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For the Better Protection of Wildlife in Hawaii

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A BRIEF HISTORY OF EXOTIC GAME BIRD AND MAMMAL INTRODUCTIONS INTO HAWAII WITH A LOOK TO THE FUTURE* By Ronald L. Walker Wildlife Biologist, Hawaii Division of Fish and Game Second and Final Installment

Discussion

In regard to the introduction of game birds to Hawaii, Caum (op.cit.) stated: "The advisability of the introduction of any foreign bird, with the possible exception of the game birds, into a new country is decidedly a moot point....There is undoubtedly a great deal to be said in favor of stringent restrictions in any program of bird introduction, and as a general rule a complete ban is likely to be of greater benefit to the country in the end than is no control at all. However, it does seem that a controlled and restricted program, with a careful selection of candidates for liberation, would be attended with but little potential danger, especially in a country like Hawaii where the native birds still in existence are very rare and restricted to the deep forests and accordingly would not come into competition with any imported species inhabiting the lowlands."

The subject of exotic introductions is, of course, controversial. However, in the case of true game species which have been introduced to Hawaii such as the upland birds, mouflon, antelope and the two species of deer, there is little validity to the argument that these animals have been disastrous to the native forest and that they compete with native animals. These species have generally adapted to the introduced forest and areas cleared of native forest where there are few endemic animals. This is not true of the feral mammals, such as the pigs which are occasionally a menace to the native koa (Acacia koa) and 'ohi'a (Metrosideros collina) forests, in that they disturb the undergrowth, root up seedlings, and transmit weed seeds in their droppings. Feral goats and sheep do extensive damage where their ranges abut or coincide with the native forest. Indications are that black-tailed deer on Kauai do not enter the impenetrable "jungle" and prefer the more open introduced forests where they can feed selectively on a wide variety of "weed" species. The axis deer is found almost exclusively in the introduced parkland habitat and enters the native forest only when it is opened up by the grazing of livestock, Although ranchers on the Island of Hawaii are opposed to the trnsplanting of this species to that island, on Molokai where the axis deer has been established for 100 years on cattle ranges, ranchers protect the deer and place a high value on them. The mouflon in its native habitat of Sardinia and Corsica favors mountainous areas bordering dense, coniferous forests but in Hawaii has adapted to the open exotic

*Presented at the Conference of the Western Association of State Game and Fish Commissioners - Honolulu, Hawaii, July 19, 1967. forests on Lanai and Hawaii. The pronghorn by nature of its preference for open grassland will never favor the closed-in native forests.

Conflicts between game mammals and agriculture are minor in Hawaii and on occasions where axis deer, for instance, have invaded alfalfa fields and pineapple plantations, they have been controlled through special hunting seasons or fencing. Feral pig damage to ranch lands where they turn over hundreds of acres of pasturage, however, is a continous problem which must be met by intensive hunting pressure. In any event, with the limited land area in Hawaii, the fact that a species may be confined to a particular island, and with the relatively high hunter pressure available as a control mechanism, it is felt that these mammal species can be adequately controlled when they become a problem.

One of the unique things about many game birds in the islands is that they are not associated with agriculture as they are in the vast grain growing regions on the mainland. The ring-necked pheasant, for instance, may be found from the semi-arid slopes near sea level to the lava fields at 10,000 feet. Thus, conflicts with agriculture are minor and occur only locally around truck farming areas. One major inimicable effect on the biota indirectly attributable to game bird introductions has taken place on Kauai, however, where in the 1920's blackberries and other exotic plants were deliberately introduced to benefit game birds. These species have spread widely and presently constitute a major menance to the native forests on that island.

Conclusion

A total of 76 game birds and 7 game mammals are known to have been liberated in the Hawaiian Islands to date (see appendices). Of the game birds, only 14 are established and open to public hunting. All seven mammal species are established, and five are hunted. The introduction of game birds and game mammals by man is as much a part of Hawaii's history as the settlement of the islands by man himself. Some of the introductions prior to the formation of a government wildlife conservation agency have been ill-advised; others have been fortuitous. The Division of Fish and Game is committed to further introductions limited to those species which will not conflict with agriculture or further upset the ecosystem. It is hoped that over the years it will also be able to partially correct some of the mistakes of the past through the gradual elimination of certain undesirable feral animals. The peculiarities of the ecology of this semi-tropical island State call for an imaginative wildlife management program.

APPENDIX I

EXOTIC GAME BIRDS WHICH ARE CONSIDERED ESTABLISHED IN HAWAII AND OPEN TO PUBLIC HUNTING

	Common Name	Scientific Name	Native Range	Original Supply Source	Year First Introduced
1.	Ring-necked Pheasant	Phasianus torquatus			
		torquatus	Asia	Unknown*	Approx, 1875
2.	Blue Pheasant	Phasianus versicolor			••• () · · ·
		versicolor	Japan	Unknown*	Prior to 1900
3.	California	Lophortyx californica			
	Valley Quail	californica	California	Calif.	Prior to 1855
4.	California	Lophortyx californica			
	Coast Quail	brunnesceus	California	Calif.	Prior to 1855
5.	Lace-necked Dove	Streptopelia chinensis			•
		chinensis	Asia	Unknown*	Prior to 1900
6.	Barred Dove	Geopelia striata striata	Indo-Malay	Unknown*	1922
7.	Japanese Quail	Coturnix coturnix japonica	China, Japan	Orient	1921

	Common Name	Scientific Name	Native Range	Original Supply Source	Year First Introduced
8.	Feral Pigeon	Columba livia	West Europe	Domestic**	1796
9.	Chukar Partridge	Alectoris graeca chukar	India	Orient	1923
10.	Gambel's Quail	Lophortyx gambeli	Southwest US	Nevada	1958
11.	Indian Grey Francolin	Francolinus pondicerianus	India	India	1958
12.	" Black "	Francolinus francolinus	India	India	1959

APPENDIX I (Continued)

1. Adapted from Bryan, 1958.

* Possibly imported directly from native country.

** Escaped from captivity

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APPENDIX II

EXOTIC GAME BIRDS WHICH ARE CONSIDERED ESTABLISHED IN HAWAII BUT NOT OPEN TO PUBLIC HUNTING 1

Common Name	Scientific Name	Native Range	Original Supply Source	Year First Introduced
. Domestic Turkey	Meleagris gallopavo	North Americ	a Chile	1815
2. Rio Grande Turkey	<u>Meleagris</u> <u>gallopavo</u> intermedia	Texas	Texas	1962
3. Pea Fowl	Pavo cristatus	Southern Asia	Unknown	1860
. Guinea Fowl	Numida meleagris			
	galeata	Africa	Domestic	1874
. Jungle Fowl	Gallus gallus	Malaysia	Polynesia	Unknown

1. Adapted from Bryan, 1958.

APPENDIX III

GAME BIRDS WHICH HAVE BEEN INTRODUCED TO HAWAII BUT WHICH ARE NOT KNOWN TO BE ESTABLISHED 1

				Original	源
				Supply	Year First
	Common Name	Scientific Name	Native Range	Source	Introduced
1.	Curassow	Crax rubra rubra	Panama	Panama	1828
2.	Guan	Penelope purpurascens aeguatorialis	Panama	Panama	1928
3.	Chacalaca	Ortalis garrula	D	Demonst	1029
4.	Prairie Chicken	<u>Cinereiceps</u> Tympanuchus cupido	Panama	Panama	1920
-	T	pinnatus	N.America	Unknown*	Unknown
5.	Chicken	pallidicinctus	N.America	Unknown*	Unknown
6.	Sharp-tailed Grouse	Pedioecetes phasianellus	DT Amonica	The loss of the t	1072
7.	Bobwhite	Columbianus Colinus virginianus	N.America	UNKNOWI!"	1972
		virginianus	N.America	Unknown*	1906
8.	Masked Bobwhite Quail	Colinus ridgwayi	Mexico	US Game Fa	rm 1960
9.	Tennessee Red Quail	Colinus virginianus	U.S.	US " "	1961

				(Origi	nal	-
					Supp	ly Y	ear First
	Common Name	Scientific Name	Native Ran	ge	Sour	ce]	ntroduced
10.	Mearn's Quail	Cvrtonix montezumae					
	(Harlequin Quail)	mearnsi	Mexico	US	Game	Farm	1961
11.	Benson's Quail	Lophortyx douglasii					
		bensoni	Mexico	US	11	**	1960
12.	Columbian Crested Qua	il					* s *
	(Douglas Quail)	Lophortyx douglasii	Mexico	US	**	11	1961
13.	Painted Quail	Excalfactoris chinensis					
	(Button Quail)	chinensis	S.E. Asia	(Orien	t	1910
14.	Chestnut Bellied	<u>Callipepla</u> <u>squamata</u>					
	Scaled Quail	castanogastris	Texas	US	Game	Farm	1961
15.	Mountain Quail	<u>Oreortyx pictus palmeri</u>	California	(Calif	•	1929
16.	Pectoral Quail	Coturnix pectoralis	Australia	1	Jnknov	m	Unknown
17.	Erckel's Francolin	Francolinus erckelii			~		2055
10	Chimage Emeral in	erckelli	Africa	US	Game	Farm	1957
10.	Pontrideo	Emonoplinus mintedoomum	China	TTC	11	19	1061
19	Sharpels Francolin	Francollinus plintadeamum	CHINA	00			1901
*).	Partridge	Francolinus sharnii	Africa	IIS	11	12	1958
20.	Heuglin's Francolin	Francolinus	H11709	00			1))0
	Partridge	icterorbynchus	Africa	US	11	**	1961
21.	Close-barred Francolin	1					
	Partridge	Francolinus adspersus	Africa	US	11	11	1963
22.	Bare-throated				2		
	Francolin Partridge	Pternistis leucoscepus	Africa	US	13	19	1958
23.	Grey or Hungarian						
	Partridge	Perdix perdix perdix	Europe	Ţ	Inknot	m*	1895
24.	Red crested Wood						
	Partridge	Rollulus roulroul	S.E.Asia	C L	Singal	pore	1924
25.	Chinese Bamboo						
	Partridge**	Bambusicola thoracica	01-1		T		1050
26	Pomborg Dontroid not	thoracica	China	TIC	Capan	Form	1959
20.	Darbary Fartridge	Alectoris barbara barbara	AIrica	05	Game	rarm	1990
21.	Pontrideco**	Alectoris graeca cypriotis	Municon	TIC	11	11	1050
28	See See Partridge	Ammonardiy grisgeogularis	Agio	US	11	19	1959
29.	Nepal Pheasant	Phasianus leucomelanos	India	US	11	11	1962
30.	Melanistic Mutant	Phasianus colchicus mut.	ATTO ACC	010			2902
	Pheasant	tenebrosus	England	US	11	11	1960
31.	English Black-necked	Phasianus colchicus	0				
	Pheasant	europaeus	England	US	13	13	1959
32.	Mongolian Pheasant	Phasianus colchicus					
		mongolicus	Turkestan	τ	Inknov	m S	ince 1865
33.	Silver Pheasant	Gennaeus nycthemerus	China	Ţ	Inknov	m	1865
34.	Reeve's Pheasant	Syrmaticus reevesii	China	US	Game	Farm	1957
35.	Copper Pheasant	Syrmaticus scemmerringii	Japan	τ	Inknov	m	1907
36.	Golden Pheasant	Chrysolophus pictus	China-Tibet	; [Inknot	m	1865
37.	Lady Amherst Pheasant	Chrysolophus amherstiae	China-Tibet	; [JS Gan	ne Fm	1932
<u>38.</u>	ked Jungle Fowl	Gallus ferrugineus	S.ASia	(11	1902
29.	Grey Jungte FOWL	Gailus Sonnerati	ASIa	l	GI		1902
40.	ingran sangrouse	ruerocies exustus	India		India		1061
		minuus tan	THATS	-	1101.5		2002

APPENDIX III (Continued)

** Open to public hunting.

				Original	
		Scientific Name	Native	Supply Y	ear First
	Common Name		Range	Source I	ntroduced
41.	Peaceful Dove	Geopelia striata			
		tranguilla	Australia	Australia	1922
42.	Bar-shouldered Dove	Geopelia humeralis	Australia	Australia	1922
43.	Diamond Dove	Geopelia cuneata	Australia	Unknown	1928
44.	White-winged Dove	Zenaida asiatica mearnsi	C.America	US Game Farm	1965
45.	Mourning Dove	Zenaidura macroura			
		marginella	N.America	Unknown*	1929
46.	Indian Ring Dove	Streptopelia decaocto	Eurasia	Unknown	1920
47.	Green-wing Dove	Chalcophaps indica	S.E.Asia	Singapore	1924
48.	Bronze-wing Dove	Phaps chalcoptera	Australia	Australia	1922
49.	Australian Crested Do	ve Ocyphaps lophotes	Australia	Australia	1922
50.	Plumed Bronze-wing				
	Pigeon	Lophophaps plumifera	Australia	Australia	1922
51.	Squadda Pigeon	Geophaps smithi	Australia	Australia	1922
52.	Ruddy Ground Dove	Oreopeleia montana	C.America	San Francis	co 1933
53.	Blue Ground Dove	Leptotila verreauxi	C.America	San Francis	co 1933
54.	Bleeding Heart Dove	Gallicolumba luzonica	Philippines	Philippines	1922
55.	Wongawonga Pigeon	Leucosarcia melanoleuca	Australia	Unknown	1922
56.	Blue-headed Quail				
	Dove	Starnoenas cvanocephala	Cuba	Unknown	1928
57.	Nicobar Pigeon	Caloenax nicobarica	Malavsia	Australia	1922
58.	Chilean Brushland	Nothoprocta perdicaria			
-	Tinamou	perdicaria	N. Chile	Chile	1966
59.	Chilean Brushland	Nothoprocta perdicaria			
	Tinamou	sanborni	S. Chile	Chile	1966
		namen and the state of the state			

APPENDIX III (Continued)

1. Adapted from Bryan, 1958

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* Possibly imported directly from native country.

APPENDIX IV

BIG GAME MAMMALS ESTABLISHED IN HAWAII

Common Name	Scientific Name	Native Range	Original Supply Source	Year First Introduced
 Hawaiian Pig Axis Deer Blacktailed Deer 	<u>Sus scrofa</u> <u>Axis axis</u> <u>Odocoileus hemionus</u>	Europe India	Polynesia India	Unknown 1868
 4. Pronghorn Antelope 5. Feral Goat 6. Mouflon Sheep 7. Feral Sheep 8. Feral Cattle** 9. Brush-tailed Rock Wallaby* 	<u>Columbianus</u> <u>Antilocapra americana</u> <u>Capra hircus</u> <u>Ovis musimon</u> <u>Ovis aries</u> <u>Bos taurus</u> Petrogale pencillata	N.America N.America Domestic Eurasia Domestic Domestic	Oregon Montana England Zoo, U.S. England Domestic	1961 1959 1778 1954 1794 1794

* On game mammal list but not open to hunting.

** Occasionally hunted but not on game mammal list.

Letter from George T. Morrison, September 27, 1967: 'Ua'u (Dark-rumped petrel,

<u>Pterodroma phaeopygia</u>) ...In the last issue of THE ELEPAIO (Vol.28, No.3, Sept.1967, p.20) Grenville Hatch published a short narration of her spring trip to Hawaii Volcanoes National Park. She mentioned the birds flying at night that we had heard in the area so often through April and May. At the time Miss Hatch was visiting, we had not positively identified the rather weird night calls. Fortunately Winston Banko was able to get near the mysterious visitors one evening when the fog was extremely thick. He felt certainly that we were hearing the White-tailed Tropic Bird, "Crater Bird," as we call them. His identification occurred after Miss Hatch had returned to California....

Win and I both feel that the record should be corrected as something of this nature could cause confusion in the future. At present, the status of Dark-rumped Petrel on Kilauea is very uncertain....

Editor's note: If you have any information on this bird, please share your experiences with other members by writing to Kojima, 725-A 8th Ave, Honolulu, Hawaii 96816.

FIELD NOTES from Walter R. Donaghho: Kauai

On August 22 the eagle was on Kauai! Saw it dive over the head of Milolii gulch near noon on that date.

The mockingbird has increased greatly on the slopes above Waimea and Kekaha. Saw one on the road just above the Scout Camp Kokee.

Observed a dayal bird (dyal, <u>Copsychus saularis</u>) flying across the road about a half mile in from the Menehune ditch in the Waimea Canyon. They are not rare here according to Swedberg.

The 'apapane is the commonest bird on the Kohua Ridge, with the 'anianiau next, with about half the numbers of the former.

On a trip in to the 'Alaka'i, August 28 with Mr. Bob Sehl, over two dozen creepers were seen; about 30 'i'iwi; 10 'amakihi; 8 kamau; 3 'akepa; and 1 puaiohi that he identified, while I was taking a photo of the 'Alaka'i ferns. We got back two miles from the Koaie gulch, but didn't see any of the four rare ones. One 'akepa was seen at the start of the trail near the end of the road.

The boobies at Kilauea point have moved across the bay to the east from the point. The shearwaters are still on the point. One brown booby was seen on the island on July 13.

The noio (white-capped noddy tern)colony in the cave on the East beach of Kalalau Valley is still a large one. There were no terms nesting in the wet cave on the West beach.

FIELD TRIP to Waipio Peninsula and Kahuku to study shore birds, September 10, 1967,

This season of field trips to search for wintering shore birds was initiated on 10 September with visits to Waipio Peninsula, the Waipahu dump and Kahuku. Being in active sugar growing areas, the Waipio and Kahuku habitats are in a constant state of flux. Many of last years ponds and mud flats are dry, overgrown or planted, but new ones have taken their place. The Waipio ponds are considerably larger and wetter than a year ago and held about 200 shore birds. The five common waders were well represented in all areas -- total counts given are rough estimates: Ruddy Turnstone-150, Golden Plover-200, Sanderling-75, Wandering Tattler-15 and Black-necked Stilt-75. However, only one unusual bird was seen--a single Black-bellied Plover at Waipio.

In addition, both doves and both cardinals, White-eye, Myna, Sparrow, House Finch and Ricebird were seen. Black-neaded Mannikin was common at Waipio as was the Cattle Egret. The day's list was rounded out by two pheasants, Black-crowned Night Herons, one Frigatebird and (at Kahuku) two Gallinules and about 15 coot.

Of possible interest as far as arrival dates and numbers of shore birds, this reporter's observations during the past summer are included: 30 June--25 Turnstones on the flat island off Lanikai; 4 July--5 Turnstones, 1 Plover and 300 Cattle Egrets at Waipio, and the little Blue Heron at Waipahu dump; 12 July--40 Plovers flying through Kilauea caldera on the Big Island; 23 July, Waipio--25 Turnstones, 6 Plovers, 3 Tattlers and 380 Stilts (by actual count); 29 July, Waipio--170 Turnstones, 10 Plovers, 1 Tattler, 175 Stilts (including 4 downy young) and 1 Wilson's Phalarope.

Dick Gauthey

READERS' NOTES from Margaret Titcomb: Ancient and modern notes on Pacific birds.

King, Warren B., George E. Watson and Patrick J. Gould. An application of automatic data processing to the study of seabirds, I. (Proceedings of the United States National Museum, Vol.123(3609), 1967)

A detailed description of the coding system used by the Smithsonian Institution by ornithologists working with the Pacific Ocean Biological Survey Program, with the modifications needed; applicable to work elsewhere.

Eardley-Wilmot, S. Our journal in the Pacific. London, 1873:p.267:

There is no shooting to speak of in the vicinity of Coquimbo, though a few snipe were obtained in some marshes near La Serena; on the plains, however at the back of Guaracan, a large number of golden plover annually make their appearance. They only remain in flocks for about three weeks, and it is difficult to say what is their object, for the ground on which they congregate is destitute of the slightest vegetation, being all sand and stones. If it be for food, insects alone can account for their presence...They are much lighter in plumage than the English golden plover, but similar in other respects, being moreover capital eating. In going after them singly it was most difficult to approach within shot, while no cover was obtainable for stalking.

Szijj, Laszlo J. Notes on the winter distribution of birds in the Western Antarctic and adjacent Pacific waters. (Auk, 84(3):366-378, 1967)

Author was cruise leader of the University of Southern California Marine Biology Program, summer of 1964. He makes especially detailed observations because the sector he reports is "rarely observed...52 consecutive days, July 29 at Wellington, ending September 17 at Valparaiso." Observations include 5 species of albatross; 13 of petrel; 2 shearwaters, the skua and the Chinstrap penguin. "While it is well known that the distribution ranges of most oceanic birds...shift to the north to varying degrees during the southern winter, some of the records presented here represent extensions well beyond the range described in the literature for the given species. ...The need for more comprehensive faunistic studies in this rarely traveled portion of the world's oceans is emphasized."

Kepler, Cameron B. Polynesian rat predation on nesting Laysan albatrosses and other Pacific seabirds. (Auk, 84(3):426-430, 1967)

On Green Island, Kure Atoll, Leeward Hawaiian Islands, a study was made, part of the program being on the rat vs seabird "interaction". Among the 5000, less or minus Laysan albatross that use the island, many birds were found dead or dying; 12 in 1963-64 season, as many or more found in the next season of search, some uncounted, the vegetation being very dense. The birds evidently have no fear or method of fighting off rats that climb on their backs and feed on the flesh of the birds, after removing some of the feathers. Most of the birds are nesting and leaving the nest is against their instinct.

By word of mouth from two men working on the Pacific Ocean Biological Survey Program, this calamity is being controlled now by a war on the rats. Sibley, Fred C. and Roger B. Clapp. Distribution and dispersal of Central Pacific Lesser Frigate birds, <u>Fregata</u> ariel. (Ibis, 109(3):373-382, 1967)

Observations, early in 1963 through June 1965 by the Pacific Ocean Biological Survey Program on the distribution and movements of birds in the Central Pacific, between 150° West and 180° West, and between 10° South and 10° North.

Contrary to previous conclusions as to habits of frigatebirds, they were found to be "not uncommon far out at sea", both <u>Fregata minor</u> and <u>F. ariel</u>. "During P.O.B.S.P. pelagic surveys over 40 Great Frigatebirds were seen more than 200 miles from the nearest land and no less than nine Great Frigatebirds at distances of 500 miles or more (P.J. Gould, pers. comm.) Recovery data of young Lesser Frigatebirds prove that this species also crosses wide expanses of open ocean and therefore must frequently be over 200 miles from land."

Fisher, Harvey I. Body weights in Laysan Albatrosses, <u>Diomedia immutabilis</u>. (Ibis, Vol. 109(3):328-337)

Data are from Midway atoll...primary source of energy comes from squid. "During the reproductive season food is sometimes gathered as far as 1100 miles from the nest-site."

FOR JUNIOR MEMBERS:

Beautification

Have you seen the article "Teen meet on Beautification" on page A-5, Honolulu Star-Bulletin, September 7, 1967?

Three Audubon junior members, Ann Butzine, Winifred Cahill, and Jerriane Sakoda, are actively participating in this project.

The article says, "Hawaii's teen-agers hope to show their elders that something can be done about beautification.

"A group of 22 has planned and organized the first Hawaii Youth for Natural Beauty conference. It has invited representatives from schools on all islands to attend an October 20-21 conference at the Hilton Hawaiian Village. The group hopes that a Youth Federation for Beautification will grow out of the conference. Then youngsters will go around educating adults about conservation, natural beauty and cleaning up after themselves...."

What are you doing about beautification? Please write to Kojima, 725-A 8th Ave. Honolulu, Hawaii 96816, about your projects.

RANGER RICK'S NATURE MAGAZINE, August 1967, page 15: A WHAT OF WHICH? by Mary Frances Hildreth. Cattle come in herds--birds in flocks. Can you match these?

	Questions			Answers
1.	Range of	wolves	1.	Range of mountains
2.	Covey of	clouds	2.	Covey of quail
3.	Mass of	stars	3.	Mass of clouds
4.	Pack of	lions	4.	Pack of wolves
5.	Pride of	prairie dogs	5.	Pride of lions
6.	Hive of	porpoises	6.	Hive of bees
7.	Forest of	bees	7.	Forest of trees
8.	Colony of	quail	8.	Colony of prairie dogs
9.	Herd of	mountains	9.	Herd of elephants
10.	Galaxy of	trees	10.	Galaxy of stars
11.	Shoal of	elephants	11.	Shoal of porpoises

THE QUESTION BOX, page 33: Please tell me where birds' ears are. Cathy Brackin, Age 8, New Jersey.

Birds do not have an outer ear as man and other mammals do, but they have keen hearing. The openings of a bird's ears are on each side of the head somewhat behind the eye and covered by feathers. A bird's ear has an eardrum, a middle ear and an inner ear. How fast can the fastest bird fly? Barbara Jean Smith, Age 9, Missouri. Duck hawks and golden eagles have been clocked by airplanes in dives at 180 miles per hour. Common swifts of Europe and Asia usually fly from 60 to 70 miles per hour and have reached a speed of 100 miles per hour in short bursts. The canvasback duck can fly 70 miles per hour.

The following publications were received for the Audubon library:

BIRDS AND AIRCRAFT ON MIDWAY ISLANDS 1959-63 INVESTIGATIONS, Special Scientific Report--Wildlife No. 85 by Chandler S. Robbins, Migratory Bird Populations Station, Division of Wildlife Research, US Dept of the Interior Fish & Wildlife Service, Bureau of Sport Fisheries and Wildlife.

THE BREEDING BIRD SURVEY 1966, Special Scientific Report--Wildlife No. 102 by Chandler S. Robbins & Willet T. Van Velzen, Migratory Bird Populations Station, same as No. 85.

A STRATEGY FOR A LIVABLE ENVIRONMENT. A report to the Secretary of Health, Education, and Welfare by the Task Force on environmental health and related problems. June 1967.

Two articles on shore birds in THE NEW YORKER, May 27, 1967 pp 40-102 and June 3, 1967 pp 42-105 by Peter Matthiessen as a reporter at large, titled, "The Wind Birds" were contributed by Thelma Hensley.

Excerpts from the minutes, Hawaii Audubon Society, General Meeting, August 21, 1957:

...The meeting was called to order by Vice President Andrew Berger....Robert N. Walters, Manager, Ophtalmic Division, American Optical Co. showed us a very fine color and sound film on nature called "Nature Remains"....A second color and sound film was then presented by Walter H. Berlet of the International Film Bureau, Inc. It was a very interesting ecological study called the "Life Zones of the Central Rockies."

ALOHA to our new members:

Roger B. Clapp, Pacific Project, US National Museum 601 W., Washington, DC 20560. Simon Fraser University Library, Processing Div.-Serials, Burnaby 2, BC, Canada.

HAWAII'S BIRDS

Yes, the book is almost ready for distribution, so send in your orders now. Eighty-eight pages of information with 74 colored illustrations and 4 maps showing birding areas for only \$2.00. For your convenience a separate order blank is enclosed.

NOVEMBER ACTIVITIES:

November 6 -General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m.PleaseSpeaker: Dr. R.W. Strandtmann, Bishop Museum Entomologist.NOTE DATETopic: Birds of McMurdo Sound, Antarctica. (Color slides)November 12 -Field trip to study shore birds. Bring lunch,water,and if
possible, your car. Transportation cost--\$1.00. Meet at the
Library of Hawaii at 8:00 am. Leader: Dr. Robert L. Pyle,tel:265-379November 13 -Board meeting at the Waikiki Aquarium Aud. at 7:30 pm. Members welcome.

HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:

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