U. S. Department of Agriculture,

MEMORANDUM

OF

TRAVELING EXPENSES

From _____, 191 9

To 7/6/28, 191

Use this Memorandum; it will assist you in making up your account. Retain for future reference. : : :

8—829

_____, 191____

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

..... 191....

	Dollars.	Cents.
Breakfast 90 tip 10	1	00
Dinner 1.15 tip 10	1	25
Supper 1.00 tip 10	1	00
Lodging		
Pullman porter		25
Waiter fees		
Hotel porter		10
Station porter		10
Checking baggage		
Arr. Jax 9:45 P.M. E.C.R.R.		
Car fare		05

8—829

..... 191....

	Dollars.	Cents.
Breakfast 10 tip 10		80
Dinner 1.50 tip 10		60
Supper 1.00 tip 10		70
Lodging	1	50
Pullman porter		
Waiter fees		
Hotel porter		10
Station porter		
Checking baggage		20
Car fare		25
Reg. No. 469913 for Gainesville 2nd		
Lv. Jax C.R.R. 5:10 P.M.		
arr. Gainesville 8:30 P.M.		
Hotel Porter		10

8—829

---------- , 191----

	Dollars.	Cents.
Breakfast ---------- tip -------		
Dinner ---------- tip -------		
Supper ---------- tip -------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

B—829

---------- , 191----

	Dollars.	Cents.
Breakfast ---------- tip -------		
Dinner ---------- tip -------		
Supper ---------- tip -------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

B—829

---------- , 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

---------- , 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

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	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

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	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

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	Dollars.	Cents.
Breakfast ---------- tip ----		
Dinner ---------- tip ----		
Supper ---------- tip ----		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

8—829

---------- , 191----

	Dollars.	Cents.
Breakfast ---------- tip ----		
Dinner ---------- tip ----		
Supper ---------- tip ----		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

6—829

----------, 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

8---829

----------, 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

8—829

Jan 30, 191

	Dollars.	Cents.
Breakfast ---- tip ----		50
Dinner ---- tip ----	1	30
Supper ---- tip ----		80
Lodging		
Pullman porter		
Waiter fees		
Hotel porter		
Station porter		
Checking baggage		
from sick bed	8	00

8—829

Jan 31, 191

	Dollars.	Cents.
Breakfast ---- tip ----		50
Dinner 1 01 tip 10	1	15
Supper ---- tip ----		10
Lodging	3	25
Pullman porter		
Waiter fees		
Hotel porter		
Station porter		
Checking baggage		

8—829

----------, 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

8—829

----------, 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging----------		
Pullman porter ----------		
Waiter fees----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

8—829

F. J. 3 ....., 191....

	Dollars	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		30
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		20
Transf bag		

8—829

F. J. 4 ....., 191....

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		2.0
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		
Trunk bus	1	50

8—829

---------- , 191----

	Dollars	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------	1	00
Supper ---------- tip ------	1	00
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		10
Station porter ----------		
Checking baggage ----------		

8—829

---------- , 191----

	Dollars.	Cents.
Breakfast ---------- tip ------		
Dinner ---------- tip ------		
Supper ---------- tip ------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

----------		50

8—829

----------, 191----

	Dollars.	Cents.
Breakfast ---------- tip ----------		
Dinner ---------- tip ----------		
Supper ---------- tip ----------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		15

8—829

Feb. 8, ----------, 191----

	Dollars.	Cents.
Breakfast ---------- tip ----------		
Dinner ---------- tip ----------		
Supper ---------- tip ----------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		15 ✓
Bag ----------		
11.14 ----------		
Lawrence ----------	3	00 ✓

8—829

Feb 15, 191---

	Dollars.	Cents.
Breakfast ---- tip ----		
Dinner ---- tip ----		
Supper Schratan ---- tip ----		50 ✓
Lodging	18	00 ✓
Pullman porter		
Waiter fees		
Hotel porter		
Station porter		
Checking baggage		
Leg		5 ✓
4 Feb 735 Schratan – 7th Lamb		Lab ✓
Labor		

8—829

Feb 16, 191---

	Dollars.	Cents.
Breakfast Phil's tip		65 ✓
Dinner Schratan's tip	1	10 ✓
Supper ---- tip ----		75 ✓
Lodging	1	00 ✓
Pullman porter		
Waiter fees		10
Hotel porter		10 ✓
Station porter		
Checking baggage		
Leg Schratan 5th		
4th Schratan's 3.15		25 ✓
Leg		

8—829

Feb. 17, 191---

	Dollars	Cents.
		50
Breakfast ---- tip ----		
Dinner ---- tip ----		75
Supper ---- tip ----	1	00
Lodging		
Pullman porter		
Waiter fees		20
Hotel porter		
Station porter		
Checking baggage		
Sundries breakfast		05
dinner		15
supper		10
Yard hire	1	25

8—829

Feb. 18, 191---

	Dollars.	Cents.
		60
Breakfast ---- tip ----		
Dinner ---- tip ----		75
Supper ---- tip ----		75
Lodging		
Pullman porter		
Waiter fees		2
Hotel porter		5
Station porter		
Checking baggage		
by Dearborn ale.	9	15

8—829

_____, 191____

	Dollars	Cents.
Breakfast _____ tip _____		
Dinner _____ tip _____		
Supper _____ tip _____		
Lodging _____		
Pullman porter _____		
Waiter fees _____		
Hotel porter _____		
Station porter _____		
Checking baggage _____		
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8—829

_____, 191____

	Dollars.	Cents.
Breakfast _____ tip _____		
Dinner _____ tip _____		
Supper _____ tip _____		
Lodging _____		
Pullman porter _____		
Waiter fees _____		
Hotel porter _____		
Station porter _____		
Checking baggage _____		
Carfare _____		15
_____		15
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_____		
_____		
Ar. Hammond 3:05 P.M.		
Store Paradise Key		350
Lv. Hammond 4:00		
Ar. Paradise Key 5:00		
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8—829

Feb. 26, 191--

	Dollars.	Cents.
Breakfast ---------- tip ----		
Dinner ---------- tip ----		
Supper ---------- tip ----		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		
auto bus ----------	5	00
boat " ----------		50

8—829

Feb. 27, 191--

	Dollars.	Cents.
Breakfast ---------- tip ----		
Dinner ---------- tip ----		
Supper ---------- tip ----		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		
laundry ----------		

8—829

F. L. & T.

....., 191....

	Dollars.	Cents.
Breakfast ..... tip		
Dinner ..... tip		75 ✓
Supper ..... tip		75 ✓
Lodging	6	00 ✓
Pullman porter		
Waiter fees		
Hotel porter		
Station porter		
Checking baggage		
Meals	1	25 ✓
Berth	3	50 ✓
Extra Passenger Fare		
Car Mileage ..... 450 m		
Taxicab		75 ✓
Tips		25 ✓
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B—829

U. S. Department of Agriculture,

MEMORANDUM

OF

TRAVELING EXPENSES

From March 1, 1917

To ....., 191

Use this Memorandum; it will assist you in making up your account. Retain for future reference. : : :

8—829

April, 191--

	Dollars.	Cents.
Breakfast ---- tip ----		15
Dinner ---- tip ----		25
Supper ---- tip ----		25
Lodging ----	1	50
Pullman porter ----		
Waiter fees ----		
Hotel porter ----		
Station porter ----		
Checking baggage ----		
Breakfast ----		50
Bath ----		25

March 2, 191---

	Dollars.	Cents.
Breakfast ---------- tip ------		75
Dinner ---------- tip ------		75
Supper ---------- tip ------		75
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		
Lv. Miami 7:40 P.M.		
Ar. Homestead 9:30 P.M.		
Lv. Homestead 7:00 A.M.		
Ar. Miami 8:30 A.M.		
Lv. Miami 4:40 P.M.		
Ar. Homestead 5:30 P.M.		

8—829

March 2, 191---

	Dollars.	Cents.
Breakfast ---------- tip ------		75
Dinner ---------- tip ------		50
Supper ---------- tip ------	1	00
Lodging ----------	3	00
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		50
Checking baggage ----------		30
Lv. Miami 7:40 P.M.	1	35
Ar. Homestead 9:30 P.M.		
Lv. Homestead 7:00 A.M.		
Ar. Miami 8:30 A.M.		
Lv. Miami 4:40 P.M.		
Ar. Homestead 5:30 P.M.		

8—829

March 4, 191---

	Dollars.	Cents.
Breakfast 95 tip 10	1	05
Dinner tip		75
Supper 90 tip 10	1	00
Lodging		
Pullman porter		25
Waiter fees		
Hotel porter		
Station porter Jax		10
Checking baggage Jax		30
arr Jax 11:30 a.m.		
4th leg 95 Jax. Tallahassee 1:45		
conductor		10
Lv. Jax SB. Ar. Gainesville 6:10 p.m.		

March 5, 191---

	Dollars.	Cents.
Breakfast tip		
Dinner tip		
Supper tip		
Lodging		
Pullman porter		25
Waiter fees		
Hotel porter		10
Station porter		
Checking baggage		
arr. Tallahassee 1:00 p.m.		
two fare		25

---------- March ----------, 191----

	Dollars.	Cents.
Breakfast 90 tip 10	1	00
Dinner ---------- tip ----------		
Supper ---------- tip ----------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

---------- March ----------, 191----

	Dollars.	Cents.
Breakfast 90 tip 10	1	00
Dinner ---------- tip ----------		
Supper ---------- tip ----------		
Lodging ----------		
Pullman porter ----------		
Waiter fees ----------		
Hotel porter ----------		
Station porter ----------		
Checking baggage ----------		

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	Dollars.	Cents.
Breakfast ---------- tip -------	--------	--------
Dinner ---------- tip -------	--------	--------
Supper ---------- tip -------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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	Dollars.	Cents.
Breakfast ---------- tip -------	--------	--------
Dinner ---------- tip -------	--------	--------
Supper ---------- tip -------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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	Dollars.	Cents.
Breakfast ---------- tip ------	--------	--------
Dinner ---------- tip ------	--------	--------
Supper ---------- tip ------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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	Dollars.	Cents.
Breakfast ---------- tip ------	--------	--------
Dinner ---------- tip ------	--------	--------
Supper ---------- tip ------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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	Dollars.	Cents.
Breakfast ---------- tip ----------	--------	--------
Dinner ---------- tip ----------	--------	--------
Supper ---------- tip ----------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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	Dollars.	Cents.
Breakfast ---------- tip ----------	--------	--------
Dinner ---------- tip ----------	--------	--------
Supper ---------- tip ----------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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	Dollars.	Cents.
Breakfast ---------- tip ----------	--------	--------
Dinner ---------- tip ----------	--------	--------
Supper ---------- tip ----------	--------	--------
Lodging----------	--------	--------
Pullman porter ----------	--------	--------
Waiter fees----------	--------	--------
Hotel porter ----------	--------	--------
Station porter ----------	--------	--------
Checking baggage ----------	--------	--------
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Jacksonville, Fla., 1/16/1919

Ring-billed Gull.
Brown Thrasher
Loggerhead Shrike
English Sparrow
Cardinal
Fish Crow
Bluejay
Kingfisher

Gainesville, Fla 1/17/1919

Red-bellied Woodpecker
Red-headed "
Bluejay
Fish Crow
English Sparrow
Sparrowhawk.
Mockingbird
Cardinal

St. Petersburg, Fla. 1/18/1919.

Killdeer
Spotted Sandpiper
Brown Pelican
Laughing Gull
Fish Crow
Redwing
Meadowlark
Eng. Sparrow
Savanna Sparrow
Palm Warbler
Yellow-rumped Warbler
Yellowthroat
Carolina Wren
Buzzard.
Scaup Duck
Red-bellied Woodpecker
Sparrowhawk
Kingfisher
Cormorant

Bradenton, Fla 1/19/19

✓ Killdeer	✓ Savanna Sparrow
✓ Buzzard	✓ Swamp "
✓ Sparrowhawk	✓ Cardinal
✓ Flicker	✓ Towhee
✓ Red-billed Woodpecker	✓ Phoebe
✓ Phoebe	✓ Myrtle Warbler
✓ Bluejay	✓ Palm "
✓ Mourning Dove	✓ Yellow "
✓ Robin	✓ Yellowthroat
✓ English Sparrow	✓ Catbird
✓ Mockingbird	✓ Meadowlark
✓ Ground Dove	✓ Redwing
✓ Grackle	✓ Red-tailed Hawk.
✓ Marsh Hawk	✓ Common Tern
✓ Spotted Sandpiper	
✓ Florida Jay	
✓ Kingfisher	
✓ Mourning Dove	
✓ Blue gray gnatcatcher.	
✓ Scaup Duck	

✓ Bradenton 1/20

✓ Black Vulture ~~1000-00-00~~ 100 100

— — — — — running about crow hopping with ugly pinched wings threatening me and dog

✓ Bald Eagle
✓ Chipping Sparrow
✓ Bluebird
✓ Screech Owl
✓ Yellow-billed Woodpecker
✓ Hermit Thrush
✓ Song Sparrow
✓ Dryobates v. ~~villosus~~ auduboni ♀ 5:00 P.M.
✓ Buzzard
✓ Sparrowhawk
✓ Flicker
✓ Red-billed Woodpecker
✓ Phoeby
✓ Bluejay
✓ House Wren
✓ Robin
✓ English Sparrow
✓ Mockingbird
✓ Grackle
✓ Kingfisher
✓ Blue-gray gnatcher
✓ Savanah Sparrow
✓ Cardinal
✓ White-eyed Towhee
✓ Starling
✓ Myrtle Warbler
✓ Palm ..

3:30 P.M. 4:30
~~101.5 102°~~ 100.4

✓ Yellow-throat
✓ Catbird
✓ Meadowlark
✓ Red-shouldered Hawk
✓ Yellow-billed Woodpecker

Terra Ceia Bay 1/21/19 flying

~~Brown Pelican~~ 10:30 ~~$ 10 3.4~~ 11:30 ~~$ 10 3.4~~ 60

Cormorant 5001-6000 - platform 10x50

Herring Gull

Laughing "

Black-billed Plover

Little Blue Heron

Loon

Royal Tern 12:30 $ ~~10 5.6~~ flying

Ruddy Turnstone

Phoebe

Boat-tailed grackle.

Killdeer

Spotted Sandpiper

Kingfisher.

Blue-gray Gnatcatcher

Palm Warbler

Bird Island 7/22/19

× Brown Pelican 100 - ~~white~~ adult with black instead of brown on sides of neck with light area down back of neck forenuck white. 100 at night.

× Man-o-war-bird

✓ × Phaeton

✓ × Red-billed Woodpecker

✓ × Egret

✓ × Great Blue Heron

✓ × Little Blue "

✓ × Black Vulture

✓ Cormorant

✓ Caspian Tern

✓ Royal "

✓ Common "

✓ Laughing Gull

✓ Herring " "

✓ Loon

✓ Horned Grebe

✓ American Merganser

^ Kingfisher

✓ Black-billed Plover

✓ × Redwing

✓ Spotted Sandpiper

✓ Killdeer

✓ Carolina Wren

✓ Cardinal

✓ Mocker

✓ Bald Eagle

✓ Bluebill

✓ White-eyed Towhee

Pass - a. Grille, Jan 23-1919.

✓ Mockingbird
✓ Ground Dove
✓ Tumstone
✓ Herring Gull
✓ Laughing "
✓ Royal Tern trees - trees still dusty
✓ Piping Plover (pale)
✓ Blackbellied "
Dowitcher
✓ Cormorant
✓ Pelican
✓ Piping Plover
✓ Willets "
✓ Semipalmated Sandpiper
" Plover
✓ English Sparrow

Cortez, Fla. 1/25/19
3:30 P. 5:15
Dendroica d. palmarum 105 ~~105~~
5:00 P.
Bubo Virginianus ~~1020~~

Cortez Fla 1/26/19
11:15
Pipilo e. albus ~~1046~~

Cortez Fla 1/27/19
8:15 a.m.
Colymbus auritus ~~1037~~

Cortez Fla 1/25/19
4:00 P.M.
Aegialitis semipalmata ~~1040~~
4:15 P.M.
Accipiter c. ptilonotus ~~1043~~ 4:45 P. 4:45 P.
Hydranassa t. ruficollis ~~1055~~ ~~1055~~

Iris rich purple at outer margin shading to dull whitish yellow around iris. Bare orbital space dusky. gape dull yellow. spot at outer (posterior) canthus same. eyelids dull leaden grey. tip & base of maxilla & streak extending from nostrils toward eye (when yellow) horn blackish. mouth lining of maxilla horn brown. tomia at tip of mandible blackish. rest dull yellowish brown. base dull yellow tarsus dull green. anterior scales of tarsus and on tops of toes blackish

Funderburg (Estuaries) Pelicans feeding in 2 to 4 in water
rat eating Uca.

Caseys Pass Fla 1/30/14
1:45

Wilsons Plover
Semipalmated Plover
Killdeer
Spotted Sandpiper
Dowitcher
Little Blue Heron
Wards "
Louisiana "
Laughing Gull (Cedar Waxwing)
Herring "
Royal Tern
Cormorant
Brown Pelican
Palm Warbler
White-eyed Vireo
Robin
Mocking bird
White-eyed Towhee
Skink
Norway Rat
Osprey

Dixon & Hall Co
M. J. Levy
50 Tons

Greenwood.
4,300.00 Oct 1-17, Mch 31-15

Higgins & Goulter
E. J. D. Higgins damage - others pay
W. E. Foreman.

2/1/19

/ Megaquiscalus Sarasota
Corbus b. fasciatus Verna
/ Passer domesticus Sarasota

Arcadia 2/1/19

/ Robin
/ Swamp Sparrow
/ Carolina Wren
/ House Wren
/ Mocker
/ Bluejay
/ Shrike
/ Meadowlark

Vdöhabla in Hossom

Punta gorda, Fla 7/2/19

Bobwhite -

- Robin
- Blue bird
- Bluegray gnatcatcher
- House Wren
- Mocker
- Swamp Sparrow
- Pine-woods "
- English "
- Florida grackle
- Meadowlark
- Bluejay
- Kingfisher
- Flicker
- Red-billed Woodpecker
- Buzzard
- Black Vultures
- Killdeer
- Herring Gull
- Royal Tern
- Bluebill
- Great Blue Heron
- Little " "
- Pelican
- Cormorant
- Snipe
- Phoebe

✓ Pine warbler 5:30
✓ Sitta pusilla 105.2

Punta Gorda, Fla 2/3/19

✓ Megaquiscalus ♂ 10:45 109.6 ♂ 109.3
✓ Quiscalus ♀ 10:45 109.6
✓ Megaquiscalus long, absurdly high pitched and small in volume compared to efforts of other grackles. Bird spreads tail & droops wings calls chu chu chu in low tone followed by a curious rattle during which mandibles are opened & closed rapidly. Then a high grackle like cluck, or some loud chipping notes or others similar in tone reminding one of some of the calls in song of mocker. Whole has an effect of efforts of starling.

✓ Herring gull
- Little Blue Heron
✓ Black-cr. Night ..
✓ Wards ..
✓ Louisiana ..
✓ Clapper Rail.
✓ Killdeer
✓ Jacksnipe
- Buzzard
✓ Sharp-shinned Hawk
✓ Sparrow Hawk
✓ Gnatcatcher

✓ Red-billed woodpecker
✓ Flicker
✓ Phoebe
✓ Bluejay
✓ Meadowlark
✓ Pine woods Sparrow
✓ Chewink
✓ Palm Warbler
✓ Mocker
✓ Robin
✓ Bluebird
✓ Kingfisher

Punta Gorda 7/4/19

Pelican, drowned out as pirating signs
both mid sometimes with Bird Jam
sometimes closed, apparently merely
explosion of air when bill closed
pouch depressed.

Cormorant
Horned Grebe
Laughing Gull.
Skimmer
Royal Tern
Cormorant
Egret
Wardo Heron
Little Blue "
Louisiana "
Black-bellied Plover
Bluebill
Kingfisher
Buffhead
Osprey

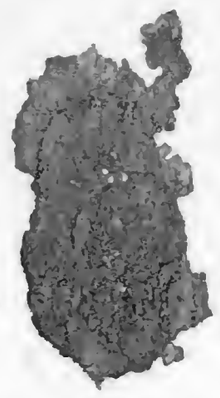
Punta Gorda, Fla. Feb. 5

Megaquiscalus Chep-chep- chee ē - x
chep chep chep. trip trip trip trip
Cowbird Chk, "
Robin
Laughing Gull
Spotted Sandpiper
Kingfisher
English Sparrow
Blue-gray Gnatcher
Brown headed Nuthatch Zolfo.
Ruby-crowned Kinglet Orange City jct
White-eyed Towhee "

New Smyrna Fla. 2/6/19.

/ Laughing Gull
/ Herring "
/ Ring-billed "
/ Red-jar Tern
/ Brown Pelican
/ Wood Heron
/ little Blue "
/ Tricolored "
/ Snowy "
/ Wood Ibis
/ Killdeer
/ least Sandpiper
/ Osprey
/ Red-bellied Woodpecker
/ Fish Crow
/ Cardinal
/ Towhee (northern)
/ Orange-crowned Warbler
/ Palm Warbler
/ Mocker
/ Brown Thrasher
/ Carolina Wren
/ Robins
/ Kingfisher

Sebastian, 7/4 2/7/19 10:45
10:20a 10:57
✓ Aphelocoma cyanea ♂ 1085 ♀ 1086 Curve.
One cru One higher pitched & some
What less in carrying power than a-Calif.
long song of notes some sweet & high
others slurred + trilled. Like that of Bluejay
but more guttural ✓ Savanna Sparrow
✓ Caspian Tern ✓ Cardinal
✓ Bonaparte's Gull ✓ Towhee
✓ laughing " ✓ Shrike
✓ Cormorant ✓ Mocker
✓ Brown Pelican ✓ Palm Warbler
✓ Wood Ibis ✓ Yellowthroat
✓ little Blue Heron ✓ Carolina Wren
✓ Lesser Scaup ✓ Robin
✓ Black Skimmer ✓ Gnatcatcher
✓ least Sandpiper
✓ Killdeer
✓ Buzzard
✓ Black Vulture
✓ Ground Dove 4:30 P. 1078
✓ Mourning "
✓ Red-bellied Woodpecker
✓ Flicker
✓ Kingfisher
✓ Bluejay
✓ Chipping Sparrow



Clupeidæ.

Brevoortia 1

Butterfish 1

(1) 3 Menhadens (2) 3 menhadens

(3) 21 menhadens 3-5 in. 1 halfbeak 1 sardine

(4) Menhadens 12 inch

(5) 16 " 4-5 "

(6) 1 " 10 "

(7)

(8) 3 " 6-7 " , 1 half-beak, 4 Mullet 3 4 inch, 1 5 inch

(9) 1 menhaden

(10) (11) (12) " 12 inch

13-14 "

(15) 4 Xystoma

Sebastian Fla 3/5/19

Bonaparte's Gull
Laughing "
Caspian Tern
Black Skimmer
Cormorant
Bluebill
Red-backed Sandpiper
Sanderling
Least Sandpiper
Semipalmated "
Willet
Killdeer
Piping Plover
Black-billed Plover
Buzzard
Black Vulture
Ground Dove
Mourning "
Red-bellied Woodpecker
Flicker
Kingfisher
Louisiana Heron
Florida Jay
Redwing
Grackle
Cardinal

Towhee
Shrike
Palm Warbler
Yellowthroat
Myrtle Warbler
Carolina Wren
Gnatcatcher
Cardinal ♀ 4:45 P.

Pelicans dd 7/8/19

Pelecanus occidentalis ~~♀ 9.4 ♂ 9.5 ♂ 9.3 ♂ 10.4~~ 12 noon

Pelecanus occidentalis ~~in~~ copulation ~~took~~ place in the nest. The female spreads her wings laterally 1/4 pm while the male walks around at one side. He then supporting himself he stops and tail back and forth Connection then side, When the steps down.

mounts on her back with waving wings, moves his spread moves his head touching then takes place at one side immediately

The mating action is as follows ♀ stands w/ edges not wide neck extended and folded. Mating finally in material of which nest is made with wings partly spread. The male walks around biting at her with his huge bill and may then imitate her action.

At noon 50 or more were engaged in soaring over the area of the island. They turned in great spirals but were widely scattered in small groups and did not maintain the close regular formation that makes these ~~exhibitions~~ so interesting

so interesting in the White Pelicans.
An copulation male seized female by middle of neck with head turned sideways and holds firmly
There is much squabbling
Among birds not yet settled on
nesting sites. ~~They~~ I saw one
small mated from two nests in
succession. Males advanced toward
her striking at her with their
great bills, which she fenced with
hers in return. Frequently one seized
the upper mandible in the bill
and shook it firmly which the
two pulled back and forth. The
birds seem to have little strength in
lateral movement in their necks as
d sometimes each one forces the bill
of another to one side and then
twist it completely over pinning
the birds head turned clear
around behind to the ground so that
it was unable to move. In
one case where released the second
bird in bringing its head around
caught the tip of the bill under
the ulna of one wing and

struggled for a minute or so before giving up. After a few minutes struggle the attacking bird managed to climb on the nest with the other and the two extended their necks on across the other, neither able to size the other because of their close proximity. Then, a minute or 20 this returning bird was crouched but immediately walked on and took possession of a second nest all this happened only 40 feet away.

Mating Action: Bird brings female Feather Offering. Stand behind her with neck extended and closed wings toward about back while giving Courting Head about twisting at the feather & repeats in kind.

Membrana nictitans is red this bright in color. Eyeball has milky Junction. Movement.

When birds fly in or out of a group others seem to be watching and if they mean

or outgoing duck other wise bird. Male brings nesting material to female at nest. Much strutting goes on with many resulting fights.

Notes of young at distance from roadside chill of hungry hogs. Young continue to call loudly after they are able to fly but adults are silent save for aspirating note.

Female expresses approval when male brings nesting material by extending head with mouth open. She then deposits stuff in edge of nest where she arranges it. Though nest material may be secured by a few feet away male usually circles and returns with it then alights near mate.

Sebastian Fla. 2/9/99.

Pileated Woodpecker 4:00 p.m.
Brown Pelican 11:30 a.m.
Cormorant
Laughing Gull
Black & Kingfisher
Black-crowned Night Heron
Yellow-crowned Night Heron
Wards Heron
Louisiana Heron
Little Blue Heron
Snowy Heron
Wood Ibis
Ground Dove
Mourning Dove
Red-bellied Woodpecker
Flicker
Red-shouldered Hawk
Man-o-war Bird
Florida Jay
Blue Jay
Seaside Sparrow
English "
Cardinal
Yellowthroat
Myrtle Warbler
Black & white "
Yellow-throated "

Shrike
Mocker
House Wren
Carolina "

Sebastian, Fla 2/10/19
1:00 P.m
Phrenoprion borealis ~~8 108.2 ♀ 108.6~~ prew
prew prew, chick chick... First note of
Head of young mountain Bluebird.

- Pelicans
- Osprey
- Bald Eagle
- Mourning Dove
- Hairy Woodpecker
- Phoebe
- Bluejay
- Cardinal
- Chipping Sparrow
- Towhee
- Skinks
- Gnatcatcher
- Robin
- Mockers.

Sebastian, Fla. 2/11/19

Charmaepelia y. terrestris 9:30a.
White-eyed Vireo 11:00a.
Grasshopper Sparrow ~~1086~~ 2:30p.
Polioptila cyanea ♂ ~~1084~~ ♂ ~~1080~~ 3:00 ♀ 1071 ♂ 1082 3:00 3:00p
Cardinalis C. floridanus ♂ ~~1106~~ 2:45
Pheucticus ludovicianus ♀ ~~1082~~ 3:30

2/12/19

Synchops nigra ~~1058~~ 9:30a 2:15
Oceanodroma leucorhoa ♀ ~~1045~~

2/13/19

Rynchops nigra. ~~1040~~
Oceanodroma leucorhoa ♀ ad ~~1063~~ struggling

2/14

Sterna maxima ~~1064~~ 11:15a
Larus atricilla ~~1059~~ " 30
Sterna S. antillarum ~~1069~~ 12:15p.

Mr. Lord Dramays Commissioner
S. J. Carson.

7 f. Mandurah, 7 Ja. 7/17/19

Sigmodon hispidus ♂ ~~10,0~~ 4:00 p.

7 f. Mandurah 7/18/19

Sylvilagus bachmani ♀ ~~10 4 0~~ 8:00 a.

This animal with its small head, short legs and heavy body when laid out looked like an agouti. Tail shows no white. Animal travels with a rush not hopping high. Runs directly along ground.

Oryzomys ♂ skel.

£1 " " skin

£2 " " in skull.

7/17 fleas in small bottle Oryzomys

7/18 " " large " "

" " small " Sylvilagus

Mrs. Lawrence 5% 1 acre

10% 2 acres.

5 pts potatoes 1/4 g starch 1/16 g sacch. 1/4 g. sod. bicarb

Ft. Lauderdale Fla. 2/17

/ Little Green Heron
/ Hellbender
/ Buzzard
/ Black Vulture
/ Quail
Ground Dove
/ Flicker
/ Red-bellied Woodpecker yak-ah yak-ah
/ Meadowlark
/ Florida Grackle
/ Redwing
/ English Sparrow
/ Cardinal
/ Towhee
/ Savanna Sparrow
/ Skunk
/ Yellow-throated Warbler
/ Yellowthroat
/ Palm Warbler
/ House Wren
/ Robin
/ Red-cockaded Woodpecker

Blarina

Ft. Lauderdale Fla 2/18

/ Bittern
/ Little Green Heron.
Snowden Kingfisher 295-120-35 Lad.
Killdeer
Buzzard
Black Vulture
Red-shouldered Hawk
Marsh Hawk
Sparrow hawk
Great Horned Owl
Red-bellied woodpecker
Flicker
Meadowlark
Fish Crow
Florida Grackle
Redwing
English Sparrow
Salamander
Towhee
Cardinal
Shrike
White-eyed Vireo
Palm Warbler
Kingbird
Yellow Throat
House Wren

Grateful Robin
Catbird
Mocker

H. B. Hamlin	4 acres	2%
Da. Friday	2 "	5%
Mrs. Lawrence	2 "	5%
S. J. Carson	2 "	50%.
	2 "	Total loss.
	3 "	25%

Dead Agnodon 12

Ft. Lauderdale 3/9.

- Green Heron
- Least Bittern
- Killdeer
- King Rail
- Red-shouldered Hawk
- Sparrowhawk
- Buzzard
- Black Vulture
- Flicker
- Red-billed woodpecker
- Red-cockaded "
- Dove
- Blue jay
- Crow
- Meadowlark
- Redwing
- Fla. Grackle
- Grasshopper Sparrow
- Savannah "
- Cardinal
- Towhee
- Shrike
- White eyed Vireo
- Northern Water Thrush
- Palm Warbler
- yellow Throat

- Cattbird
- Mockler
- Robin
- Bluebird
- Gnatcatcher
- Gallinule.

Royal Palm State Park 2/20

- Limpkin
- Little Blue Heron
- Remaining:
  - Wards
  - Broad-winged Hawk
  - Whip-poor-will
  - Cardinal

- Royal Palm State Park 2/21

Anhinga
White Ibis
Louisiana Heron
Wards "
Little Blue "
Green "
Bittern
Fla Gallinule
Killdeer
Sandhill Crane
Broadwinged Hawk
Red-shouldered "
Barred Owl
Kingfisher
Flicker
Red-bellied Woodpecker
Crow
Redwing
Great-tailed Grackle Amphilaria
Great-crested Flycatcher
Bluejay
Cardinal
White-eyed Vireo
Yellowthroat song short
House Wren
Robin

Catbird
Gnatcatcher
Water Thrush
3:30 PM - 3:45
Aramus 104.3 ~~104.6~~

Paradise Key 12/22/19.

Pileated woodpecker
White Ibis
Little Blue Heron
Bittern
Louisiana Heron
Wardi "
Quail "
Buzzard
Crow
Florida Gallinule
Boat tailed grackle.
Kingfisher
Cardinal
Whippoorwill
Yellowthroat
Robin
Catbird
Redwing
Swamp Sparrow
King Rail
White-eyed Vireo
Phoebe
Gnatcatcher
Broad winged Hawk
Bluejay
Flicker

Paradise Key 2/23/19

Anhinga
Little Blue Heron
Green "
Wards "
Louisiana "
White Ibis
Killdeer
Buzzard.
Red-shouldered Hawk
Sparrow hawk
Barred Owl
Bittern
Broad-winged Hawk
Kingfisher
Flicker
Red-bellied Woodpecker
Pileated "
Crow
Bluejay
Redwing
Great-tailed grackle
Cardinal
Towhee
White-eyed Vireo
Great-crested Flycatcher
Phoebe

Yellow-throat
Palm Warbler
House Wren
Carolina "
Robin
Catbird
Gnatcatcher

higuly
11 miles S.W. Paradise Key near dugraham
Highway. (All flow here are of this acon
plate coloration) 5/17/15 C.G. Morin

West Lake 7 Lu. 2/25/19

1 Anhinga anhinga 4:15 lp 4:15 p.
1 Ardea alba
✓ Ward's Heron
✓ Louisiana Heron
✓ Bittern
Egret
1 Limpkin
✓ Killdeer
✓ Buzzard.
< Red-shouldered Hawk
✓ Osprey
✓ Great Horned Owl
✓ Sparrowhawk
✓ Red-bellied Woodpecker
✓ Flicker
✓ Phoebe
✓ Fish Crow
✓ Common Crow
✓ Cardinal
✓ Towhee
✓ White-eyed Vireo
✓ Great White Heron
✓ Florida gallinule
✓ Wood Ibis
✓ Catbird.
✓ Bald Eagle

Westlake, Fla 2/26/19

Blue-winged Teal
Man-o-war bird
Anhinga
Wood Ibis
Great White Heron
Little Blue Heron
Egret.
Bittern
Louisiana Heron
Buzzard
Red-Shouldered Hawk
Crow
Fish Crow
White Ibis.
Towhee
Cardinal
White-eyed Vireo
Carolina Wren
Catbird
Solitary Sandpiper
Robin.

Paradise Key 2/27/19

/ Florida Yellowthroat flight song
/ Anhinga
/ Ward's Heron
/ Little Blue "
/ Hummingbird "
/ Bittern
/ Green Heron
/ White Ibis
/ Limpkin
/ Killdeer
/ Kingfisher
/ Woodpecker
/ Barred Owl. various notes
/ Buzzard
/ Red Shouldered Hawk
/ Crow
/ Bluejay
/ Swamp Sparrow
/ Cardinal
/ Towhee
/ Palm Warbler
/ White-eyed Vireo
/ Catbird

Paradise Key 7/28/19

/ Wards Heron
/ Lar. "
/ Little Blue "
/ Bittern
/ Buzzard
/ Bluejay
/ Crow
/ Barred Owl
/ Meadowlark
/ Swamp Sparrow
/ Yellow-throat
/ Catbird -
/ Meadowlark
/ Pileated Woodpecker

Homestead, Fla. 7/28/19

English Sparrow
/ Fl. Grackle

Hattie Bauer Hamm ½ m. S. Naranja
1½ m. W. Right hand side
of road - 2½ mi
S. Ste. N.W. Homestead
near Tuchs Place.
Rose & Castillo Item.
near Silver Palm bus from
Homestead. main daily.
½ mi N. Silver Palm

Homestead, Fla 3/1/19

English Sparrow
Florida Crackle
Buzzard
Tufted
Red-billed Woodpecker
Yellow-billed "
Crow
Bluejay
Mockbird
Bluebird
Hairy Woodpecker
Brown-headed Nuthatch
Bluegray Gnatcatcher
Crested Flycatcher.

Homestead 3/2/19

Red-cockaded Woodpecker
Brown-headed Nuthatch
English Sparrow
Florida Crackle.

Key Largo, Fla 3/2/19

✓ Louisiana Heron
✓ Wards " "
Snowy " "
✓ Buzzard
✓ Chickadee
✓ Prairie Warbler in song
✓ White-eyed Vireo
Carolina Wren.
✓ Osprey
✓ Warbler
✓ Cardinal
✓ Red-shouldered Hawk
Crow
✓ Flicker
✓ Buzzard
✓ yellowthroat.
✓ Kingfisher
✓ Sparrowhawk.

Distichlis, ranker coarser, more erect

Miami Beach, Fla 3/3/19

J Brown Pelican. Many in ad. winter plumage. others in breeding plum.
/ Royal Tern
/ Laughing Gull
/ Herring "
✓ Killdeer
✓ Black Skimmer
/ English Sparrow.
✓ Bobolink
- Am. Magpie
/ Kingfisher
- Sparrowhawk.
/ Osprey.
✓ Wood Heron

Ormond Fla 3/4/19

✓ 8 Marila affinis 2 im.

Film I

1 Gil. nitrog Jayson Kay Fla 1/25/19
2
3
4
5
6

Film II

1
2
3 Saving Cortez Fla 1/29/19
4
5
6

Film III

1
2
3
4
5
6

Film IV

1
2
3
4
5 Pelican Id 2/8/19
6

Film 5

1 Pelican dd 2/8/19
2
3
4
5
6

Film 6

1-6 ditto

Film 7

1-6 ditto

Film 8

1-6 ditto ~~Feb 9~~

Film 9

1-6 ditto Feb 9

Film 10

1-6 ditto "

Film 11

1-6 " Feb 11

Film 12

1-6 " "

Film 13

1-6 " Feb 12

Film 14

1-6 " "

Form Bi-108
July, 1919

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY

COPY.

No. 292-Bi.

LETTER OF AUTHORIZATION—AMENDMENT*

Washington, D. C., December 13, 1919.

Alexander Wetmore,

Assistant Biologist,

Under authority contained in the Secretary's letter No. 8-Sec., dated July 1, 1919, you are hereby authorized to incur expenses as may be necessary under the appropriation "General Expenses, Bureau of Biological Survey, 1920" (Protection of Migratory Birds), in the performance of your official duties as follows:

1. Actual and necessary traveling expenses between your official station at Washington, D. C. and points throughout the United States, subsistence expenses not to exceed $5.00 per day.

2. Hire of temporary assistants subject to civil service rules.

3. Such other minor expenses as may be necessary to the proper conduct of the work to which you are assigned.

Accounts chargeable to this authorization will be paid from the sums allotted for your use for the fiscal year 1920.

All expenditures hereunder must be in strict conformity with the Fiscal Regulations of the Department of Agriculture, or orders of the Secretary, and in accordance with your instructions. All travel performed on Department business must be by the shortest practicable routes and without any unusual or unnecessary delays.

Expenditures under this letter of authorization, including all accounts certified by you and all expenses covered by transportation requests used and bills of lading issued, will be charged to, when not in excess of the amounts allotted to you.

Object of travel: Enforcement of Migratory Bird Treaty Act.

Your permanent headquarters will be Washington, D. C.

A. True. (Sgd.) E. W. Thompson
Chief Clerk and Executive Assistant.

6—3473

W. C. Henderson
Acting Chief of Bureau.

Bi-359
JUNE.'19

No. 118

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ALLOTMENT, AND INCREASE OR DECREASE.

Date: December 13, 1919.

Alexander Wetmore

Assistant Biologist,
Washington D. C.

Dear Sir:

By direction of the Chief, Bureau of Biological Survey, the sum of

$ 125.00 has been ~~The amount~~ allotted for expenditures under the appropriation "General Expenses, Bureau of Biological Survey, 1920 ," during this fiscal year, under Letter of Authorization No. 292 -Bi., dated December 13, 1919.
(Protection of Migratory Birds)

This is for the purpose of performing necessary travel and incurring other necessary expenses in the enforcement of the provisions of the Migratory Bird Treaty Act and Regulations, securing general information regarding migratory birds, and consulting and cooperating with local state game officials, local associations and individuals in carrying out the provisions of the Act and Regulations.

You will be held responsible for compliance with the terms of your Letter of Authorization and for keeping within the amount of your allotment. IF YOUR TOTAL ALLOTMENT IS EXCEEDED WITHOUT PREVIOUSLY OBTAINED WRITTEN AUTHORITY OF THE CHIEF OF THE BUREAU, THE EXCESS WILL NOT BE MET BY THE BUREAU, UNLESS (1) THERE IS MONEY AVAILABLE FROM THE PROPER APPROPRIATION AND (2) A SATISFACTORY EXPLANATION IS MADE FOR FAILURE TO SECURE IN ADVANCE THE NECESSARY INCREASE.

Very truly yours,

HERBERT S. WARD

In Charge of Accounts.

COMMISSION

for Collecting Specimens for the Florida State Museum

FLORIDA STATE MUSEUM, UNIVERSITY OF FLORIDA

GAINESVILLE, FLORIDA, December 10, 1919.

In accordance with the provision of chapter 7368 (Number 110), Section Six, Acts of the General Assembly of Florida for 1917, establishing the Florida State Museum and Natural History and Ethnological Survey of the State of Florida, I hereby authorize Mr. Alexander Wetmore of U. S. Biological Survey to collect specimens for this museum.

The collecting of specimens for this museum by Mr. Wetmore shall be such specimens, and shall be collected in such manner as provided for in chapter 7368, General Assembly of Florida for 1917, and in accordance with instructions received from the Director of the Florida State Museum.

T. Vaughan Jr. Director.

Approved by { J. L. EARMAN, E. L. WARTMANN, T. B. KING, J. B. HODGES, J. T. DIAMOND, } State Board of Control.

Per Bryan Mack Secretary.

[SEE OVER.]

AN ACT to Establish a State Museum at the University of Florida and a Natural History and Ethnological Survey of the State of Florida.

Be It Enacted by the Legislature of the State of Florida:

Section 1. There shall be established at the University of Florida at Gainesville, Florida, a department of said university to be known as the Florida State Museum.

Sec. 2. The functions of the Florida State Museum shall be to make scientific investigations towards the further development of the natural resources of the State and maintain a depository and exhibition of the collections acquired by the surveys provided for in this Bill, and of collections and specimens otherwise coming into its possession, and of a library of publications pertaining to the work as herein provided. The collections and library of said museum shall be open free to the public, under suitable rules and regulations to be promulgated by the Director of said Museum, and approved by the State Board of Control.

Sec. 3. The said Museum shall be under the control of a Director who shall be nominated by the President of the University of Florida and elected by the State Board of Control. He shall receive such compensation as may be fixed by the State Board of Control.

Sec. 4. It shall be the duty of the Director to conduct surveys of the State of Florida and collect specimens and data of a scientific and economic nature in the three kingdoms; mineral, vegetable and animal, in such numbers and quantities as may be needful for the purpose of said Museum. Said collections and acquisitions may be made at any season of the year and upon all properties owned by the State of Florida, and no provision of any existing law shall be construed so as to prohibit the taking of necessary specimens for said Museum. The permission of the owner or agent shall be first secured before taking any specimens from the lands of any person or corporation. The Director shall collect specimens and data of a civic nature pertaining to the early history of the State, locate and chart historic sites, prehistoric earthworks, shell heaps, and collect specimens relative to the prehistoric and aboriginal tribes of the State as represented in its mineral, vegetable and animal industries. He shall, as may be practicable, prepare such duplicate specimens as may accrue into traveling exhibits and circulate them as loans to the public schools of the State.

Sec. 5. The Director shall make an annual report of the expenditure and general work of the department to the State Board of Control, which said Board shall publish, and the Director shall from time to time publish and distribute bulletins and monographs recording data and exploiting the work of the said Museum.

Sec. 6. The Director may, subject to the approval of the State Board of Control, authorize persons in writing to assist him in procuring specimens in any section of the State.

Sec. 7. This Act shall take effect when it is approved by the Governor.

Approved May 30, 1917.

To A. Wetmore with
compliments, from Thomas E. Snyder

[Reprinted from the Proceedings of the Entomological Society of Washington Vol. 21, No. 8, November, 1919.]

NOTES ON THE SEASONAL ACTIVITY OF TABANIDAE IN THE LOWER EVERGLADES OF FLORIDA.

By C. A. Mosier, *Warden, Royal Palm State Park, Dade Co., Fla.*, and T. E. Snyder, *Bureau of Entomology.*

Since 1916, notes on the seasonal activity of Tabanids in southern Florida have been recorded in these Proceedings, especially the flight of *Tabanus americanus* in large numbers at dawn. Apparently, species of *Tabanus* are active during every month of the year; this, however, includes belated "stragglers" or specimens that emerge very early.

At Paradise Key, in the Lower Everglades, *Tabanus lineola* was overabundant on the prairies and common in the hammock during late July and early August. On the prairie these flies were especially common where the land has been farmed and is now covered with a heavy growth of weeds and grass—some ten feet high. Further into the natural prairie where less or no farming had been done, they diminished in numbers until near the the seashore there were none.

On August 30, 1918, Mosier noted that all the saw palmettoes (*Seronoa*) from which the leaves had been cut in April and on

which Tabanids had been observed, had an unusually heavy crop of fruit; the blooms were in the open and not shaded; possibly they were pollenated by the Tabanids. The males of *Tabanus lugubris*, *T. atratus* and *T. lineola* seemed to feed more after the leaves had been removed. All these species were common, feeding on the fruits of the palmetto. There is a waxy exudation from the ripe palmetto fruit.

During the late autumn and early winter several species of *Tabanus* were observed. On November 28 and 29, 1918, the region 11 to 16 miles southwest of Paradise Key on Ingraham Highway was visited. Quite a few adults of *Tabanus atratus*[1] and some adults of *T. lineola* were observed. A span of mules working on the highway were annoyed by these flies and the cook at the dredge working on the road, southwest of Paradise Key, stated that the species came into the house frequently, although not in such great numbers as *Tabanus trijunctus*, *T. americanus* and *T. turbidus*.

On December 6 two adults of *T. atratus* were seen at Paradise Key and several adults of *T. lineola* were observed during the week. Adults of *Chrysops* were very persistent and annoying.

Mosier noted that *T. atratus* and *T. lineola* adults occasionally were seen as late as December 12; all were females. They occurred oftener on the prairie and near water than within Royal Palm Hammock (Paradise Key). These gadflies are found around mules when they are going through the hammock on the road. On December 12, Mosier saw a Tabanid struggling in the water. No males of either species had been observed for some time.

There was a heavy rain on the morning of December 15, which was very unusual for this season. A few adults of *T. atratus* and *lineola* were very persistent in attacking Mosier; a few were around the house but they were mostly on the road through the prairies. These are unusually late dates for any Tabanidae. However, occasional adults occur at Paradise Key during all the winter months. In 1918 there was an abnormal autumn; Mosier noted on December 15 that willow (*Salix amphibia*) was in bloom, *Icacorea*, and *Erythrina arborea*, the harbinger of spring, was budding and would soon be in bloom. Saw palmetto, which bloomed in April in 1918, was putting out buds. Some live oaks were just shedding their acorns. Mastic that shed leaves in February, 1918, was nearly through shedding on December 15.

Water covers the saw grass prairies of the Lower Everglades intermittently throughout the year after heavy rains; the lower sloughs are often completely inundated for long periods.

[1] Identified by C. T. Greene, of the Bureau of Entomology.

On December 28 and 29, 1918, a few adults of *Tabanus atratus* were observed on the screen around the veranda of the Lodge. Another adult of this black gadfly was observed on January 24, 1919.

Occasional adults of *Chrysops* were noted throughout the winter months at Paradise Key. An adult of *Chrysops flavidus* Wied. was captured on January 27, 1919.

An adult of the small gadfly *Tabanus lineola* was observed on the veranda screen on February 4, 1919, at Paradise Key. On February 11, 1919, a few deerflies (*Chrysops* sp.) flew about Mosier's head while he was walking along the road in the hammock at twilight; Mosier killed one on his face.

The junior author visited Paradise Key on February 17, 1919. One adult of *Chrysops flavidus* was observed on this day, although the weather was cool.

On February 19 the first adult of *Tabanus lineola* seen by the junior author at Paradise Key in 1919 was collected. Female adults of *Tabanus lineola* and *T. 5 vittatus* Wied. were captured on February 20, by the junior author. On the 21st recently transformed adults of this gadfly, both females and males, began to appear in numbers. On this date the live oak (*Quercus virginiana*) had the leaf buds opening.

Digging in the moist muck under saw grass plants (*Cladium effusum*) in the sloughs of the Everglades, just northeast of Paradise Key, on February 21, the junior author found the larvae of two species of *Tabanids;* large black striped larvae of *T. stygius* Say and smaller yellowish white larvae of *Chrysops* sp. Tabanid larvae are predaceous.

The muck is deep, at least one foot; the Tabanid larvae are found from one to several inches below the surface. At this date the muck was wet, since water had just receded; the surface of the slough was covered with a film of drying, whitish scum—low plant growth (algae), which floats on the water when the sloughs are flooded.

On February 23, adults of *Chrysops* were collected about twenty miles southwest of Paradise Key, near the present termination of the unfinished Ingraham Highway. Early in the morning of February 25, C. A. Mosier took the junior author and H. S. Barber of the Bureau of Entomology, and A. Wetmore of the Biological Survey, from Paradise Key by auto to this point. After regretfully leaving Mr. Mosier, from this point we walked along the rough, unfinished, rocky road bed, to where the dredge was working. This dredge is towed along the canal made by blasting and dredging out material (limestone rock, marl, etc.), for the road. *Chrysops* and *Tabanus lineola* were present near

the dredge and bunk house. It might be stated that evidences of deer are common on the prairies, hence the presence of deer-flies (*Chrysops*) is easily explained.

After leaving the dredge we ran a straight compass course for Cape Sable through the lower hammocks, lagoons of White Water Bay, and across the saw grass prairies. North of West Lake adults of *Tabanus lineola* and *Chrysops flavidus* and *plangens* Wied., a small dark species, were captured. Our intention had been to make an exploration and collecting trip to Cape Sable, but due to the very rough travel and limited time, we decided to turn back. We were forced to hack our way with a machette through the low but dense and almost impenetrable hammocks, and the low thickets of aerial roots of the red mangrove. It was necessary also to wade through lagoons up to our waists in mud and water, and finally to make our way through high saw grass (a sedge *Cladium effusum*).

Night comes very suddenly in the tropics and sub-tropics and we made camp on one of the higher hammocks; after the short dusk, fire flies appeared. During this night of February 25, we were able to sleep by using our insect sweeping nets to protect our hands and faces from mosquitoes The usual night cries of wild life broke the stillness. We could also hear the pounding of surf.

The Lower Everglades or grassy marsh lands south of Lake Okeechobee, and in general south of latitude 27°, have a humid, tropical flora. As Gifford (1911) points out,[1] this latitude is the same as that of Egypt. The region south of Paradise Key towards Cape Sable is still wild; as the region immediately north of West Lake is approached, the low morass is more frequently dotted here and there with beautiful, green hardwood hammocks, the elevation of the ground being slightly higher than the saw grass prairie.

The edges of some of the first hammocks encountered south of Paradise Key were strikingly fringed with bald cypress trees which late in February, 1919, were mostly bare of foliage. Against the background of the green foliaged hardwood trees in the hammock, these bare, grey cypress stood out like "ghost" trees, and appeared white as if frosted, especially so in the early morning fog just after dawn, when the sun first struck them.

Farther south, clumps of the beautiful saw-cabbage palmetto *Paurotis wrightii* appeared in the hammocks. Other trees were cocoa plum, poison wood (*Metopium*), sweet bay, bay berry, white mangrove, red mangrove, and cabbage palmetto. The red

[1] Gifford, J., "The Everglades and Southern Florida." Miami, 1911.

mangrove trees are mainly low which may be explained by the presence of brackish water or brackish soil at the roots.

The black muck soil of the Everglades overlies marl or limestone rock.

Near West Lake are encountered endlessly meandering lagoons of White Water Bay, with mud or rock bottoms and with the only slightly brackish water waist deep.

The endless waste of brown saw grass—as high as a man's head—is even here broken by low, green hammocks of red mangrove, bay berry, poison wood and cocoa plum. A tropical aspect is afforded by the presence of the green but leafless wild vanilla vines.

Tracks of otter, deer and marsh rabbits were observed.

C. A. Mosier captured an adult of *Tabanus americanus* at Paradise Key in 1919, on February 28. This was the first appearance of this fly for the season. On March 1 another adult was observed; on March 2 there were a few adults on the veranda screen; there was a slight increase in numbers on March 4 to 5.

On March 2 the junior author collected an adult of *T. lineola* in the Everglades directly west of Miami along the Tamiami trail.

On March 7, *Tabanus lineola* was increasing in numbers at Paradise Key, but only a few adults of *T. americanus* were observed daily. March 8 and 9 showed an increase in numbers of *T. americanus* and *lineola*.

The first pronounced flight of *T. americanus* at dawn at Paradise Key in 1919 occurred on March 10. On March 11 the flight had increased about three hundred per cent.

The junior author had made plans to shoot with dust shot some of the lower hovering adults of *T. americanus* during 1919, but had to leave Paradise Key before the flight began. It was desired to determine whether the flight was composed entirely of males and whether the flies occasionally hovered upside down. However, on March 11, H. S. Barber shot three adults with a 22 caliber pistol, using dust shot. All these adults were hovering and were males. The weather was foggy and cloudy and rain was forecasted. Adults of *Chrysops* were common and *T. lineola* was daily increasing in numbers.

On March 12 the flight of *Tabanus americanus* at dawn was of increased volume. Barber shot two males on the wing, hovering. One adult of the nocturnal flying *T. flavus* was on the veranda screen during the day.

March 13 was cold and there was no flight. On March 14 it was dark and cloudy at the usual time for the flight; there had been rain during the night. Nevertheless, there was a consider-

able flight—the heaviest up till that time of the season. Two males of *T. americanus* were shot down during the flight at dawn; as usual, no females were observed in the flight.

On March 15 it was raining and there was no flight of *T. americanus*. On March 16 it was cooler with high winds; on March 17 there were high winds and no flight; fewer females of *T. americanus* were in evidence, the weather being squally. The temperature on March 18 was 68° F., and too cool for a flight; the numbers of females of *T. americanus* on tree trunks and screen were increasing. On March 19, it was cool and there was no flight, but numbers of females of *T. americanus* were increasing on the screens and in the woods.

On March 21, the temperature was as low as 42° F. at daybreak; there was no flight. March 22, with a temperature of only 58°, witnessed the heaviest flight of the season. However, the flight had not yet reached the full proportions of last season. Numerous female adults of *T. flavus* were collected on this date. There was a slight rain in the afternoon. On March 23 there was a strong flight of *Tabanus americanus*. One female adult of *T. trijunctus* was collected on the veranda screen on this date.

The dawn was clear and it was warm on March 24; there was a strong flight of *T. americanus*. One male of *T. trijunctus* was captured in the hammock.

On April 2 the early morning flight of *T. americanus* was strong; three males were shot while hovering; all that have so far been shot have been males. By April 3 to 4 the flight seems to have reached its full height.

On April 5, 6 and 7 the flight continued normal.

April 8, 9 and 10 dawned with a heavy fog and no flight; on April 10 the males were feeding on flowers in the forest, keeping well in the shade during sunshine.

On April 11 there was a bright dawn, and a strong flight—one of the loudest and strongest flights ever witnessed.

From April 12 to 16 the flight continued to be strong (at its height); two adults were observed to strike in mid-air, descending to the brush below, clasped; they escaped before their sex could be determined.

On April 17 there were light showers at dawn; there was no flight. April 18 was cloudy and there was a very light flight of but few minutes' duration.

From April 19 to 21 there were moderate flights. Females were later seen on saw palmetto blossoms.

On April 22 *T. trijunctus* was at the height of its season and adults were very annoying to both man and beast; the adults gathered in automobile tops, followed teams, etc. All work animals were covered with bagging for protection against these gadflies.

From April 23 to 30 the flight continued to be normal. On April 25 the screen door of the veranda was left open for two hours following sunrise and 60 *T. americanus*, 323 *T. trijunctus*, 84 *T. lineola* and 3 *T. flavus* female adults were captured. One female adult of *T. turbidus* was also captured.

On May 1, after a heavy afternoon rain on April 30, there was one of the heaviest flights of the season. Rain seems to increase the flight. Evidently fresh adults were just emerging and could be heard trying out their wings.

Normal flights occurred on May 2, 3, 4 and 5; the flights always being stronger on bright, fair dawns than on foggy, cloudy or misty mornings, the duration of the flight being governed by the rapidity of dawn. May 6–11 saw the flight decreasing in strength, females were in evidence but males were still numerous in the shade of the hammock. On May 5 a few female adults of *T. flavus* were collected on the veranda screen.

On May 12 there was a drizzling rain and no flight. May 13 dawned foggy and the flight was very short and not as strong as usual.

There was a normal flight on May 14, although the adults were decreasing in numbers; there was heavy rainfall in the evening and night.

On May 15 there was a very light flight owing to the damp atmosphere. May 16 dawned clear but there was a perceptible waning of the flight of the large gadfly. The loud "roaring swarming" was past for the season but there were still "stragglers" present in the hammock. While this flight lasted in 1919, it was even stronger than in former years. Other gadflies, *Tabanus trijunctus* and *T. lineola*, as well as "deerflies" (*Chrysops*), were still abundant and annoying. Mosquitoes were now present and also made life interesting.

By May 17 the flight was declining in volume daily; the females were more abundant than the males.

From the 18th to 22nd the flight was decreasing and was of very much shorter duration—lasting only 9 minutes on May 18.

On the 23rd the flight was noted only over the densest portion of the hammock.

There was a very small flight on May 24—only 3 adults were observed hovering and a few more were heard.

During the week of May 25 to 31 there was no flight of *T. americanus*. An occasional male could still be observed on flowers and quite a few females were in evidence. *T. lineola* adults were not so numerous. *T. atratus* was more in evidence than

last year, especially on the lower end of the road to Cape Sable—beyond Paradise Key.

June 4. First appearance of *T. melanocerus* Wied.; this gadfly was observed only about dusk and dawn—they were more numerous than last season. *T. lineola* was plentiful. *T. atratus* and *T. turbidus* were only occasionally seen.

On June 9 near the dredge *T. americanus, T. melanocerus, T. flavus* and *T. atratus* were collected, *T. atratus* being the most numerous species.

On June 14 the dredge was about $^1/_2$ mile from West Lake and two miles from the limit of Dade County line. The 'glades were full of water to the brim and about one mile of the roadway in the glades between here and Homestead was under water. Water was running across the road east and west of the Park where the Tabanid larvae were dug up. The water was waist deep on this date and no more grass grows here than the little that was present in February, when the water had just receded.

June 10–30 *T. flavus* was more numerous than in 1918; *T. atratus* was more numerous on the prairies but fewer were in the hammock.

July 10. One adult of *T. flavus* and two adults of *T. melanocerus* were collected on the veranda screen. Adults of *Chrysops* were numerous at the hammock.

On July 16 numerous female adults of the small *T. costalis* Wied. and a few adults of the slightly larger *T. lineola* were aggregated in the windows of stores and garages at Homestead, Florida; customers were very much annoyed by these gadflies.

July 29. *Tabanus melanocerus* and *T. linoela* were very common around stock on the highway, also in pine woods where mules were at work. *Chrysops* were very numerous and troublesome. The water on the 'glades was high.

August 9. *T. atratus, turbidus* and *costalis* were common.

On August 15 several species of Tabanids were collected.

Aug. 23. Heavy rains appeared to increase the number of the Tabanids as more were collected than on Aug. 9 and 15; they were more aggressive both to man and beast.

By September 8, only an occasional adult Tabanid was to be seen at Paradise Key. At the dredge, southwest on the Cape Sable road, Tabanids were still numerous in the bunk house.

On Sept. 25–28 *T. costalis* was the species still aggressive.

To summarize—some species of *Tabanus*, as *americanus* and *trijunctus*, are apparently restricted to a definite season, whereas other species are active throughout the entire year.

A calendar of the seasonal activity of Tabinidae (1918 to 1919) in the lower Everglades of Florida is appended.

By the expedient of shooting the flies while hovering, the evidence has been increased that the main swarm at dawn consists of males only and that the females are attracted to these swarming males for mating, as in case of certain mosquitoes. These flights are probably not the result of concerted action but rather a consequence of imitation or desire to follow others.

With regard to our previous statement that at certain times while hovering *T. americanus* reverses and hovers upside down—this has not yet been definitely proven or disproven. It is very difficult to shoot the flies.

It must not be concluded from the foregoing notes that mosquitoes and gadflies at Paradise Key are a pest at this beautiful Everglade hammock throughout the entire year. These insects are not troublesome during the winter months. In place of the hum of blood-thirsty mosquitoes, there is at dusk the hum of beautiful moths (*Sphingidae*) which hover over wild purple verbena blossoms. At night, near West Lake, mosquitoes bother while sleeping outdoors (Feb. 25) but these can not be compared with the later hordes which occur at Paradise Key and the offshore reefs. On the open, sawgrass prairies, mosquitoes are not a pest.

Large portions of the Lower Everglades should be set aside as a federal preserve. Unless this is done, carelessly, or wantonly set forest fires, hurricanes following tree cuttings and trespass will ruin the wildness and natural beauty of this region. Hunting must be prohibited to save the remaining wild bird life, once so wonderful. This will be especially necessary after Ingraham Highway from Miami to Cape Sable has been completed. Many interesting water birds are still plentiful.

Anyone who, approaching the edge of Royal Palm Hammock (Paradise Key), has seen these majestic, feathery palms—50 to 130 feet high—overtopping the other hammock trees, in silhouette against a sky tinted by dawn or at dusk will desire to preserve this never-to-be-forgotten sight (Plate 17) for future generations.

Royal Palm Hammock (Paradise Key) is at present a State Park under supervision of the Florida Federation of Women's Clubs. This organization is to be commended on its successful efforts in conservation. However, it lacks funds and should have further assistance from the state or from the federal government.

CALENDAR OF SEASONAL ACTIVITY OF TABANIDAE* IN THE LOWER EVERGLADES OF FLORIDA— 1918 TO 1919.

Species.	Sex.	Locality.	Date.	Collector.
"GADFLIES:"				
Tabanus americanus Forster	♀	Paradise Key, Fla.	Feb. 28, 1919	C. A. Mosier
	♂	Paradise Key, Fla.	March 10, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	March 12, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	March 27, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	April 16, 1919	C. A. Mosier
	♀	24 mi. southwest of Paradise Key, Fla.	June 9, 1919	C. A. Mosier
Tabanus atratus Fabr.	♀	24 mi. southwest of Paradise Key. Fla.	June 9, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	June 10–30, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	August 15, 1919 August 23, 1919 Sept. 28, 1919	C. A. Mosier
Tabanus lugubris Macq.	♀	Paradise Key, Fla.	March 31, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	April 7, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	August 15, 1919	C. A. Mosier
Tabanus turbidus Wied.	♀	Paradise Key, Fla.	April 8, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	April 25, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	July 13, 1919	C. A. Mosier
Tabanus trijunctus Walker	♀	Paradise Key, Fla.	March 22, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	March 27, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	March 31, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	April 7, 1919	C. A. Mosier
Tabanus melanocerus Wied.	♀	24 mi. southwest of Paradise Key, Fla.	June 9, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	June 10–30, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	July 10–29, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	August 15, 1919	C. A. Mosier
Tabanus lineola Fabr.	♀	Paradise Key, Fla.	Sept. 9, 1918	C. A. Mosier
	♀	Paradise Key, Fla.	Feb. 18, 1919	T. E. Snyder
	♀	Paradise Key, Fla.	Feb. 20, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	Feb. 26, 1919	C. A. Mosier

* Identifications by C. T. Greene, Ass't Custodian of Diptera, U. S. Nat. Museum, based on specimens actually now in this collection.

	♀	Paradise Key, Fla.	Feb. 26, 1919	T. E. Snyder
	♀	Paradise Key, Fla.	March 27, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	April 16, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	June 10–30, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	July 16–29, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	August 15, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	Sept. 28, 1919	C. A. Mosier
Tabanus 5-vittatus Wied.	♀	Paradise Key, Fla.	Feb. 20, 1919	T. E. Snyder
Tabanus costalis Wied	♀	Paradise Key, Fla.	May 22, 1919	C. A. Mosier
	♀	Homestead, Fla.	July 16, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	Aug. 9–23, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	Sept. 25–28, 1919	C. A. Mosier
Tabanus pumilus Macq.	♀	Paradise Key, Fla.	Feb. 17, 1919 March 1, 1919	C. A. Mosier C. A. Mosier
Tabanus flavus Macq.	♀	Paradise Key, Fla.	March 22, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	March 27, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	March 31, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	April 7, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	June 10–30, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	July 10, 1919	C. A. Mosier
"DEERFLIES"				
Chrysops flavidus Wied.	♀	Paradise Key, Fla.	Jan. 27, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	Feb. 17, 1919	T. E. Snyder
	♀	Paradise Key, Fla.	Feb. 22, 1919	T. E. Snyder
	♀	West Lake, Fla.	Feb. 25, 1919	T. E. Snyder
	♀	Paradise Key, Fla.	April 13, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	May 22, 1919 July 29, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	August 15, 1919	C. A. Mosier
Chrysops plangens Wied.	♀	West Lake, Fla.	Feb. 25, 1919	T. E. Snyder
	♀	Paradise Key, Fla.	March 16, 1919 April 13, 1919	C. A. Mosier
"THE YELLOW FLY OF THE DISMAL SWAMP"				
Diachlorus ferrugatus Fabr.	♀	Paradise Key, Fla.	Sept. 18, 1918	C. A. Mosier
	♀	Paradise Key, Fla.	March 31, 1919	C. A. Mosier
	♀	Paradise Key, Fla.	May 22, 1919	C. A. Mosier

(Actual date of publication November 10, 1919.)

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PARADISE KEY, ROYAL PALM HAMMOCK, LOWER EVERGLADES, FLORIDA

FIGS. 1 and 4.—Royal palm trees (*Roystonea regia* O. F. Cook), at edge of hammock as seen across sawgrass prairie, overtopping other hammock trees. (Photos by Wilson Popenoe.)

FIG. 2.—View of tops of royal palms showing clusters of seed below foliage. (Photo by W. E. Brown.)

FIG 3.—View of royal palms showing clear length and taper of trunks. (Photo by W. E. Brown.)

The Brown Pelican in relation to the

Fishing Industry in Florida.

Introduction & Itinerary.

In accordance with instructions and letter of authorization 323-Bi. I left Washington on January 14, 1919 in order to secure data on the food of the Brown Pelican and the relation of this bird to the fishing industry in Florida. Following is the itinerary followed in carrying on this investigation.

Jacksonville, Fla., Jan. 16, Gainesville, Jan. 17, St. Petersburg, Jan. 18, Bradentown, Jan. 19-24, Cortez, Jan. 25-29, Sarasota, Jan. 30- Feb. 1, Punta Gorda, Feb. 2- Feb. 5, New Smyrna Feb. 6, Sebastian, Feb. 7-15, and Tallahassee, March 5. Work was done on Tampa Bay and the Manatee River from Bradentown, on Tampa and Sarasota Bays from Cortez and on Charlotte Harbor from Punta Gorda. At Sebastian I studied the food of the birds at our reservation on Pelican Island. The period from February 16 to March 4 was occupied by other work.

Claims of Damage.

Claim has been that the Brown Pelican is responsible for the reduction that has been noted in recent years in abundance of mullet, while some include the destruction of other food fishes in the list of crimes attributed to this bird. Because of these statements there was much feeling in certain quarters and complaints had been made of the protection afforded the Brown Pelican in the breeding colonies, which are maintained as bird reservations. Some advocated the reduction of the colonies by shooting, taking the eggs and killing the young while others demanded the extermination of the birds, through the removal of all restriction against killing them.

as an outcome of this feeling in May 1918 the breeding colony in the Indian River near Sebastian was raided and 300 or 400 young were killed. Much publicity was given the alleged depredations of the pelicans in the press and the matter of their protection was made in a way a political issue during the last state campaign. A pertinent reason for this last may be found in the fact that as 4,000 state licenses were issued last year to fishing boats, each of which carries a crew of from one to ten men, there are at a conservative estimate 10,000 or 12,000 men engaged in this industry. As these men are voters in nearly all cases the value of catering to them in a political way is evident at a glance.

During the course of the present work many of the fishermen were sounded as to their views on the pelican. As these men on the whole take a purely utilitarian view of life all confessed that they were unable to see why pelicans should be protected, as they were of no apparent use in any way, either as a source of food or as aid in destroying any form of life detrimental to the interests of man. Even those who in a rough way made pets of the great birds by throwing them worthless fish taken in their nets were free to say that they considered the birds ugly and ill favored and seemed more interested in their somewhat amazing ability to gulp down fish of some size entire, rather than in attracting them through any real interest in them.

As regards the alleged destructiveness of the pelican sentiment was found to be about evenly divided in favor of or against the bird. Certain of the fishermen claimed that pelicans fed upon mullet to the exclusion of other fish and that each individual bird consumed from ten to fifteen pounds of these fish daily. As estimates of the number

of pelicans present on the coast of Florida made by these men ranged from one hundred thousand to one million individuals the destruction of mullet was claimed to be enormous. On the other hand as many of the men engaged actively in fishing considered the amount of mullet and other food fish taken by pelicans a negligible factor in regulating the abundance of these fishes. This side of the case is seldom heard however as the opponents of the protection afforded the pelican are loud in denunciation of the birds, while the others seldom consider the matter of sufficient importance to dispute them though personally they do not concur in these sentiments. For this reason statements are not elicited from this class save on direct question.

According to the Laws of Florida governing Salt water fishing (Section 2) it is unlawful to fish with any net measuring less than "one and one-half inch bar, measured from knot to knot, or a stretched mesh of three inches from knot to knot after being tarred or shrunk". As a matter of actual fact it was found that the nets in common use were all of smaller sizes, a condition that was ignored entirely by the fish wardens though the fishermen were aware that they were violating the law. Fish were in demand and were bringing a fair price so that it was desirable to market as many as possible. With a smaller mesh net than that sanctioned by law it was possible to capture smaller fish in laeger number and so increase the total catch. It is also unlawful to place stop nets across creeks, streams, bayous or passes (Section 5). In stop-netting a small-meshed net is stretched across such places at high tide when the fish have come in on the flats to feed. The nets are set in such a way that as the tide goes out the fish are left stranded on the mud. This practise is a most wasteful one as it destroys quantities

of small fry that are too small for sale and that normally would furnish the fish caught during subsequent years, so that the destructiveness and waste of this method is easily evident. Yet stop-netting is commonly practised by some of the more unscrupulous fishermen who set their nets at night and no apparent effort is made to stop them. During the course of my work I examined many nets briefly but in no instance did I see one with a larger mesh than 1-1/4 inches from bar to bar (2-1/2 inch stretch mesh) while men who were stop netting used a net with 1-1/8 inch bar (2-1/4 inch stretch mesh). If it was so desired it would be an easy matter to apprend those using these illegal nets as it would be necessary only to visit the drying racks or to examine the nets when in use and apply a measuring rule on them. The Wardens are empowered to confiscate such nets and it would be necessary to do this only once as nets are expensive and the fishermen could not afford to take chances if they knew that they were actually liable to arrest. Yet nothing is done at present to check these misdemeanors.

The better class of fishermen realize the evils of the present system of fishing and deprecate it as they see that they are destroying the source of their livelihoods by their own Acts. These men however are thrown into competition with other less scrupulous and in order to compete with them are forced to use small mesh nets in ordinary fishing even though they may decline to resort to stop-netting. The whole system apparently is one that may be fostered and supported by powerful fish dealers.

Observations.

The great bulk of species of valuable food fishes are of deep swimming habit and so seldom come within reach of the Pelican. The mullet is the only abundant species in this group that occurs regularly on the shoals where it is available for these birds, and it is available ~~for these birds~~, and it is this fish whose decrease in number is attributed to the Brown Pelican by part of the fishermen.

According to common belief in Florida mullet are said to appear at certain times in solid schools in or near the passes leading to the ocean during spawning and fertilization of the eggs, and to remain thus for a number of hours. It was claimed that at such periods pelicans gathered to feed on the massed fish and proved very destructive as they ate many roe mullet. It was a common statement that the mullet paid no attention to the birds, and that the pelicans were careful not to dive into the closely packed fish through fear of doing bodily injury to themselves! This spawning period came from November to February according to the locality.

In part it was in hope of securing definite information on this that the present field trip was undertaken. Upon reaching the west coast of Florida however it was found that this massed spawning was one of those elusive things that does not happen where one is working but is always about to occur at some point farther on. On inquiry among the fishermen it was found in a way to be tradition among them though many claimed to have seen it during previous years. No one was seen who had observed it this year or last. The place at which it might occur was also uncertain so that after considerable inquiry I was forced to give up any idea of observing the pelicans in connection with this phenomenon. On returning to Washington I learned from Dr. R. E. Coker of

the Bureau of Fisheries that though this massing of mullet has been commonly reported that it has not been witnessed or described in print so far as he knew by any observer of scientific training. Further than that the mullet probably spawned in the open ocean no information concerning its breeding was available. Judgement on the Brown Pelican on the score of its feeding on these fish as has been described must be withheld therefore until fully substantiated.

Observations made in the field seem to indicate that while pelicans will take mullet when they are to be secured, these fish are in general so quick in avoiding attack that only occasionaly, perhaps only by a few certain birds more expert than others, can they be captured. The rapid darting of mullet when startled is well known to those who have observed them, and apparently enables them to elude capture. On February 4 near Crow Key in Charlotte Harbor I watched a flock of twenty pelicans feeding for an hour. Schools of small mullet were running here and the great birds struck at them steadily but during this entire period of observation only one pelican succeeded on one occasion in capturing a single fish. Finally all of the birds gave up the effort.

The birds were observed feeding on schools of a small sardine (Stolephorus) in Terre Ceia bay and on Glass minnows (Opisthonema oglinum) in Charlotte Harbor.

Pelicans in most cases seem to ralize that mullet fishing is not profitable and usually paid no attention to these fish other than to watch them with interest as they passed over them. On many days during the period of observation fish were not easily available as cold drove them to take refuge in deep water. At such times the pelicans

had difficulty in securing food and in some cases it was certain that some of them secured none for a period of two or even three days. Even under these conditions they did not turn systematically to mullet fishing though these fish were present in small schools on the shoals.

The Brown Pelican however is often a decided nuisance to mullet fishermen in the following way. When gill nets are used pelicans frequently gather after a "set" of the nets has been made and endeavor to pull out mullet that are caught in the mesh on the outer circle. I witnessed this personally while travelling with fishermen, from Cortez. The Pelicans knew well what the fishermen were about and when the circle of nets was completed came flying over to investigate them. When the fish began to strike the pelicans gathered at the side of the circle away from the fishermen and pulled and hauled at the fish dragging the net up and endeavoring to swallow the mullet and seeming much disgusted when the fish were held in the meshes. Often half a dozen pulled and hauled at the net in an effort to get one fish but usually they did not succeed in securing it. I was told that when nets became old that pelicans frequently tore them badly, a statement that there is no reason to doubt as the birds are strong and five or six hauling at one spot would produce considerable strain. Frequently mullet had large areas on their sides scraped bare of scales by the bills of the birds in their struggles to pull them out. This difficulty with pelicans was said to be more common during cold weather when fish were scarce and was reported to be worse in some localities than in others. I observed it personally several times but was present on numerous other occasions when pelicans paid no attention whatever to the nets. It is probable that the birds could be driven away by throwing stones, clams or heavy mollusk shells at them.

Food of Pelicans at Pelican Island.

At Sebastian a detailed study of the food of the Brown Pelican was made on the Pelican Island reservation. At the time of my visit about two thousand pairs of pelicans were nesting in the colony. A part of these occupied the small island, now bare of vegetable growth that formed the original Pelican Island but the majority were breeding in the mangroves on another island a short distance east that is also included in our reservation. About half of the occupied nests contained young.

During part of my stay the weather was cold and unfavorable for fishing and in fact on two days it was considered unwise to disturb the birds by visiting the rookery. There were many newly hatched young in the nests that felt the cold severely when left uncovered by the parents and if exposed too long there was danger that they might succumb. On several occasions there seemed to be a scarcity of fish due to the inclement weather and the young were ravenously hungry, so that they called incessantly and beseiged incoming adults for food. At these times they were very reluctant to give up any food that they had secured. After the first few days when they had become somewhat accustomed to my presence it was at times almost impossible to get them to to regurgitate. Often other young seized the food as soon as it was dropped and on several occasions even adults swooped down within a few feet of me to secure fish disgorged by young birds.

The adult pelicans seemed to do most of their fishing along the coast to the northward and there was a constant stream of birds passing to and from the islands in this direction. The birds crossed the peninsula that that separated Indian River from the ocean to the outer beach and then flew along parallel to the coast a short distance from shore. Comparatively few

were seen in the protected waters of Indian River. In work at the island I walked about slowly watching the young birds and examining the nests and disgorged food. Until the young reached the age of 15 days to 21 days, they showed little fear and in nearly all cases refused resolutely to regurgitate what they had eaten. In many cases where the stomach was filled and fish projected in the gullet I was able to work it out by gentle manipulation from the outside despite the protests vocal and physical of the struggling youngster. Older birds gave up more or less readily when they found that they were cornered and unable to escape and after disgorging watched me in solemn disgust while I examined the food remains. Young perched high up out of reach in the mangroves were often induced to disgorge by standing around and eyeing them intently for several minutes. It was necessary for the observer to watch his step in passing under these mangroves as at times a younster concealed among the leaves gave up a mass of partly digested fish that fell with a thud to the mud below. After one or two narrow escapes from receiving these unsavory peace offerings on my head I learned to avoid standing about under the trees when the outlook above was not clear. After examining the fish I passed on to other victims when there was a grand scramble among the young to secure the choice morsels a second time. Usually they fell to the original owner but often others greedily seized them before he could prevent. Any waste was cleaned up by the Black Vultures attendant on the colonies.

Adults while incubating if not disturbed suddenly, often regurgitated before leaving the nest. This was especially the case where the nest was located among branches through or over which flight was difficult.

Regurgitation was more frequent where the birds had fed recently but sometimes masses of partly digested bones were brought up, often only after considerable effort.

Following is a detailed statement of the examination of the food of pelicans made at Pelican island. Each number represents the material secured from one bird. The number of fish of each kind is given and in most cases an indication as to the size of the fish.

Table I

Food of Brown Pelican.

No.	Date	Food
1.	Feb. 7, 1919	3 Brevoortia tyrannus
2.	"	" " "
3.	"	(21 " " 3-5 inch, 1 Menidia sp.
	"	(1 Hyporhamphus roberti
4.	"	1 Brevoortia tyrannus 12 inches long.
5.	"	16 " " 4-5 "
6.	"	1 " " 10 "
7.	"	1 " " 10 "
8.	"	(3 " " 6-7 "
		(1 Hyporhamphus roberti, 3 Mugil Cephalus two 4 inch, one 18 inch.
9.	"	1 Brevoortia tyrannus.
10.	"	1 " " 12 inch
11.	"	1 " " " "
12.	"	1 " " " "

Table I

Food of Brown Pelican.

No.	Date	Food		
13.	Feb. 7, 1919	1	Brevoortia tyrannus.	12 inch
14.	"	1	" "	" "
15.	"	4	Choroscombrus chrysurus	
16.	Feb. 8, 1919	2	Brevoortia tyrannus	12 inch
17.		1	" "	" "
18.		1	" "	" "
19.		1	" "	" "
20.		4	" "	6 "
21.		2	" "	" "
22.		2	" "	" "
23.		1	" "	14 "
24.		2	" "	10 "
25.		2	" "	6 "
26.		1	" "	" "
27.		2	Mugil cephalus	5 and 8 inch
28.		2	Brevoortia tyrannus	4 inch
29.		4	" "	4-8 " (in nest with newly hatched young)
30.		3	" "	6-9 "
31.		2	" "	14 "
32.		1	" "	9 "
33.		1	" "	14 "(in nest with bird 2 weeks old)
34.		1	" "	14 "
35.		1	" "	14 "

Table I

Food of Brown Pelican.

No.	Date	Food				
36.	Feb. 8, 1919.	1	Brevoortia	tyrannus	14	inch
37.		6	"	"	7-8	"
38.		4	"	"	"	"
39.	Feb. 9, 1919	2	"	"	14	"
40.		1	"	"	15	"
41.		1	"	"	12	"
42.		1	"	"	12	"
43.		1	"	"	5	"
44.		5	"	" three	1	" 2, 6 inch
45.		1	"	"	14	"
46.		4	"	"	8	"
47.		5	"	"	8	"
48.		21	"	"	4-5	"
49.		1	"	"	14	"
50.		4	"	"	6	"
51.		1	"	"	14	"
52.		1	"	"	15	"
53.		1	"	"	12	"
54.		2	"	"	6	"
55.		4	"	"	8	"
56.		25	"	"	4	"
57.		25	"	"	4	"
58.		2	"	"	14	"
59.		6	"	" two	14	" Four 6 inch,

Table I

Food of Brown Pelican.

No.	Date	Food				
60.	Feb. 9, 1919.	2	Brevoortia tyrannus		14 inch	
61.		2	"	"	6 "	
62.		4	"	"	8 "	
63.		1	"	"	14 "	
64.		2	"	"	one 14 "	one 12 inch.
65.		1	"	"	14 "	
66.		2	"	"	10 "	
67.		3	"	"	10 "	
68.		5	"	"	4 "	
69.		1	"	"	14 "	
70.		1	"	"	14 "	
71.		1	"	"	10 "	
72.		18	"	"	4-5 "	
73.		1	"	"	14 "	
74.		4	"	"	8 "	
75.		1	Chloroscombrus chrysurus		7 "	
76.		4	Brevoortia tyrannus		10 "	
77.		1	"	"	10 "	
78.		28	"	"	3-5 "	
79.		5	"	"	10 "	
80.		1	"	"	12 "	
81.		1	"	"	10 "	
82.		1	"	"	9 "	
83.		1	"	"	12 "	

Table I

Food of Brown Pelican.

No.	Date	Food			
84.	Feb. 9, 1919	2	Brevoortia tyrannus		10 inch
85.		3	"	"	10 inch
86.		1	"	"	12 "
87.		1	"	"	14 "
88.		3	"	"	10 "
89.		1	"	"	8 "
90.		3	"	" two	8 " one 10 inch
91.		1	"	"	14 "
92.		1	"	"	14 "
93.		1	"	"	14 "
94.		12	"	"	6 "
95.		5	"	" one	14 " ~~six~~ four 6 inch
96.		12	"	"	4-5 "
97.		14	"	"	6-8 "
98.		6	"	"	6 "
99.		1	"	"	14 "
100.		3	"	"	8 "
101.		2	"	"	6 "
102.		2	"	"	6 "
103.		2	"	"	6 "
104.		1	"	"	10 "
105.		2	"	"	14 "
106.		3	"	"	5 "
107.		2	"	"	12 "

Table I

Food of Brown Pelican.

No.	Date	Food					
108	Feb. 9, 1919	1	Brevoortia	tyrannus	14 inch		
109		2	"	"	14 inch		
110		25	"	"	5-6 "	2	Chloroscombrus chrysurus
111		1	"	"	12 "		
112		1	"	"	12 "		
113		4	Pomolobus	mediocris	8 "	1	Brevoortia tyrannus 8 inch
114		3	"	"	8 "		
115		2	Brevoortia	tyrannus	6 "		
116		2	"	"	6 "		
117	Feb. 12, 1919	4	"	"	8 "		
118		1	"	"	12 "		
119		4	"	"	5 "		
120		2	"	"	12 "		
121		1	"	"	14 "		
122		1	"	"	14 "	10	Stolephorus brownii
		3	"	"	4 "		
123		1	"	"			12 inch
224		5	"	"	5 "		
125		1	"	"	12 "		
126		1	"	"	10 "		
127		1	"	"	12 "		
128		1	"	"	12 "		
129		2	"	"	10 "		

Table I

Food of Brown Pelican.

No.	Date	Food				
130	Feb. 12, 1919	1	Brevoortia	tyrannus	12 inch	
131		1	"	"	12	"
132		6	"	"	8-10	"
133		1	"	"	15	"
134		2	"	"	8	"
135		2	"	"	15	"
136		3	"	"	12	"
137		4	"	"	10	"
138		1	"	"	15	"
139		1	"	"	12	"
140		1	"	"	10	"
141		1	"	"	8	"
142		3	"	"	8	" 6 Chàoroscombrus chrysurus 4 inch.
143		14	"	"	5	"
144		1	"	"	14	"
145		7	"	"	8	"
146		2	"	"	15	"
147		2	"	"	8	" 31 4-5 inch
148		1	"	"	15	"
149		1	"	"	15	"
150		1	"	"	15	"
151		3	"	"	8	"
152		1	"	"	14	"
153		1	"	"	14	"

Table I

Food of Brown Pelican.

No.	Date	Food				
154	Feb. 12, 1919	1	Brevoortia	tyrannus	14	inch
155		1	"	"	12	"
156		1	"	"	14	"
157		2	"	"	14	"
158		1	"	"	12	"
159		4	"	"	4-5	"
160		2	"	"	12	"
161		1	"	"	12	"
162		1	"	"	12	"
163		2	"	"	5	"
164		1	"	"	15	"
165		3	"	"	8	"
		1	Mugil	cephalus	8	" 1 Sciaenops ocellatus 8 inch
166		25	Cyprinodon	carpio		
167		2	Brevoortia	tyrannus	8	"
168		4	"	"	8	"
169		1	"	"	12	"
170		1	"	"	15	"
171		1	"	"	12	"
172		1	"	"	8	"
173		1	"	"	12	"
174		1	"	"	15	"
175		1	Chloroscombrus	chrysurus	6	"
176		2	Brevoortia	tyrannus	6	"

Table I

Food of Brown Pelican.

No.	Date	Food			
177	Feb. 12, 1919	1 Brevoortia tyrannus			6 inch
178		1 " "			8 "
179		33 " "			3 1/2 - 4 inch
180		2 " "		one	12 inch one 8 inch
181		1 " "			12 inch
182		3 " "		one	10 inch two, 4 inch
183	Feb. 13, 1919	1 " "			12 "
184		2 " "			10 "
185		1 " "			12 "
186		1 " "			8 "
187		1 " "			12 "
188		2 " "			6 "
189		2 " "			6 "
190		1 " "			6 "
191		1 " "			12 "
192		1 " "			12 "
193		5 " "		four	10 " one 5 inch
194		3 " "		two	10 " one 12 inch
195		3 " "			10 "
196		1 " "			14 "
197		2 " "			12 "
198		1 Mugil cephalus			12 "
199		1 Brevoortia tyrannus.			14 "
200		3 " "			8 "
201		4 " "			6 "

Table I

Food of Brown Pelican.

No.	Date	Food				
202	Feb. 13, 1919	4	Brevoortia tyrannus		5 10	inch
203		1	"	"	10	"
204		5	"	"	5	"
205		2	"	"	15	" one 10 inch
206		1	"	"	12	"
207		2	"	"	8	"
208		2	"	" one	15	" one 6 inch
209		1	"	"	12	"
210		2	"	"	10	"
211		1	"	"	15	"
212		1	"	"	10	"
213		1	"	"	8	"
214		2	"	"	8	"
215		1	"	"	8	"
216		1	Pomolobus mediocris		8	"
217		1	"	"	8	"
218		1	Brevoortia tyrannus		8	"
219		3	"	"	10	"
220		4	"	"	8	"
221		6	"	"	4-5	"
222		1	"	"	12	"
223		2	"	"	8	"
224		1	"	"	12	"
225		3	"	"	8	"
226		1	"	"	12	"

Table I

Food of Brown Pelican.

No.	Date	Food							
227	Feb. 15, 1919	1	Brevoortia	tyrannus		10	inch		
228		5	"	"		8	"		
229		5	"	"	four	8	"	one 4	inch
230		1	"	"		10	"		
231		1	"	"		8	"		
232		1	"	"		15	"		
		2	"	"		8	"	1 Sciaenops ocellatus 8	inch
233		1	"	"		5	"		
234		3	"	"		6	"		
235		12	"	"		6	"		
236		8	"	"		6	"		
237		7	"	"		8	"		
238		1	"	"		15	"		
239		1	"	"		15	"		
240		6	"	"		8	"		
241		1	"	"		15	"		
242		1	"	"		12	"		
243		2	"	"	one	14	"	one 8	inch
244		5	"	"		6	"		
245		1	"	"		8	"		
246		2	"	"		12	"		

The data given above was tabulated according to number of fishes. The following enumeration has no significance as an indicator of the relative bulk of food formed by each species as a minnow two inches long has a standing equal to that of a Menhaden fifteen inches in length. It gives however, an idea of the loss of individual fish through pelicans and is thus of value.

Opposite the name of each species of fish is given the number of individuals that were noted in the 246 meals tabulated and the percentage that this makes of the whole.

The species are arranged in systematic order after Jordan and Evermann (Bull.47, U. S. National Museum).

Table II

Name	Number	Percent.
Pomolobus mediocris	9	1.1
Brevoortia tyrannus	744	91.4
Stolephorus browni	10	1.2
Cyprinodon carpio	25	3.2
Hyporhamphus roberti	2	.2
Menidia sp.	1	.1
Mugil cephalus	7	.9
Chloroscombrus chrysurus	14	1.7
Sciaenops ocellatus	2	.2
	814	100.00

On examining this tabulation it is seen that there are only two species included that are considered to be valuable food fish. These are the mullet (Mugil cephalus) and the red fish or channel-bass (Sciaenops ocellatus). Seven of the first and two of the second were included.

taken together these nine food fishes form 1.3% of the whole. The Menhaden is the main item of the food so much so that other species seem to be included more or less by chance.

Notes on Habits.

On the West coast of Florida the Brown Pelicans were not breeding and so were not gathered in numbers at the breeding colonies. When conditions were normal the birds seemed to feed from shortly after daylight until about nine in the morning when they ceased and gathered at some suitable point where they remained, sleeping, preening their feathers and resting for the remainder of the day. About 100 were found thus on the breeding ground at Indian Key where they were resting in the mangroves. These birds when driven out returned at sunset to spend the night. Another flock of the same size was seen at Pass- a- grille where the birds occupied a sandbar a short distance off shore. Smaller parties were encountered elsewhere. Near Bradentown pelicans flew across each evening from the Manatee River to Sarasota Bay flying over high in the air.

Frequently however the birds fished all day long especially when they were taking small fish such as sardines. Fishermen who were reliable told me that at times they had seen the birds fishing on bright moonlit nights.

In feeding Brown Pelicans circled about over the water flapping until they gathered momentum and then sailed along with set wings in a gradually descending curve. When near the water they rose again for another observation. In flight the neck was drawn in and the bill extended straight ahead so that it rested on the recurved neck. The head was turned alertly however to watch fish that appeared at one side. When fish were sighted in a suitable position the pelican turned abruptly and darted directly

down with surprising speed without checking speed in the least. As the water was entered the bill was opened and thrust forward with a scooping motion. In case the fish surged ahead the neck was extended with a quick dart. At times this movement was at a lateral angle so that the birds struck the water on one side but immediately righted themselves never becoming overbalanced so that they turned on the back. On assuming an erect position on the surface the bill was drawn slowly up to drain the water from the tip without carrying the fish with it. The bill was then thrown up and out and the fish were swallowed. This process often was aided by a quick motion of the tongue and hyoids that loosened the fish from the walls of the pouch so that the tongue in spite of its rudimentary condition seems to have a certain function. When gulls came up in an attempt to rob, the pelicans turned their backs to them often whirling round and round to evade attack. Occasionally when fish were running deep the pelicans dived from a height of 50 feet, struck the water perpendicularly, and went clear beneath the surface. After observing the feeding habits of these birds the extraordinary development of the air cells lying between the skin and body may be readily explained on the ground that these act as buffers in protecting the muscles beneath from bruising and injury from the impact with which the bird strikes the water. This emphysematous condition may be thought then to have arisen in the diving species and to have persisted in those forms in which it now has no value. That it is used for the purpose described is shown by the fact that the air cells are especially numerous on the anterior part of the body where most of the shock is received.

At Pelican Island during the work of securing data on the food of these birds I had abundant opportunity to make observations on their habits. The birds were more or less unafraid and by moving about slowly without

abrupt motions of hands or head it was possible to approach them or pass near them without trouble. A blind for use in observation or from which to take pictures was not needed. I was able to secure any number of pictures of adult birds at distances of from fifteen to twenty-five feet and occasionally made exposures at six feet. In approaching the birds it was necessary only to move slowly and to avoid looking directly at the individuals that I desired to approach.

There was much squabbling and fighting among the adults over nesting material and nesting sites. Males brought nesting material to their mates and though frequently the sticks to be used were picked up only a few feet away the male often rose and circled around on the wing and then returned to pass the material over to his mate at the nest. Evidently supplies from a distance are more valuable than those from nearby! Copulation took place on the nest or on the ground near it with the male grasping the female by seizing her neck in the middle of his long bill. At the nest the two often went through grotesque awkward movements with the neck extended and the pouch drawn down while the birds emitted the curious aspirating, sighing sound that seems to form the only note of the adult. Birds that had not nested gathered on the flats in close flocks adjacent to the rookeries. At times they circled high in the air above the island or the river opposite. The birds turned in great spirals with set wings but were widely scattered in small groups and did not maintain the close, regular formation that makes the aerial evolutions of the white Pelican so impressive and beautiful to observe.

There was much fighting among birds not yet settled on nesting sites. Some females attempted to appropriate whole nests and on one occasion I saw a female ousted from two nests in succession. Males advanced toward

her striking with their great bills while she fenced with hers in an attempt to ward them off. In fighting one pelican often seized the upper mandible of another and held firmly while the two pulled back and forth. Though strong in pulling the birds seem to have little strength in lateral movement in their necks. The effort in fighting thus was to force the bill of the opponent to one side and then with a sudden thrust to pin the opposing bird to the ground with its head twisted completely around, when it was unable to move until released. In one case one of these birds caught the tip of its own bill behind one wing and struggled for two or three minutes before getting free. Often two fighting birds climbed finally into a nest side by side where they were unable to seize one another because of their close proximity, which rendered their great bills, clumsy and awkward in any lateral movement, useless. After a few minutes however the usurper was crowded out.

The eye of the pelican is much more freely movable in its socket than in most birds. The eyes are rather prominent and project slightly. In looking at various objects the eyeball is rotated about so that in most cases it is not necessary for the pelican to turn its head. This development may be a compensation in part for the long bill and the heavy pouch that bring about the characteristic resting attitude in which the bill rests on the forepart of the neck, making it more of an effort to turn the head about than in most birds.

Birds at rest frequently opened the bill and drew the lower mandible down on the bend of the neck so that the rami slipped down on either side and the pouch was turned half out. This thrust the upper end of the trachea up far beyond its usual level. Usually the upper mandible was then closed down upon this with gentle pressure and a slight rubbing motion. Following

this the bill was thrown directly up and slightly back beyond a perpendicular line with the mouth still open. At the same time the tip of the lower mandible was spread in a bow so that it measured at least eight inches across the tip. This stretching perhaps gave some relief from the irritation caused by the Mallophaga (Menopon titan) that were attached in pairs to the inner walls of the pouch near the gape where they clung with their jaws while in copula. Many times during this stretching the pelicans shook the head slapping the sides of the pouch and perhaps occasionally getting rid of some of these parasites.

Pelicans dressed their feathers deftly with their great bills, working carefully to squeeze the water from their breast feathers. The pectinated middle claw was used frequently in scratching the sides of the head and neck, producing a scuffing rasping noise as audible as the scratching of a dog infested with fleas.

The full complement of eggs in a nest was three. These were chalky white in color but as incubation proceeded became much stained with excrement and other dirt. Many of the females seemed to experience some difficulty in ovipositing as the greater part of the fresh eggs examined were streaked with blood. These streakings were broad and began about one fourth of the length from the small end of the egg. From that point they extended toward the large end being most prominent over the central bulge. At one side on the large end there was usually the imprint of the distal end of the oviduct outlined in blood, impressed apparently as the egg was extruded. The streakings were uniformly present on all three eggs in the set. These markings might be attributed to a prima passu on the part of a young female breeding for the first time were it not that they were present on so many of the eggs examined. As the oviduct

shrinks away to such an extent at the close of the breeding season it may be supposed too that previous use would be of little moment in toughening the lining. The abrasion must be due to the roughness of the calcareous shell and the rapidity with which it hardens as the size of the egg is not excessive when compared to the bulk of the bird depositing it. I do not recall having seen this streaking of blood on the eggs of other species of birds that have come to my attention.

Young Pelicans when first hatched are entirely naked and seem to feel cold severely, so much so that if deprived of the protection of the parents for any length of time on cold days they sometimes perished. The air-sacs that attain so remarkable a growth in the adults were well developed in the young especially about the neck and fore part of the body. When a few days old if left uncovered the young settled down in the nest and remained with the air-sacs fully distended. By providing a dead air space the sacs in this case must have aided materially in keeping the body warm, a use for them that has not been recognized previously.

Young birds when only a day old seemed ravenous for food and pecked eagerly at my fingers. They were fed on small menhaden that usually were partly digested. On one occasion I took a menhaden four inches long from the throat of a bird not more than a day old as the opening of the yolk-sac in the abdomen was not closed. This bird had its eyes open and swallowed the mass of fish again immediately. Many times when food was scarce these young were given fish too large to swallow. At times the feeding instinct seemed to come to parents before it was required as it was not unusual to find fish in nests containing heavily incubated eggs. Until they were able to move about the young seldom regurgitated when I approached and when food was forced up in their throats swallowed it immediately when released.

A biting fly gathered in groups of from two to twenty on the back of the head on the young birds, at the summit of the curve in the neck, so that the bird was unable to dislodge them by rubbing them on the back. Frequently the bites of these insects drew small drops of blood, and at times sores were occasioned by their attacks. Specimens of these flies collected for identification unfortunately were lost.

The callnotes of the young were loud and vociferous and at a distance somewhat resembled the squealing of hungry hogs. Young unable to walk called and struck at me angrily when I approached while older birds though often vociferous showed more fear. The young continued to call after they were able to fly but the only utterance heard from adults was the curious aspirating call that has been described. From its sound this may have been made by forcing air through the narrowed opening of the glottis past the compressed epiglottidial process that in the pelican projects from the anterior end of the thyroid cartilage.

Mortality among the young was high and I believed that adults did not succeed in rearing more than three young to every four pairs of birds, in spite of the number of eggs deposited. This mortality was due in part to trampling by the adults but more to difficulty in securing fish to feed the smaller young. Well grown young were probably able to continue without food for two or three days with no ill effect apparent but younger birds were not so resistant. Often I found birds under three weeks old that were so weak that they were unable to hold the head erect. Such partly starved birds were unable to stand cold to any marked degree. I suspected too that the adult pelicans often were not overly devoted to their offspring so that young were at times deserted and left to die. With these facts understood there need be no fear of excessive increase in the pelican population,

through the protection accorded them in spite of repeated statements of fishermen to the contrary. I was of the opinion that mortality was lower among birds reared in tree nests than among those hatched on the ground in the open. This was due to the more protected nesting site when chosen among the dense mangroves and to the fact that young in tree nests did not begin to wander about until they were well grown.

In the mangrove colony young of various ages sat in their nests or on the limbs nearby. As I approached those among the open branches frequently returned precipitately to their own nests or crowded in with other birds. Here they seemed to consider themselves safer. Often these young sought haven in nests containing sets of eggs where they manifestly did not belong. Half grown pelicans clambered in and out of nests placed three or four feet from the ground with little apparent trouble. In the trees the birds walked about on the tough, flexible branches of the mangroves with long reaches of their great feet spreading their wings wide and balancing by pressing them on the branches on either side. At the same time the bill was hooked over limbs ahead and so aided in pulling along. The head was used especially in climbing up as the birds reached up and swung the bill over limbs above and then clambered up to this new hold. Young birds on the ground gathered in little groups that scrambled along ahead of me waddling, falling and clambering over obstructions. When half grown the birds swam with ease and took to the water readily.

On days when the wind was high adult pelicans frequently had some difficulty in rising on the wing. When on the ground on such occasions they ran rapidly away to one side when openings permitted. When cornered in brush through which they were unable to penetrate easily they stood their ground until the last minute hissing and clapping their bills loudly.

I caught several to examine them and to take bodytemperatures and found that they were able to bite fiercely though their neck muscles were weak so that it was easy to hold them. When birds rose in flight from among groups of others the neighboring pelicans realizing their clumsiness watched closely and ducked their heads quickly when necessary to avoid being struck, often biting angrily at the flying bird as they did so . Once on the wing the pelicans were complete masters of themselves.

Though the broad webbed feet of the adults seemed clumsy they perched with ease on the tough slender branches of the mangroves maintaining a hold with no apparent trouble. In alighting the birds balanced a moment and then had no further trouble in keeping their equilibrium and they moved about with more or less freedom. It has been stated that in life there is no character available by which the sex of adult pelicans may be distinguished. On observation however I found that the two sexes were in many cases readily told apart by their size, the male being distinctly larger than the female. This difference was well shown in the length of the bill which was one and one half to two inches longer in males than in females. In groups of pelicans it was often a simple matter to pick out the males with a considerable degree of accuracy and also at times to distinguish the sex in single birds after I was well accustomed to their appearance. Subsequent measurements made from museum specimens substantiated this character noted first in field observations.

Amount of Food consumed by Pelicans.

The quantity of food consumed by pelicans in most cases has been grossly exaggerated. It is the opinion of the writer that the birds normally feed but once a day. The statement is made commonly that each pelican consumes ten pounds of fish per day. In regard to this the fol-

lowing statement from N. Hollister, Superintendent of the National Zoological Park, Washington, D. C., (written March 19, 1919) is of interest: "The Brown Pelicans in the National Zoological Park eat each from one to one and a half pounds of fish per day. That this is enough to keep the birds in excellent condition, even in the large flight cage where they get plenty of exercise, is shown by the fact that two specimens received from Orlando, Florida, September 6, 1899, are still living in good health after twenty years of such scanty diet. Another specimen from Mexico has been here eight years."

It can hardly be believed that birds in a wild state would consume much more. Certainly a maximum of two pounds per day would be ample for birds at freedom where they secured constant exercise. With this fact in view the estimates of fish consumed by pelicans, whether such fish are of value as food or not must be greatly cut down.

Summary.

Serious complaint has been made in recent years that Brown Pelicans in Florida were responsible for the marked decrease in food fishes and many have protested against the protection afforded the birds in their breeding colonies on bird reservations. Complaint was made especially that they were responsible for the marked lessening in the catch of mullet.

Inquiry among fishermen revealed that opinion was about evenly divided in regard to the alleged damage so that as many of these men considered that pelicans were not injurious as there were that believed the reverse. The majority of fish useful for human food are species that normally swim deep where pelicans cannot reach them. The mullet is the only one that habitually runs in shallow water. In field observation it was found that these fish were so swift and alert that it was seldom that

pelicans could capture them. For this reason the birds seldom paid attention to them. Pelicans however at times were a nuisance about gill nets when the fishermen were making sets for mullet as they attempted to steal the fish and were said to tear the nets at times in these endeavors.

At Pelican Island in the Indian River data was secured on 246 meals of adult and young Brown Pelicans. In a total of 814 fishes composing these there were seven mullet and two channel bass, a total of 9 fishes valuable as food or 1.3% of the entire amount. The remainder (98.7%) was made up entirely of fish that are not considered of value for food. Five additional species were represented among them and of these the Menhaden was the most abundant as it formed 91.4% of the entire amount.

Pelicans are said to be destructive to mullet during the spawning period but as the manner in which those fish spawn has not been definitely determined the damage claimed is open to question. Any decrease in the supply of fish must be attributed to wasteful methods in fishing and non-enforcement of existing laws protecting fish. Within comparatively recent years mullet were many times seined for sale to fertilizer plants and twenty-five years ago this was common practise. Among natural enemies sharks and porpoises are very destructive as they are able to secure deep swimming fish and are not restricted to those that appear near the surface as is the pelican.

From present evidence the Brown Pelican cannot be considered harmful.

Respectfully submitted

A. Wetmore

Washington, D. C. May 13, 1919.

Memorandum: Proposed title and outline for Year Book Article.

The Brown Pelican in relation to the fishing industry.

(1) Federal reservations for breeding pelicans in Florida.

~~Complaints made against these birds by fishermen.~~

(2) Complaints of destruction of food fish made against these birds by fishermen.

(3) Investigation of food of adults and young proves these groundless.

(4) These studies indicate need for protection for pelicans and similar birds.

A.W.: Du.

A report on Damage by Rodents to sugar cane in Florida.

Itinerary.

In accordance with instructions an investigation was made between Feyruary 17 and 20, 1919 of reported damage by rodents to sugar cane in reclaimed areas in the Everglade region near Fort Lauderdale, Florida. Time available did not permit ~~field~~ field work in other regions but inquiries were made regarding the matter in Miami on March 3rd. At Fort Lauderdale field work was carried on in a limited section three and one-half miles south-west of town.

Introduction.

The region in question is an area of so-called "muck" land that has been opened recently to cultivation. A large canal in which the water level varies with the tides comes in to this tract and ditches ten feet wide and four feet deep connected with this traverse the country at intervals. Smaller ditches run as laterals and cut the entire area into a series of small squares. Part of these tracts were under cultivation last year and a part had lain idle so that they were covered with a heavy growth of weeds furnishing abundant cover for rodents. Sugar cane had been planted in small tracts of a few acres each as an experiment to determine its feasibility as a crop. From a cultural standpoint it seemed to do weal and indications are that a considerable acreage will be devoted to it as much of the region around Lake OKeechobee that has been drained is said to be suited for it.

Damage to cane.

As has been stated cane was grown only in small tracts; all that were examined showed more or less damage from rodents,

As is shown in the following statement(in which the percentage given indicates extent of loss.)

S. J. Carson	2 acres	total loss.
"	3 "	25 per cent
"	2 "	50 per cent
H. B. Hamlin	4 "	2 per cent
Dr. Friday	2 "	5 per cent
Mrs. Lawrence	2 "	5 per cent

In some of the areas the stand of cane was light, a condition that may have been due to rodents destroying the "eyes" in the planted cane though no information as to this was available. Most of the observations recorded were made in fields belonging to S. J. Carson as damage here was more severe then elsewhere.

It was discovered that the trouble was due mainly to the Cotton rat (Sigmodon hispidus). A small part of the damage was attributed to the swamp rabbit (Sylvilagus p. paludicola), and the Rice rat (Oryzomys palustris) seemed to feed on cane to some extent apparently at cuttings made primarily by the Cotton rat.

The stalks of cane were cut down at the base by being gnawed completely through. Sometimes the work stopped here. Again when the stalks lay prostrate every section was cut out completely between the nodes, leaving the whole connected only by a band of the tough outer fibre. In cutting the animals discarded the tough fibrous coat surrounding the stalk so that this lay in fragments in little piles, while the pithy interior with its sweet juice was eaten. Bent over or fallen stalks that were covered by weeds, leaves or rubbish so that they were under cover, were more frequently eaten than those that lay in

the open. Stomachs of trapped individuals of Sigmodon were distended with the pulp and the sweet juice of the cane. The stomach of this animal is much larger in proportion to its bulk of body than is the case in Oryzomys.

The Swamp Rabbit (Sylvilagus p. paludicola) was common in this region and was responsible for a small part at least of the damage. Old droppings of these animals were in many cases made up entirely of remains of cane pulp. One that was shot however had the stomach filled entirely with other matter.

Under normal conditions cane in these fields would have been harvested in December. As it happened, there was no syrup mill convenient at that time, and this cane was left standing for use as seed for the following crop. Had it been cut at the proper time the amount of damage would have been greatly lessened.

Habits of the Cotton Rat.

The slightly elevated ditch banks that run through the cane fields formed the main habitations of the cotton rats and in these the animals lived apparently in colonies about which the ground was made soft by their burrows. The base for these runs was often the crab holes tunneled in the ground. Broad, poorly defined runways extended through the grass and rubbish along the ditch banks, sometimes continuous for ten or fifteen feet but more often definitely outlined for distances of from one to three feet only. From these poorly marked trails led out into the cane. At the bottoms of the ditches burrows often opened into the mud and water and long runs were found in such situations so that Sigmodon seems to pay little attention to wet. The animals were more or less active by day and

were seen frequently as I worked through the cane.

They are more or less carnivorous apparently as many of the specimens caught in traps had been partly eaten.

Experiments with Poisoned Baits.

Three quarts of sweet potato baits cut into half inch cubes were poisoned with a mixture of powdered strychnine and sodium bicarbonate sifted over them. These baits were distributed singly in holes and a along the runs in the ditch banks at distances of 8 or 10 feet. On the following morning examination showed that 50 per cent or more of the baits had been nibbled and some nearly consumed. Matted vegetation[illegible]-abundant cover and holes were frequent, but in a search made twelve dead Sigmodon were discovered. It was significant that these had not been eaten as had been the case in trapped specimens. On the following morning 8 more all of them young were found on the same area. This bait would have been improved by the use of Saccharin.

A second bait was made with oatmeal poisoned with strychnine and saccharin in solution in hot water. This bait was spread in little heaps containing approximately a teaspoonfull placed in the runs and at the entrances of holes. It was used on an area contiguous to that poisoned by the other method. On the following morning twelve dead animals were picked up. Time did not permit intensive trapping as a check on the efficacy of these poisons but from observation it was believed that their use was very successful. The area covered comprised two acres in each case and in both cover was so abundant that it was difficult to find dead animals.

The areas given to the culture of cane will undoubtedly be increased next year and it is thought that there may be considerable damage to it by the Cotton Rats. It is the belief of the writer that

the destruction of the "eyes" in the seedling cane will prove to be of more importance than the actual eating of the matured stalk as in most cases this latter will be harvested before serious damage can result.

Damage to other crops.

Serious complaint was made of damage to tomato and pepper crops by mice and it was supposed that these were likewise the Cotton rats. Examination of one or two fields showed tomatoes and peppers that had been partly eaten by some rodent but I was unable to establish definitely what it was. It was noticed that a number of plants had been topped by the abundant swamp rabbits.

A. Wetmore

March 19, 1919.

3-5-19.

Fort Pierce, Florida, Feb. 21, 1919.

Mr. Alexander Wetmore, Ass't Biologist,

Bureau of Biological Survey,

U.S.Department of Agriculture,

My Dear Mr. Wetmore:

We of the Florida Federation are always glad to welcome represen-tatives of the Department of Agriculture to our beautiful Royal Palm State Park, as we have received most courteous treatment as well as helpful co-operation and encouragement from such scientists as have visited the Park and certain greatly appreciated favors from the head of the Department.

Our Board of Directors has ordered that permission be given for the collection of various scientific specimens, free to the Government and our State Institutions, so I take it that you may collect such specimens as you mention, since you come in an official capacity. We greatly enjoyed Mr. Howells and felt that we gained a great deal from his visit and the talks he gave. Mr. Mosier will gladly assist in such ways as he can, and I am sure you will find him very intelligently helpful.

Hoping that your stay in the Park may be pleasant and interesting, I am

Sincerely yours, Mrs. Edgar Lewis
President, F.F.W.C.

letter 2/17/19.

Mrs. Edgar Lewis
Fort Pierce, Fla.
Pres. Florida Federation of Women's Clubs

Chas. A. Mosier
Homestead, Fla.
Warden Royal Palm State Park.

Prof Chas. T. Simpson
Little River, Fla.
take bus from Miami.

Edward. Simmonds Dept. Agric.
Miami, Fla Plant Inspector.
Phone

T. Van Hyning
Curator Florida State Museum
Gainesville, Fla

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

Night Letter

Washington, D. C. February 20, 1919.

Alex Navarro,

Homestead, Florida.

Your work came not sufficient. Wire Rayner, Manager Swan Island Club, Knotts Island, North Carolina, and J. B. White, Waterlily, North Carolina, for information swan malady. Conditions may not warrant trip. If not, spend more time in Florida. Make special effort to see Williams. If North Carolina conditions urgent proceed according to your plan.

HENDERSON.

CLASS OF SERVICE	SYMBOL
Telegram	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a telegram. Otherwise its character is indicated by the symbol appearing after the check.

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT — GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

03 26 15 26 47

RECEIVED AT

44JD ~~19~~ COLLECT Govt account

VIA SNOWDEN

WATERLILLY NC 130P FEB 19-19

A WETMORE,
FTLAUDERDALE, FLO

HAVE ONLY SEEN THREE SICK SWAN YET THEY LEAVE HERE
ABOUT THE MIDDLE OF MARCH NO SICK DUCKS

JASPER B WHITE

240P

Acct Biological Survey

Proceed Homestead Florida ~~to~~ twentieth. ~~Hold~~ ~~mail.~~ ~~Unless otherwise ordered~~ investigation cane damaged by rats made here. Unless ~~xxx~~ otherwise instructed shall not continue this ~~further at other points~~. Have determined species concerned and carried on successful ~~experiments~~ Foram. Plan start Currituck Sound twenty-fifth. ~~Hold~~ Unable to get in touch with Shellfish Commissioner Williams. Shall yet leave without seeing him. Hold mail.

Form 1204

CLASS OF SERVICE	SYMBOL
Telegram	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a telegram. Otherwise its character is indicated by the symbol appearing after the check.

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT

GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

CLASS OF SERVICE	SYMBOL
Telegram	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a telegram. Otherwise its character is indicated by the symbol appearing after the check.

26

RECEIVED AT 28 JD

FTLAUDERDALE, FLO

YOURS 18 POYNER UNABLE PHONE KNOTTISLAND WE MAIL

DESK 2, NOFFOLK VA FEB 19-19

1033AM

A. Wetmore
New River Hotel

Feb. 28 Lv. Key West 7:30 P.M. Lv. Miami 10:40 P.M. Feb 25. 23.
Mar. 1 Arr. Jax 2:30 P.M. Arr. Jax 11:30 A.M.

Mar 1 Lv. Jax 9.45 P.M. Feb. 26 24
Mar 2 Arr. Rockymt. 7:40 A.M.
Mar 2 Lv. ... 8:35 A.M. 1.06 P.M.
Mar. 2 Arr. Norfolk 1.50 P.M. 5:45 " Feb. 27 25
Mar. 3. Arr. Boston Feb 28

Form 4b.
Approved by the Comptroller of the Treasury
May 28, 1914.

SUBVOUCHER FOR MEALS AND LODGING.

No. 8

$ 16 00/100

City or Town, Sebastian, Fla.

To be completely filled in before signature by payee, and there must not be any erasure or other alteration whatever.

Name of Hotel, _____

Date Feb. 15, 1919

RECEIVED IN CASH OF Alex Wetmore

U. S. DEPARTMENT OF AGRICULTURE Sixteen and 00/100 Dollars,

for MEALS and LODGING from Supper Feb. 7, 1919, to dinner, Feb. 15, 1919, inclusive.

Time covered, 8 days, at $ 2 00 per day.

If charge for fractional part of day is greater in proportion, it must be explained HEREUNDER.

I certify the foregoing to be correct.

(Signature) Mrs G. A. Cain

(DO NOT SIGN IN DUPLICATE.)

(Title) Prop.

USE ONE SIDE ONLY.

8—2707

Form 4 b. USE ONE SIDE ONLY.

Approved by the Comptroller of the Treasury May 28, 1914.

No. _____

Subvoucher for Supplies, Livery and Miscellaneous Services, and Expenses.

U. S. Department of Agriculture.

To _____, Dr.

Address: _____

_____, 191 .

For _____		
TOTAL, - - - - - - - - $		

TO BE COMPLETELY FILLED IN BEFORE SIGNATURE BY PAYEE, AND THERE MUST NOT BE ANY ERASURE OR OTHER ALTERATION WHATEVER.

RECEIVED IN CASH this _____ day of _____, 191 , from _____

_____ Dollars, in full
100
of the above account, which I CERTIFY TO BE CORRECT.

Do not sign in duplicate.

(Signature) _____

(Title) _____

Witness to signature by mark.

_____ _____

(Name.) (Address.)

Palmyra Notes on Fishes.

1. Tylosurus marinus - Needle fish.

Caudal peduncle depressed.

T. notatus which may occur has the caudal peduncle compressed and the tips of fins & tail black and in life.

2. Fundulus majalis

♀ 2 or 3 dark horizontal stripes ♂ about 12 crossbars & dark dorsal ocelli.

Fundulus heteroclitus

♀ nearly plain. ♂ dorsal ocelli faint or wanting.

3 Opisthonema oglinum - Thread Herring.

similar to Menhaden but has elongate, longer than head.

4. Menidia peninsulae Silversides

Small herring like fishes. silvery in color with silver side stripe bordered with black. Anal Rays I, 15-18,

M. menidia has Anal Rays I, 22-24.

5 Brevoortia tyrannus Menhaden

Posterior Ventral scales strongly keeled. Dorsal filament short not produced. (shorter than head.

6 Raja notatus ?

Rajidae - no serrated dorsal tail spine.

Dasyatidae a serrated dorsal tail spine

7. Hypsäema cinereum Mojarra.

Second interhaemal spine long

propercle entire. ~~(pectoral rays long)~~

Gerres has propercle serrate and second interhaemal spine very long.

8. Cyprinodon carpio

Cyprinodon has bicuspid incisors

On this genus the sides are coppery colored.

9. Ophichthyidae - Snake eels.

Eels with no caudal fin.

No fins, ~~dorsal pectoral~~ Verma

Dorsal fin present no anals or pectorals Letharchus

" " " also " and " Bascanichthys

Bascanichthys scuticaris.

10 Opsanus sp.

11. Lepomis sp.

12 Symphurus plagiusa, tongue fish
Color & eyes on left side.

13. Archosargus Sheepshead.
pectoral long. a procumbent spine
in front of dorsal.
Archosargus probatocephalus
Common Sheepshead.
" uniniculatus
differs from A. prob. in having
a distinct dark humeral spot,
& thin occipital crest.

14. Mugil cephalus.
Ventral spines present abdominal
Dorsal fins 2, anterior with 4 strong
spines, posterior with rays. no
lateral line, teeth small subequal
Ventral fins I, 5.

TELEPHONE 6160

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DECATUR
ILLINOIS

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

February 14, 1919.

Dr. Alex. Wetmore,

Sebastian, Florida.

My dear Wetmore:

Your request for photographic films has been filled to the extent of the stock now on hand. If you need more, please let us know. As indicated in our telegram we have a considerable number of pictures of pelicans taken at some little distance from the birds. The views that are most desirable therefore, are those made as close as possible and illustrating the nest, eggs, and young, rather than the adult birds.

Checks for salary have been sent you at Bradentown and Punta Gorda. If you have not received them you should write to the Postmasters at these points regarding them.

All of the cameras in stock are now in use in the field so that it will be impracticable to give you the camera you formerly used. However, the negatives you are securing with this one are very good. In conclusion, I may say that the name of the manager of the Swan Island Club is Poyner. Mr. Moses Williams of Boston is the president. You may have to hurry your Florida work to get back to Currituck Sound before the swans leave. In order to get definite information on the date they usually leave and as to whether very many sick birds have been observed this year, it might be well to write or telegraph, as you think best, to Mr. Poyner, whose address is Knotts Island, N. C., and to Mr. J. B. White, Waterlily, N.C.

Buchanan has just reported that he has been discharged from the army and after a vacation period will be already to return to work. With best regards.

Sincerely yours,

W. L. McAtee

Tab. 12

1.	4	10	Romarna	12	m
2.	1			12	
3	4				
	2			17	
				14	
6	1			14	
7	1			12	
8	1			5	
9	1			12	
10	1				
11	1				
12	1			12	
13	1				
14	1			12	
15	1			12	
16	1			8	
17	1			15	
18	2			8	
19	4			5	
20				2	
21	4			2	
22	1			2	
23	1			2	
24	1			13	
25	1			8	
26	3			5	
27	14	Mankadan		5	
28	1			11	
29	7			8	

30	2			13	m
31	31	Mankadan			
32	1			12	
33	1				
34	1				
35	1			11	
36					
37					
38				14	
39					
40	1			14	
41	2			14	
42	1				
43	11			4.5	
44	2			2	
45	1			12	
46	1			12	
47	3			8	
48					
49					
50	4				
51	1			12	
52				15	
53	1			12	

215
2:104.5

54	10	Romarna		8	m
55				12	
56	1			15	
57	1	Kyttarna		6	
58	1	Romarna		6	
59	1			8	
60	33	Mankadan		3½	m in
61	10	Romarna		12	m in
62	1			12	m
63	1			18	m 2 Mankadan

746.13.
106.3

1	10	Romarna	12	m	
2	2		10		
3	1		1		
4	1		8		
5	1		12		
6	2		6		
7	2		6		
8	1		6		
9	1		12		
10	1		1		
11	4		5		1 Mankadan
12	2		10 m	12	m in
13	3				
14	1		12		
15	2		12		
16	1	Mankadan	12		
17	1	Romarna	14		
18	3		8	m	
19	4		6	m	
20	11	Mankadan	5		
21	1	Romarna	10		
22	5		5		
23	1	10	15		m 16

24	1	Romarna	12	m	
25	2		8	m	
26	1		15	16	m
27	1		12		
28	1		12	m	
29	1		13	m	
30	1		16	m	
31	1		8	m	
32	2		8	m	
33	1		8		
34	1	Chipawa	8	m	
35	1		4	m	
36	1	Romarna			
37	1				
38					
39	6	Mankadan	4.5	m	
40	1	Romarna	12	m	
41	2		8	m	
42	1		12		
43	3		8	m	
44	1		12	m	
45	1		10	11	
46	5		5		
47	4		7		1 Mankadan
48	1		10		

49	1	Romarna	7	m	
50	1		13	m	
51	2		9	m	1 Redfort 7 m 1 Mankadan
52	3		6	m	
53	12	Mankadan	6	m	
54	2	10 Romarna	6	m	
55	7		8	m	
56	1		15		
57	1		15		
58	6		8	m	
59	1		15		
60	1		12		
61	1		14		18 m
62	5		6		
63	1		8		
64	2		12		

15
23
78
66
64
246

1	2	Manhaden	14 in
2	1	"	15 "
3	1	"	12 "
4	1	"	12 "
5	1	"	5 "
6	1	"	12 in 2 6 "
7	1	"	14 in
8	1	"	8 in 3 Menhaden
9	2	"	" 3 "
10	21	Menhaden	4-5 in
11	1	Mossbunker	14 in
12	4	"	6 "
13	1	"	14 "
14	1	"	13 "
15	1	"	12 "
16	2	Menhaden	6 "
17	4	Mossbunker	8 "
18	25	Menhaden	4 "
19	25	"	" "
20	2	Mossbunker	14 "
21	2	"	14 2 in, 21 Menhaden
21	1	"	16 in
22	2	"	" "

1	2	Mossbunker	9 in
2	1	"	9 "
3	1	"	9 "
4	1	"	9 "
5	1	Menhaden	6 in 11 8
6		Mossbunker	
7	2	"	
8	1	"	14 in
9	2	"	4 in
10	1	"	4 in
12	2	Menhaden	1 5 1 8 in
13	2	Mossbunker	4 in
14	4	"	4-5 in
	in mat with mud		[illegible]
15	3	"	6-9 in
16	2	"	16 in
17	1	"	9 in
18	4	"	14 "
	in mat with mud		[illegible]
19	4	"	4 in partly digested
	4	Menhaden	
20	1	Mossbunker	14 in
21	1	"	"
22	6	"	7.5 "
23	4	"	"

24	1	Mossbunker	9 in
25	1	"	14 "
26	1	"	14 " 1 12 in
27	1	"	14 in
28	2	"	10 "
29	1	"	10 " Menhaden
30	5	Menhaden	4 in
31	1	Mossbunker	15 in
32	1	"	"
33	1	"	15 in
34	5	Menhaden	4-5 in
35	1	Mossbunker	14 in
36	4	"	8 in
37	1	Menhaden	"
38	4	Mossbunker	10 "
39	1	"	10 "
40	25	Menhaden	3-5 in
41	5	Mossbunker	10 in
42	1	"	12 in
43	1	"	10 "
44	1	"	9 "
45	1	"	12 "
46	2	"	10 "
47	3	"	10 "
48	1	"	12 "

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

DAY

Washington, D. C. February 10, 1919.

Alex Wetmore,

Sebastian, Florida.

Film sent today. Specialize on close up views. About thirty.
We have plenty of others.

Chief of Bureau.

CONFIRMATION OF TELEGRAM.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C. February 8, 1919.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

Mr. Alexander Wetmore,
Assistant Biologist,
~~Bureau of Biological Survey.~~
Sebastian, Florida

Dear Sir:

In the examination of your reimbursement account for the period January 14, to 31, 1919, payable under authorization No. 323-Bi (Food Habits of Birds and Mammals), it has been necessary to suspend the following.

January 15. Waiter fees enroute from Washington, D.C., to Jacksonville, Florida. $0.20

Information is necessary to show in what state or states these fees were paid.

Amount claimed	$106.70
Amount suspended	.20
Approved for	$106.50

Very truly yours,

Executive Assistant,
In Charge of Accounts.

2-17-19 -

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

February 4, 1919.

Mr. Alexander Wetmore,

Sebastian, Florida.

Dear Wetmore:

Mr. Nelson asks me to remind you of the investigations relating to killing of egrets in Florida at present and traffic in their plumes. If you have learned anything of interest in this connection he wishes you tosend it in now, as he will have need for all data on this point very soon.

Your second shipment of specimens was safely received and attended to as you desired. I have learned the names of some of the last lot of plants sent and inclose them on a separate sheet.

I will add, also, that the botanies desired by you were mailed to Punta Gorda, in case you have not received previous letters giving this information.

Sincerely yours,

W. R. McAtee

Assistant Biologist.

Form Bi-200 c.
July, 1916.

UNITED STATES DEPARTMENT OF AGRICULTURE.

No. .....

BUREAU OF BIOLOGICAL SURVEY.

REQUISITION FOR SUPPLIES—REQUISITIONER'S COPY.

Feb. 1st, 1919

Chief Clerk,
Bureau of Biological Survey.
The following articles are needed for official use at .....
(Shipping address.)

(*Signature*) W. R. McAtee

(*Official title*) .....

QUANTITY.	ARTICLES.	√	REMARKS.
one	Stud tape		
one	ounce saccharine		
½	doz Schuyler Rat Traps		
½	" Auto Light Rat "		
6	sheets Wrapping paper		

INSTRUCTIONS.—Requisitions for supplies should be made quarterly so far as practicable; at other times only in case of emergency. Prepare requests in triplicate, forwarding Forms Bi-200 a and Bi-200 b to the Bureau and retaining this form (Bi-200 c). No letter of transmittal is required unless an explanation is necessary. Make no entries in columns 3 or 4 or in the space provided for number. Form Bi-200 b (invoice) will be returned for receipting when supplies are shipped and requisitioner should note any changes in request on his retained copy. Articles of nonexpendable property should also be noted and must be taken up and accounted for on next annual property return (see paragraph 46, Property Regulations).

8—3511

check mailed 2/15/19

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 30, 1919.

Dr. Alex. Wetmore,
Assistant Biologist,
Bradentown, Fla.

Dear Dr. Wetmore:

When I mailed your check a few days ago covering balance on salary for the period January 1 to 15, 1919, in connection with your recent promotion, I failed to call attention to the fact that a refund would be necessary from you, in the amount of $5.00, being the increase of compensation paid for the first half of January. In view of your recent promotion the increase of compensation will have to be discontinued, effective December 31, 1918. Will you therefore kindly send us a check made payable to A. Zappone, Disbursing Clerk, in the amount of $5.00?

Very truly yours,

W. W. Cheesman.

Executive Assistant,
In Charge of Accounts.

2-6-19

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C. January 28, 1919.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

Dr. Alex Wetmore,
Assistant Biologist,
Bradentown, Fla.

My dear Wetmore:

I am glad to have your report of progress, from which I note that field work is bringing the usual series of mishaps. However, you seem to be in the proper place to get information on the problem with which you are concerned. The specimens shipped by you have not yet been received with exception of a package of plants in envelopes. *

The Orthopterous insect you inquire about probably is not a locustid, but an acridid of the genus Tryxalis. All of the locustids as far as I know, have long slender antennae.

By correspondence with Hon. Moses Williams, President of the Swan Island Club, permission has been secured for you to make the island your headquarters, even after the closing of the club at the end of the hunting season. You will be taken care of by the manager, Mr. Poyner (whose initials, I think, are A.W.). Mr. Williams has written to him about the matter and it would be well for you to do so before going to that part of the country, and if possible, to arrange a definite date for landing at Knott's Island, in which case, I am sure Mr. Poyner will be glad to meet you. If you cannot perfect such an arrangement you will be able to get in touch with Mr. Poyner otherwise, as it is his custom to come to Knott's Island daily for mail.

With best regards, I am

Very truly yours,

W. L. McAtee

In Charge, Economic Ornithology.

* Box received since.

Dictated to stenographer

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 28, 1919.

Dr. Alex Wetmore,
Assistant Biologist,
Bradentown, Florida.

Dear Dr. Wetmore:

I inclose herewith check for $12.50, being the balance due on salary for the period January 1 to 15, 1919.

Very truly yours,

W. T. Shoemaker.

Executive Assistant,
In Charge of Accounts.

Inclosure 9207.

1-29-19

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 25, 1919.

Dr. Alex Wetmore,

Bradentown, Florida.

My dear Wetmore:

I have just received your telegram notifying us that Bradentown will continue to be your mail address, which is fortunate, as a number of letters have been forwarded to you there. Complaints have reached the Biological Survey that the water rat of Florida (Neofiber) has been doing considerable damage to sugar cane in some districts near those you will visit a little later on. It will be advisable for you to call at some of the addresses on the inclosed slip and learn what you can from actual inspection. It is not intended that you should make a complete investigation of the subject, but, since there will be no other representative of the Biological Survey ~~repent~~ in Florida for some time and since the present may be the only time to get good data on the subject, I am asking you to look into the matter enough to confirm or refute the charges of damage. If you have any traps or facilities for poisoning, it might be well to experiment briefly along these lines.

With best regards, I am,

Sincerely yours,

W. L. McAtee

Assistant Biologist.

Inclosure 9959.

Chattahoochee

Pt. Leavenworth Seaplane

+ Canal Co.

Marina Fla.

Pt. Harris Park

Ft. Louderdale

J. M. Burgesses

Coral Gables

Lake Okeechobee

Reached by canal

boat from West Palm

Beach.

Southern Sta. to Land

+ Timber Co.

West Palm Beach.

Animal-Reptiles alligators

Round Tailed Muskrat.

TES DEPARTMENT OF AGRICULTURE
REAU OF BIOLOGICAL SURVEY

CALPS--REPORT OF HUNTER TO INSPECTOR

_____ _____ 191__.

r. Date of Shipment.

lps shipped.		Skins and scalps retained (not sufficiently cured for shipment).
previ- month ended.	Total.	

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 21, 1919.

Feb. 6
Trying this
Trying again.

Mr. Alex Wetmore,
Assistant Biologist,
Jacksonville, Florida.

Dear Mr. Wetmore:

Your letter of January 16 received, and after talking with Mr. Nelson I find that he wishes you to have an interview with Commissioner Williams while you are in Florida, as he thinks it may do considerable good. To avoid disappointment it probably will be well for you to begin correspondence with Mr. Williams and arrange for a definite time and place to see him. It is possible that he might be induced to come to Jacksonville for the purpose.

Mr. Nelson also wishes correspondence from field men to be addressed to the Chief of the Bureau for the attention of whatever other person you wish to see the letter.

Another box for storing insect specimens will be sent to you at once. I have forwarded various letters to Bradentown for which you should make inquiries at the Post Office, if you have not already done so.

With best wishes,

Sincerely yours,

W. L. McAtee

Assistant Biologist.

Dear Dr Watmore:

Check should be
mailed within a day or
two to Sebastian, Fla.

Leo

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 21, 1919.

MEMORANDUM FOR DR. WETMORE.

Dear Dr. Wetmore:

I desire to inform you that the Acting Secretary, Mr. Christie, has approved for publication in the journals indicated, the following articles by you:

"A Note on the Decrease of the Carolina Wren Near Washington." The Auk.

"Bird Records from the Sacramento Valley, California." The Condor.

It is understood that no compensation will be received for these articles. The Bureau Editor should be advised of the dates of publication.

Very truly yours,

E. Thompson
Chief Clerk.

1-29-19

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 21, 1919.

Mr. Alex. Wetmore,
Assistant Biologist,
Bradentown, Florida.

Dear Mr. Wetmore:

It gives me great pleasure to send you herewith a notice of a promotion increasing your salary to $2,100 per annum, effective January 1. This is a well merited promotion based on the efficient work you have been rendering the Bureau during the last few years.

It will interest you to know that there is now a bill before Congress increasing by $240 a year the salaries of all Government employees receiving less than $2,750 per annum. The bill appears to have a good chance of passing, and if it does will probably become effective July 1.

Sincerely yours,

E. W. Nelson
Chief of Bureau.

(Enclosure 7655)

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

January 14, 1919.

Mr. Alexander Wetmore,
Bureau of Biological Survey.

Dear Mr. Wetmore:

In accordance with the provisions of letter of authorization No. 323-Bi you are directed to proceed to Florida for the purpose of securing information on the food and economic importance of the brown pelican and other birds.

During the past year there has been considerable agitation on the part of fishermen and others who claim that pelicans are destroying great quantities of food fishes. It has been stated that these birds have been especially destructive to mullet during the spawning season. Although these charges seem as yet unfounded it is important to secure as much information on the subject as possible. You should visit two or more of the important fishing centers on the west coast of Florida and there secure what information you may from fishermen and others, and also spend considerable time in observing the habits of pelicans in the field, especially at times when the mullet are running. If pelicans seem to be following the schools of mullets at this time, it is important to secure a number so that their stomachs may be examined. In addition you should visit the breeding colonies of these birds near Palma Sola in order to determine what fish are brought by the adult birds to feed their young. Following this you should visit the breeding colonies in the Indian River on the east coast, in order to make similar studies.

You should endeavor to see Mr. J. A. Williams, State Fish Commissioner, and others interested in this matter, as well as members of the Florida Audubon Society and other persons active in bird protection in the State.

Upon completion of this investigation you should proceed to Southern Florida and there visit two or more points in the sub-tropical zone for the purpose of collecting insects, seeds, berries and other similar material for our reference collections here in Washington. We have a considerable number of bird stomachs on hand from this area and are constantly augmenting this number. It is very important that

we secure representative collections of bird food material from this region in order that the fragments in these stomachs may be successfully identified. It is important to visit at least one inland and one coastal locality in making these collections.

Upon completion of this work you should return to Norfolk, Virginia and from there visit Currituck Sound for the purpose of securing information on the disease of swans and other water fowl known as "keux".In the vicinity of Knotts Island and Swan Island a number of birds are found each year in early spring suffering from this peculiar malady. Sportsmen and others are much interested in this and it is desirable to ascertain the nature of this affection and its cause.

Upon completion of this work, unless otherwise directed, you should return to the Washington office.

With best wishes,

Very truly yours,

E. W. Nelson

Chief of Bureau.

Form B1-120
March, 1918

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY

LETTER OF AUTHORIZATION

No. 323-B1

Washington, D. C., January 7, 1919.

Alex Wetmore,

Assistant Biologist.

Under authority contained in the Secretary's letter, No. 8 Sec., dated ~~July~~ Oct. 1, 1918, you are hereby authorized to incur such expenses as may be necessary, in strict accordance with law, the Fiscal Regulations of the Department, and the decisions of the Comptroller of the Treasury, for the purpose stated and during the period named below, not to exceed

$ **400.00**, to be paid from the appropriation "General Expenses, Bureau of Biological Survey, 1919," **(Food Habits of Birds and Mammals.)**

To proceed from Washington, D. C., on January 12, 1919, or as soon thereafter as practicable, to some point in Florida, and to perform necessary travel in the States of Florida, Georgia, South Carolina, North Carolina, and Virginia, for the purpose of securing information on the food and feeding habits of pelicans and other birds, and on lead poisoning in swans and other species. You are further authorized to hire temporary assistants (subject to the rules of the Civil Service Commission); and to pay for their transportation and subsistence while in a travel status; to hire special means of conveyance when necessary; to hire launches and other boats; to hire or purchase necessary camp equipment; to purchase field supplies and natural history specimens; to pay for necessary repairs to your own fire arms, if damaged while being used officially, as a consideration for their use; and to incur such other expenses as may be found necessary in carrying out this work. Upon completion of this work you will return to Washington, D. C., your official headquarters.

No expenses for freight charges to be incurred hereunder.

Your permanent headquarters will be **Washington, D. C.**

A true copy:

[signature]
Clerk and Executive Assistant.

E. W. Nelson
Acting Chief of Bureau.

S T . P E T E R S B U R G

Name	Plan	Rates per day	Managers	Location	
Wigwam	American	On appl.	Eleanor C. Reed	256 First St. N.	ST. PETERSBURG
Anna Maria	Both	On appl.	Chas. Baldwin		ANNA MARIA BEACH
Albion Hotel	American	2.00	Joe Guthrie		CORTEZ
Haven Beach Hotel	For particulars write Florida Beach Development Co.				HAVEN BEACH
Holloway	American	On appl.	E. J. Shanock		
Pass-a-Grille Hotel	American	On appl.	Robert Carroll		PASS-A-GRILLE
Hotel Lizotte	American	On appl.	Geo. Lizotte		

The St. Petersburg Tarpon Club will give its first Surf Angling Contest as a member of the Association of Surf Angling Clubs on March 27 and 28, 1918

RULES AND REGULATIONS OF ST. PETERSBURG TARPON CLUB

OBJECT OF THE CLUB

To encourage the use of rod and reel in game fishing, to promote social intercourse among its members, to aid in securing the protection of game fishes, and to elevate the sport to its highest standard.

MEMBERSHIP

Membership is open to all persons satisfactory to the directors upon the payment of the membership fee; but no person shall be entitled to wear a club button until he or she shall have captured a tarpon under the club rules, and the first fish so captured shall be eligible for any trophy awarded that season.

FEES AND DUES

The membership fee shall be Five Dollars. The annual dues shall be $5.00, and no capture shall be entered upon the club record unless all fees and dues are paid in full.

CLUB BUTTONS

A blue-and-gold tarpon club button will be presented to each member who shall have captured a tarpon under the club rules.

A green-and-gold kingfish button will be issued to each member who shall have captured a kingfish weighing not less than 10 lbs., under the club rules, and using no line heavier than 9-thread, button costing member $2.00.

A red-and-silver redfish button will be issued to each member who shall have captured a redfish weighing not less than 15 lbs., under the club rules, and using no line heavier than 15-thread, button costing member $2.50.

CLUB RULES FOR 1918

1. All catches must be recorded on the cards furnished by the secretary and duly certified by the official measurers or directors, and all requirements on the card complied with.

2. No member shall be eligible to compete unless all his dues have been paid.

3. The line used for tarpon must be a standard linen line of not more than 24-thread; and for kingfish of not more than 15-thread. The line used for mackerel shall not exceed 9-thread. The line for trout shall not exceed 6-thread. The line used for fresh-water bass in competition for the Rinaldi Cup cannot have a breaking strength of over 12 pounds, and for the other prizes over 18 pounds. The rods shall not weigh over 6 oz. and 9 oz., respectively.

4. The rod shall not be less than 6 feet over all in length. A bamboo rod shall have the metal tip fixed directly upon it, without any artificial or unusual extension or enlargement.

5. Only thumb brakes shall be used, with no mechanical, adjustable drag to the unfair disadvantage of the fish; but an uniform, or non-adjustable, mechanical tension of not to exceed 4 pounds shall be permitted; provided, that there shall be no bar against mechanical brakes or drags for lines of 15-thread or

PART OF KINGFISH CATCH

less. This does not apply to competition for membership buttons. Drags are allowed for button competition.

6. There must not be more than 36 inches of tarpon line doubled back at the tie, and the leader must not exceed 6 feet in length.

7. Anglers fishing for membership, trophies or prizes must submit their tackle for inspection to one of the directors or official measurers when the catch is measured or recorded.

8. The angler must hook and bring the fish to gaff unaided, and the fish must be reeled in. A rod broken during the capture bars the fish from the trophy and prize class.

MAP OF
FISHING GROUNDS
OF THE
ST. PETERSBURG TARPON CLUB
ST. PETERSBURG, FLA.

Lights ☼ ☼ Buoys ●

Railroad Lines —— Trolley Lines -·-·- County Roads ═══

The Depths (the 12-foot, the 18-foot and the 36-foot line) are at mean low water.

High Water Heights, 1.4 ft. at Egmont Key, 2.2 ft. at Tampa, and 1.8 ft. at Dunedin.

Storm Warning Displays are made by the U. S. Weather Bureau at Egmont Key, St. Petersburg, Port Tampa, and Tampa.

SCALE OF NAUTICAL MILES

0 ½ 1 2 3 4 5 6 7 8 9 10

SCALE OF STATUTE MILES

0 ½ 1 2 3 4 5 6 7 8 9 10

Redfield-Kendrick-Odell Co., New York

Photo by Julian A. Dimock

A HARD FIGHTER

9. Fish competing for any trophy or prize must be measured and weighed by a director, or an official measurer of the club. Other fish, the measurements verified by a second party, will be accepted for record.

10. The angler may elect which trophy or prize a fish shall compete for, but no fish shall be considered for more than one trophy or prize.

11. All tarpon to be weighed, and measured in case of tie, all kingfish to be weighed and none eligible for a prize unless reported on an official card to the secretary.

TROPHIES AND PRIZES FOR 1918

Prizes are offered by the club for competition among the members during the year 1918.

Tarpon season from January 1 to December 1. All others from January 1 to December 31.

Tarpon (24-thread line)—Silver cup given by A. G. Butler, Middletown, Conn. Second prize, reel offered by the Enterprise Mfg. Co., Akron, Ohio.

Tarpon (15-thread line)—H. Walter Fuller cup given for the longest and heaviest tarpon caught on 15-thread line. Cup to be won three times for permanent possession. Second prize, 600 yards of 24-thread line given by the Ashuaway Line and Twine Co., Ashuaway, R. I.

Tarpon (9-thread line)—Cup given by J. Frank Harrison, St. Petersburg, Fla. Second prize, 900 feet 9-thread line given by the Ashuaway Line & Twine Co., Ashuaway, R. I.

Tarpon—Cup for the first tarpon, offered by M. L. Stoner & Co.

Tarpon—Cup for the last tarpon, offered by the St. Petersburg Times.

Redfish—Cup offered by H. E. Mitchell, of St. Petersburg, for largest redfish caught on 15-thread line. 2nd prize, Thermos bottle, offered by A. W. Rogers, St. Petersburg.

Kingfish (15-thread line)—Reel offered by the Pinellas Hardware Co. 2nd prize, rod, offered by Horrocks-Ibbotson Co., Utica, New York.

Kingfish (9-thread line)—Reel offered by Knight & Wall Co., Tampa, Fla. 2nd prize, 600 feet 6-thread line offered by E. K. Tryon Co., Philadelphia, Pa.

Kingfish (Geo. Lizotte Cup)—For the largest kingfish caught on the lightest tackle. (The weight of the fish divided by the number of threads in the line.)

Mackerel—For the heaviest mackerel caught on 9-thread line. A rod given by Tracy Lewis, St. Petersburg. 2nd prize, one year's subscription to the American Field given by American Field Publishing Co.

Trout—For the heaviest trout caught on 6-thread line. Reel offered by the Shakespeare Co., of Kalamazoo, Mich. 2nd prize, one-half year's subscription to American Field.

Fresh Water Bass—1st prize, rod offered by F. C. West, St. Petersburg, Fla. 2nd prize, ½ doz. artificial bait offered by South Bend Bait Co., South Bend, Ind.

Rinaldi Challenge Cup—For the largest black bass (Fla.) caught under club rules. Cup to be won three times for permanent possession. Given by H. C. Rinaldi, of Tampa, Fla.

Guide's Prize—Prize of $10.00 cash for guide catching largest fish on lightest tackle. Only open to guides under club regulation.

RULES COVERING TOURNAMENT FOR FRESH-WATER BASS CONTEST

1. Fish may be caught in the lakes included in both Hillsborough, Pinellas, and Pasco counties.
2. Fish must be weighed and entered with the secretary on special cards furnished by the committee. No fish under 8 lbs. is eligible for the Rinaldi Cup, and must be caught on a rod weighing not over 6 ozs. and a line with a breaking strength of 12 lbs.
3. For the other prizes a rod must weigh not over 9 ozs. and the line to have a breaking strength not over 18 lbs.

No live bait can be used.

4. Fish can be weighed by any member of the Fresh-Water Committee, Knight & Wall, in Tampa, Tampa Tribune, and any other official weighers of the club. Rules and regulations will be furnished upon application to the secretary.

H. C. RINALDI, Tampa — F. C. WEST, St. Petersburg
W. H. JOHNSON, St. Petersburg — W. REYNOLDS BECKWITH, Tampa
T. W. WESTON, Secretary, St. Petersburg, Fla.

SURF ANGLING CONTEST COMMITTEE

W. W. Flavell — Joseph W. Taylor — S. E. Cornman
Dr. Lipschutz — T. W. Weston

ENTERTAINMENT COMMITTEE

Sherman Rowles — W. D. McAdoo — T. W. Weston

OFFICIAL MEASURERS

(All catches must be recorded on official cards by the measurers to be eligible for prizes.)

ST. PETERSBURG (Central Avenue) M. L. Stoner, Tracy Lewis; (Yacht Basin) N. B. Hayes; (A. C. L. Dock) Oliver Eady.
PASS-A-GRILLE—J. A. Saunders.

Key West Reservation.

Capt. J. J. Asher, Key West, Fla.

Around Charlotte Harbour

Passage Key

Two Pelicans

Indian or Bird Key

Pelicans -

Pine island = Usuffee Cuno

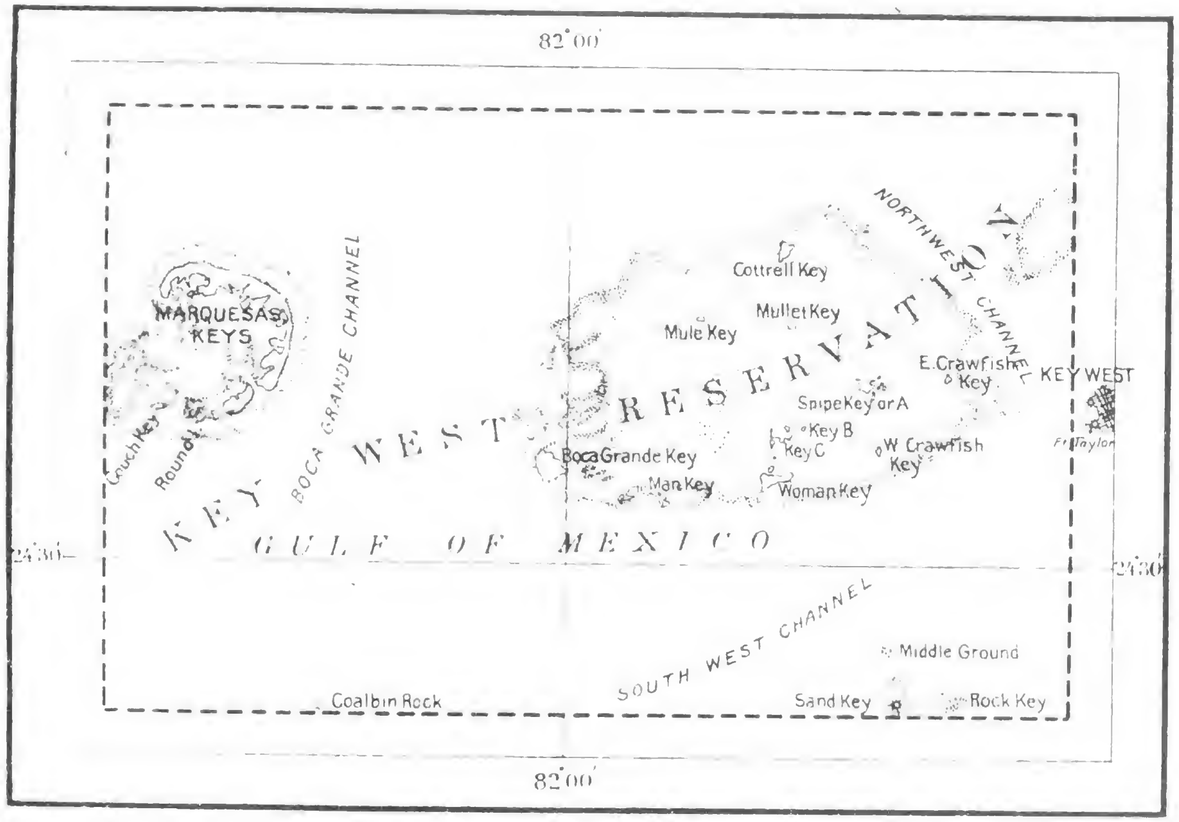
Many pelicans

KEY WEST RESERVATION

For Protection of Native Birds

FLORIDA

Embracing all Islands segregated
by broken line and designated
"Key West Reservation"



DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE
Fred Dennett, Commissioner

Executive Order

It is hereby ordered that all keys and islands of the Florida keys group, between latitude 24° 27' and 24 40' north, and longitude 81° 49' and 82 10' west from Greenwich, as the same are shown upon coast survey chart No. 170, and located within the area segregated by the broken line shown upon the diagram hereto attached and made a part of this order, are hereby reserved and set aside for the use of the Department of Agriculture as a preserve and breeding ground for native birds. This reservation is subject to, and is not intended to interfere with, the use of "Marquesas keys" for life saving purposes, reserved by Executive Order of March 12, 1884, nor with the use of "Man key" and Woman key", reserved for naval purposes by Executive Order of June 8, 1908; nor is it intended in any manner to vacate such orders. This reservation to be known as Key West Reservation.

THEODORE ROOSEVELT

The White House,
August 8, 1908.

[No. 923.]

J. A. Williams

Fish Commissioner

Jacksonville,

Fla.

6/11/18

Asa N. Pillsbury, Palma Sola, Fla.
Running season for Mullet Nov. 15 to
Feb. 1 or 15

Sebastian Fla.
P. Kroegel - 1 Oct. 15 - Nov. 1. 6/9/18
" Investigation Oct. 1 - Nov. 30

B. J. Pacetti - Ponce Park, Fla. 6/11/18
Oct. 15 - run to Feb. 1.

L. Ashburner - Roseland, Fla. 6/5
Nov. 20 - Jan. 1

A. H. Pilsbury - Palma Sola 6/11/18
mullet run Nov. 15 to Feb. 1 or 15.

P. Kroegel - Sebastian Flas 19/9/18.
mullet run Oct. 15 - Nov. 1
recommends investigation Oct 1 - Nov. 30

B. J. Pacetti - Ponce Park. Fla. 6/11/18.
Mullet run Oct. 15 - Feb. 1
comparatively few in Cat runs.

See letter to Pearson of July 24/18
giving data on material examined
from workers.

T. J. Ashe 816 Fleming St, Key West

582 Rhizophora mangle } a poor illustration of
3 " " } one of these before.

5 Conocarpus erectus
6 Suriana maritima
8 Ximenia fasciculata

well have
to visit
herbarium
for others.

575 Schinus sp. uncertain
6 Ilex glabra
7 Myrica cerifera
8 Ceratiola ericoides
9 Rapanea guianensis
580 Acer rubrum
1 Lagunculania racemosa
2 Mimusops pavifolia ?
3 " " ?