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A REVIEW OF SHARK ATTACKS IN THE HAWAIIAN ISLANDS

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Although human injury and death associated with shark attacks have periodically occurred in the Hawaiian Islands, a comprehensive list of these events has not been assembled, analyzed, and published. The classic book entitled "Sharks and Survival", edited by Dr. Perry Gilbert (1963), contains a worldwide list of shark attacks that includes cases for the Hawaiian Islands. However, important aspects of these attacks, along with literature references, are not presented. Baldrige (1973) analyzed 1165 worldwide cases of shark attack in an effort to identify environmental and behavioral relationships, but the results of this work did not produce specific information for the Hawaiian Islands.

The purpose of this paper is to consolidate and review all known shark attacks in the Hawaiian Islands, current to October, 1980. The continued documentation of such incidents, and the long-term maintenance of accurate records, are basic to gaining a better understanding of this limited but nevertheless distinct hazard of the Hawaiian marine environment.

METHODS

All shark attacks for the Hawaiian Islands listed in Gilbert's book were consolidated and, when possible, verified, corrected as necessary, and expanded using newspaper articles and other literature sources. Cases that have occurred since the book's preparation in January of 1963, as well as earlier attacks not covered, were located using newspaper indices and files at Hamilton Library, University of Hawaii, and other reference collections. Most of this work was carried out in conjunction with literature searches aimed at documenting predator-prey relationships of sharks and Hawaiian sea turtles.

FINDINGS

Fifty-two cases of shark attack were compiled covering the years 1886 to 1980; 21

of these involved the death of the victim (Tables 1 and 2). Sixteen of the cases (36-52, Table 1) constitute attacks occurring after the publication of Gilbert's book. In addition, cases 27 (September 1953), 28 (April 1954), and 30 (April 1955) represent earlier records that did not appear in this book. Only two of the 52 cases involved female victims.

Corrections to the information presented in Gilbert's book that have been incorporated in this paper include: case 12 that occurred in May instead of June; case 20 which involved a male victim at Laupahoehoe, Hawaii, rather than a female at Hilo; and case 21, where the victim died rather than survived. Three cases were found to be of questionable validity, and therefore have not been included in this paper. One of these (case 285 in Gilbert) involved human injury from a gaff broken during a shark hunt, rather than any direct injury from a shark (Anon. 1931). The second case (1043 in Gilbert) involved an encounter with a shark, but with no apparent physical contact or injury (Mrs. V. Valentine, pers. commun.). The third questionable case (870 in Gilbert) involved three fatalities and one survivor in a Navy airplane crash on February 3, 1960. The occurrence of shark attack in association with this accident could not be confirmed through newspaper accounts that appeared at that time (Storm 1960; Anon. 1960a). Furthermore, the site of the crash was 40 miles southwest of Barbers Point, Oahu, not "Near Maui" as listed in Gilbert's book.

Activity of victims

The specific circumstances for seven of the attacks listed in Table 1 could not be determined. All occurred prior to 1960, and two were associated with fatalities.

Of the remaining 45 cases in which more detailed information could be obtained, 23 took place in conjunction with some form of fishing activity, such as spearfishing, fishing from shore or from a boat, net fishing or, in one case, dynamiting for fish.

Fatalities were associated with 11 of these 23 cases. Only three of the 23 cases involved the actual capture of a shark, thereby directly provoking the attack. None of these three cases resulted in a fatality.

Six of the attacks listed in Table 1 occurred in conjunction with body surfing or while surfing with a board or air mattress. All of these cases have taken place since 1958, and two (32 and 42) have involved fatalities.

Only two cases (41 and 49) listed in Table 1 involved scuba diving, with one resulting in a fatality.

Cause of death

Of the 45 cases in which some details could be obtained, 19 constituted fatalities. However, in 12 of these 19 cases the actual cause of death could not be positively determined. That is, it is uncertain if death resulted directly from shark attack, or if the victim drowned and then was bitten or consumed by a shark. A review of these 12 cases indicates that four very likely involved death directly from shark attack (cases 1, 9, 12 and 49), and three (21, 35, and 37) in which the victim probably drowned before being attacked. In the remaining five cases (13, 20, 28, 39 and 42), there is insufficient information to make even a speculative determination.

Size and species of sharks

Estimates made by victims or observers of the size of the shark associated with attacks are available for 17 of the cases listed in Table 1. In three other cases, the size is known from measurement taken following the shark's capture and recovery of human remains from the stomach. Of these 20 total cases where some record of size exists, 12 involved non-fatal attacks and eight involved fatal attacks. For the non-fatal attacks, the estimated sizes of the sharks ranged from 4 to 14 ft., with a mean of 7.1 ft. (S.D.=3.4). For fatal attacks, estimated sizes ranged from 11 to 22 ft., with a mean of 16.2 ft. (S.D.=4.6). As would be expected, fatalities are more likely to result from attacks involving larger sharks.

Determinations of the species of shark associated with attacks are only available for six cases. The accuracy of some of these identifications is subject to question due to the absence of voucher specimens or photographs. For the three cases that were not fatal, one (15) involved a hammerhead

(*Sphyrna* sp.), one (39) a great white (*Carcharodon carcharias*), and one (52) a tiger shark (*Galeocerdo cuvier*). For the three cases that were fatal, one (12) involved a great white and two (32 and 39) involved tiger sharks. Case 12 is of special interest because it involved the recovery of human remains (along with ulua, lobsters and turtle) from the stomach of a great white shark captured off Kahuku, Oahu, in June of 1926. The victim had disappeared 14 days earlier after suddenly calling for help while swimming with friends in water 12 feet deep off Haleiwa. A newspaper account of this incident (Anon. 1926c) stated in part that "The creature was identified as a real 'man-eater' or white shark called Niuhi (Niuhi) by the natives. It measured 12 feet 6 inches in length and its opened jaws had a spread of 20 inches. Its mouth was full of triangular teeth as sharp as razors, although the worn condition of some of the front teeth seemed to indicate that the animal was an old one."

Attacks by decade, month and island

The number of shark attacks occurring for each decade since the 1880's was at its highest during the 1950's when 14 cases were reported (Table 2). Although several intensive shark fishing programs were conducted in Hawaiian waters from 1959 to 1976 (Ikehara 1961, Tester 1969, Fujimoto and Sakuda 1972, Naftel and Taylor 1976) the number of cases remained relatively high, with eight attacks during the 1960's and 10 during the 1970's. Increases in the human populations of some of the Hawaiian Islands may have influenced this pattern. The fatality rates, however, declined considerably from 50% during the 1950's, to 20% during the 1970's.

The number of shark attacks occurring during each month of the year (Table 3) has been greatest for April (8 cases), followed by September (6 cases), and August (5 cases). The lowest number of attacks have been during May (1 case) and February and November (2 cases each).

The greatest number of shark attacks have taken place off Oahu (Table 2), which is undoubtedly a reflection of the relatively large human population residing on this island. No attacks have ever been recorded for the islands of Lanai, Kahoolawe, Niihau, or any of the Northwestern Hawaiian Islands except Midway. Although eight attacks have taken place off Maui, with five of these during the 1970's, no fatalities have been recorded for this island.

TABLE 1

Annotated List of Shark Attacks in the Hawaiian Islands

Case No. * = fatal	Date	Location	Victim	Circumstances and References
1*	June 2, 1886	Hamakua, Hawaii	two females	Washed into the sea while fishing from shore; one woman found bitten (fatal), the other woman disappeared. 4,12
2*	August 8, 1902	Kalihi, Oahu	young male	Pulled under while crabbing; both arms amputated. 4,12
3*	1904	Honolulu, Oahu	male	Unprovoked attack, but unable to determine circumstances. 4
4*	1907	Pepeekeo, Honomu, Hawaii	male	Bitten while fishing. 4
5	October 13, 1907	Kalepolepo, Kihei, Maui	male	Bitten while retrieving fish caught in net. 4,12
6*	January 17, 1908	Mana, Kauai	male	Pulled under while gathering fish stunned by dynamite. 4,12,23
7	April, 1910	Pearl Harbor, Oahu	Martin Lund	Unprovoked attack, but unable to determine circumstances. 4
8*	1910	Hilo, Hawaii	male	Bitten while fishing. 4
9*	March 3, 1914	Honomu, Hawaii	Okomoto	Washed into the sea while picking opihi; attacked by two large sharks. 4,24
10	September 28, 1922	Keawanui, Kamalo, Molokai	male	Bitten while inspecting wharf. 4,12,25
11	April 7, 1926	Hilo Bay, Hawaii	Mrs. Leonard Carlsmith	Bitten while swimming in turbid water near yacht club; severe lacerations on leg; 6 ft. shark observed in area. 4,12,26
12*	May 18, 1926	Haleiwa, Oahu	William J. Goins	Gave a sudden shriek then disappeared while swimming at Haleiwa; remains of body found in 12.5 ft. great white shark caught off Kahuku. 4,27,28,29, 30,31
13*	September 2, 1931	Kahala, Oahu	George Gaspar	Swept out to sea by strong currents while fishing; remains of body found in 18 ft. shark caught off Barber's Point. 4, 33,34

TABLE 1 (Cont'd)

Annotated List of Shark Attacks in the Hawaiian Islands

Case No. * = fatal	Date	Location	Victim	Circumstances and References
14	October 4, 1939	Kaneohe Bay, Mokapu, Oahu	James Akina	Bitten on hand by 5 ft. shark while spearfishing in shallow water. 4,12,35
15	July 1, 1941	Nanakuli, Oahu	Hisao Shimoto	Bitten on arm while removing 100 lb. shark from fishing line. 4,12,35
16	1943	Midway	male	Unprovoked attack, but unable to determine circumstances. 4
17	1943	Midway	male	Unprovoked attack, but unable to determine circumstances. 4
18	June 27, 1947	Makaha, Oahu	Valentine Limatoc	Bitten while spearfishing with six other men. 4,12,37
19	September 19, 1948	Makapuu, Oahu	Noah Kalama	Bitten on leg while swimming. 4,12,38
20*	June 25, 1951	Kapehu Beach, Laupahoehoe, Hawaii	Alejandro Nodura	Swept out to sea while fishing from shore. Victim seen in shark's mouth. 39
21*	August 3, 1952	Ala Moana, Oahu	Shigeichi Kawamura	Missing while swimming, shark bite found on right side of body. 4,40
22*	December 3, 1952	Maile, Oahu	Gerbacio Solano	Bitten on arm while swimming from fishing boat; shark reported to be in excess of 22 ft. 4,41,42
23	February 18, 1953	Barbers Point, Oahu	James S. Takeuchi	Bitten on hand while removing shark from net. 4,12,43
24	July 4, 1953	Kaula Rock	David Crick	Fell off boat while fishing; bitten on leg. 9,44
25*	April 15, 1953	Oahu	Leonard Gaut	Unprovoked attack, but unable to determine circumstances. 4
26*	July 26, 1953	Maile, Oahu	Harold Souza	Bitten on thigh while spearfishing close to shore; 10 ft. shark observed. 4,45,46
27	September 2, 1953	Waiau, Pearl Harbor, Oahu	Daniel Gonsalves	Bitten on leg and foot by 5 ft. hammerhead shark while crabbing. 47

TABLE 1 (Cont'd)

Annotated List of Shark Attacks in the Hawaiian Islands

Case No. * = fatal	Date	Location	Victim	Circumstances and References
28*	April 8, 1954	Wailupe, Oahu	Gordon S. Chun	Missing while fishing from shore; body recovered in mutilated condition. 48,49
29	1954	Molokai	Severino	Unprovoked attack, but unable to determine circumstances. 4
30	April 1955	Hilo, Hawaii	Kanematsu Oshiro	Bitten on hand while fishing from boat. 57
31	September 20, 1955	East Molokai	Phillip C. Diez	Bitten on arm while swimming. 4,11
32*	December 13, 1958	Lanikai, Oahu	William S. Weaver	Leg amputated while surfing on an air mattress near Twin Islands; 15-25 ft. shark (believed to be tiger shark) observed near body. 4,5,13,20
33	1950's	Waikiki, Oahu	David Lloyd	Provoked attack, but unable to determine circumstances. 4
34	February 27, 1960	Makena, Maui	John Benjamin	Severe lacerations obtained while spearfishing. 4,51
35*	December 27, 1960	Maile Point, Oahu	Harold Riley	Swept out to sea while net fishing; 20 ft. shark observed attacking victim; body recovered off Nanakuli. 4,52,53
36	August 2, 1961	Pearl Harbor, Oahu	Kazuhiko Kato	Bitten on hand by 8 ft. shark while net fishing. 4,54
37*	April 8, 1963	Hapuna Beach, Hawaii	Roy C. Kametani	Washed into the sea while picking opihi; parts of body recovered. 55,56
38	April 12, 1963	Awili, South Kona, Hawaii	Aiona Aka	Bitten on leg and foot while surfing; 12-15 ft. shark observed. 8,57
39*	September 20, 1967	Kailua Bay, Oahu	male	Victim lost at sea when boat capsized between Oahu and Molokai; remains of body found in 11 ft. tiger shark. 21,22,58

TABLE 1 (Cont'd)

Annotated List of Shark Attacks in the Hawaiian Islands

Case No. * = fatal	Date	Location	Victim	Circumstances and References
40	March 9, 1969	Makaha, Oahu	Licius Lee	Bitten on leg while surfing; identified as great white shark; dead whale recently removed from the area. 6,9,59 & R. Wass, pers. commun.
41	November 11, 1969	Barbers Point, Oahu	D. R. McGinnis	Bitten on tank while scuba diving; abrasions on arms and legs resulting from contact with shark. 22
42*	March 31, 1970	Waimea Bay, Oahu	Ernie Reathaford	Swept out to sea while body surfing; 15-18 ft. shark observed. 60
43	October 24, 1970	Brennecke Beach, Poipu, Kauai	James C. Mattan	Bitten on shoulder and arm while body surfing. 2
44	March 16, 1972	Waihee, Wailuku, Maui	Adam Gomes, Jr.	Bitten on leg while spearfishing. 61
45	August 17, 1972	Waimanu, Honokaa, Hawaii	Eric Fotherby	Bitten on arm by 8 ft. shark while spearfishing. 62
46	January 9, 1973	Hookipa Beach, Paia, Maui	Robert Sterling	Bitten on leg while surfing close to shore; 4-6 ft. shark observed in area. 15
47	December 18, 1973	Kalama Beach, Kihei, Maui	Gary W. Floyd	Bitten on leg while swimming close to shore. 63,64
48	June 10, 1976	Kamaole Beach Park #1, Kihei, Maui	Donald Gard	Bitten on foot and leg by 3-5 ft. shark while swimming. 17
49*	July 20, 1976	Mahaulepu, Koloa, Kauai	Stephen C. Powell	Missing while scuba diving; lower remains of body recovered. 19,65
50	April 21, 1976	Kaanapali, Maui	Ruskin Vest	Bitten on arm by 4 ft. shark while swimming close to shore. 66
51	November 27, 1978	Ewa, Oahu	Wendell Cabunoc	Bitten on arm while surfing; 8 ft. shark observed. 10,67
52	August 6, 1980	Puamana, Lahaina, Maui	Mark Skidgel	Bitten on left side of body while surfing close to shore; identified as 14 ft. tiger shark. 7,68

TABLE 2

Number of Shark Attacks by Decade and Island

	1880 -89	1890 -99	1900 -09	1910 -19	1920 -29	1930 -39	1940 -49	1950 -59	1960 -69	1970 -79	1980	TOTAL	NO. FATAL	% FATAL
Hawaii	1	.	1	2	1	.	.	2	2	1	.	10	6	60
Maui	.	.	1	.	.	.	.	.	1	5	1	8	0	0
Molokai	.	.	.	.	1	.	.	2	.	.	.	3	0	0
Lanai	.	.	.	.	.	.	.	.	.	.	.	0	0	0
Kahoolawe	.	.	.	.	.	.	.	.	.	.	.	0	0	0
Oahu	.	.	2	1	1	2	3	9	5	2	.	25	13	52
Kauai	.	.	1	.	.	.	.	.	.	2	.	3	2	67
Niihau	.	.	.	.	.	.	.	.	.	.	.	0	0	0
Kaula	.	.	.	.	.	.	.	1	.	.	.	1	0	0
Midway	.	.	.	.	.	.	2	.	.	.	.	2	0	0
Total	1	0	5	3	3	2	5	14	8	10	1	52	21	40
No. Fatal	1	0	4	2	1	1	0	7	3	2	0			
% Fatal	100	0	80	67	33	50	0	50	37	20	0			

CONCLUSIONS

The synthesis of information presented in this paper establishes a basis for answering fundamental questions relating to shark attacks in the Hawaiian Islands. The continued documentation of such incidents will be valuable from the standpoints of identifying trends, and eventually making predictions useful to management and education programs.

Shark research and control programs have shown that large tiger sharks commonly reside around the eight main Hawaiian Islands. Furthermore, greater numbers are thought to occur in the Northwestern Hawaiian Islands (Taylor and Naftel 1978). In view of the regular presence of these large predators, along with many other species of sharks, the number of attacks in Hawaiian waters does not seem substantial. An average of approximately one case of shark attack each year has occurred in the Hawaiian Islands over the past 30-year period. As a compari-

TABLE 3

Number of Shark Attacks by Month, 1886-1980

Month	No. of attacks*	No. fatal
January	2	1
February	2	0
March	4	2
April	8	3
May	1	1
June	4	4
July	4	2
August	5	2
September	6	3
October	3	0
November	2	0
December	4	3

*represents 45 cases in which the month is known.

son, on a worldwide basis Baldridge (1973) found that about 26 cases per year were reported from 1941 through 1968.

Control programs aimed at substantially reducing the numbers of sharks have potential for adversely altering the Hawaiian marine ecosystem. Such programs should only be undertaken when clear and proven needs exist.

The authors would appreciate receiving any reports of shark attacks in the Hawaiian Islands that are not listed in this paper.

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SANDY BEACH-MAKAPU'U HEAD FIELD TRIP

On July 13, 1980, the Hawaii Audubon Society held its monthly field trip along the Sandy Beach-Makapu'u Head coastline to enjoy the scenic views and to observe and study the tidepool life, native coastal ecosystems, seabirds, and coastal geologic and physiographic features.

15 members and guests took off from Sandy Beach Park at 8:30 a.m. under sunny skies and low surf conditions (2-4 feet). The first area of interest was the native coastal land ecosystem at Kaloko, where the adaptive features of the native coastal herbs were pointed out. The group then proceeded to the Kalama Stream estuary where several Ruddy Turnstones and American Golden Plovers were observed feeding on what was believed to be a crab. At the next estuary, a juvenile Black-crowned Night Heron was observed in flight over the red mangroves. After a cursory look at the

mangrove swamp, the group continued along the shoreline to Makapu'u Head. Along the way, Red-vented Bulbuls and Red-crested Cardinals were sighted in the exotic scrub vegetation. Also seen was the ma'o, the native Hawaiian cotton.

The Makapu'u Head tidepools are considered among the best in the state due to its wide range of environmental conditions, rich and diverse marine life, and the relatively large area they cover. A few of these marine pools were large enough for some of us to swim and snorkel in. Noteworthy inhabitants of these tidepools included a variety of seaweeds, sponges, sea anemones, zoanthids, corals, spaghetti worms, Christmas tree worms, snake's head cowries, tube-shell snails, bivalves, sea cucumbers, sea urchins, reef fishes, and a Wandering Tattler feeding along the edge of the bench. Disappointments were the disappearances of the pinna beds in the sedimented tidepool and the octocoral (*Anthelia edmondsoni*) in one of the wave-exposed tidepools. The octocoral was probably killed about a month before during a low tide with calm winds and flat surf conditions.

Seabirds were also commonly sighted flying offshore and overhead. Of particular interest were the Great Frigatebirds harassing the Sooty Terns for their food. Other seabirds that frequented the area were the red-footed Booby and the Brown Noddy or the Black Noddy.

Of geologic and physiographic interests were the shoreline features that illustrated the natural processes which formed our shorelines. The shoreline features pointed out included the bench itself, sea cliffs, sea stacks and arches, a blow hole, a "toilet bowl," sea caves, and exposures of dikes and the lava flows that built up the headland.

Approximately midway on the western face of Makapu'u Head, the group headed up the lookout. The ridgeline afforded us with sweeping views of Koko fissure and Waimanalo Bay and environs. On the way down the group hastily walked through the native coastal herbs ecosystem on spray-swept cliffs. The nature hike ended at 3:00 p.m. when we reached Makapu'u lookout.

Caution is advised to those planning to hike this coastline trail on their own. The Makapu'u Head basalt bench can be exceedingly dangerous during moderate and high surf conditions. Those unfamiliar and inexperienced with our wave-exposed shorelines should not attempt to hike the basalt bench without proper supervision by experienced and responsible individuals.

Wayne H. Souza
355 Kawaihae Street
Honolulu

ANNUAL TREASURER'S REPORT 1980

Assets

	<u>1 Jan. 1980</u>	<u>31 Dec. 1980</u>
Checking	\$1,436.15	\$1,784.51
Svgs. Accts:		
General	10,120.70	11,089.06
Book	22,649.64	17,144.25
Svgs. Cert.	<u>10,979.48</u>	<u>31,991.48</u>
Totals	\$45,184.97	\$62,009.30

Balance: \$16,824.33

1980 Expenses

General Office:

Supplies	\$ 75.49
Postage	467.45
Copying and Printing	332.53
Telephone Calls	27.61

Publications:

'Elepaio (12 issues)

Printing	5,091.99
Postage	768.61
Labels and Plates	300.12
Supplies & Misc.	227.91
Paper Stock and Masters	1,978.72

Pacific Birds Book

Paintings (5 @\$400.00)	2,000.00
Insurance	50.00
T-Shirts	250.00

Contributions:

Conservation Council of Hawaii	200.00
Sierra Club Legal Defense	50.00
Hanawi Stream Fund	150.00

Taxes	119.65
Fees and Deposits	130.50
Miscellaneous	63.39
N.A.S. Joint (from H.A.S.)	<u>266.00</u>

Total Expenses: \$12,549.97

1980 Income

Dues:

Local, regular	1,950.00
Local, life	780.00
Joint from N.A.S.	4,200.50
N.A.S. Dues (through H.A.S.)	266.00

Donations 3,419.85

Publications:

Hawaii's Birds	
Direct Sales	4,091.53
Distributor Sales	7,977.06

Guide to Hawaiian Birding	94.04
Field Checklist	31.28
Preliminary Checklist	22.50
Posters	25.50
'Elepaio, back issues	782.82
T-Shirts	530.37
Taylor Scholarship	450.00
Galapagos Program	186.24
Savings Interest	4,157.38
Sale of Addressograph	250.00
Postage	98.58
Tax	14.21
Refunds	<u>46.44</u>

Total Income \$29,374.30

Norris Henthorne, Treasurer

Approved by the Audit Committee:

R. L. Pyle
George Campbell
C. J. Ralph

APRIL CONSERVATION UPDATE

From Executive Board
Hawaii Audubon Society

Lapa Ridge Pu'u Ka Pele, Kauai: On February 24 several HAS representatives and others from the Conservation Council for Hawaii, Hawaiian Botanical Society, Honolulu Group, Hawaii Chapter, Sierra Club plus our legal counsel Ken Kupchak met with State Forester Libert Landgraf and Kauai District Forester Ralph Daehler to discuss illegal bulldozing of State Forest lands on Lapa Ridge and the State Division of Forestry's "reforestation" program in Hawaii. Harry Whitten, Honolulu Star-Bulletin reporter was also present. The purpose of the meeting was to try to maintain dialogue between the State Division of Forestry and Wildlife and conservation groups concerned about our public forests and to get assurances that Forestry would abide by laws, rules and regulations concerning our forests. From the verbal agreement then reached with Mr. Landgraf, our lawyer has received a draft agreement from the Department of Land and Natural Resources. We are now critiquing this draft to try to reach an agreement regarding Forestry's preparation of Environmental Assessments and obtaining Conservation District Use Application permits before proceeding with site preparation and tree planting activities. Interestingly, such an agreement, writes Mr. Landgraf, "is predicated on the assumption erroneous statements

made in publications issued by organizations represented at the meeting (February 24) would be corrected." Here is an individual who has not publicly admitted any illegality in the Lapa Ridge operation, nor, for example, in bulldozing native forest in the Nanawale Forest Reserve, Hawaii Island for "interim papaya use," and yet calls us "yellow journalists" and "alarmists." One of the "burning issues" is our apparent insinuation that bulldozed trees and shrubs were deliberately burned. This matter would be easier to clarify if Society representatives could receive the fire marshall's report on the alleged 11 November 1980 on Lapa Ridge at an early date, as was promised other Society members.

Honomalino Suit: The Board of Land and Natural Resources (BLNR) has asked the 3rd Circuit Court for another Stipulation (i.e. postponement) in the hearing contesting the Department of Land and Natural Resources' earlier filing of a Negative Declaration or non-impact statement on the proposed lease of 2,700 acres of primarily native forest at Honomalino, S. Kona, Hawaii Island. Our legal counsel, T. Anthony Gill informed the Society that another State agency, apparently the Office of Hawaiian Affairs, has asked for a full archaeological survey of the proposed lease, before any leasing be undertaken. It is the BLNR's feeling that no leasee would be willing to fund this survey and that the proposal to lease Honomalino will die a quiet death. In the agreement for another Stipulation, Mr. Susumu Ono, Chairman of the BLNR indicated that no action will be taken for three months. At that time the situation can be reviewed to see if there are any further plans to lease the area and if further action is required.

Kaula Island: In collaboration with the Sierra Club, Greenpeace, and the Conservation Council for Hawaii, the Hawaii Audubon Society is continuing to vigorously pursue the necessary legal strategy to prevent resumption of live bombing by the Navy at the small Hawaii State Seabird Sanctuary of Kaula Island. The Hawaii Audubon Society has a long history of opposition to this periodic abuse of our native biota. We are hopeful that Mr. Susumu Ono, Chairman of the Board of Land and Natural Resources, will intercede and deny the Navy the required State permit to kill seabirds while practice bombing. The Fish and Wildlife Service has apparently already decided to grant the Navy a 2-year research permit that would allow such killing under the U.S. Migratory Bird Treaty Act.

Palila Victory: As was noted in the March issue of the *'Elepaio*, the 9th Circuit Court of Appeals ruled that the State Forestry and Wildlife Division must rid Palila critical habitat of feral sheep and goats by August 1, 1981. This appears to culminate the long court battle over this endangered Hawaiian honeycreeper and the two prime factors destroying its habitat: feral sheep and goats in the *mamane-naio* forest on the slopes of Mauna Kea. A special vote of thanks goes to our attorney, Michael Sherwood, who did such a masterful job on the plaintiff's behalf: Sierra Club, Hawaii Audubon Society, Mae E. Mull and Dr. Alan Ziegler against the defendant, the State Division of Forestry and Wildlife. The 9th Circuit Court of Appeals upheld U.S. District Court Judge Samuel King's ruling made about two years ago that the feral mammals were jeopardizing the Palila in violation of the U.S. Endangered Species Act. Big Island sportsmen, long opposed to such a ruling, have now made an about-face in light of the latest decision. The Sportsmen's Committee on Mauna Kea which claims to represent 44 organizations in Hawai'i now urges all hunters to take part in the sheep and goat eradication program before the July 31 deadline. Otherwise, State Fish and Game personnel will have to carry out that responsibility.

Hawaii Natural Area Reserves System: Since this system was legally constituted over a decade ago, only 2 comparatively small reserves have been formally designated. Final processing by the Department of Land and Natural Resources (DLNR) of another 12 reserves approved by the Board of Land and Natural Resources (BLNR) has been exceedingly slow. Through correspondence with Lt. Gov. Jean King, we have learned what the "procedural concerns" allegedly holding up their processing. According to the Lt. Gov., the DLNR was waiting for an opinion from the State Attorney General (AG) as to whether the DLNR had to go through the Conservation District Use Application (CDUA) process to formally establish the BLNR-approved reserves. On February 20, Mr. Susumu Ono, Chairman of the BLNR, decided not to wait any longer and ordered the DLNR to process the CDUAs. Later, the AG ruled that a CDUA was necessary. Roger Evans, CDUA officer, told the Lt. Gov.'s staff that this would take about 5 months. Mr. Evans also told her staff that he could not give preference to government initiated CDUAs over private CDUAs, that these are processed on a first come first served basis in line with BLNR policy, and that each CDUA must be reviewed within 180 days or it is automatically approved. He also claimed that there is only one person to handle the processing.

1980 HONOLULU CHRISTMAS BIRD COUNT

By Robert L. Pyle

Cloudy weather with moderate southerly winds occasionally gusty and frequent rain showers sometimes heavy in the mountains, impeded counting this year in the 37th annual Honolulu Christmas Bird Count. Although the 50 participants this year were the same number as last year, total party-hours afield were down to 111 from last year's 130. The weather caused some parties to stop early and bird observation generally was hindered by the occasional rain and wind.

The 20,226 birds found is about 1300 higher than last year, but the difference is more than accounted for by the 1300 more mynas this year (3517) and 600 more Red-vented Bulbuls (1174), which offset decreases in many other species. The Honolulu count has exceeded 20,000 birds only once before, in 1968 when the 22,641 total included 6000 Sooty Terns circling over Moku Manu at dusk.

Only 44 regular species were identified this year, compared to 55 species in '76, '78, and '79, which were the highest recorded for the Honolulu count. No migrant duck species at all, no gulls, and misses on such things as owls, Hwa-mei (Melodious Laughingthrush), Lavender Fire-Finch and waxbills kept down the species total this year.

Two 'I'iwi were heard this year (by the Howarths) near the junction of Kapalama Ridge Trail and Alewa Heights Trail, about where one was heard and seen well last year. Otherwise, native forest birds were all well down from last year's good weather counts.

In other comparisons, the new high total of 222 Red-whiskered Bulbuls is almost double last year's record count, while totals slightly above previous highest were recorded for Hawaiian Gallinule, Golden Plover, Ruddy Turnstone, Black Noddy, Rock Dove, Red-crested Cardinal and House Finch. All but the gallinule and noddy reflect increased effort in parks and residential areas (large, wet short-grass areas were especially attractive to plovers and turnstones). This habitat category received 40% of party-hours afield this year, compared to 35% for mountain forests which formerly has had the highest percentage of party-hours.

The most unexpected and perhaps most significant bird on this year's count was the European Starling discovered by Peter Donaldson at Sand Island Park. It was seen later numerous times through early January by several observers. Finally, on January 14 it was collected by state wildlife officials to prevent any possibility that this individual would contribute to becoming established in Hawaii. Further details of the occurrence will be published soon in the 'Elepaio.

Two Gray Francolins seen and heard well by Mike Ord on Na Laau Trail are a first for Oahu as well as for the Honolulu count. Subsequently it has been learned that a resident on the slope of Diamond Head near the trail has been seeing Gray Francolins there since last spring.

Species recorded this year but not included in the official totals were 3 "domestic" goose, 31 feral Mallard, 13 "domestic" chicken, 1 Nanday Conure (a parrot-like bird) and 1 lone Indian Hill Myna (by Pat Conant) remaining from the group of a dozen or so males released some years ago in upper Manoa Valley. All these are undoubtedly escaped captive birds; none have established viable breeding populations here.

Sectors Covered

- 1 : Aiea Trail: John Obata, Susan Schenck, Lee Lynn
- 2-A: Sand Island, Salt Lake, Moanalua Gardens, Ft. Shafter: Peter Donaldson, Susan Frosch, Bill Pimm
- B: Nuuanu Valley, Foster Gardens, Iwilei: Jack & Alice Mitchell, Ruth Atkin, Louise Hinkley
- C: Kamehameha Schools, Alewa Hts. Trail: Jaan Lepson, Charles Burrows
- D: Kapalama Ridge: Frank & Frankie Howarth
- 3-A: Manoa Cliffs Trail (part), Ailiulama Trail, Round Top Dr.: Peter Galloway, Margit Anonsen, Greg Fulkerson, Marilyn Milberger
- B: Manoa Cliffs Trail (part), Pauoa Flats, Makiki Valley Trail: Wayne Gagné, Marie Morin
- C: Ft. DeRussy, Ala Moana Park, Honolulu Harbor, Punchbowl Cemetery: George Campbell, Betty Johnson, Eugene Walz
- 4-A: Upper Manoa, Woodlawn, Pu'u Pia Trail: Pat Conant, Stephanie Nagata
- B: Lower Manoa, Mid-Pac campus, University: Sheila Conant, Fanny Dale
- C: Lyon Arboretum: Leilani Pyle

HONOLULU CHRISTMAS COUNT - 1980

Sectors	1	2	3	4	5,6	7	8	9	10	Total
Blue-faced Booby	.	.	.	.	.	.	.	3	.	3
Brown Booby	.	7	.	.	1	.	.	37	2	47
Red-footed Booby	.	2	.	.	30	.	.	1100	.	1132
Great Frigatebird	.	.	.	.	8	.	7	600	.	615
Cattle Egret	.	.	.	.	.	17	329	661	65	1072
Black-crowned Night-Heron	.	.	.	.	.	9	6	28	.	43
Hawaiian Duck (Koloa)	.	.	.	.	.	4	8	3	4	19
Gray Francolin	.	.	.	.	2	.	.	.	.	2
Hawaiian Gallinule	.	.	.	.	.	1	18	.	.	19
Hawaiian Coot	.	11	.	.	.	7	8	.	2	28
Golden Plover	3	295	102	55	53	157	128	828	263	1884
Ruddy Turnstone	.	23	.	.	3	12	11	307	41	397
Wandering Tattler	.	3	.	.	.	2	3	20	2	30
Long-billed Dowitcher	.	.	.	.	.	.	.	1	.	1
Sanderling	.	2	.	.	.	.	.	17	.	19
Hawaiian Stilt	.	10	.	.	2	5	4	94	.	115
Pomarine Jaeger	.	40	.	.	.	.	.	.	.	40
Brown Noddy	.	.	.	.	.	.	.	1	.	1
Black(Hawaiian)Noddy	.	.	.	.	.	.	.	50	.	50
White Tern	.	.	.	.	6	.	.	.	.	6
Rock Dove	.	228	147	.	.	2	222	45	.	644
Spotted Dove	23	92	98	140	50	38	267	262	134	1104
Barred Dove	9	464	393	382	328	29	416	204	316	2541
Red-whiskered Bulbul	.	16	105	89	12	.	.	.	.	222
Red-vented Bulbul	3	241	47	152	14	179	223	126	189	1174
Mockingbird	.	6	1	.	3	1	.	.	.	11
Shama	11	25	42	46	.	16	10	2	15	167
Japanese Bush-Warbler	.	.	26	.	.	.	.	.	13	39
Oahu 'Elepaio	6	.	6	1	.	.	.	.	.	13
European Starling	.	1	.	.	.	.	.	.	.	1
Common Myna	2	485	258	443	392	50	1055	613	279	3577
Japanese White-eye	106	193	230	225	16	49	79	57	48	1003
Oahu 'Amakihi	2	69	20	61	.	.	.	.	.	152
'Apapane	78	20	19	30	.	.	.	.	.	147
'I'iwi	.	2	.	.	.	.	.	.	.	2
Spotted Munia	38	175	51	101	16	37	10	37	39	504
Black-headed Munia	.	65	3	.	.	.	.	.	.	68
House Sparrow	.	287	338	173	250	29	227	299	81	1684
Java Sparrow	.	40	92	56	46	.	.	.	.	234
Red-crested Cardinal	.	66	86	127	38	19	37	114	34	521
Northern Cardinal	11	63	49	70	12	15	40	41	10	311
House Finch	26	168	130	82	8	21	102	24	13	574
Yellow-fronted Canary	.	.	.	.	6	.	.	.	.	6
Saffron Finch	.	.	.	.	4	.	.	.	.	4
No. of Individuals	318	3099	2243	2233	1300	699	3210	5574	1550	20,226
No. of Species	13	29	21	17	23	22	22	27	19	44

- D: Wa'ahila Park and Ridge Trail, Wood-lawn Trail: Maile Stemmermann, Norris Henthorne
- 5,6: Kapiolani Park, Na Laau Trail, Paiko Lagoon: Mike Ord, David Potter
- 7-A: Waimanalo, Bellows AFS, Kaelepulu Pond: David and Ulalia Woodside, C. J., Carol, and Peter Ralph, Duncan McIntosh
- B: Maunawili: Richard Smith
- 8-A: Lanikai: Rick Coleman, Peggy Hodge
- B: Kawainui Dike, Hamakua Dr., Kailua: Don, Doris and Colin Huddleston
- C: Kawainui Marsh, Quarry Rd., Kapaa Landfill: Rob Shallenberger
- 9 : Kaneohe Bay Dr., Kaneohe MCAS, Moku Manu: Ron Walker, Robert Pyle, Kirk Lauritsen
- 10 : Kahaluu, Heeia, Kam Highway, Old Pali Rd.: Tim Burr, Allan Samuelson

Habitat Coverage: parks and residential
40% of party-hours, mountain forest
35%, lowland woods and scrub 11%,
marshes and ponds 9%, beach and ocean
5%.

Fifty participants in 21 parties. Total party-hours 111 (83 on foot, 28 by car). Total party-miles 270 (66 on foot, 204 by car).

741 N. Kalaheo Ave.
Kailua, Hawaii 96734

APRIL TV PROGRAM

HAWAIIAN SEA LIFE CONSERVATION

Sea life conservation will be the special topic on KHET-TV's Dialog program for April 16 at 8:00 p.m. Wildlife experts will show the film, "Beyond Honolulu", which we recommend for both students and teachers. This film about the wildlife on and around the North-western Hawaiian Islands is also available for signing out from the State Library, the U.S. Fish and Wildlife Service, and the State Department of Education.

Listeners are urged to phone in questions and comments during the discussion period of the program.

APRIL PROGRAM; THE NATURE CONSERVANCY'S ENDANGERED HAWAIIAN FOREST BIRD PROJECT

On Monday, April 20 Mr. Hardy Spoehr, Project Director and Mr. Kelvin Taketa, Field Representative of the Honolulu office of the Nature Conservancy will introduce and explain their Endangered Hawaiian Forest Bird Project to our Society. The Nature Conservancy (TNC) is a private, non-profit organization involved internationally in preserving natural diversity and protecting rare, threatened, and endangered species. TNC headquarters is in Washington, D.C. with regional offices located throughout the United States. Locally, the organization is perhaps best known for its efforts in acquiring Kipahulu Valley and transferring most of it to Haleakala National Park.

TNC's Endangered Hawaiian Forest Bird Project's principle goal is to preserve viable Hawaiian forest bird populations by protecting and in some instances restoring representative examples of native Hawaiian forests and by educating the public about Hawaii's unique forest birds and their habitat. The total project is envisioned to take three years with protective reserves to be established on five of the neighbor islands. Their presentation will be illustrated with slides.

APRIL FIELD TRIP TO OBSERVE SEABIRDS AND WATERBIRDS

Each spring Hawaii Audubon Society pays a visit to the birds of Kaneohe Marine Corps Air Station (KMCAS). The trip involves tramping and driving the outskirts of Nu'upia Ponds where we will probably find Hawaiian Stilts, possibly nesting, and Black Noddies, Auku'u. a breeding colony of Cattle Egrets and a variety of shorebirds. If the Marine Corps gives us permission to pass through the firing range, we will take a half mile walk to the Red-footed Booby nesting colony at Ulupau Head. From there, with good spotting scopes, we will see the Frigatebirds, perhaps the Masked Booby and Gray-backed Tern and possibly others. Turtles, sharks and whales have been seen from the overlook.

Please bring shovels and old clothes to help reconstruct nesting islands for the Hawaiian Stilt following the field trip.

Meet at the Punchbowl Street side of the State Library at 7:30 a.m., or at H-3 gate to KMCAS at 8:00 a.m., Saturday, April 11th.

HAWAII AUDUBON SCHEDULE OF EVENTS

(for details, see inside back page)

April 13 (Monday). HAS Board Meeting at home of George Balazs, 992-A Awaawaanoa Pl., Hawaii Kai, 7:15 pm. Ph: 395-6409. Society members encouraged to attend.

April 11 (Saturday). Field trip to Kaneohe Marine Corps Air Station, Oahu. Meet at Punchbowl Street side of State Library at 7:30 a.m., or at H-3 gate to Air Station at 8:00 a.m. Call Rick Coleman for details (262-8424).

April 20 (Monday). Regular meeting at the McCully-Moiliili Library, 7:30 p.m. Mr. Hardy Spoehr and Mr. Kelvin Taketa of the Nature Conservancy will speak on the Conservancy's *Endangered Hawaiian Forest Bird Project*.

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