

State Biannual Waterbird Survey

Current Methodology

August 2019

Waterbird Surveys

- Assessment of waterbirds in Hawaii, specifically targeting four endangered waterbirds
 - Hawaiian Duck or Koloa Maoli (*Anas wyvilliana*)
 - Hawaiian Gallinule or 'Alae 'ula (*Gallinula galeata sandvicensis*)
 - Hawaiian Stilt or Ae'ō (*Himantopus mexicanus knudseni*)
 - Hawaiian Coot or 'Alae ke'oke'ō (*Fulica alai*)
- Simultaneous surveys on all Main Hawaiian Islands
- Long data set: twice a year since 1970

Survey Protocol

- Survey conducted twice a year: every 3rd Wednesday in January and August
 - Reschedule day is Thursday if needed (e.g. bad weather)
- Site locations established to capture distribution and population: wetlands, reservoirs, aquatic habitats, farms, ponds, ephemeral water ponding (fields, lawns), etc.
- Start time: ½ hour after sunrise
- End time: noon
- Minimum survey time at each site: 10 minutes

Pre-survey preparation

- Contact landowners for permission and access to survey sites
- Know your sites: if unfamiliar with your assigned sites, speak with island lead on clarifications
- Bring binoculars, bird ID guide, spotting scope if identifying birds at a distance or to read bands, data sheets, pen/pencil

Data Collection

- ALL established survey sites
 - Use correct site name, avoid abbreviations
 - Note when wetland is not visited due to access or other issue, this should be noted why in the data sheet
 - Each site you are assigned should be filled out in the datasheet
- Each site: record wetland condition, weather, time, etc
- Start and stop times (minimum time is 10 minutes)
- Print clearly
- Minimize disturbance to birds as approaching site
- Try to view all areas of site

Data Collection

- Count all waterbirds, shorebirds, migratory waterfowl at or surrounding site (not while driving to survey site)
- Prevent double counting
 - Keep track of bird movements
 - Do not count birds that fly in from an area previously surveyed
 - Do not record birds flying over site and not landing on site
- Note adults and subadults for endangered waterbirds (subadults include chicks and juv)
- Do not distinguish male/female, record all as adults
- Hawaiian coots need not be distinguished by color shield
- If no birds observed during survey, fill out all covariates, start/stop time and write 'no birds' down column
- If no access or survey site not visited, write 'no access' or 'not surveyed' down column and provide reason in comments

Data Collection

- Record other information in Comments Section
 - Band data for re-sight information
 - Leg bands on HAST, HAGA, HAWD, HAGO
 - Neck collars on HACO
 - Read bands from bird perspective (left is bird's left)
 - Color coded bands: record color/aluminum band such as: RA:GY [red over aluminum left:green over yellow right]
 - Alphanumeric bands read from bottom up and note color
 - Nests
 - Record nests and eggs observed
 - Uncertainty on Identification
 - Use photo guide/book, iBird or Cornell Lab of Ornithology app, etc.
 - If unable to identify, record in comments on appearance and behavior and take photos

Target Species

Table 1. Target species of waterbirds for the Hawaii Biannual Waterbird Survey.

Scientific Name	Hawaiian Name ^a	Common Name
<i>Endemic waterbirds (federally endangered)</i>		
<i>Fulica alai</i>	‘Alea ke‘o ke‘o	Hawaiian coot
<i>Gallinula galeata sandvicensis</i>	‘Alae ‘ula	Hawaiian gallinule (previously moorhen)
<i>Himantopus mexicanus knudseni</i>	Ae‘o	Hawaiian stilt
<i>Anas wyvilliana</i>	Koloa maoli	Hawaiian duck
Migratory shorebirds^b		
<i>Pluvialis fulva</i>	Kolea	Pacific golden plover
<i>Arenaria interpres</i>	‘Akekeke	Ruddy turnstone
<i>Tringa incana</i>	‘Ulili	Wandering tattler
<i>Calidris alba</i>	Hunakai	Sanderling
<i>Numenius tahitiensis</i>	Kioea	Bristle-thighed curlew
Migratory waterfowl^b		
<i>Anas acuta</i>	Koloa mapu	Northern pintail
<i>Anas clypeata</i>	Koloa mōhā	Northern shoveler
<i>Anas platyrhynchos</i>		Mallard (migratory)
<i>Aythya affinis</i>		Lesser Scaup
Other		
<i>Anas wyvilliana</i> x <i>A. platyrhynchos</i>		Koloa-mallard hybrid
<i>Anas platyrhynchos</i>		Feral/domestic mallards

^a Hawaiian diacritical marks are used for accuracy of Hawaiian bird names; however, these diacritical marks are not included in bird names or Hawaiian place names in the database or the polygon shapefile.

^b Includes the most commonly observed species and/or species of conservation interest, but is not be a complete list of all species surveyed.

DATA SHEET

- Current version August 2017

WATERBIRD SURVEY DATASHEET

WETLAND CONDITION CODES				WEATHER CODES			
Water Level (WL) 0 = dry 1 = lower than normal 2 = normal 3 = higher than normal	Human Impact (HI) 0 = indirect (little garbage, few people) 1 = moderate 2 = heavy (many people present; e.g., wading, boating, fishing, etc)	Rainfall (RF) 0 = no rain 1 = mist or fog 2 = drizzle 3 = light rain 4 = heavy rain 5 = snow or hail	Wind 0 = no wind, < 1 mph 1 = smoke drifts, 1-3 mph 2 = wind felt on face, 4-7 mph 3 = leaves and twigs rustle, 8-12 mph 4 = dust raises, branches stir, 13-18 mph 5 = small trees sway, >18 mph				
Vegetation Cover (VC) 0 = open water (<25% veg) 1 = 26-50% veg cover 2 = 51-75% veg cover 3 = >75% cover	Shoreline Condition of Tidal Wetlands (SC) 0 = water at high tide mark 1 = water 25 ft from high tide mark 2 = water 50 ft from high tide mark 3 = water >50 ft from high tide mark	Cloud Cover (CC) = Estimate to the nearest 10%					

REMEMBERS: If site is not accessible, include wetland name and write 'no access'
If no birds observed, fill out top portion and write 'no birds'

KEEP A COPY FOR YOUR RECORDS
Subadult includes juveniles and chicks

Date _____ **Observers** _____

Island _____

Wetland Name	Wetland 1				Wetland 2				Wetland 3				Wetland 4			
	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC
Condition	CC	RF	Wind		CC	RF	Wind		CC	RF	Wind		CC	RF	Wind	
Weather	Start	Stop			Start	Stop			Start	Stop			Start	Stop		
Time	Start		Stop		Start		Stop		Start		Stop		Start		Stop	
COOT adult																
COOT subadult																
BALLINULE/MOORHEN adult																
BALLINULE/MOORHEN subadult																
STILT adult																
STILT subadult																
KOLOA adult																
KOLOA subadult																
Koloa/Mallard Hybrid																
Mallard (domestic/feral)																
Other Domestic Duck																
Black-cr. Night Heron																
Cattle Egret																
Pacific Golden Plover																
Ruddy Turnstone																
Sanderling																
Wandering Tattler																
Northern Pintail																
Mallard (migratory)																
Lesser scaup																
Comments																

Protocol and instructions

Hawaii Biannual Waterbird Survey 2017 Protocol Update



Prepared for:
U.S. Fish and Wildlife Service, Inventory and Monitoring Program
and
State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife

Prepared by:
Adonia R. Henry, Wetland Ecologist, Scaup & Willet LLC

December 2017

HAWAII BIENNIAL WATERBIRD SURVEY INSTRUCTIONS (Dec. 2017 revision)

General Instructions:

1. Surveys are conducted the 3rd Wednesdays of January and August. Counts should begin ½ hour after sunset and be completed before noon.
2. Use the revised waterbird survey form (revision date Aug. 2017) to record all wetland and waterbird data. Data from 4 survey sites can be recorded on each datasheet.
3. Contact private landowners prior to the survey for permission to access the survey site.
4. Visit all survey sites on your current assigned list and shown on survey route maps.
5. If storm events or heavy rainfall and winds inhibits accurate observations of waterbirds, the survey may be completed on the following day (3rd Thursdays of January and August are alternate survey days if needed).
6. If you visit a 'new' survey site that has not been previously surveyed:
 - a. Record it is a new site in the comments.
 - b. Submit a map and/or GPS points showing the boundary of the new survey site.
 - c. Contact DOFAW Island Biologist and Waterbird Survey Coordinator to ensure the site is added to the database, polygon shapefile, and distribution list for future surveys.
7. If a site is no longer suitable habitat (e.g., drained reservoir), include relevant information in the comments so it can be determined if the site should be 'discontinued' from the survey until further notice.
8. Use binoculars and/or spotting scopes to identify species at a distance and to accurately read band numbers.
9. Bring a bird identification book and the photo guide for waterbirds in Hawaii to assist with identification, especially for migrant and/or vagrant species.
10. **KEEP A COPY OF THE DATASHEET FOR YOUR RECORDS.**
11. Send the original datasheet (or legible scanned copy) to *DOFAW Island Biologists* on or before the 4th Wednesdays of January and August (within 1 week of the survey).
 - a. Original datasheets are preferred.
 - b. If you transcribe your data to a fillable pdf after the survey, please also submit your original datasheet from the field.
 - c. Summary forms may be submitted, but are not required.
12. *DOFAW Island Biologists*: Ensure you have datasheets for ALL wetlands surveyed, scan and send electronically to the *DOFAW Waterbird Coordinator* by February 1st and September 1st. Keep copies of all datasheets. In case data are lost or misplaced, this ensures a duplicate set is available!!

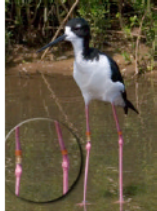
Other Resources

HAWAII STATE WATERBIRD COUNT – PHOTOGRAPHIC IDENTIFICATION GUIDE

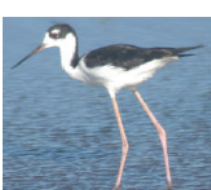
by Eric A. VanderWerf, June 2005

This guide is intended to help identify waterbirds that may be encountered during the Hawaii State waterbird count, including the four species of endangered waterbirds and some of the more common species of migratory shorebirds, waterfowl, gulls, and terns. If you observe a bird that does not match any of the species shown below, make careful notes on its appearance and behavior, take photographs if possible, then consult field guides for further information. All photos copyrighted, used with permission.

Hawaiian Stilt



Hawaiian Stilt male. Note the black back and bright pink legs. Photo Hugo de Vries.



Hawaiian Stilt juvenile. Note the more brownish back, dull pink legs, and more extensive white on the neck and forehead. Photo Eric VanderWerf.



The bands on this juvenile stilt are red over aluminum left, blue over white right, or RA/BW. Photo Eric VanderWerf.

Hawaiian Coot

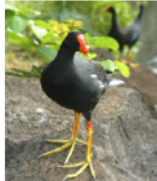


Hawaiian Coot adult (left) and juvenile. Juveniles are grayish and lack the white bill. Photo Eric VanderWerf.



Adult Hawaiian Coots can have white or red frontal shields above the white bill. Photo Eric VanderWerf.

Hawaiian Moorhen



Hawaiian Moorhen. Note the long unlobed toes. Photo Eric VanderWerf.



Hawaiian Moorhen with chicks. Note the long unlobed toes. Photo David Desrochers.

HAWAII WATERBIRD SURVEY – BIRD IDENTIFICATION TIPS (Aug. 2017)

The most frequently observed species in Hawaii are briefly described below. In addition, please consult the 2005 photographic field guide available from DOFAW. For other species, please consult field guides.

Endangered Waterbirds

- *Hawaiian Coot* or '*alae ke'oke'o*'. Dark slate gray with a white bill and a large frontal shield (patch on top of head). The frontal shield is usually white but can vary from bluish white to yellow to dark blood red. They have white undertail feathers that are seen when swimming or during their courtship displays. Male and female coots look alike. They measure about 15 inches in length. Juveniles are gray and lack the white frontal shield of adults.
- *Hawaiian Gallinule* (previously *moorhen*) or '*alae 'ula*'. Dark gray birds with a black head and neck, and white feathers on their flanks and on their undertail or feathers. They have a very distinctive red frontal shield, and their bill tip is yellow with a red base. Their legs and feet are greenish and without lobes. They measure about 13 inches in length. Both sexes are similar and have chicken-like cackles and croaks.
- *Hawaiian Stilt* or '*ae'o*'. Juveniles can be distinguished by their more extensive white on the forehead and sides of the neck, duller pink legs, and higher-pitched calls. Juveniles cannot be distinguished by back color; male stilts have black backs, females and juveniles have brownish-black backs.
- *Hawaiian Duck* or '*Koloa maoli*'. (please see below).

Koloa, Koloa/Mallard hybrids, Feral/Domestic Mallards, and Migratory Mallards

Koloa are very similar to female mallards, but many birds can be distinguished by careful observation of the characters described in the table below. The descriptions in the table below are preliminary.

Character	Koloa	Female Mallard
Size	Small; 70-80% length of Mallards. Male: 600 g, female: 460 g	Large; male: 1240 g, female: 1080 g.
Bill size	Smaller, narrower	Larger, wider
Bill color	Mostly dark, often greenish, tip of bill may be orange in female	Mostly orange, with some dark blotches in center
Tail and undertail covert color	Whitish with brown spots or mottling	Whitish
Speculum Color	Emerald green to blue	Blue

Koloa-Mallard hybrids are intermediate and variable, and individuals may exhibit characteristics of both species. Outside Kauai and parts of the Big Island, many ducks that superficially appear to be Koloa may actually be hybrids.

DATA SHEET

WATERBIRD SURVEY DATASHEET

WETLAND CONDITION CODES				WEATHER CODES			
Water Level (WL) 0 = dry 1 = lower than normal 2 = normal 3 = higher than normal	Human Impact (HI) 0 = indirect (little garbage, few people) 1 = moderate 2 = heavy (many people present; e.g., wading, boating, fishing, etc)	Rainfall (RF) 0 = no rain 1 = mist or fog 2 = drizzle 3 = light rain 4 = heavy rain 5 = snow or hail	Wind 0 = no wind, < 1 mph 1 = smoke drifts, 1-3 mph 2 = wind felt on face, 4-7 mph 3 = leaves and twigs rustle, 8-12 mph 4 = dust raises, branches stir, 13-18 mph 5 = small trees sway, >19 mph				
Vegetation Cover (VC) 0 = open water (<25% veg) 1 = 26-50% veg cover 2 = 51-75% veg cover 3 = >75% cover	Shoreline Condition of Tidal Wetlands (SC) 0 = water at high tide mark <small>N/A=not applicable</small> 1 = water 25 ft from high tide mark 2 = water 50 ft from high tide mark 3 = water >50 ft from high tide mark	Cloud Cover (CC) = Estimate to the nearest 10%					

REMINDEES: If site is not accessible, include wetland name and write 'no access'
 If no birds observed, fill out top portion and write 'no birds'
KEEP A COPY FOR YOUR RECORDS
 Subadult includes juveniles and chicks

Date _____ Observers _____
 Island _____

Wetland Name	Condition				Weather				Time	
	WL	VC	HI	SC	CC	RF	Wind	Start	Stop	
COOT adult										
COOT subadult										
GALLINULE/MOORHEN adult										
GALLINULE/MOORHEN subadult										
STILT adult										
STILT subadult										
KOLOA adult										
KOLOA subadult										
Koloa/Mallard Hybrid										
Mallard (domestic/feral)										
Other Domestic Duck										
Black-cr. Night Heron										
Cattle Egret										
Pacific Golden Plover										
Ruddy Turnstone										
Sanderling										
Wandering Tattler										

Covariates needed for each site

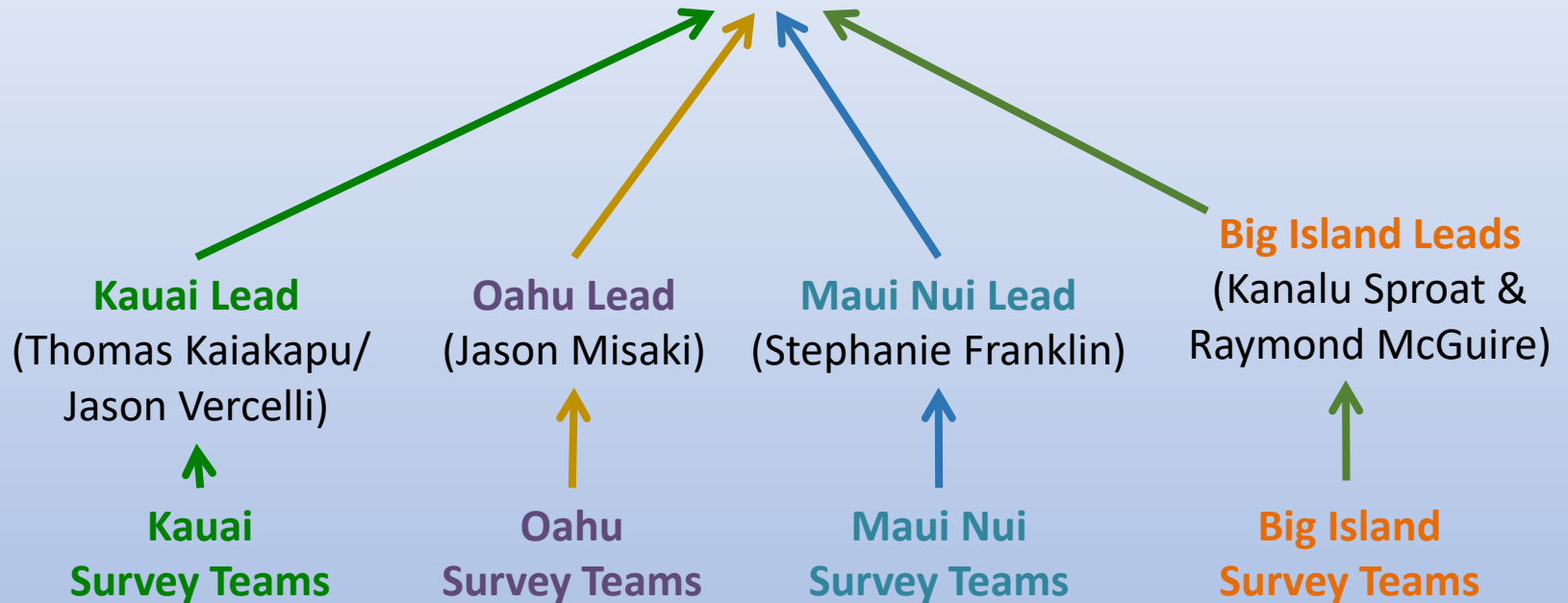
- Water Level
- Vegetation Cover
- Human Impact
- Shoreline Condition (tidal influenced sites)
 - Can look up tide at the time of survey
- Rainfall
- Wind (Beaufort scale)
- Cloud Cover (nearest 10%)
 - Look at the sky in every direction above 14 degrees by holding your hands out in a “V”, hands even with the height of the top of your head, and estimating the cloud cover of the sky between your hands

If weather changes during survey, record the average condition during the time of the survey, record any anomalies (e.g. poured for 1 minute, but only a drizzle for 9 minutes.)

After Data Collection

- Provide original data sheet to your island lead biologist within one week of survey, keep a copy for your records
- Fill out column on data sheet for EACH site even if not visited
- Island Lead Biologists sends ALL site data sheets to Statewide Coordinator by email due:
 - Winter: February 1
 - Summer: September 1
- Island lead biologists keep original data sheets secure

**State-wide Survey Lead
DOFAW Waterbird Coordinator
(Afsheen Siddiqi)**



**Make sure datasheets are legible and COMPLETE
Send ORIGINALS to Island Leads**

KEEP A COPY OF YOUR DATASHEETS!

Adding/Discontinuing a Site

- Add a new site
 - Record in comments that this is a new site
 - Submit a map and/or GPS showing boundary of new site
 - Confirm with island lead and coordinator that site was added to the database
- Discontinue a site
 - Provide in comments why site is no longer suitable for survey
 - Confirm with island lead and coordinator that site no longer shall be surveyed

Data Issues: Field Data Collection

- Disparity of wetland names on survey forms
- Inconsistent information on survey forms
- General lack of completeness overall
- For survey to be valuable as a management and research tool...
 - ...data accuracy, completeness, and consistent entry are critical

Data Issues: Data Management

- Misplacement or loss of data from approximately 1200 surveys due to:
 - Lack of duplicate copies
 - Staff turnover
 - Complexity of the organizational system
 - Lack of annual data entry & QA/QC
 - Lack of resources and funding
 - Prevented addressing content issues quickly
 - Allowed many issues to be propagated

Site/Subwetland Names

- Need consistent use of site names
- Many synonyms per site, often not obvious
 - 1,232 synonyms for the 591 official subwetland names (1/18/16)

Island	WetlandName	WetlandAndSubName	WetlandSynonymName
Oahu	Kahuku Shrimp Farms	Amorient	Amorient (Ming Lease)
Oahu	Kahuku Shrimp Farms	Amorient	Amorient (Ming)
Oahu	Kahuku Shrimp Farms	Amorient	Amorient Aquafarm's saltwater pond
Oahu	Kahuku Shrimp Farms	Amorient	James Campbell (Ming)
Oahu	Kahuku Shrimp Farms	Amorient	James Campbell NWR (Ming)
Oahu	Kahuku Shrimp Farms	Amorient	Ming
Oahu	Kahuku Shrimp Farms	Amorient	Ming Dynasty Aquaculture
Oahu	Kahuku Shrimp Farms	Amorient	Suisan
Island	WetlandName	WetlandAndSubName	WetlandSynonymName
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Kapu Res.
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Lakeland
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Lakeland Kapu Res.
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Lakeland Res.
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Puu Kapa Reservoir
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Puu Kapu R.
Hawaii	Puu Kapu Reservoir	Puu Kapu Reservoir	Puu Kapu Res.

- Write as much of the entire official name as possible
- Severe abbreviation makes data entry difficult

Combining Sites

- Observers combining multiple subwetland sites into one survey
 - Person entering data cannot peel apart combined data
 - i.e., Oahu: Dillingham Ranch Big Pond & Dillingham Ranch Small Pond
 - 2 subwetlands in database
 - Surveyed as 1 site here (Mokuleia Ranch)

Island: Oahu Required

SubWetland: Dillingham Ranch Big Pond Required

Island: Oahu Required

SubWetland: Dillingham Ranch Small Pond Required

Mokuleia Ranch			
WL	VC	HI	SC
0	1	1	
CC	RF	Wind	
10	0	1	
Start		Stop	
730		830	

CANNOT SPLIT DATA
APART FOR COMPLETE
RECORD IF DATA IS
LUMPED!!

Splitting Sites

- Observers splitting one site into many
 - If it was an error:
 - Manually add together the birds
 - Average the wetland conditions
 - i.e., Kauai: Poipu Bay Golf Course
 - 1 subwetland in database
 - Surveyed as 3 separate sites only once

Wetland Name	Poipu Bay G.C. 1				Poipu Bay G.C. 2				Poipu Bay G.C. 3			
Condition	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC
	1	0	2	-	2	0	2	-	2	0	2	-
Weather	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind			
	25	0	3	25	0	3	25	0	3			
Time	Start	Stop	Start	Stop	Start	Stop						
	8:10	8:15	8:20	8:25	8:30	8:35						

Splitting Sites

- Observers splitting one site into many
 - If this is consistent over many years:
 - Discontinue the old combined subwetland
 - Split it into multiple subwetlands
 - i.e., Hawaii: Keanakolu Road Stock Ponds
 - Consistently surveyed as 9 separate sites (KRSP #1, KRSP #2, etc...)
 - Discontinued Keanakolu Road Stock Ponds
 - Created 9 new “KRSP” subwetlands

Wetland Name	KRSP #1				KRSP #2				KRSP #3				KRSP #4				KRSP #5			
Condition	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC
	0	2	0	3	2	1	0	0	1	1	0	0	2	0	0	0	2	0	0	0
Weather	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind		
	30	0	1	25	0	0	40	0	2	40	0	1	60	0	2					
Time	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop						
	0837	0849	0856	0906	0920	0935	0947	1000	1016	1025										

▶ Keanakolu Road Stock Ponds		Although data was usually	^	Discontinued	▼	8/20/2008
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Bird Counts

- However you record observations, make total # obvious
- Tally the number of birds and circle it if you...
 - ...use Roman numerals
 - ...use hash marks
 - ...write a series of numbers and/or tallies
 - ...use the dot & line system

COOT	- adult	XXXXXX	
	- juvenile		
MOORHEN	- adult		
	- juvenile		
STILT	- adult		
	- juvenile		
KOLOA	- adult		
	- juvenile		
Koloa/Mallard hybrid			
Mallard (domestic)		VII	
Muscovy			
Other Dom. Waterfowl			
Black-cr. Night-Heron			

Other Dom. Waterfowl			
Black-cr. Night-Heron		1, 2, 1, 3, 4	
Cattle Egret			
Pacific Golden Plover			
Ruddy Turnstone			
Sanderling			
Wandering Tattler			
		2, 2	

COOT	- adult	Tide 0.81	" Tide 0.51	Tide 0.26	"	X"
	- juvenile					
MOORHEN	- adult					Buff/Nada
	- juvenile					2 last yrs
STILT	- adult	XX"	XXXXXXXX	" GA: SB		X
	- juvenile	00' GA	2 yrs			
KOLOA	- adult		copulating Golden Star			
	- juvenile					
Koloa/Mallard hybrid						
Mallard (domestic)						
Muscovy						
Unkn. Dom. Duck			+ 2			
Unkn. Migr Waterfowl			GA:			
Black-cr. Night-Heron						" (2am juvs)
Cattle Egret						
Pacific Golden Plover						
Ruddy Turnstone						GRSC " 27"
Sanderling						RNDY "
Wandering Tattler						
		Had missed	NHDP			
		0.01' @ 6AM	GADN			
			SUGD			
			ANKE			

Koloa/Mallard hybrid			
Mallard (domestic)			(3)
Muscovy			
Other Dom. Waterfowl			
Black-cr. Night-Heron			(3)
Cattle Egret			
Pacific Golden Plover			(1)

More Suggestions

- Only circle ONE number per species.
- No ranges of values for weather conditions
- Writing "0"s if you did not see a species
 - Clutters the datasheet

COOT	- adult	① ① ①
	- juvenile	
MOORHEN	- adult	
	- juvenile	
STILT	- adult	④ ③ ④ ① ② ②
	- juv	② ③
KOLOA	- ad	
	- juvenile	
Koloa Mallard hybrid		①
Mallard (domestic)		
Muscovy		
Other Dom. Waterfowl		
Black-cr. Night-Heron		② ① ⑤ ① ①
Cattle Egret		② ③ ⑥ ②
Pacific Golden Plover		① ② ① ① ④

Wetland Name		Brant Blvd.			
Condition		WL	VC	HI	SC
		1-2	0-1		
Weather		CC	RF	Wind	
		30	0	3	
Time		Start		Stop	
		09:15		11:20	
COOT	- adult	120			
	- juvenile	2			
MOORHEN	- adult	55			
	- juvenile	8			
STILT	- adult	49			
	- juvenile	1			
KOLOA	- adult	0			
	- juvenile	0			
Koloa/Mallard hybrid		18			
Mallard (domestic)		0			
Muscovy		0			
Other Dom. Waterfowl		0			
Black-cr. Night-Heron		4			
Cattle Egret		7			
Pacific Golden Plover		52			
Ruddy Turnstone		24			
Sanderling		6			
Wandering Tattler		3			
Bristled-Thigh Curlew		13			

Data Completeness

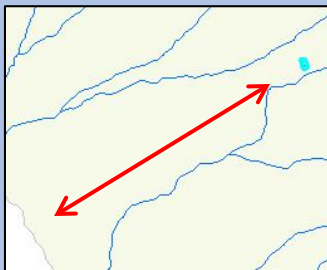
- Print neatly and press firmly
- Fill in all fields/categories
- Explain notes as clearly as possible

Date: 19 Jan 06
 Island:
 Observers:
 Wetland Name: Gull Gully Mallard Mall
 Condition: Gully Mall
 Weather:
 Time:
 COOT - adult
 COOT - juvenile
 MOORHEN - adult
 MOORHEN - juvenile
 STILT - adult
 STILT - juvenile

Wetland Name	Coot's Corner				Plover Place				Ruddy Road				Stilt Street				Frigatebird Field			
Condition	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC	WL	VC	HI	SC
Weather	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind	CC	RF	Wind		
Time	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop				
	2	1	1																	
	5	0	3																	
	8:00	8:51	9:00	9:15	9:19	9:45	9:50	10:10	10:15	10:30										

Data Completeness

- Common errors observed for Weather and Wetland Condition data
 - “-” vs. “0” data
- Weather , Water Level (WL), Vegetation (VC), and Human Impact (HI)
 - Apply to every site and should never have a “-” or “N/A”
 - Observers likely meant “0”
- Shoreline Condition
 - ONLY applies to tidal wetlands
 - Inland sites should never have a “0”...rather use “-” or “N/A”



Wetland Name	Avocet Avenue			
Condition	WL	VC	HI	SC
Weather	CC	RF	Wind	
Time	Start	Stop		
	8:38	8:56		

A large red 'X' is drawn over the table, indicating an error in data entry. The 'SC' column in the Condition row contains a '0' instead of a dash or N/A.

Wetland Name	Teal's Turn			
Condition	WL	VC	HI	SC
Weather	CC	RF	Wind	
Time	Start	Stop		
	0710	0730		

The table is circled in green, indicating it is a correct example of data entry. The 'SC' column in the Condition row contains a dash (-).

New and Updated User References

- 2017 Survey Instructions
- 2017 Field Form
 - Hand-written & Electronically fill-able
 - Do NOT use old versions of forms
- 2005 Photo I.D. Guide
- 2017 Identification Tips Guide
- 2017 Protocol Update
- 2015 Database User Manual - DRAFT

Hawaiian Stilt



Hawaiian Stilt male. Note the black back and bright pink legs. Photo Hugo de Vries.



Hawaiian Stilt juvenile. Note the more brownish back, dull pink legs, and more extensive white on the neck and forehead. Photo Eric VanderWerf.



The **bands** on this juvenile stilt are red over aluminum left, blue over white right, or **RA/BW**. Photo Eric VanderWerf.

Lastly, enjoy the day
Happy surveying!
Mahalo 😊

