358	N21° 37.409'	W158° 12.868'	S22	EBISUI III	Fishing
9/28/2020	Oahu	38350	N21° 37.419'	W158° 15.187'	S22	EBISUI III	Fishing
9/28/2020	Oahu	38420	N21° 37.704'	W158° 18.374'	S15	EBISUI III	Fishing
9/28/2020	Oahu	38250	N21° 37.170'	W158° 20.406'	S17	EBISUI III	Fishing
9/28/2020	Oahu	38491	N21° 37.989'	W158° 21.852'	S24	EBISUI III	Fishing
9/28/2020	Oahu	37923	N21° 36.093'	W158° 22.150'	S22	EBISUI III	Fishing
9/28/2020	Oahu	37845	N21° 35.821'	W158° 21.861'	S22	EBISUI III	Fishing
9/28/2020	Oahu	37691	N21° 35.280'	W158° 22.153'	S22	EBISUI III	Fishing
9/28/2020	Oahu	37498	N21° 34.189'	W158° 20.419'	S15	EBISUI III	Fishing
9/28/2020	Oahu	37359	N21° 33.090'	W158° 16.948'	S12	EBISUI III	Fishing
9/29/2020	Oahu	39320	N21° 41.630'	W157° 52.836'	S20	EBISUI III	Fishing
9/29/2020	Oahu	39326	N21° 41.618'	W157° 51.096'	S24	EBISUI III	Fishing
9/29/2020	Oahu	39612	N21° 42.977'	W157° 51.666'	S24	EBISUI III	Fishing
9/29/2020	Oahu	39846	N21° 44.075'	W157° 53.687'	S22	EBISUI III	Fishing
9/29/2020	Oahu	39978	N21° 44.619'	W157° 53.973'	S20	EBISUI III	Fishing
9/29/2020	Oahu	40099	N21° 45.170'	W157° 55.420'	S20	EBISUI III	Fishing
9/29/2020	Oahu	40498	N21° 47.082'	W157° 57.727'	S24	EBISUI III	Fishing
9/7/2020	Oahu	34929	N21° 17.356'	W157° 32.780'	S19	AMY C	Fishing
9/7/2020	Oahu	35428	N21° 18.716'	W157° 33.345'	S22	AMY C	Fishing
9/7/2020	Oahu	35622	N21° 19.544'	W157° 35.072'	S20	AMY C	Fishing
9/7/2020	Oahu	34176	N21° 16.009'	W157° 33.660'	S19	AMY C	Fishing
9/7/2020	Oahu	33695	N21° 15.203'	W157° 34.536'	S23	AMY C	Fishing
9/7/2020	Oahu	33693	N21° 15.208'	W157° 35.114'	S17	AMY C	Fishing
9/7/2020	Oahu	33672	N21° 15.257'	W157° 41.184'	S21	AMY C	Fishing
9/7/2020	Oahu	33671	N21° 15.260'	W157° 41.473'	S21	AMY C	Fishing
9/12/2020	Maui Nui	25799	N21° 1.901'	W157° 4.645'	S20	AMY C	Fishing
9/12/2020	Maui Nui	25225	N21° 1.346'	W157° 3.498'	S20	AMY C	Fishing
9/12/2020	Maui Nui	25523	N21° 1.584'	W157° 0.609'	S11	AMYC	Fishing
9/12/2020	Maui Nui	22825	N20° 58.809'	W156° 55.165'	S05	AMYC	Fishing
9/12/2020	Maui Nui	23345	N20° 59.326'	W156° 53.138'	S14	AMY C	Fishing
9/12/2020	Maui Nui	23869	N20° 59.864'	W156° 52.842'	S14	AMYC	Fishing
9/12/2020	Maui Nui	22334	N20° 58.235'	W156° 52.577'	S12	AMY C	Fishing
9/12/2020	Maui Nui	21093	N20° 56.998'	W157° 2.401'	S02	AMYC	Fishing
9/12/2020	Maui Nui	19350	N20° 54.319'	W157° 5.031'	S02	AMYC	Fishing
9/13/2020	Maui Nui	19226	N20° 54.061'	W157° 6.187'	S21	AMY C	Fishing

SAMPLE DATE	Island	PSU	lat_deg	lon_deg	STRATA 2020	VESSEL	GEAR
9/13/2020	Maui Nui	20471	N20° 56.218'	W157° 5.295'	S20	AMY C	Fishing
9/13/2020	Maui Nui	23560	N20° 59.750'	W157° 6.116'	S22	AMY C	Fishing
9/13/2020	Maui Nui	23825	N21° 0.014'	W157° 5.535'	S22	AMY C	Fishing
9/13/2020	Maui Nui	24094	N21° 0.292'	W157° 6.109'	S22	AMY C	Fishing
9/13/2020	Maui Nui	24932	N21° 1.101'	W157° 5.810'	S21	AMY C	Fishing
9/27/2020	Oahu	33107	N21° 14.215'	W157° 46.686'	S16	AMY C	Fishing
9/27/2020	Oahu	33233	N21° 14.506'	W157° 49.574'	S22	AMY C	Fishing
9/30/2020	Maui Nui	34809	N21° 16.956'	W157° 18.906'	S19	AMY C	Fishing
9/30/2020	Maui Nui	35355	N21° 18.317'	W157° 19.469'	S19	AMY C	Fishing
9/30/2020	Maui Nui	35444	N21° 18.564'	W157° 17.152'	S20	AMY C	Fishing
9/30/2020	Maui Nui	32810	N21° 13.437'	W157° 19.235'	S20	AMY C	Fishing
9/30/2020	Maui Nui	31412	N21° 10.804'	W157° 27.354'	S22	AMY C	Fishing
9/3/2020	Kauai	42446	N21° 56.930'	W159° 45.440'	S22	YUKIE-LYNN	Fishing
9/3/2020	Kauai	42447	N21° 56.932'	W159° 45.150'	S21	YUKIE-LYNN	Fishing
9/3/2020	Kauai	41444	N21° 52.635'	W159° 35.545'	S10	YUKIE-LYNN	Fishing
9/3/2020	Kauai	41449	N21° 52.640'	W159° 34.093'	S10	YUKIE-LYNN	Fishing
9/3/2020	Kauai	41278	N21° 52.106'	W159° 31.478'	S10	YUKIE-LYNN	Fishing
9/3/2020	Kauai	41133	N21° 51.567'	W159° 30.605'	S21	YUKIE-LYNN	Fishing
9/3/2020	Kauai	41488	N21° 52.673'	W159° 22.478'	S16	YUKIE-LYNN	Fishing
9/3/2020	Kauai	41869	N21° 54.031'	W159° 21.320'	S16	YUKIE-LYNN	Fishing
9/3/2020	Kauai	42030	N21° 54.844'	W159° 21.031'	S14	YUKIE-LYNN	Fishing
9/3/2020	Kauai	42031	N21° 54.845'	W159° 20.741'	S20	YUKIE-LYNN	Fishing
9/3/2020	Kauai	42125	N21° 55.388'	W159° 20.452'	S15	YUKIE-LYNN	Fishing
9/4/2020	Kauai	43457	N22° 2.439'	W159° 18.143'	S10	YUKIE-LYNN	Fishing
9/4/2020	Kauai	43569	N22° 3.254'	W159° 17.272'	S16	YUKIE-LYNN	Fishing
9/4/2020	Kauai	43598	N22° 3.524'	W159° 17.563'	S10	YUKIE-LYNN	Fishing
9/4/2020	Kauai	43691	N22° 4.609'	W159° 16.984'	S15	YUKIE-LYNN	Fishing
9/4/2020	Kauai	44013	N22° 7.863'	W159° 16.118'	S11	YUKIE-LYNN	Fishing
9/4/2020	Kauai	44105	N22° 8.677'	W159° 15.538'	S16	YUKIE-LYNN	Fishing
9/4/2020	Kauai	44486	N22° 11.385'	W159° 17.289'	S13	YUKIE-LYNN	Fishing
9/4/2020	Kauai	44698	N22° 12.738'	W159° 18.165'	S03	YUKIE-LYNN	Fishing
9/4/2020	Kauai	45141	N22° 14.630'	W159° 21.080'	S06	YUKIE-LYNN	Fishing
9/4/2020	Kauai	45272	N22° 15.172'	W159° 20.790'	S22	YUKIE-LYNN	Fishing
9/4/2020	Kauai	45271	N22° 15.172'	W159° 21.081'	S22	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45250	N22° 15.156'	W159° 27.196'	S14	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45246	N22° 15.153'	W159° 28.360'	S01	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45364	N22° 15.694'	W159° 28.653'	S13	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45485	N22° 16.774'	W159° 30.113'	S23	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45426	N22° 16.229'	W159° 30.984'	S17	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45298	N22° 15.416'	W159° 30.982'	S02	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45499	N22° 17.036'	W159° 33.026'	S13	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45474	N22° 16.764'	W159° 33.316'	S05	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45438	N22° 16.483'	W159° 35.936'	S16	YUKIE-LYNN	Fishing
9/5/2020	Kauai	45281	N22° 15.399'	W159° 35.931'	S01	YUKIE-LYNN	Fishing
9/6/2020	Kauai	44586	N22° 12.116'	W159° 43.484'	S09	YUKIE-LYNN	Fishing
9/6/2020	Kauai	44621	N22° 12.386'	W159° 43.777'	S22	YUKIE-LYNN	Fishing
9/6/2020	Kauai	44582	N22° 12.111'	W159° 44.648'	S23	YUKIE-LYNN	Fishing
9/6/2020	Kauai	44495	N22° 11.565'	W159° 45.518'	S17	YUKIE-LYNN	Fishing
9/6/2020	Kauai	44366	N22° 10.745'	W159° 46.969'	S13	YUKIE-LYNN	Fishing
9/6/2020	Kauai	44080	N22° 8.570'	W159° 48.412'	S06	YUKIE-LYNN	Fishing
9/6/2020	Kauai	43990	N22° 7.755'	W159° 48.698'	S05	YUKIE-LYNN	Fishing
9/6/2020	Kauai	43698	N22° 4.773'	W159° 48.971'	S07	YUKIE-LYNN	Fishing
9/6/2020	Kauai	43605	N22° 3.683'	W159° 50.128'	S24	YUKIE-LYNN	Fishing
9/6/2020	Kauai	43135	N22° 0.434'	W159° 49.528'	S24	YUKIE-LYNN	Fishing
9/6/2020	Kauai	42996	N21° 59.628'	W159° 48.070'	S09	YUKIE-LYNN	Fishing
9/6/2020	Kauai	42591	N21° 57.471'	W159° 45.734'	S10	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	43463	N22° 2.501'	W160° 6.691'	S22	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	43109	N22° 0.315'	W160° 9.289'	S22	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	43058	N22° 0.037'	W160° 10.159'	S24	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	43017	N21° 59.771'	W160° 9.575'	S16	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42851	N21° 58.683'	W160° 10.148'	S14	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42799	N21° 58.409'	W160° 10.436'	S01	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42849	N21° 58.678'	W160° 10.729'	S20	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42742	N21° 58.126'	W160° 12.177'	S17	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42690	N21° 57.855'	W160° 12.174'	S07	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42133	N21° 55.399'	W160° 14.477'	S13	YUKIE-LYNN	Fishing
9/12/2020	Niʻihau	42181	N21° 55.668'	W160° 14.770'	S21	YUKIE-LYNN	Fishing
9/13/2020	Niʻihau	41986	N21° 54.582'	W160° 15.051'	S13	YUKIE-LYNN	Fishing
9/13/2020	Niʻihau	41669	N21° 53.220'	W160° 15.910'	S01	YUKIE-LYNN	Fishing

9 13/200 Nithau 41/38 N21*23.04 Nithau 41/38 N21*23.04 Nithau 40/38 N21*25 N32 VIK/E-L/NN Feshing 9/13/200 Nithau 40/38 N21*43.02 Nithau 40/38 N21*43.02 Nithau Fishing	SAMPLE DATE	Island	PSU	lat deg	lon deg	STRATA 2020	VESSEL	GEAR
9/13/2020 Ni Inhua 41035 N21 + 51.052 VIL60 + 15.897 S10 YLKR-LINN Fishing 9/13/2020 Ni Inhua 39862 N21 + 44.302 VIL60 + 12.641 S12 YLKR-LINN Fishing 9/13/2020 Ni Inhua 40359 N21 + 44.302 VIL60 + 10.787 S14 YLKR-LINN Fishing 9/13/2020 Ni Inhua 40359 N21 + 44.312 VIL60 + 10.916 S14 YLKR-LINN Fishing 9/13/2020 Ni Inhua 40360 N21 + 42.12 VIL60 + 10.811 S15 YLKR-LINN Fishing 9/16/2020 Ni Inhua 40560 N21 + 50.582 VIL60 + 5.317 S14 YLKR-LINN Fishing 9/16/2020 Ni Inhua 4055 N21 + 47.596 VIL60 + 5.317 S14 YLKR-LINN Fishing 9/16/2020 Ni Inhua 4055 N21 + 47.596 VIL60 + 5.317 S14 YLKR-LINN Fishing 9/16/2020 Ni Inhua 4085 N21 + 47.596 VIL60 + 5.318 ALMAK Fishing <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>								
9/13/2202 Ni Tihua 40948 N21 50.781 V160*15.889 \$10 YTKE-LYNN Fishing 9/13/2202 Ni Tihua 4002 N12+45.121 W160*11.778 \$14 YTKE-LYNN Fishing 9/13/2202 Ni Tihua 4002 N12+45.121 W160*9.488 \$10 YTKE-LYNN Fishing 9/13/2202 Ni Tihua 40746 N12+45.211 W160*9.488 \$10 YTKE-LYNN Fishing 9/13/2202 Ni Tihua 40765 N12+45.217 W160*5437 S10 YTKE-LYNN Fishing 9/16/2020 Ni Tihua 40656 N12+63.557 W160*5437 S14 YTKE-LYNN Fishing 9/16/2020 Ni Tihua 40655 N12+43.596 W160*575 S21 YTKE-LYNN Fishing 9/16/2020 Ni Tihua 40655 N12+43.597 W160*4338 S22 YTKE-LYNN Fishing 9/16/2020 Ni Tihua 4055 N12+43.597 W160*4378 S22 YTKE-LYNN Fishing 8/17/2020								Fishing
9/12/200 Ni: fubur 39862 Ni: 1600 <								
9/13/2020 Ni: Ihau 4002 N.21*45.121 W160*10.718 \$14 YUKE-LYNN Fishing 9/13/2020 Ni: Ihau 4076 N.21*445.211 W160*9.488 \$10 YUKE-LYNN Fishing 9/13/2020 Ni: Ihau 40766 N.21*445.212 W160*9.488 \$10 YUKE-LYNN Fishing 9/16/2020 Ni: Ihau 4161 N.21*53.682 W160*1.681 \$05 YUKE-LYNN Fishing 9/16/2020 Ni: Ihau 44051 N.21*5.682 W160*5.717 \$14 YUKE-LYNN Fishing 9/16/2020 Ni: Ihau 40526 N.21*4.2499 W160*6.578 \$21 YUKE-LYNN Fishing 9/16/2020 Ni: Ihau 40536 N.22*52.02 YUKE-21.285 NO N								
9/13/2020 Nr. ihau 40736 N.21" 48.931" W160" 19.916" S10 <i>JUKRE-LINN</i> Fishing 9/13/2020 Nr. ihau 40766 N.21" 49.212" W160" 8.039" S10 <i>TUKRE-LINN</i> Fishing 9/16/2020 Nr. ihau 41611 N.21" 53.048" W160" 4.039" S10 <i>TUKRE-LINN</i> Fishing 9/16/2020 Nr. ihau 440616 N.21" 53.048" W160" 5.457" S14 <i>TUKRE-LINN</i> Fishing 9/16/2020 Nr. ihau 440656 N.21" 45.150" W160" 5.457" S14 <i>TUKRE-LINN</i> Fishing 9/16/2020 Nr. ihau 44055 N.21" 45.150" W160" 5.25" 20.821" S05 <i>ArtOMI K</i> Fishing 9/16/2020 Maxi Nia 23408 N21" 45.20" W160" 5.20" S05 <i>ArtOMI K</i> Fishing 9/17/2020 Maxi Nia 23408 N21" 45.20" N160" 2.43" S06 <i>MtOMI K</i> Fishing 8/17/2020 Maxi Nia 23408 N21" 55" 27.65" S06 <i>MtOMI K</i> Fishing								
9132020 Nr. Thau 40766 N2.17 49.212 'W160' 9.48' S10 <i>YUKIE-17NN</i> Fishing 9162020 Nr. Thau 40766 N21' 49.212 'W160' 1.68' N505 <i>YUKIE-17NN</i> Fishing 9162020 Nr. Thau 40766 N21' 51.682 'W160' 5.16' S10 <i>YUKIE-17NN</i> Fishing 9162020 Nr. Thau 40766 N21' 50.858 'W160' 5.317' S14 <i>YUKIE-17NN</i> Fishing 9162020 Nr. Thau 40766 N21' 49.499 'W160' 5.719' S24 <i>IVUKIE-17NN</i> Fishing 9162020 Nr. Thau 4055 N21' 47.596 'W160' 5.73' S21 <i>IVUKIE-17NN</i> Fishing 9162020 Nr. Thau 4055 N21' 47.596 'W160' 5.73' S21 <i>IVUKIE-17NN</i> Fishing 9162020 Nr. Thau 4055 N21' 47.596 'W160' 5.73' S22 <i>IVUKIE-17NN</i> Fishing 9162020 Nr. Thau 4055 N21' 49.597 'W160' 5.73' S22 <i>IVUKIE-17NN</i> Fishing 9162020 Mr. Thau 4055 N21' 49.597 'W160' 5.73' S22 <i>IVUKIE-17NN</i> Fishing 8172020 Main Nia 24667 N20' 59.202' W15C' 54.683' S08 <i>NLOWI K</i> Fishing 8172020 Main Nia 24667 N20' 55.637 'W15C' 54.683' S08 <i>NLOWI K</i> Fishing 8172020 Main Nia 2448 N20' 55.637 'W15C' 21.699 NLOWI K Fishing 8172020 Main Nia 2448 N20' 55.637 'W15C' 21.699 NLOWI K Fishing 8182020 Main Nia 2448 N20' 55.637 'W15C' 12.499 NLOWI K Fishing 8182020 Main Nia 2448 N20' 55.637 'W15C' 11.644' S24 <i>NLOWI K</i> Fishing 8182020 Main Nia 22668 N20' 57.597 'W15C' 15.1044' S20 <i>MAOMI K</i> Fishing 8182020 Main Nia 22668 N20' 57.947 'W15C' 15.1044' S20 <i>MAOMI K</i> Fishing 8182020 Main Nia 22668 N20' 57.947 'W15C' 15.1044' S20 <i>MAOMI K</i> Fishing 8182020 Main Nia 22668 N20' 57.947 'W15C' 15.1044' S20 <i>MAOMI K</i> Fishing 8182020 Main Nia 22668 N20' 57.947 'W15C' 15.104' M20 <i>MAOMI K</i> Fishing 8182020 Main Nia 22668 N20' 57.947 'W15C' 15.104' M20 <i>MAOMI K</i> Fishing 8182020 Main Nia 22668 N20' 57.947 'W15C' 15.104' M20 <i>MAOMI K</i> Fishing 8182020 Main Nia 12706 N20' 59.907 'W15C' 10.4400 <i>NAOMI K</i> Fishing 8182020 Main Nia 12706 N20' 59.907 'W15C' 10.470 <i>MAOMI K</i> Fishing 8182020 Main Nia 12706 N20' 59.907 'W15C' 10.470 <i>MAOMI K</i> Fishing 8192020 Main Nia 1320' 40.293 'W15C' 10.570 'M16C' 10.470 <i>MAOMI K</i> Fishing 8192020 Main Nia 1320' 40.293 'W15C' 50.154' 13.07 'M100 MAOMI K Fishing 8192020 Main Nia 1320' 40.293 'W15C' 30.485'								
9112020 Nr. Thau 4076 N21*49.212* V160* 8.09* S17 17/2/2/2-17/Nr Fishing 9162020 Nr. Thau 41611 N21*51.448* V160* 1.681* S05 17/2/2.217/Nr Fishing 9162020 Nr. Thau 41611 N21*51.682* V160* 3.413* S10 17/2/2.217/Nr Fishing 9162020 Nr. Thau 40966 N21*50.585* V160* 5.437* S14 17/2/2.17/Nr Fishing 9162020 Nr. Thau 40256 N21*47.596* V160* 5.719* S24 17/2/2.217/Nr Fishing 9162020 Nr. Thau 40576 N21*47.596* V160* 5.719* S24 17/2/2.217/Nr Fishing 9162020 Nr. Thau 40556 N21*47.596* V160* 3.778* S22 17/2/2.217/Nr Fishing 9162020 Nr. Thau 40556 N21*48.50* V160* 3.78* S22 17/2/2.217/Nr Fishing 817.2020 Maii Nai 24603 N20*59.22* V156* 24.533* S08 Ar/OM/ K Fishing 817.2020 Maii Nai 24607 N29*9202* V156* 24.533* S08 Ar/OM/ K Fishing 817.2020 Maii Nai 24607 N29*9202* V156* 24.535* S08 Ar/OM/ K Fishing 817.2020 Maii Nai 24408 N20*58.726* V156* 24.535* S08 Ar/OM/ K Fishing 817.2020 Maii Nai 24408 N20*58.726* V156* 24.535* S08 Ar/OM/ K Fishing 817.2020 Maii Nai 24408 N20*58.726* V156* 12.149* S10 Ar/OM/ K Fishing 817.2020 Maii Nai 2440 N20*58.726* V156* 11.614* S24 Ar/OM/ K Fishing 818.2020 Maii Nai 2440 N20*57.942* V156* 13.549* S10 Ar/OM/ K Fishing 818.2020 Maii Nai 2468 N20*57.942* V156* 13.547* S10 Ar/OM/ K Fishing 818.2020 Maii Nai 22688 N20*57.942* V156* 13.547* S10 Ar/OM/ K Fishing 818.2020 Maii Nai 22688 N20*57.942* V156* 13.547* S10 Ar/OM/ K Fishing 818.2020 Maii Nai 23400 N20*57.945* V156* 14.307* S07 Ar/OM/ K Fishing 818.2020 Maii Nai 23460 N20*57.945* V156* 14.307* S10 Ar/OM/ K Fishing 818.2020 Maii Nai 23460 N20*57.945* V156* 14.507* S10 Ar/OM/ K Fishing 818.2020 Maii Nai 23460 N20*57.945* V156* 14.507* S10 Ar/OM/ K Fishing 818.2020 Maii Nii 23460 N20*57.945* V156* 14.507* S10 Ar/OM/ K Fishing 819.2020 Maii Nii 23460 N20*57.945* V156* 14.507* S10 Ar/OM/ K Fishing 819.2020 Maii Nii 1335* N20*0.57.945* V156* 14.507* S10 Ar/OM/ K Fishing 819.2020 Maii Nii 1335* N20*0.57.945* V156* 13.078* S10 Ar/OM/ K Fishing 819.2020 Maii Nii 1353* N20*0.406*0* V156* 30.445* S10 Ar/OM/ K Fishing 82.202020 Maii Nii 1353* N20*0.407*57.95*								
9/16/2020 Nr. Thau 4101 N21*53.082 W160*1.681* S05 PT/KTE-12VN Fishing 9/16/2020 Nr. Thau 40966 N21*53.682 W160*5.313* S10 PT/KTE-12VN Fishing 9/16/2020 Nr. Thau 40965 N21*54.29499 W160*5.719 S24 PT/KTE-12VN Fishing 9/16/2020 Nr. Thau 4055 N21*44.590 W160*4.383* S22 PT/KTE-12VN Fishing 9/16/2020 Nr. Thau 4055 N21*44.510 W160*4.383* S22 PT/KTE-12VN Fishing 9/16/2020 Nr. Thau 40854 N21*45.150 W160*4.383* S22 PT/KTE-12VN Fishing 9/16/2020 Mair Nai 24503 N20*59.957 W156*20.821* S05 Ar/OM1 K Fishing 8/17/2020 Mair Nai 24503 N20*59.957 W156*20.821* S05 Ar/OM1 K Fishing 8/17/2020 Mair Nai 2468 N20*59.957 W156*20.616* S060 Ar/OM1 K Fishing 8/17/2020 Mair Nai 2468 N20*59.822 W156*20.616* S060 Ar/OM1 K Fishing 8/17/2020 Mair Nai 2448 N21*05*8.922 W156*20.506 S060 Ar/OM1 K Fishing 8/17/2020 Mair Nai 2448 N21*05*8.220 W156*20.506 S060 Ar/OM1 K Fishing 8/17/2020 Mair Nai 2448 N21*05*8.220 W156*20.506 S060 Ar/OM1 K Fishing 8/17/2020 Mair Nai 22469 N20*57.220 V156*20.506 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22469 N20*57.220 W156*11.614 S20 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22469 N20*57.242 W156*13.559 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22468 N20*57.342 W156*13.359 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22468 N20*57.342 W156*13.359 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22468 N20*57.942 W156*13.359 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22468 N20*57.950 W156*13.359 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 22468 N20*57.950 W156*13.359 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 23705 N02*59.076 W156*13.539 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 23705 N02*59.076 W156*13.539 N10 Ar/OM1 K Fishing 8/18/2020 Mair Nai 23705 N02*59.076 W156*13.539 N10 Ar/OM1 K Fishing 8/19/2020 Mair Nai 14333 N20*0606 W156*10.946 S10 Ar/OM1 K Fishing 8/19/2020 Mair Nai 14335 N20*0405*89 307 Ar/OM1 K Fishing 8/19/2020 Mair Nai 14335 N20*0407*89 305*30.4769 X70 M1/K Fishing 8/19/2020 Mair Nai 14335 N20*0407*89 3057 Xr/OM1 K Fishing 8/19/2020 Mair Nai 14420 N20*04.938 W156*30.548 S03 Ar/OM1 K Fishing 8/19/2020 Mair Nai 1442 N20*04.938 W156*30.548 S0								
9/16/2020 Nr. Thau 4111 N21*15.085* W160* 5.437 S10 Y/X/KE-JVNN Fishing 9/16/2020 Nr. Thau 40668 N21*45.085* W160* 5.719 S24 Y/X/KE-JVNN Fishing 9/16/2020 Nr. Thau 40676 N21*45.50* W160* 5.719 S24 Y/X/KE-JVNN Fishing 9/16/2020 Nr. Thau 40635 N21*45.50* W160* 5.83* S22 Y/X/KE-JVNN Fishing 9/16/2020 Nr. Thau 40633 N20*59.20* V15*2-24.583 S08 M/AOM/K Fishing 8/17/2020 Maui Nui 24/61 N20*59.20* V15*2-24.583 S08 M/AOM/K Fishing 8/17/2020 Maui Nui 24/41 N20*57.65 S06 M/AOM/K Fishing 8/17/2020 Maui Nui 24/41 N20*57.65 V15*2.05 S06 M/AOM/K Fishing 8/18/2020 Muii Nui 24/48 N20*57.65 V15*2.13.57 S0 M/AOM/K Fishing 8/18/2020 Muii N								
9/16/2020 Ni'ihau 40828 N21*9.585 W160*5.17 S14 YUKRE-LYNN Fishing 9/16/2020 Ni'ihau 40828 N21*47.596 W160*6.575 S21 YUKRE-LYNN Fishing 9/16/2020 Ni'ihau 40655 N21*47.596 W160*6.575 S21 YUKRE-LYNN Fishing 9/16/2020 Ni'ihau 40653 N21*49.590 W160*3.978 S22 YUKRE-LYNN Fishing 8/17/2020 Maui Nui 24403 N20*59.957 W156*24.583 S08 NAOM/K Fishing 8/17/2020 Maui Nui 2449 N20*59.927 W156*27.165 S06 NAOM/K Fishing 8/17/2020 Maui Nui 2449 N20*57.577 W156*12.499 S10 NAOM/K Fishing 8/18/2020 Maui Nui 2469 N20*57.577 W156*13.046 S20 NAOM/K Fishing 8/18/2020 Maui Nui 2208 7.947 W156*13.047 S10 NAOM/K Fishing 8/18/2020 M								
914G2020 Ni: hun 40876 N21*9499 W160* 5.719 S24 YUKEL-LYN Fishing 914G2020 Ni: hun 40655 N21*4150 W160* 4.838 S22 YUKEL-LYN Fishing 914G2020 Ni: hun 40634 N21*44510 W160* 3.98* S22 YUKEL-LYN Fishing 81172020 Maui Nui 23671 N20*59.20* W156* 24.88* S08 NAOM/K Fishing 81172020 Maui Nui 23671 N20*59.20* W156* 25.660* S09 NAOM/K Fishing 81172020 Maui Nui 24481 N20*59.22* W156* 27.16* S06 NAOM/K Fishing 81182020 Maui Nui 23460 N20*59.29* V156* 13.44* S24 NAOM/K Fishing 81182020 Maui Nui 22688 N20*57.947* V156* 13.59* S10 NAOM/K Fishing 81182020 Maui Nui 23648 N20*57.947* V156* 15.61 NAOM/K Fishing 81182020 Maui Nui								
9/16/2020 Ni ⁺ Thau 40055 N21 ⁹ 47.5967 N160 ⁺ 6.5757 S21 7777 Fishing 9/16/2020 Ni ⁺ Thau 40053 N21 ⁹ 4.5107 N160 ⁺ 4.587 S22 7777 Fishing 8/17/2020 Maui Nai 24503 N20 ⁺ 9.5977 N156 ⁺ 2.54.583 S08 M40M/K Fishing 8/17/2020 Maui Nai 24503 N20 ⁺ 5.9202 N156 ⁺ 2.4583 S08 M40M/K Fishing 8/17/2020 Maui Nai 24491 N20 ⁺ 5.8562 N156 ⁺ 2.4583 S08 M40M/K Fishing 8/17/2020 Maui Nai 24491 N20 ⁺ 5.8562 N156 ⁺ 2.565 S06 M40M/K Fishing 8/17/2020 Maui Nai 24491 N21 ⁰ 5.9542 N156 ⁺ 2.71.65 S06 M40M/K Fishing 8/17/2020 Maui Nai 24491 N20 ⁺ 5.5677 N156 ⁺ 1.2499 S10 M40M/K Fishing 8/18/2020 Maui Nai 24491 N20 ⁺ 5.5677 N156 ⁺ 1.2499 S10 M40M/K Fishing 8/18/2020 Maui Nai 2460 N20 ⁺ 5.75677 N156 ⁺ 1.2499 S10 M40M/K Fishing 8/18/2020 Maui Nai 22688 N20 ⁺ 5.7927 N156 ⁺ 1.3447 S10 M40M/K Fishing 8/18/2020 Maui Nai 22683 N20 ⁺ 5.7927 N156 ⁺ 1.5479 S10 M40M/K Fishing 8/18/2020 Maui Nai 22683 N20 ⁺ 5.7927 N156 ⁺ 1.5479 S10 M40M/K Fishing 8/18/2020 Maui Nai 22687 N20 ⁺ 5.7927 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 22687 N20 ⁺ 5.7927 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 23706 N20 ⁺ 5.9727 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 23706 N20 ⁺ 5.9727 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 23706 N20 ⁺ 5.9747 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 23706 N20 ⁺ 5.9747 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 23706 N20 ⁺ 5.9747 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/18/2020 Maui Nai 14333 N20 ⁺ 40.598 N156 ⁺ 1.5407 S10 M40M/K Fishing 8/19/2020 Maui Nai 1433 N20 ⁺ 40.598 N156 ⁺ 1.5417 S10 M40M/K Fishing 8/19/2020 Maui Nai 1433 N20 ⁺ 40.598 N156 ⁺ 1.5417 S10 M40M/K Fishing 8/19/2020 Maui Nai 1433 N20 ⁺ 40.598 N156 ⁺ 1.5418 S10 M40M/K Fishing 8/19/2020 Maui Nai 1433 N20 ⁺ 40.598 N156 ⁺ 3.1207 S11 M40M/K Fishing 8/19/2020 Maui Nai 1433 N20 ⁺ 40.598 N156 ⁺ 3.1207 S11 M40M/K Fishing 8/19/2020 Maui Nai 1433 N20 ⁺ 40.598 N156 ⁺ 3.1207 S11 M40M/K Fishing 8/19/2020 Maui Nai 14542 N20 ⁺ 4.3599 N156 ⁺ 3.1207 S11 M40M/K Fishing 8/20/202 Maui Nai 14542 N20 ⁺ 4.3599 N156 ⁺ 3.3737 S00 M40M/K Fi								
9/16/2020 Ni: Than 40653 N21*48.150' W160*3.978' S22 YUKEL-LYNN Fishing 8/17/2020 Maii Nui 24633 N20*59.957' W156*24.583' S08 NADM/K Fishing 8/17/2020 Maii Nui 23677 N20*59.202' W156*26.660' S09 NADM/K Fishing 8/17/2020 Maii Nui 24481 N20*58.962' W156*27.660' S09 NADM/K Fishing 8/17/2020 Maii Nui 24481 N20*57.67' S06 NADM/K Fishing 8/18/2020 Maii Nui 23462 N20*57.67' S16 NADM/K Fishing 8/18/2020 Maii Nui 23688 N20*57.94'' W156*13.45'' S10 NADM/K Fishing 8/18/2020 Maii Nui 22688 N20*57.94'' W156*16.622'' S10 NADM/K Fishing 8/18/2020 Maii Nui 2376 N20*59.07'' W156*16.22'' S10 NADM/K Fishing 8/18/2020 Maii Nui 2346								
91/6/202 Ni Thau 4034 N21*49.510 W160*2.978 S22 VLACUL IVN Fishing 81/7/202 Maui Nu 2403 N20*99.52 W156*2.45.83 S08 NADM K Fishing 81/7/202 Maui Nu 23408 N20*9.85.22 W156*2.45.83 S08 NADM K Fishing 81/7/202 Maui Nu 23408 N20*9.82.22 W156*2.71.65 S06 NADM K Fishing 81/7/202 Maui Nu 24195 N20*9.82.22 W156*2.71.65 S06 NADM K Fishing 81/8/202 Maui Nu 23460 N20*5.87.26 V156*1.13.44 S24 NADM K Fishing 81/8/202 Maui Nu 22687 N20*5.7947 W156*1.507 S10 NADM K Fishing 81/8/202 Maui Nu 22687 N20*5.7927 W156*1.6510 S10 NADM K Fishing 81/8/202 Maui Nu 23705 N20*9.9072* W156*1.6510 S10 NADM K Fishing 81/8/2020 Maui Nu								
8/17/020 Muii Nuii 22403 N20 ⁶ 99.957 W156 ² 20.821 ¹ S05 NAOMI K Fishing 8/17/020 Muii Nuii 22408 N20 ⁶ 52.950 ⁶ S09 NAOMI K Fishing 8/17/020 Muii Nuii 22408 N21 ⁶ 0.527 S06 NAOMI K Fishing 8/17/020 Muii Nuii 22440 N20 ⁶ 52.9765 S06 NAOMI K Fishing 8/18/020 Muii Nuii 22440 N20 ⁶ 52.9765 S06 NAOMI K Fishing 8/18/020 Muii Nuii 22460 N20 ⁶ 58.75 ⁶ V156 ⁶ 11.6146 S20 NAOMI K Fishing 8/18/0200 Muii Nuii 22688 N20 ⁶ 57.942 ² W156 ⁶ 15.650 ⁶ S10 NAOMI K Fishing 8/18/0200 Muii Nuii 22683 N20 ⁶ 57.945 ⁷ W156 ⁶ 16.50 ⁶ S10 NAOMI K Fishing 8/18/0200 Muii Nuii 23706 N20 ⁶ 59.072 ⁷ W156 ⁶ 16.522 ⁷ S10 NAOMI K Fishing 8/18/0200 Muiii Niii 23706								
8/17/2020 Maui Nui 23677 N20 ⁶ 59.202 W156 ² 24.583 ⁷ S08 MAOM K Fishing 8/17/2020 Maui Nui 23448 N21 ⁶ 0.054 ⁷ W156 ² 27.165 ⁷ S06 MAOM K Fishing 8/17/2020 Maui Nui 24448 N20 ⁶ 57.65 ⁷ S06 MAOM K Fishing 8/18/2020 Maui Nui 23442 N20 ⁶ 57.65 ⁷ W156 ⁶ 11.614 ⁴ S24 MAOM K Fishing 8/18/2020 Maui Nui 23982 N20 ⁶ 57.947 W156 ⁶ 13.539 ⁶ S10 MAOM K Fishing 8/18/2020 Maui Nui 22687 N20 ⁶ 57.947 W156 ⁶ 13.540 ⁷ S10 MAOM K Fishing 8/18/2020 Maui Nui 22446 N20 ⁶ 58.72 ⁷ W156 ⁶ 16.510 ⁷ S10 MAOM K Fishing 8/18/2020 Maui Nui 23706 N20 ⁶ 59.075 ⁷ W156 ⁶ 16.510 ⁷ S10 MAOM K Fishing 8/18/2020 Maui Nui 23706 N20 ⁶ 59.075 ⁷ S07 MAOM K Fishing								
8/17/020 Maui Nui 22408 N20*8.9.02* W156* 27.165* S06 NAOMI K Fishing 8/17/020 Maui Nui 24495 N20*9.9.822* W156* 27.165* S06 NAOMI K Fishing 8/18/0200 Maui Nui 22440 N20*9.87.26* W156* 12.49* S10 NAOMI K Fishing 8/18/0200 Maui Nui 22460 N20*9.87.26* W156* 13.446* S20 NAOMI K Fishing 8/18/0200 Maui Nui 22688 N20*57.942* W156* 13.447* S10 NAOMI K Fishing 8/18/0200 Maui Nui 22683 N20*57.965* W156* 15.60* S10 NAOMI K Fishing 8/18/0200 Maui Nui 23706 N20*9.9072* W156* 15.60* S10 NAOMI K Fishing 8/18/0200 Maui Nui 23706 N20*9.9072* W156* 03.70* S07 NAOMI K Fishing 8/19/0200 Maui Nui 23706 N20*9.9072* W156* 03.70* S07 NAOMI K Fishing								
8/17/2020 Maui Nui N1i 22/48 N21° 0.054' W156' 27.765' S06 NAOMI K Fishing 8/17/2020 Maui Nui 22/42 N20° 57.657 W156' 11.614' S24 NAOMI K Fishing 8/18/2020 Maui Nui 22/42 N20° 58.726' W156' 11.614' S24 NAOMI K Fishing 8/18/2020 Maui Nui 22/687 N20° 57.947' W156' 13.559' S10 NAOMI K Fishing 8/18/2020 Maui Nui 22/687 N20° 57.947' W156' 13.559' S10 NAOMI K Fishing 8/18/2020 Muii Nui 22/687 N20° 57.947' W156' 15.622' S10 NAOMI K Fishing 8/18/2020 Muii Nui 23/05 N20° 59.076' W156' 16.510'' N10'''' W156' 16.522'''''''''''''''''''''''''''''''''''								Fishing
ski # 2020 Maui Nui 24195 N20* 57.65* S06 MAOM K Fishing 8/1 # 2020 Maui Nui 23460 N20* 57.67* W156* 12.49* S10 NAOM K Fishing 8/1 # 2020 Maui Nui 23460 N20* 52.7* W156* 13.36* S10 NAOM K Fishing 8/1 # 2020 Maui Nui 22688 N20* 57.965* W156* 13.36* S10 NAOM K Fishing 8/1 # 2020 Maui Nui 22683 N20* 57.965* W156* 15.60* S10 NAOM K Fishing 8/1 # 2020 Maui Nui 2346 N20* 57.965* W156* 15.62* S10 NAOM K Fishing 8/1 # 2020 Maui Nui 23105 N20* 59.076* W156* 10.62* S10 NAOM K Fishing 8/1 # 2020 Maui Nui 1333 N20* 40.594* W156* 17.097* S07 NAOM K Fishing 8/1 # 2020 Maui Nui 14335 N20* 40.994* W156* 30.370* NAOM K Fishing 8/1 # 2020 Maui Nui								
ski 8/2020 Maui Nui 22442 N20° \$7.657 W156° 11.614' S24 N40MI K Fishing ski 8/2020 Maui Nui 23982 N20° \$9.291 W156° 13.046' S20 N40MI K Fishing ski 8/2020 Maui Nui 22683 N20° \$7.947' W156° 13.647' S10 N40MI K Fishing ski 8/2020 Maui Nui 22683 N20° \$7.947' W156° 13.647' S10 N40MI K Fishing ski 8/2020 Maui Nui 22463 N20° \$7.957' W156° 16.500' S10 N40MI K Fishing ski 8/2020 Maui Nui 23706 N20° \$9.072' W156° 16.510' S10 N40MI K Fishing ski 8/2020 Maui Nui 23184 N20° \$8.544' W156° 30.370' S07 N40MI K Fishing ski 9/2020 Maui Nui 14333 N20° 41.973' W156° 31.387' S10 N40MI K Fishing ski 9/2020 Maui Nui 1433 N20° 41.973' W156° 31.486' S02 N40MI K Fishing <								
ski 8/2020 Maui Nui 23460 N20* 58.726' W156° 11.614' S24 MADMI K Fishing 8/18/2020 Maui Nui 22688 N20* 57.942' W156° 13.359' S10 MAOMI K Fishing 8/18/2020 Maui Nui 22683 N20* 57.965' W156° 15.464'' S10 MAOMI K Fishing 8/18/2020 Maui Nui 22683 N20* 57.965' W156° 15.650' S10 MAOMI K Fishing 8/18/2020 Maui Nui 23705 N20* 58.792' W156° 16.222' S10 MAOMI K Fishing 8/18/2020 Maui Nui 123705 N20* 59.070' W156° 16.210'' S10 MAOMI K Fishing 8/19/2020 Maui Nui 14335 N20* 40.958'' W156° 30.30'' S07'' MAOMI K Fishing 8/19/2020 Maui Nui 14335 N20* 40.958'' W156° 31.20''' S10 MAOMI K Fishing 8/19/2020 Maui Nui 15101 N20* 42.255''								
\$\text{N82220} Manit Nuit 22982 N20° 59.291 W156° 13.59° S10 NAOMI K Fishing \$\text{812200} Manit Nuit 22687 N20° 57.947 W156° 13.59° S10 NAOMI K Fishing \$\text{812200} Mauit Nuit 22687 N20° 57.947 W156° 13.650° S10 NAOMI K Fishing \$\text{81220} Mauit Nuit 23706 N20° 57.927 W156° 15.650° S10 NAOMI K Fishing \$\text{81200} Mauit Nuit 23706 N20° 50.072 S10 NAOMI K Fishing \$\text{81200} Mauit Nuit 23184 N20° 50.972 W156° 17.097 S07 NAOMI K Fishing \$\text{8192020} Mauit Nuit 14333 N20° 40.060° W156° 30.346° S10 NAOMI K Fishing \$\text{8192020} Mauit Nuit 14703 N20° 43.187° S10 NAOMI K Fishing \$\text{8192020} Mauit Nuit 15361 N20° 42.781 W156° 31.486° S02 NAOMI K Fishing								
\$\text{N2202} Mauit Nui 22688 N20° 57.942 W156° 13.647 S10 NAOMI K Fishing \$\text{8182020} Mauit Nui 22683 N20° 57.965 W156° 14.800' S10 NAOMI K Fishing \$\text{8182020} Mauit Nui 23464 N20° 59.072 W156° 16.522' S10 NAOMI K Fishing \$\text{8182020} Mauit Nui 23705 N20° 59.072 W156° 16.522' S10 NAOMI K Fishing \$\text{8182020} Mauit Nui 23705 N20° 59.076' W156° 16.510' S10 NAOMI K Fishing \$\text{8192020} Mauit Nui 14333 N20° 40.060' W156° 30.348' S03 NAOMI K Fishing \$\text{8192020} Mauit Nui 14974 N20° 41.922 W156° 31.207' S11 NAOMI K Fishing \$\text{8192020} Mauit Nui 1526 N20° 42.237' W156° 31.207' S11 NAOMI K Fishing \$\text{8192020} Mauit Nui 1526 N20° 42.59' W156° 31.467' S02 <								
8/18/2020 Mauit Nui 22687 N20° 57.947 W156° 14.800' S10 NAOMI K Fishing 8/18/2020 Mauit Nui 23446 N20° 58.792' W156° 15.650' S10 NAOMI K Fishing 8/18/2020 Mauit Nui 23706 N20° 59.072' W156° 16.222' S10 NAOMI K Fishing 8/18/2020 Mauit Nui 23706 N20° 59.072' W156° 16.510' S10 NAOMI K Fishing 8/19/2020 Mauit Nui 14333 N20° 40.969' W156° 30.346' S10 NAOMI K Fishing 8/19/2020 Mauit Nui 14333 N20° 40.952' W156° 30.346' S03 NAOMI K Fishing 8/19/2020 Mauit Nui 15101 N20° 42.237' W156° 31.207' S11 NAOMI K Fishing 8/19/2020 Mauit Nui 1522 N20° 42.527' W156° 31.486' S02 NAOMI K Fishing 8/19/2020 Mauit Nui 1524 N20° 42.53' W156° 53.244' S02 NAOMI K Fishing </td <td>8/18/2020</td> <td></td> <td></td> <td></td> <td>W156° 13.046'</td> <td></td> <td>NAOMI K</td> <td></td>	8/18/2020				W156° 13.046'		NAOMI K	
\$\text{N8:2020} Mauit Nui 22483 N20° 57.965 W156° 14.800' \$10 NAOM/K Fishing \$\text{8/18:2020} Mauit Nui 23706 N20° 59.072 W156° 16.510' \$10 NAOM/K Fishing \$\text{8/18:2020} Mauit Nui 23705 N20° 59.072 W156° 16.510' \$10 NAOM/K Fishing \$\text{8/18:2020} Mauit Nui 23735 N20° 59.072' W156° 16.510' \$10 NAOM/K Fishing \$\text{8/19:2020} Mauit Nui 14333 N20° 40.060' W156° 30.340' \$10 NAOM/K Fishing \$\text{8/19:2020} Mauit Nui 14974 N20° 41.952' W156° 31.207' \$11 NAOM/K Fishing \$\text{8/19:2020} Mauit Nui 15101 N20° 42.235' W156° 31.460' \$02 NAOM/K Fishing \$\text{8/19:2020} Mauit Nui 1526 N20° 42.527' W156° 31.461' \$02 NAOM/K Fishing \$\text{8/19:2020} Mauit Nui 1524 N20° 43.39' W156° 34.459' \$10 </td <td></td> <td>Maui Nui</td> <td></td> <td>N20° 57.942'</td> <td>W156° 13.359'</td> <td></td> <td>NAOMI K</td> <td></td>		Maui Nui		N20° 57.942'	W156° 13.359'		NAOMI K	
8/18/2020 Maui Nui 23446 N20° 58.792 W156° 16.522 S10 NAOMI K Fishing 8/18/2020 Maui Nui 23705 N20° 59.076 W156° 16.522 S10 NAOMI K Fishing 8/18/2020 Maui Nui 23705 N20° 59.076 W156° 16.510 S10 NAOMI K Fishing 8/19/2020 Maui Nui 14333 N20° 40.606 W156° 30.370 S07 NAOMI K Fishing 8/19/2020 Maui Nui 14433 N20° 40.606 W156° 30.346 S03 NAOMI K Fishing 8/19/2020 Maui Nui 14494 N20° 41.972 W156° 31.486 S02 NAOMI K Fishing 8/19/2020 Maui Nui 15361 N20° 42.781 W156° 31.486 S02 NAOMI K Fishing 8/19/2020 Maui Nui 1524 N20° 42.557 W156° 31.486 S02 NAOMI K Fishing 8/19/2020 Maui Nui 1524 N20° 42.539 W156° 53.544 S01 NAOMI K Fishing								
8/18/2020 Maui Nui 23706 N20° 59.072 W156° 16.510 S10 NAOMI K Fishing 8/18/2020 Maui Nui 23184 N20° 58.544 W156° 16.510 S10 NAOMI K Fishing 8/19/2020 Maui Nui 14335 N20° 40.598 W156° 30.370' S07 NAOMI K Fishing 8/19/2020 Maui Nui 14333 N20° 40.606 W156° 30.348' S03 NAOMI K Fishing 8/19/2020 Maui Nui 14974 N20° 41.972 W156° 31.787 S10 NAOMI K Fishing 8/19/2020 Maui Nui 15101 N20° 42.235' W156° 31.486' S02 NAOMI K Fishing 8/19/2020 Maui Nui 15226 N20° 42.781' W156° 31.486' S02 NAOMI K Fishing 8/19/2020 Maui Nui 15216 N20° 42.235' W156° 32.642' S02 NAOMI K Fishing 8/19/2020 Maui Nui 1531 N20° 40.328' W156° 51.463' S02 NAOMI K Fishing								
818/2020 Maui Nui 23705 N20° 59.076 W156° 16.510 S10 NAOMI K Fishing 818/2020 Maui Nui 14335 N20° 40.598 W156° 30.370' S07 NAOMI K Fishing 81/9/2020 Maui Nui 14333 N20° 40.696 W156° 30.370' S07 NAOMI K Fishing 81/9/2020 Maui Nui 14974 N20° 41.957 W156° 31.787' S10 MAOMI K Fishing 81/9/2020 Maui Nui 1510 N20° 42.235' W156° 31.207' S11 MAOMI K Fishing 81/9/2020 Maui Nui 1526 N20° 42.237' W156° 32.642' S02 MAOMI K Fishing 81/9/2020 Maui Nui 15218 N20° 42.579' W156° 34.639' S02 MAOMI K Fishing 81/9/2020 Maui Nui 15218 N20° 40.328' W156° 51.403' S24 MAOMI K Fishing 82/0/2020 Maui Nui 13528 N20° 39.291' W156° 53.691' S24 MAOMI K Fishing	8/18/2020	Maui Nui		N20° 58.792'	W156° 15.650'		NAOMI K	
8/18/2020 Maui Nui 23184 N20° 58.544 W156° 17.097 S07 NAOMI K Fishing 8/19/2020 Maui Nui 14333 N20° 40.606 W156° 30.3946 S10 NAOMI K Fishing 8/19/2020 Maui Nui 14974 N20° 41.952 W156° 30.348 S03 NAOMI K Fishing 8/19/2020 Maui Nui 14969 N20° 41.952 W156° 31.787 S10 NAOMI K Fishing 8/19/2020 Maui Nui 15101 N20° 42.235 W156° 31.486 S02 NAOMI K Fishing 8/19/2020 Maui Nui 15226 N20° 42.527 W156° 32.642 S02 NAOMI K Fishing 8/19/2020 Maui Nui 1511 N20° 42.559 W156° 53.288 S10 NAOMI K Fishing 8/19/2020 Maui Nui 1512 N20° 43.639 W156° 54.249 S21 NAOMI K Fishing 8/20/2020 Maui Nui 1353 N20° 32.55 W156° 54.281 S24 NAOMI K Fishing 8	8/18/2020	Maui Nui		N20° 59.072'	W156° 16.222'		NAOMI K	Fishing
8/19/2020 Maui Nui 14335 N20° 40.598 W156° 30.370 S07 NAOMI K Fishing 8/19/2020 Maui Nui 14333 N20° 40.606 W156° 30.348 S03 NAOMI K Fishing 8/19/2020 Maui Nui 14974 N20° 41.952 W156° 31.787 S10 NAOMI K Fishing 8/19/2020 Maui Nui 1510 N20° 42.235 W156° 31.207 S11 NAOMI K Fishing 8/19/2020 Maui Nui 1526 N20° 42.257 W156° 32.642 S02 NAOMI K Fishing 8/19/2020 Maui Nui 1522 N20° 42.559 W156° 34.639 S02 NAOMI K Fishing 8/19/2020 Maui Nui 15218 N20° 42.559 W156° 51.403' S21 NAOMI K Fishing 8/20/2020 Maui Nui 1352 N20° 30.255' W156° 51.403' S24 NAOMI K Fishing 8/20/2020 Maui Nui 1352 N20° 40.33' W156° 53.06' S24 NAOMI K Fishing	8/18/2020	Maui Nui	23705	N20° 59.076'	W156° 16.510'	S10	NAOMI K	Fishing
8/19/2020 Maui Nui 14333 N20° 40.606' W156° 30.946' S10 NAOMI K Fishing 8/19/2020 Maui Nui 14974 N20° 41.952' W156° 31.787' S10 NAOMI K Fishing 8/19/2020 Maui Nui 15101 N20° 42.731' W156° 31.787' S10 NAOMI K Fishing 8/19/2020 Maui Nui 15361 N20° 42.731' W156° 31.207' S11 MAOMI K Fishing 8/19/2020 Maui Nui 1526 N20° 42.527' W156° 32.642' S02 MAOMI K Fishing 8/19/2020 Maui Nui 15742 N20° 43.639' W156° 34.649' S10 MAOMI K Fishing 8/19/2020 Maui Nui 15742 N20° 40.032'' W156° 51.403' S24 MAOMI K Fishing 8/20/2020 Maui Nui 13528 N20° 39.251' W156° 53.405' S24 MAOMI K Fishing 8/20/2020 Maui Nui 14012 N20° 40.337' W156° 53.601' S24 MAOMI K Fishing	8/18/2020	Maui Nui	23184	N20° 58.544'	W156° 17.097'	S07	NAOMI K	Fishing
8/19/2020 Maui Nui 14974 N20° 41.952 W156° 30.348 S03 MAOMI K Fishing 8/19/2020 Maui Nui 15101 N20° 41.973 W156° 31.207 S11 MAOMI K Fishing 8/19/2020 Maui Nui 15361 N20° 42.235 W156° 31.207 S11 MAOMI K Fishing 8/19/2020 Maui Nui 15361 N20° 42.237 W156° 35.2642 S02 MAOMI K Fishing 8/19/2020 Maui Nui 14442 N20° 40.938 W156° 35.2642 S10 MAOMI K Fishing 8/19/2020 Maui Nui 15742 N20° 41.559 W156° 34.639 S02 MAOMI K Fishing 8/20/2020 Maui Nui 15742 N20° 41.569 S10 NAOMI K Fishing 8/20/2020 Maui Nui 13238 N20° 39.255 W156° 53.463 S24 MAOMI K Fishing 8/20/2020 Maui Nui 14303 N26 4.033 W156° 53.406 S24 MAOMI K Fishing 8/20/2020 M	8/19/2020	Maui Nui	14335	N20° 40.598'	W156° 30.370'	S07	NAOMI K	Fishing
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8/23/2020 Maui Nui 16819 N20° 46.431' W156° 40.644' S10 NAOMI K Fishing	8/23/2020	Maui Nui	16318	N20° 45.057'	W156° 39.225'	S11	NAOMI K	
	8/23/2020	Maui Nui	16622	N20° 45.885'	W156° 40.364'	S04	NAOMI K	Fishing
	8/23/2020	Maui Nui	16819	N20° 46.431'	W156° 40.644'	S10	NAOMI K	Fishing
	8/24/2020	Maui Nui	17006	N20° 47.007'	W156° 43.228'	S01	NAOMI K	

SAMPLE DATE	Island	PSU	lat deg	lon deg	STRATA 2020	VESSEL	GEAR
8/24/2020	Maui Nui	16190	N20° 44.867'	W156° 45.276'		NAOMI K	Fishing
8/24/2020	Maui Nui	16076	N20° 44.607'	W156° 46.144'	S07	NAOMI K	Fishing
8/24/2020	Maui Nui	16068	N20° 44.637'	W156° 48.447'	S08	NAOMI K NAOMI K	Fishing
8/24/2020	Maui Nui	15951	N20° 44.370'	W156° 48.739'	S14	NAOMI K NAOMI K	Fishing
8/24/2020	Maui Nui	15951	N20° 42.748'	W156° 49.050'	S20	NAOMI K NAOMI K	Fishing
8/24/2020	Maui Nui	15032	N20° 42.502'	W156° 51.070'	S20 S22	NAOMI K NAOMI K	Fishing
		13032			S21		Fishing
8/24/2020	Maui Nui Maui Nui	14316	N20° 41.404'	W156° 49.933'	S17	NAOMI K	Fishing
8/24/2020	Maui Nui		N20° 42.730'	W156° 47.611'		NAOMI K	
8/26/2020	Maui Nui	12805	N20° 37.437'	W156° 36.752'	S02	NAOMI K	Fishing
8/26/2020	Maui Nui	12546	N20° 36.916'	W156° 38.199'	S07	NAOMI K	Fishing
8/26/2020	Maui Nui	12541	N20° 36.935'	W156° 39.637'	S13	NAOMI K	Fishing
8/26/2020	Maui Nui	13207	N20° 38.282'	W156° 39.041'	S20	NAOMI K	Fishing
8/26/2020	Maui Nui	13446	N20° 38.870'	W156° 42.486'	S22	NAOMI K	Fishing
8/26/2020	Maui Nui	14172	N20° 40.491'	W156° 42.174'	S22	NAOMI K	Fishing
8/26/2020	Maui Nui	14293	N20° 40.766'	W156° 42.457'	S22	NAOMI K	Fishing
8/26/2020	Maui Nui	14798	N20° 41.864'	W156° 43.593'	S11	NAOMI K	Fishing
8/27/2020	Maui Nui	11622	N20° 34.856'	W156° 46.286'	S24	NAOMI K	Fishing
8/27/2020	Maui Nui	11728	N20° 35.100'	W156° 44.268'	S22	NAOMI K	Fishing
8/27/2020	Maui Nui	11832	N20° 35.371'	W156° 44.264'	S19	NAOMI K	Fishing
8/27/2020	Maui Nui	11834	N20° 35.364'	W156° 43.689'	S21	NAOMI K	Fishing
8/27/2020	Maui Nui	11837	N20° 35.352'	W156° 42.826'	S22	NAOMI K	Fishing
8/27/2020	Maui Nui	12058	N20° 35.894'	W156° 42.818'	S22	NAOMI K	Fishing
8/27/2020	Maui Nui	12059	N20° 35.890'	W156° 42.530'	S22	NAOMI K	Fishing
8/28/2020	Maui Nui	29731	N21° 5.317'	W156° 35.157'	S17	NAOMI K	Fishing
8/28/2020	Maui Nui	30261	N21° 6.457'	W156° 39.180'	S22	NAOMI K	Fishing
8/28/2020	Maui Nui	30260	N21° 6.461'	W156° 39.468'	S19	NAOMI K	Fishing
8/28/2020	Maui Nui	31510	N21° 10.225'	W156° 37.387'	S23	NAOMI K	Fishing
8/28/2020	Maui Nui	32309	N21° 11.866'	W156° 38.517'	S19	NAOMI K	Fishing
8/28/2020	Maui Nui	32156	N21° 11.611'	W156° 39.676'	S22	NAOMI K	Fishing
8/28/2020	Maui Nui	32921	N21° 12.985'	W156° 41.099'	S24	NAOMI K	Fishing
8/28/2020	Maui Nui	32120	N21° 11.750'	W156° 50.073'	S08	NAOMI K	Fishing
8/28/2020	Maui Nui	31833	N21° 11.237'	W156° 52.392'	S04	NAOMI K	Fishing
8/28/2020	Maui Nui	31998	N21° 11.396'	W156° 43.723'	S01	NAOMI K	Fishing
8/28/2020	Maui Nui	31388	N21° 9.994'	W156° 40.279'	S05	NAOMI K	Fishing
9/1/2020	Maui Nui	21220	N20° 56.294'	W156° 11.948'	S10	NAOMI K	Fishing
9/1/2020	Maui Nui	20797	N20° 55.714'	W156° 9.653'	S20	NAOMI K	Fishing
9/1/2020	Maui Nui	19839	N20° 54.365'	W156° 9.966'	S10	NAOMI K	Fishing
9/2/2020	Maui Nui	13242	N20° 38.140'	W156° 28.971'	S05	NAOMI K	Fishing
9/2/2020	Maui Nui	12101	N20° 35.694'	W156° 28.436'	S21	NAOMI K	Fishing
9/2/2020	Maui Nui	11571	N20° 34.336'	W156° 28.171'	S20	NAOMI K	Fishing
9/2/2020	Maui Nui	11574	N20° 34.323'	W156° 27.308'	S20 S22	NAOMI K	Fishing
9/2/2020	Maui Nui	11283	N20° 33.519'	W156° 27.897'	S22 S22	NAOMI K	Fishing
9/2/2020	Maui Nui	10882	N20° 31.902'	W156° 28.499'	S22 S22	NAOMI K	Fishing
9/2/2020	Maui Nui	10930	N20° 32.182'	W156° 29.069'	S22 S22	NAOMI K NAOMI K	Fishing
9/2/2020	Maui Nui	11565	N20° 34.361'	W156° 29.896'	S20	NAOMI K NAOMI K	Fishing
9/2/2020	Maui Nui	13223	N20° 38.218'	W156° 34.438'	S10	NAOMI K NAOMI K	Fishing
9/3/2020	Maui Nui	13223	N20° 40.711'		S15		Fishing
				W156° 38.428'	~ • •	NAOMI K	0
9/3/2020	Maui Nui	12537	N20° 36.951'	W156° 40.788'	S20 S20	NAOMI K	Fishing
9/3/2020	Maui Nui	12660	N20° 37.229'	W156° 41.359'		NAOMI K	Fishing
9/3/2020	Maui Nui	12170	N20° 36.176'	W156° 43.677'	S22	NAOMI K	Fishing Fishing
9/3/2020	Maui Nui	12914	N20° 37.798'	W156° 43.365'	S19	NAOMI K	
9/3/2020	Maui Nui	15969	N20° 44.302'	W156° 43.556'	S02	NAOMI K	Fishing
9/4/2020	Maui Nui	10357	N20° 29.683'	W156° 44.348'	S05	NAOMI K	Fishing
9/4/2020	Maui Nui	10244	N20° 28.893'	W156° 46.085'	S24	NAOMI K	Fishing
9/4/2020	Maui Nui	10399	N20° 29.972'	W156° 45.782'	S09	NAOMI K	Fishing
9/4/2020	Maui Nui	10752	N20° 31.612'	W156° 46.908'	S11	NAOMI K	Fishing
9/4/2020	Maui Nui	10494	N20° 30.562'	W156° 49.511'	S24	NAOMI K	Fishing
9/4/2020	Maui Nui	10845	N20° 32.176'	W156° 48.626'	S22	NAOMI K	Fishing
9/4/2020	Maui Nui	12267	N20° 36.532'	W156° 50.290'	S24	NAOMI K	Fishing
9/4/2020	Maui Nui	14403	N20° 41.089'	W156° 46.483'	S21	NAOMI K	Fishing
8/15/2020	Big Island	18	N18° 51.466'	W155° 41.132'	S12	AO SHIBI IV	Fishing
8/15/2020	Big Island	37	N18° 52.278'	W155° 41.116'	S10	AO SHIBI IV	Fishing
8/15/2020	Big Island	50	N18° 52.523'	W155° 39.689'	S22	AO SHIBI IV	Fishing
8/15/2020	Big Island	101	N18° 53.876'	W155° 39.663'	S01	AO SHIBI IV	Fishing
8/15/2020	Big Island	132	N18° 54.397'	W155° 38.514'	S10	AO SHIBI IV	Fishing
8/17/2020	Big Island	538	N19° 2.147'	W155° 32.950'	S21	AO SHIBI IV	Fishing
8/17/2020	Big Island	575	N19° 3.213'	W155° 32.073'	S24	AO SHIBI IV	Fishing
8/17/2020	Big Island	628	N19° 4.566'	W155° 32.045'	S20	AO SHIBI IV	Fishing
8/17/2020	Big Island	700	N19° 6.704'	W155° 30.577'	S22	AO SHIBI IV	Fishing
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SAMPLE DATE	Island	PSU	lat deg	lon deg	STRATA 2020	VESSEL	GEAR
8/17/2020	Big Island	1249	N19° 15.482'	W155° 9.300'		AO SHIBI IV	Fishing
8/17/2020	Big Island	1335	N19° 16.257'	W155° 7.572'	S10	AO SHIBI IV	Fishing
8/17/2020	Big Island	1335	N19° 17.567'	W155° 5.546'	S10 S12	AO SHIBI IV AO SHIBI IV	Fishing
8/17/2020	Big Island	1484	N19° 19.626'	W155° 0.651'	S12 S22	AO SHIBI IV AO SHIBI IV	Fishing
8/18/2020	Big Island	2416	N19° 38.217'	W155° 0.051 W154° 57.053'	S11		Fishing
8/18/2020	Big Island	2265	N19° 35.468'	W154° 55.123'	S21	AO SHIBI IV AO SHIBI IV	Fishing
	Big Island				S21 S22		Fishing
8/18/2020	0	2183	N19° 34.070'	W154° 53.160'		AO SHIBI IV	
8/18/2020	Big Island	2165	N19° 33.793'	W154° 52.882'	S16	AO SHIBI IV	Fishing
8/18/2020	Big Island	2055	N19° 32.046'	W154° 47.504'	S24	AO SHIBI IV	Fishing
8/18/2020	Big Island	1947	N19° 30.166'	W154° 48.124'	S16	AO SHIBI IV	Fishing
8/18/2020	Big Island	1905	N19° 29.362'	W154° 48.430'	S12	AO SHIBI IV	Fishing
8/18/2020	Big Island	1510	N19° 20.136'	W154° 59.213'	S22	AO SHIBI IV	Fishing
8/18/2020	Big Island	1496	N19° 19.884'	W155° 0.074'	S16	AO SHIBI IV	Fishing
8/19/2020	Big Island	2524	N19° 40.400'	W154° 57.855'	S04	AO SHIBI IV	Fishing
8/19/2020	Big Island	2673	N19° 43.671'	W154° 58.916'	S03	AO SHIBI IV	Fishing
8/19/2020	Big Island	2895	N19° 45.281'	W154° 58.304'	S22	AO SHIBI IV	Fishing
8/19/2020	Big Island	2937	N19° 45.551'	W154° 58.297'	S22	AO SHIBI IV	Fishing
8/19/2020	Big Island	3028	N19° 46.098'	W154° 58.569'	S22	AO SHIBI IV	Fishing
8/19/2020	Big Island	3027	N19° 46.105'	W154° 58.855'	S22	AO SHIBI IV	Fishing
8/19/2020	Big Island	3025	N19° 46.118'	W154° 59.426'	S22	AO SHIBI IV	Fishing
8/19/2020	Big Island	2931	N19° 45.589'	W155° 0.011'	S02	AO SHIBI IV	Fishing
8/19/2020	Big Island	3175	N19° 46.961'	W155° 0.834'	S21	AO SHIBI IV	Fishing
8/19/2020	Big Island	3226	N19° 47.263'	W155° 2.256'	S10	AO SHIBI IV	Fishing
8/19/2020	Big Island	3506	N19° 48.660'	W155° 4.223'	S10	AO SHIBI IV	Fishing
8/19/2020	Big Island	3631	N19° 49.201'	W155° 4.210'	S10	AO SHIBI IV	Fishing
8/19/2020	Big Island	3516	N19° 48.596'	W155° 1.365'	S20	AO SHIBI IV	Fishing
8/20/2020	Big Island	5366	N19° 55.544'	W154° 57.472'	S24	AO SHIBI IV	Fishing
8/20/2020	Big Island	4845	N19° 53.670'	W154° 58.378'	S24	AO SHIBI IV	Fishing
8/20/2020	Big Island	4693	N19° 53.149'	W154° 59.249'	S24	AO SHIBI IV	Fishing
8/20/2020	Big Island	4062	N19° 50.676'	W154° 57.596'	S24	AO SHIBI IV	Fishing
8/20/2020	Big Island	3656	N19° 49.041'	W154° 57.066'	S24	AO SHIBI IV	Fishing
8/20/2020	Big Island	3580	N19° 48.854'	W155° 0.787'	S20	AO SHIBI IV	Fishing
8/20/2020	Big Island	4047	N19° 50.773'	W155° 1.883'	S20	AO SHIBI IV	Fishing
8/20/2020	Big Island	4321	N19° 51.861'	W155° 2.142'	S21	AO SHIBI IV	Fishing
8/20/2020	Big Island	4604	N19° 52.974'	W155° 3.545'	S20	AO SHIBI IV	Fishing
8/20/2020	Big Island	4896	N19° 54.107'	W155° 5.805'	S07	AO SHIBI IV	Fishing
8/20/2020	Big Island	5675	N19° 57.169'	W155° 9.737'	S07	AO SHIBI IV	Fishing
8/20/2020	Big Island	5819	N19° 57.729'	W155° 10.582'	S02	AO SHIBI IV	Fishing
8/21/2020	Big Island	5703	N19° 56.993'	W155° 1.728'	S24	AO SHIBI IV	Fishing
8/21/2020	Big Island	5851	N19° 57.527'	W155° 1.428'	S24	AO SHIBI IV	Fishing
8/21/2020	Big Island	6042	N19° 58.390'	W155° 3.696'	S24	AO SHIBI IV	Fishing
8/21/2020	Big Island	6231	N19° 59.220'	W155° 4.534'	S23	AO SHIBI IV	Fishing
8/21/2020	Big Island	5906	N19° 57.887'	W155° 5.426'	S20	AO SHIBI IV	Fishing
8/21/2020	Big Island	6520	N20° 0.655'	W155° 8.221'	S20 S24	AO SHIBI IV AO SHIBI IV	Fishing
8/21/2020	Big Island	6698	N20° 1.939'	W155° 17.639'	#N/A	AO SHIBI IV AO SHIBI IV	Fishing
8/21/2020	U	7153	N20° 4.415'	W155° 19.587'	\$20		Fishing
	Big Island	7425	N20° 5.810'	W155° 21.560'	S20	AO SHIBI IV	-
8/21/2020	Big Island				~ • •	AO SHIBI IV	Fishing
8/21/2020	Big Island	7484	N20° 6.080'	W155° 21.553'	S20	AO SHIBI IV	Fishing
8/21/2020	Big Island	7680	N20° 6.892'	W155° 21.535'	S20	AO SHIBI IV	Fishing
8/21/2020	Big Island	7477	N20° 6.122'	W155° 23.558'	S20	AO SHIBI IV	Fishing
8/22/2020	Big Island	8554	N20° 10.227'	W155° 25.757'	S24	AO SHIBI IV	Fishing
8/22/2020	Big Island	8414	N20° 9.680'	W155° 25.483'	S24	AO SHIBI IV	Fishing
8/22/2020	Big Island	8415	N20° 9.674'	W155° 25.196'	S24	AO SHIBI IV	Fishing
8/22/2020	Big Island	8338	N20° 9.444'	W155° 27.208'	S24	AO SHIBI IV	Fishing
8/22/2020	Big Island	7744	N20° 7.221'	W155° 24.393'	S20	AO SHIBI IV	Fishing
8/22/2020	Big Island	7812	N20° 7.550'	W155° 27.251'	S20	AO SHIBI IV	Fishing
8/22/2020	Big Island	7655	N20° 7.038'	W155° 28.696'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	11211	N20° 33.171'	W156° 22.726'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	11307	N20° 33.416'	W156° 20.996'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	11408	N20° 33.660'	W156° 19.267'	S14	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	11411	N20° 33.646'	W156° 18.404'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	11415	N20° 33.628'	W156° 17.254'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	12135	N20° 35.432'	W156° 11.470'	S21	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	12370	N20° 35.974'	W156° 11.460'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	12371	N20° 35.969'	W156° 11.172'	S14	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	12258	N20° 35.675'	W156° 9.739'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	14115	N20° 39.585'	W156° 0.747'	S10	AO SHIBI IV	Fishing
9/26/2020	Maui Nui	14237	N20° 39.841'	W155° 59.879'	S16	AO SHIBI IV	Fishing
9/27/2020	Maui Nui	17688	N20° 48.513'	W156° 0.284'	S22	AO SHIBI IV	Fishing
							8

SAMPLE_DATE	Island	PSU	lat_deg	lon_deg	STRATA_2020	VESSEL	GEAR
9/27/2020	Maui Nui	17244	N20° 46.854'	W155° 58.301'	S02	AO SHIBI IV	Fishing
9/27/2020	Maui Nui	16674	N20° 45.209'	W155° 57.182'	S10	AO SHIBI IV	Fishing
9/27/2020	Maui Nui	15907	N20° 43.314'	W155° 57.220'	S15	AO SHIBI IV	Fishing
9/27/2020	Maui Nui	15255	N20° 41.971'	W155° 57.823'	S11	AO SHIBI IV	Fishing
8/22/2020	Big Island	304	N18° 57.747'	W155° 44.139'	S22	RIDE ON	Fishing
8/22/2020	Big Island	323	N18° 58.018'	W155° 44.134'	S16	RIDE ON	Fishing
8/22/2020	Big Island	422	N19° 0.258'	W155° 48.360'	S22	RIDE ON	Fishing
8/22/2020	Big Island	435	N19° 0.548'	W155° 49.494'	S22	RIDE ON	Fishing
8/22/2020	Big Island	541	N19° 2.777'	W155° 53.153'	S16	RIDE ON	Fishing
8/22/2020	Big Island	611	N19° 4.696'	W155° 54.542'	S16	RIDE ON	Fishing
8/22/2020	Big Island	1704	N19° 26.378'	W155° 55.562'	S10	RIDE ON	Fishing
8/22/2020	Big Island	1765	N19° 28.017'	W155° 56.388'	S15	RIDE ON	Fishing
8/22/2020	Big Island	2420	N19° 39.759'	W156° 2.169'	S13 S22	RIDE ON	Fishing
8/23/2020	Big Island	8702	N20° 11.602'	W155° 55.550'	S10	RIDE ON RIDE ON	Fishing
8/23/2020	Big Island	8567	N20° 11.056'	W155° 55.274'	S10	RIDE ON RIDE ON	Fishing
8/23/2020	Big Island	8493	N20° 10.805'	W155° 56.426'	S19	RIDE ON RIDE ON	Fishing
8/23/2020	U	8358	N20° 10.254'	W155° 55.864'	S19 S15	RIDE ON RIDE ON	Fishing
	Big Island						-
8/23/2020	Big Island	7129	N20° 5.075'	W155° 53.958'	S14	RIDE ON	Fishing
8/23/2020	Big Island	6923	N20° 3.988'	W155° 53.693'	S17	RIDE ON	Fishing
8/23/2020	Big Island	6416	N20° 1.296'	W155° 54.606'	S24	RIDE ON	Fishing
8/23/2020	Big Island	6245	N20° 0.453'	W155° 52.903'	S22	RIDE ON	Fishing
8/23/2020	Big Island	6310	N20° 0.704'	W155° 51.752'	S09	RIDE ON	Fishing
8/23/2020	Big Island	5809	N19° 58.528'	W155° 51.223'	S03	RIDE ON	Fishing
8/23/2020	Big Island	5584	N19° 57.791'	W155° 55.533'	S08	RIDE ON	Fishing
8/23/2020	Big Island	5445	N19° 57.245'	W155° 55.257'	S08	RIDE ON	Fishing
8/23/2020	Big Island	5379	N19° 56.974'	W155° 55.263'	S06	RIDE ON	Fishing
8/30/2020	Big Island	5033	N19° 55.616'	W155° 55.003'	S04	RIDE ON	Fishing
8/30/2020	Big Island	5102	N19° 55.916'	W155° 56.715'	S06	RIDE ON	Fishing
8/30/2020	Big Island	5242	N19° 56.467'	W155° 57.277'	S21	RIDE ON	Fishing
8/30/2020	Big Island	4722	N19° 54.587'	W155° 58.172'	S05	RIDE ON	Fishing
8/30/2020	Big Island	4507	N19° 53.770'	W155° 57.901'	S08	RIDE ON	Fishing
8/30/2020	Big Island	4359	N19° 53.263'	W155° 59.915'	S05	RIDE ON	Fishing
8/30/2020	Big Island	4022	N19° 51.890'	W155° 58.796'	S01	RIDE ON	Fishing
8/30/2020	Big Island	4076	N19° 52.237'	W156° 3.369'	S11	RIDE ON	Fishing
8/30/2020	Big Island	3487	N19° 49.800'	W156° 3.414'	S09	RIDE ON	Fishing
8/30/2020	Big Island	3037	N19° 47.681'	W156° 6.315'	S10	RIDE ON	Fishing
8/30/2020	Big Island	2743	N19° 45.767'	W156° 5.205'	S05	RIDE ON	Fishing
8/30/2020	Big Island	2559	N19° 42.765'	W156° 3.830'	S24	RIDE ON	Fishing
10/18/2020	Big Island	9949	N20° 18.564'	W155° 51.108'	S22	RIDE ON	Fishing
10/18/2020	Big Island	10008	N20° 18.840'	W155° 51.389'	S19	RIDE ON	Fishing
10/18/2020	Big Island	9945	N20° 18.585'	W155° 52.255'	S18	RIDE ON	Fishing
10/18/2020	Big Island	9827	N20° 18.038'	W155° 51.979'	S16	RIDE ON	Fishing
10/18/2020	Big Island	9649	N20° 17.226'	W155° 51.996'	S11	RIDE ON	Fishing
10/18/2020	Big Island	9707	N20° 17.507'	W155° 52.564'	S10	RIDE ON	Fishing
10/18/2020	Big Island	9880	N20° 18.339'	W155° 53.695'	S18	RIDE ON	Fishing
10/18/2020	Big Island	9873	N20° 18.375'	W155° 55.704'	S22	RIDE ON	Fishing
10/18/2020	Big Island	9571	N20° 17.041'	W155° 56.878'	S24	RIDE ON	Fishing
10/18/2020	Big Island	9336	N20° 15.923'	W155° 54.891'	S11	RIDE ON	Fishing
10/18/2020	Big Island	9032	N20° 14.044'	W155° 55.789'	S13	RIDE ON	Fishing
10/18/2020	Big Island	8963	N20° 13.492'	W155° 55.226'	S10	RIDE ON	Fishing
10/18/2020	Big Island	8891	N20° 12.961'	W155° 55.810'	S10	RIDE ON	Fishing
10/18/2020	Big Island	8993	N20° 13.788'	W155° 56.655'	S22	RIDE ON	Fishing
10/23/2020	Big Island	8976	N20° 13.252'	W155° 42.036'	S10	RIDE ON	Fishing
10/23/2020	Big Island	9014	N20° 13.512'	W155° 41.457'	S15	RIDE ON	Fishing
10/23/2020	Big Island	9086	N20° 14.086'	W155° 43.166'	S10	RIDE ON	Fishing
10/23/2020	Big Island	9126	N20° 14.356'	W155° 43.160'	S10	RIDE ON RIDE ON	Fishing
10/23/2020	Big Island	9436	N20° 15.959'	W155° 41.979'	S20	RIDE ON RIDE ON	Fishing
10/23/2020	Big Island	9430 9741	N20° 17.328'		S20 S22	RIDE ON RIDE ON	Fishing
	Big Island	9741 9678	N20° 17.074'	W155° 42.810' W155° 43.677'	822 822		
10/23/2020	Big Island Big Island					RIDE ON	Fishing Fishing
10/23/2020	0	9737	N20° 17.350'	W155° 43.958' W155° 45 100'	S22	RIDE ON	
10/23/2020	Big Island	9792	N20° 17.642'	W155° 45.100'	S20	RIDE ON	Fishing
10/23/2020	Big Island	9307	N20° 15.476'	W155° 45.145'	S10	RIDE ON	Fishing
10/23/2020	Big Island	9544	N20° 16.591'	W155° 46.843'	S05	RIDE ON	Fishing
10/23/2020	Big Island	9841	N20° 17.965'	W155° 47.963'	S20	RIDE ON	Fishing
10/30/2020	Big Island	7725	N20° 7.331'	W155° 29.835'	S10	RIDE ON	Fishing
10/30/2020	Big Island	8111	N20° 8.684'	W155° 29.805'	S20	RIDE ON	Fishing
	Big Island	8613	N20° 10.578'	W155° 29.763'	S24	RIDE ON	Fishing
10/30/2020							
10/30/2020 10/30/2020 10/30/2020	Big Island Big Island Big Island	8532 8102	N20° 10.353' N20° 8.735'	W155° 32.062' W155° 32.384'	S23 S17	RIDE ON RIDE ON	Fishing Fishing

SAMPLE_DATE	Island	PSU	lat_deg	lon_deg	STRATA_2020	VESSEL	GEAR
10/30/2020	Big Island	7871	N20° 7.934'	W155° 32.975'	S10	RIDE ON	Fishing
10/30/2020	Big Island	8094	N20° 8.780'	W155° 34.676'	S14	RIDE ON	Fishing
10/30/2020	Big Island	8240	N20° 9.338'	W155° 35.524'	S20	RIDE ON	Fishing
c10/30/2020	Big Island	8088	N20° 8.813'	W155° 36.396'	S10	RIDE ON	Fishing
10/30/2020	Big Island	8444	N20° 10.177'	W155° 36.939'	S20	RIDE ON	Fishing
10/30/2020	Big Island	8369	N20° 9.934'	W155° 38.378'	S10	RIDE ON	Fishing
11/15/2020	Big Island	8508	N20° 10.486'	W155° 38.940'	S10	RIDE ON	Fishing
11/15/2020	Big Island	8768	N20° 11.563'	W155° 38.630'	S20	RIDE ON	Fishing
11/15/2020	Big Island	8652	N20° 11.038'	W155° 39.502'	S10	RIDE ON	Fishing
11/15/2020	Big Island	8651	N20° 11.044'	W155° 39.788'	S10	RIDE ON	Fishing
11/15/2020	Big Island	8715	N20° 11.320'	W155° 40.069'	S10	RIDE ON	Fishing
11/15/2020	Big Island	8797	N20° 11.878'	W155° 40.918'	S10	RIDE ON	Fishing
11/15/2020	Big Island	8795	N20° 11.888'	W155° 41.491'	S02	RIDE ON	Fishing
11/15/2020	Big Island	8871	N20° 12.424'	W155° 41.193'	S10	RIDE ON	Fishing
11/15/2020	Big Island	9718	N20° 17.450'	W155° 49.408'	S05	RIDE ON RIDE ON	Fishing
11/15/2020	Big Island	9718	N20° 17.430	W155° 50.556'	S03 S07	RIDE ON RIDE ON	Fishing
		9653			S10		
11/15/2020 8/22/2020	Big Island Oahu	9653 34115	N20° 17.205' N21° 16.162'	W155° 50.848'	S10 S22	RIDE ON RENEE NV	Fishing
				W157° 53.898'			Fishing
8/22/2020	Oahu	34111	N21° 16.169'	W157° 55.054'	S24	RENEE NV	Fishing
8/22/2020	Oahu	33353	N21° 14.843'	W157° 59.690'	S23	RENEE NV	Fishing
8/22/2020	Oahu	35907	N21° 21.943'	W158° 9.479'	S22	RENEE NV	Fishing
9/3/2020	Maui Nui	24918	N21° 1.194'	W157° 14.466'	S24	RENEE NV	Fishing
9/3/2020	Maui Nui	24909	N21° 1.221'	W157° 17.063'	S17	RENEE NV	Fishing
9/3/2020	Maui Nui	23816	N21° 0.149'	W157° 18.230'	S16	RENEE NV	Fishing
9/3/2020	Maui Nui	24344	N21° 0.705'	W157° 19.667'	S20	RENEE NV	Fishing
9/3/2020	Maui Nui	24075	N21° 0.434'	W157° 19.670'	S20	RENEE NV	Fishing
9/3/2020	Maui Nui	22780	N20° 59.102'	W157° 21.993'	S22	RENEE NV	Fishing
9/13/2020	Maui Nui	24820	N21° 1.448'	W157° 42.749'	S20	RENEE NV	Fishing
9/13/2020	Maui Nui	23468	N21° 0.097'	W157° 43.338'	S14	RENEE NV	Fishing
9/13/2020	Maui Nui	20406	N20° 56.589'	W157° 45.387'	S14	RENEE NV	Fishing
9/13/2020	Maui Nui	20659	N20° 56.732'	W157° 29.519'	S24	RENEE NV	Fishing
9/16/2020	Maui Nui	24927	N21° 1.117'	W157° 7.253'	S22	RENEE NV	Fishing
9/16/2020	Maui Nui	25213	N21° 1.385'	W157° 6.961'	S22	RENEE NV	Fishing
9/16/2020	Maui Nui	25502	N21° 1.653'	W157° 6.669'	S22	RENEE NV	Fishing
9/16/2020	Maui Nui	26092	N21° 2.195'	W157° 6.662'	S22	RENEE NV	Fishing
9/16/2020	Maui Nui	26089	N21° 2.204'	W157° 7.528'	S22	RENEE NV	Fishing
9/16/2020	Maui Nui	26394	N21° 2.478'	W157° 7.813'	S15	RENEE NV	Fishing
9/16/2020	Maui Nui	26697	N21° 2.759'	W157° 8.675'	S13 S22	RENEE NV	Fishing
9/30/2020	Maui Nui	32703	N21° 12.978'	W157° 1.902'	S07	RENEE NV	Fishing
9/30/2020	Maui Nui	32868	N21° 13.253'	W157° 2.187'	S10	RENEE NV	Fishing
9/30/2020	Maui Nui	33021	N21° 13.563'	W157° 5.651'	S05	RENEE NV	Fishing
9/30/2020	Maui Nui	33180	N21° 13.834'	W157° 5.647'	S10	RENEE NV RENEE NV	Fishing
9/30/2020	Maui Nui	33178	N21° 13.834 N21° 13.841'	W157° 6.225'	S05	RENEE NV RENEE NV	Fishing
9/30/2020	Maui Nui Maui Nui	33447	N21° 13.841 N21° 14.383'	W157° 6.218'	S05 S20	RENEE NV RENEE NV	Fishing
9/30/2020	Maui Nui Maui Nui	33591	N21° 14.676'	W157° 8.238'	S05	RENEE NV	Fishing
9/30/2020	Maui Nui	34215	N21° 15.791'	W157° 11.114'	S20	RENEE NV	Fishing

Appendix B: Fall 2020 Camera Deployment Locations (Two per PSU) by Stratum, and Vessel

1008/2020 Oubs 37489 N21*3.729 W157* 48.273 S10 <i>dot Shih II</i> Camera 1008/2020 Oubs 37342 N21*3.274 W157* 48.274 S10 <i>dot Shih II</i> Camera 1008/2020 Oubs 37342 N21*3.274 W157* 47.093 S10 <i>dot Shih II</i> Camera 1008/2020 Oubs 36953 N21*2.9344 W157* 45.053 S11 <i>dot Shih II</i> Camera 1008/2020 Oubs 36966 N21*2.7421 W157* 44.073 S10 <i>dot Shih II</i> Camera 1008/2020 Oubs 36666 N21*2.7421 W157* 41.073 S10 <i>do Shih II</i> Camera 1008/2020 Oubs 36657 N21*2.6612 W157* 41.277 S10 <i>do Shih II</i> Camera 1008/2020 Oubs 36431 N21*2.553 W157* 41.777 S10 <i>do Shih II</i> Camera 1008/2020 Oubs 36449 N21*2.553 W157* 41.078 S10 <i>do Shih II</i> Camera 1008/20	SAMPLE DATE	Island	PSU	lat_deg	lon_deg	STRATA 2020	VESSEL	GEAR
1008/2020 Oaha 37342 N121 32,744 N157 47,768 S10 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 37342 N21 22,675 W157 47,608 S10 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36053 N21 29,342 W157 45,502 S11 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36918 N21 29,362 W157 44,361 S03 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36066 N21 27,472 W157 44,361 S03 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36666 N21 27,472 W157 44,1973 S10 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36657 N21 22,563 W157 44,175 S10 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36431 N21 22,554 W157 44,175 S10 <i>As Shib</i> , <i>IT</i> Camera 1008/2020 Oaha 36432 N21 22,553 W157 44,188 S03 <i>As Shib</i> , <i>IT</i> Camera								
1008/2020 Oaku 37342 N21*32.741 W157*47.693 S10 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36953 N21*2.9344 W157*45.603 S11 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36953 N21*2.9344 W157*45.653 S11 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36918 N21*2.9124 W157*43.661 S03 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36666 N21*2.7475 W157*41.946 S10 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36667 N21*2.662 W157*41.224 S10 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36647 N21*2.662 W157*41.034 S10 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36441 N21*2.553 W157*41.034 S03 <i>Ao Shibi</i> /// Camern 1008/2020 Oaku 36441 N21*2.553 W157*34.034 S04 <i>Ao Shibi</i> /// Camern 10								
1008/2020 Oaku 3742 N21*24.675 W157*47.093 S10 <i>do Shibi II</i> Camera 1008/2020 Oaku 36953 N21*2.93.62 W157*45.653 S11 <i>do Shibi II</i> Camera 1008/2020 Oaku 36918 N21*2.93.62 W157*43.360 S03 <i>do Shibi II</i> Camera 1008/2020 Oaku 36666 N21*2.74.74 W157*43.361 S03 <i>do Shibi II</i> Camera 1008/2020 Oaku 36656 N21*2.74.72 H157*41.973 S10 <i>do Shibi II</i> Camera 1008/2020 Oaku 36457 N21*2.6612 W157*41.777 S10 <i>do Shibi II</i> Camera 1008/2020 Oaku 36431 N21*2.553 W157*41.122 S10 <i>do Shibi II</i> Camera 1008/2020 Oaku 36431 N21*2.553 W157*41.083 S0 <i>do Shibi II</i> Camera 1008/2020 Oaku 36431 N21*2.553 W157*35.95 S02 <i>do Shibi II</i> Camera								
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10/11/2020Oahu38089N21° 36.696W158° 20.514S08Ao Shibi IVCamera10/11/2020Oahu37925N21° 36.100W158° 21.606S16Ao Shibi IVCamera10/11/2020Oahu37925N21° 36.131W158° 21.682S16Ao Shibi IVCamera10/11/2020Oahu35823N21° 21.393W158° 08.935S15Ao Shibi IVCamera10/11/2020Oahu35823N21° 21.444W158° 08.997S15Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.632W158° 08.909S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.632W158° 08.909S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.646W158° 08.964S03Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.040W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.788W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera	10/11/2020	Oahu	38089	N21° 36.666	W158° 20.390	S08	Ao Shibi IV	Camera
10/11/2020Oahu37925N21° 36.100W158° 21.606S16Ao Shibi IVCamera10/11/2020Oahu37925N21° 36.131W158° 21.682S16Ao Shibi IVCamera10/11/2020Oahu35823N21° 21.393W158° 08.935S15Ao Shibi IVCamera10/11/2020Oahu35823N21° 21.444W158° 08.997S15Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.632W158° 08.909S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.646W158° 08.909S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.646W158° 08.964S03Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.040W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.788W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera	10/11/2020	Oahu	38089	N21° 36.696	W158° 20.514		Ao Shibi IV	Camera
10/11/2020Oahu37925N21° 36.131W158° 21.682S16Ao Shibi IVCamera10/11/2020Oahu35823N21° 21.393W158° 08.935S15Ao Shibi IVCamera10/11/2020Oahu35823N21° 21.444W158° 08.997S15Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.632W158° 08.909S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.646W158° 08.964S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 17.040W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.788W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera	10/11/2020	Oahu		N21° 36.100				
10/11/2020 Oahu 35823 N21° 21.393 W158° 08.935 S15 Ao Shibi IV Camera 10/11/2020 Oahu 35823 N21° 21.444 W158° 08.997 S15 Ao Shibi IV Camera 10/11/2020 Oahu 35713 N21° 20.632 W158° 08.909 S03 Ao Shibi IV Camera 10/11/2020 Oahu 35713 N21° 20.646 W158° 08.909 S03 Ao Shibi IV Camera 10/11/2020 Oahu 35713 N21° 20.646 W158° 00.556 S01 Ao Shibi IV Camera 10/11/2020 Oahu 34573 N21° 17.040 W158° 00.556 S01 Ao Shibi IV Camera 10/11/2020 Oahu 34573 N21° 17.081 W158° 00.569 S01 Ao Shibi IV Camera 10/12/2020 Maui Nui 26279 N21° 02.768 W157° 41.537 S02 Ao Shibi IV Camera 10/12/2020 Maui Nui 26279 N21° 02.738 W157° 41.552 S02 Ao Shibi IV Camera								
10/11/2020Oahu35823N21° 21.444W158° 08.997S15Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.632W158° 08.909S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.646W158° 08.964S03Ao Shibi IVCamera10/11/2020Oahu35713N21° 20.646W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.040W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.768W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera		Oahu						
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10/11/2020Oahu35713N21° 20.646W158° 08.964S03Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.040W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.768W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera		Oahu						
10/11/2020Oahu34573N21° 17.040W158° 00.556S01Ao Shibi IVCamera10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.768W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera			35713		W158° 08.964			Camera
10/11/2020Oahu34573N21° 17.081W158° 00.569S01Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.768W157° 41.537S02Ao Shibi IVCamera10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera	10/11/2020	Oahu	34573	N21° 17.040	W158° 00.556	S01	Ao Shibi IV	Camera
10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera	10/11/2020	Oahu		N21° 17.081			Ao Shibi IV	Camera
10/12/2020Maui Nui26279N21° 02.738W157° 41.552S02Ao Shibi IVCamera10/12/2020Maui Nui29356N21° 05.770W157° 37.479S02Ao Shibi IVCamera	10/12/2020	Maui Nui	26279	N21° 02.768	W157° 41.537	S02	Ao Shibi IV	Camera
	10/12/2020	Maui Nui	26279	N21° 02.738	W157° 41.552		Ao Shibi IV	Camera
10/12/2020 Maui Nui 29356 N21° 05.774 W157° 37.429 S02 Ao Shibi IV Camera		Maui Nui						Camera
	10/12/2020	Maui Nui	29356	N21° 05.774	W157° 37.429	S02	Ao Shibi IV	Camera

SAMPLE_DATE	Island	PSU	lat_deg	lon_deg	STRATA_2020	VESSEL	GEAR
10/12/2020	Maui Nui	30747	N21° 08.617	W157° 29.450	S05	Ao Shibi IV	Camera
10/12/2020	Maui Nui	30747	N21° 08.684	W157° 29.385	S05	Ao Shibi IV	Camera
10/12/2020	Maui Nui	30673	N21° 08.345	W157° 26.271	S05	Ao Shibi IV	Camera
10/12/2020	Maui Nui	30673	N21° 08.395	W157° 26.234	S05	Ao Shibi IV	Camera
10/12/2020	Maui Nui	21526	N20° 57.868	W157° 29.268	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	21526	N20° 57.851	W157° 29.373	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	22517	N20° 58.881	W157° 26.572	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	22517	N20° 58.921	W157° 26.631	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	22765	N20° 59.146	W157° 26.275	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	22765	N20° 59.188	W157° 26.271	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	23017	N20° 59.418	W157° 26.019	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	23017	N20° 59.480	W157° 26.009	S10	Ao Shibi IV	Camera
10/12/2020	Maui Nui	25752	N21° 02.071	W157° 21.732	S04	Ao Shibi IV	Camera
10/12/2020	Maui Nui	25752	N21° 02.137	W157° 21.718	S04	Ao Shibi IV	Camera
10/12/2020	Maui Nui	25772	N21° 02.076	W157° 16.034	S05	Ao Shibi IV	Camera
10/12/2020	Maui Nui	25772	N21° 02.153	W157° 16.056	S05	Ao Shibi IV	Camera
10/13/2020	Maui Nui	25772	N21° 02.047	W157° 15.876	S05	Ao Shibi IV	Camera
10/13/2020	Maui Nui	25772	N21° 02.104	W157° 15.888	S05	Ao Shibi IV	Camera
10/13/2020	Maui Nui	32337	N21° 12.642	W157° 18.111	S05	Ao Shibi IV	Camera
10/13/2020	Maui Nui	32337	N21° 12.630	W157° 18.056	S05	Ao Shibi IV	Camera
10/13/2020	Maui Nui	34030	N21° 15.592	W157° 18.076	S05	Ao Shibi IV	Camera
10/13/2020	Maui Nui	34030	N21° 15.670	W157° 18.108	S05	Ao Shibi IV	Camera