

San Luis National Wildlife Refuge Complex
P.O. Box 2176
Los Banos, CA 93635
(209) 826-3508/ Fax (209) 826-1445

MEMORANDUM

May 15, 1998

TO: Assistant Regional Director, ARD
Portland, OR

FROM: Wildlife Biologist (Sande)
San Luis NWR Complex

SUBJECT: Disease Loss Report 1997-1998 (1997 Disease Year)

Enclosed is the 1997-1998 Wildlife Disease Loss Report for the San Luis National Wildlife Refuge (NWR) Complex, California Department of Fish and Game (DFG); Los Banos Wildlife Area, Modesto Oxidation Ponds, and Faith/Mapes Ranches near Modesto. A total of 11,283 birds suspected of dying from disease were picked up on federal, state, and private lands throughout the grasslands (Table 1, also see map Figure 1). Appendix 1 shows the patterns of the outbreaks throughout the grasslands.

There was no disease losses recorded for San Luis NWR. However, 2100 birds were recovered on the Arena Plains unit of Merced NWR (Table 2). This is the first recorded year of losses on this area. The outbreak spanned from January 27 to March 9, 1998. Coots made up 95% (n=1986) of birds collected. Seven carcasses were sent to the National Wildlife Health Research Center (NWHRC) and lesions of avian cholera were isolated on the livers of 3 specimens; the remaining specimens were saved for use as training birds (Appendix 2). The Merced Unit of the Merced NWR had a relatively moderate cholera year with only 241 dead birds. Ross' geese were the most common bird picked up there (n=164) (Table 3).

Avian cholera returned to San Joaquin River NWR again this year. The outbreak lasted from December 13, 1997 to March 2, 1998. A total of 391 birds were picked up (Table 4). Of these, four Aleutians, two cackling Canada geese, and one gadwall were sent to NWHRC for examination; all deaths were attributed to avian cholera (Appendix 2). Aleutian Canada geese were the number one bird picked up (n=155).

The local DFG had a busy cholera year this year. Throughout the Grasslands 8551 birds were picked up between December 22, 1997 and March 4, 1998. American coot was the most affected bird, 81% (n=6909) (Table 5). DFG picked birds up at O'Neill Forebay and the San Luis Detention Dam for the first recorded year. Eighteen waterbirds were sent to The Resources Agency of California Department of Fish and Game Wildlife Investigations Laboratory by Greg Gerstenberg, they all showed signs of avian cholera (Appendix 2). Gerstenberg of DFG

estimated that 30,000 birds died during the 1997-1998 avian cholera year in the grasslands.

The Secondary Treatment Facility of Modesto retrieved 1035 birds suspected of dying from cholera from December 19, 1997 to March 31, 1998 (Table 6). Ruddy ducks made up 46% of birds collected.

Pick up and disposal of carcasses on federal lands was conducted by San Luis NWR Complex staff; whereas pick-up and disposal on Modesto Oxidation Ponds, state, and private lands was handled by appropriate staff.

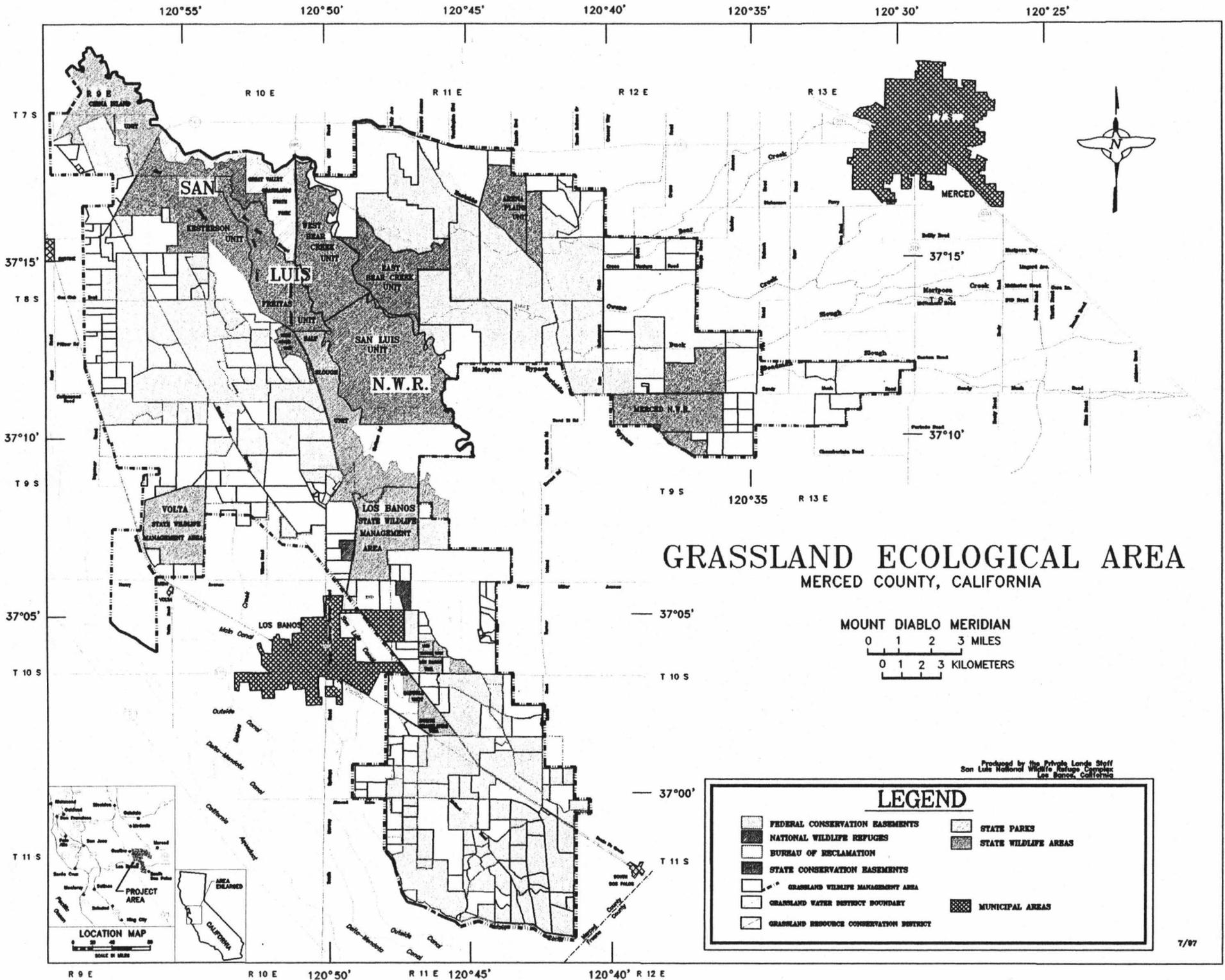


Table 1. Total birds picked up during disease abatement activities on federal, state, and private lands in Merced and Stanislaus Counties between December 1997 and March 1998.

Location	Number
California Department of Fish and Game	8551
Arena Plains unit of Merced NWR	2100
Modesto Secondary Treatment Facility	1035
San Joaquin River NWR	391
Merced unit of Merced NWR	241
Total	12318

Table 2. Avian cholera birds picked up at the Arena Plains Unit of Merced NWR in Merced County, California, January 27, 1998 to March 9, 1998.

<u>Species</u>	<u>Number</u>
American Coot	1986
Northern Shoveler	42
Green Winged Teal	15
Wigeon	12
Cinnamon Teal	11
Gadwall	11
Ross' Goose	10
Pied Billed Grebe	6
Pintail	5
Ruddy	5
Mallard	3
White Fronted Goose	3
Common Moorhen	1
<hr/>	
Total	2110

Table 3. Avian cholera birds picked up at Merced NWR, Merced County, California, December 6, 1997 to February 19, 1998.

<u>Species</u>	<u>Number</u>
Ross' Goose	164
American Coot	47
Snow Goose	14
Shoveler	7
Black Necked Stilt	4
Mallard	3
Pintail	2
<hr/>	
Total	241

Table 4. Avian Cholera birds picked up at San Joaquin River NWR, Stanislaus County, California, December 13, 1997 to March 2, 1998.

<u>Species</u>	<u>Number</u>
Aluetian Canada Goose	155
Cackling Canada Goose	38
White Fronted Goose	35
Ross' Goose	34
Snow Goose	33
American Coot	29
Mallard	29
Green Winged Teal	10
Northern Shoveler	10
Gadwall	6
Wigeon	6
Ruddy	4
Pintail	1
<hr/>	
Total	390

Table 5. Avian cholera birds picked up on California Department of Fish and Game land, Merced County, California, December 22, 1997 to March 10, 1998.

<u>Species</u>	<u>Number</u>
American Coot	6909
Ducks	1528
Shorebirds	87
Other	24
<u>Geese</u>	<u>3</u>
Total	8551

Table 6. Avian cholera birds picked up on Modesto Secondary Treatment Facility, Stanislaus County, California, December 19, 1997 to March 31, 1998.

<u>Species</u>	<u>Number</u>
Ruddy	478
American Coot	346
Northern Shoveler	129
Gull	32
Unidentified	20
Gadwall	12
Golden Eye	7
Canada Geese	5
Pied billed Grebe	4
American Avocet	1
Tern	1
<hr/>	
Total	1035

Appendix 1:
Avian cholera outbreak patterns on each pick up area.

Avian cholera birds picked up at Arena Plains unit of the Merced NWR between January 27, 1998 and March 9, 1998.

DATE	SPECIES													TOTALS
	Coot	Moorhen	Wigeon	Pintail	Shoveler	Mallard	Gadwall	G-W Teal	Cinn Teal	Ruddy	Ross'	White-front	P-B Grebe	
27-Jan	4													4
28-Jan	25		1											26
29-Jan	100		1	1									1	103
30-Jan	41				2									43
31-Jan	136		3			1				1	1			142
1-Feb	80		2	1							2			85
2-Feb	26													26
5-Feb	22				2									24
6-Feb	183		1		8						1			193
7-Feb	126		1		4		1	2				1		135
9-Feb	135		1	1	2									139
10-Feb	355		1	2	6	2	4	6		2			1	379
11-Feb	96				3		2	2			2		1	106
13-Feb	106				5		2	2	1				1	117
14-Feb	67	1			2			1			3		2	76
15-Feb	22											1		23
17-Feb	132		1		6		1			2	1			143

Avian cholera birds picked up at Arena Plains unit of the Merced NWR between January 27, 1998 and March 9, 1998.

DATE	SPECIES													TOTALS
	Coot	Moorhen	Wigeon	Pintail	Shoveler	Mallard	Gadwall	G-W Teal	Cinn Teal	Ruddy	Ross'	White-front	P-B Grebe	
18-Feb	118				1									119
19-Feb	65													65
20-Feb	23													23
21-Feb	7													7
22-Feb	38				1		1							40
24-Feb	29							1						30
26-Feb	31													31
27-Feb	12											1		13
2-Mar	3							1						4
9-Mar	4													4
TOTALS	1986	1	12	5	42	3	11	15	1	5	10	3	6	2100

Avain cholera birds picked up at Merced NWR between December 6, 1997 and February 19, 1998.

DATE	SPECIES							TOTAL
	Snow Goose	Ross'	Coot	Pintail	Mallard	Shoveler	Stilt	
6-Dec	1							0
7-Dec	1							1
17-Dec			1					1
22-Dec	3	1		1				5
23-Dec		2						2
24-Dec	1							1
29-Dec	1	1	1					3
30-Dec			2					2
7-Jan	2							2
9-Jan		5					1	6
10-Jan	1	2						3
11-Jan			1					1
12-Jan	1		1					2
13-Jan	1		2					3
14-Jan	1		1					2
15-Jan						1		1
25-Jan			2					2
26-Jan			2		1			3
27-Jan		25					1	26
28-Jan		77	1		1	2	2	83
29-Jan		12	3			1		16
30-Jan		11	2		1			14
31-Jan	1	9				2		12
1-Feb		2						2
4-Feb		3	3					6

Avian cholera birds picked up at Merced NWR between December 6, 1997 and February 19, 1998.

DATE	SPECIES							TOTAL
	Snow Goose	Ross'	Coot	Pintail	Mallard	Shoveler	Stilt	
5-Feb			3					3
6-Feb			2					2
7-Feb			2					2
8-Feb		1	2					3
9-Feb			4					4
11-Feb			3					3
12-Feb			6					6
13-Feb		2	1	1				4
14-Feb		6	2					8
15-Feb		2						2
17-Feb						1		1
18-Feb		1						1
19-Feb		2						2
TOTAL	14	164	47	2	3	7	4	241

Avian chlorea birds picked up at San Joaquin River NWR between December 13, 1997 and March 2, 1998.

DATE	SPECIES															TOTAL
	ACG	CCG	LCG	Snow	Ross'	White Front	Coot	Mallard	Pintail	Gadwall	Shoveler	Wigeon	GW Teal	Ruddy		
13-Dec				1											1	
14-Dec								1							1	
15-Dec	1														1	
16-Dec	1	1													2	
20-Dec				1			2								3	
21-Dec	3														3	
29-Dec	2														2	
30-Dec	2														2	
31-Dec	3					1				2					6	
2-Jan	4	1					1				1				7	
3-Jan	2			1		1	2								6	
4-Jan	10				1		2				1				14	
5-Jan	16	4			1		1				1	1			24	
6-Jan	4	1						2							7	
7-Jan	4	1			1	1	3	1					1	1	13	
8-Jan	1			2	1	2	1	4							11	
9-Jan	2			2		2	2	4				1		1	14	

Avian chlord birds picked up at San Joaquin River NWR between December 13, 1997 and March 2, 1998.

DATE	SPECIES															TOTAL
	ACG	CCG	LCG	Snow	Ross'	White Front	Coot	Mallard	Pintail	Gadwall	Shoveler	Wigeon	GW Teal	Ruddy		
10-Jan	3			5			1	2					2		13	
11-Jan	8	4			2	1		1		1	2	1	1		21	
12-Jan	7				3			4		2		1	2		19	
13-Jan	9	1			1	7	1	5			1	1	3		29	
14-Jan	4				2	1	2	2					1		12	
15-Jan	2		1		1		1	1			1				7	
16-Jan	11	2			2	4	2								21	
17-Jan	7	5			2										14	
19-Jan	8				2					1					11	
20-Jan	13	8		1		1	3				3				29	
21-Jan	1	2					3							1	7	
22-Jan	1			1				1							3	
24-Jan	1	2				1									4	
25-Jan	1														1	
26-Jan	3					2									5	
27-Jan	2	1		3		2									8	
28-Jan	5	1		1	1	2			1					1	12	

Avian chlord birds picked up at San Joaquin River NWR between December 13, 1997 and March 2, 1998.

DATE	SPECIES															TOTAL
	ACG	CCG	LCG	Snow	Ross'	White Front	Coot	Mallard	Pintail	Gadwall	Shoveler	Wigeon	GW Teal	Ruddy		
29-Jan	3															3
30-Jan	1															1
31-Jan					2											2
2-Feb					1											1
3-Feb					1											1
4-Feb	2															2
5-Feb	1	2				1										4
6-Feb				2												2
9-Feb	2			3	3		1	1								10
10-Feb	2			8	6	2	1					1				20
11-Feb	2	1		1	1	3										8
13-Feb						1										1
27-Feb	1	1														2
2-Mar				1												1
TOTAL	155	38	1	33	34	35	29	29	1	6	10	6	10	4		391

Avian cholera birds picked up by California Department of Fish and Game between December 22, 1997 and March 2, 1998

DATE	SPECIES					TOTAL
	Coot	Ducks	Geese	Shorebirds	Other	
22-Dec	96	30		1		127
23-Dec	103	6		2		111
24-Dec		7				7
28-Dec		2				2
29-Dec	853	187		16	1	1057
30-Dec	411	86		6		503
31-Dec		82				82
2-Jan	461	161		8		630
5-Jan	866	157	1	18	4	1046
6-Jan	115	87		6		208
7-Jan	23	42				65
8-Jan	353	91		13		457
9-Jan	183	103		8	6	300
10-Jan	2	10	1			13
11-Jan	25					25
12-Jan	625	128		3	2	758
13-Jan	85	72	1			158
14-Jan	10	26				36
15-Jan	70	22		2	2	96
16-Jan	8	21			3	32
17-Jan	27	1				28
20-Jan	100	64		2		166

Avian cholera birds picked up by California Department of Fish and Game between December 22, 1997 and March 2, 1998

DATE	SPECIES					TOTAL
	Coot	Ducks	Geese	Shorebirds	Other	
22-Jan	408	24			1	433
23-Jan	50					50
26-Jan	187	17		1	3	208
27-Jan	14	1				15
28-Jan		30				30
30-Jan		15				15
2-Feb	3					3
3-Feb	254	5				259
5-Feb	9	2				11
6-Feb	264	3			1	268
9-Feb	24	4				28
10-Feb	551	13			1	565
12-Feb	35	1				36
13-Feb	414	5		1		420
17-Feb	198	11				209
19-Feb	6	1				7
23-Feb	36	1				37
24-Feb	15	1				16
4-Mar	25	9				34
TOTAL	6909	1528	3	87	24	8551

Appendix 2:
Diagnostic service case reports.

USGS-BIOLOGICAL RESOURCES DIVISION
NATIONAL WILDLIFE HEALTH CENTER
6006 Schroeder Road
Madison, Wisconsin 53711-6223
608-270-2400 (FAX 608-270-2415)

DIAGNOSTIC SERVICES CASE REPORT

Case: #15622, 001-004

Epizoo: 97-132

RHT: LHC

Submitter:

Karine Sande
San Luis NWR
P.O. Box 2176
Los Banos, CA 93635

Specimen description/identification:

Aleutian Canada Geese

Date Submitted: 01/09/98

Location: San Joaquin River NWR,
Stanislaus Co., CA.

General Diagnosis: 001-004: Avian cholera

Comments: Each goose had gross lesions indicating avian cholera and *Pasteurella multocida* was isolated from the liver of each bird. No other significant health problems were apparent at necropsy. Liver lead analyses are in progress; if elevated concentrations are detected, a supplementary report will be sent.

Final Report (01/16/98)
date

See attached necropsy records for individual specimen observations.

Note: Copies of this report have been sent to:

USFWS Regional Office (RO-7)

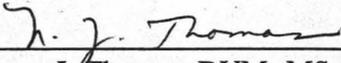
Attention:

Migratory Bird Coordinator

F & W Enhancement: Endangered Species (Attn: B. Anderson)

F & W Enhancement: Environmental Contaminants Coordinator

ARD Refuges and Wildlife



Pathologist: Nancy J. Thomas, DVM, MS
Diplomate, American College of Veterinary Pathologists



If you have questions regarding this case, contact: Lynn Hayes Creekmore, DVM, MS
at 608-270-2400. Include above Case Number. Diagnostic findings may not be used for publication without the pathologist's knowledge and consent.

USGS-BIOLOGICAL RESOURCES DIVISION
NATIONAL WILDLIFE HEALTH CENTER
6006 Schroeder Road
Madison, Wisconsin 53711-6223
608-270-2400 (FAX 608-270-2415)

DIAGNOSTIC SERVICES CASE REPORT

Case: #15623, 001-002

Epizoo: 97-132

RHT: LHC

Submitter:

Karine Sande
San Luis NWR
P.O. Box 2176
Los Banos, CA 93635

Specimen description/identification:

001: Gadwall.
002: Cackling Canada Goose.

Date Submitted: 01/09/98

Location: San Joaquin River NWR,
Stanislaus Co., CA.

General Diagnosis: Avian cholera: 001, 002.

Comments: Both of these birds had necropsy lesions compatible with avian cholera and *Pasteurella multocida* was isolated from the liver of both birds.

Final Report (02/17/98)
date

Note: Copies of this report have been sent to:

USFWS Regional Office (RO-1)

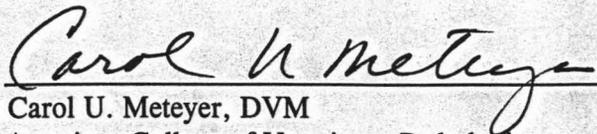
Attention:

Migratory Bird Coordinator

F & W Enhancement: Endangered Species

F & W Enhancement: Environmental Contaminants Coordinator

ARD Refuges and Wildlife



Pathologist: Carol U. Meteyer, DVM

Diplomate, American College of Veterinary Pathologists



If you have questions regarding this case, contact: Lynn Hayes Creekmore, DVM, MS
at 608-270-2400. Include above Case Number. Diagnostic findings may not be used for publication without the pathologist's knowledge and consent.

USGS-BIOLOGICAL RESOURCES DIVISION
NATIONAL WILDLIFE HEALTH CENTER
6006 Schroeder Road
Madison, Wisconsin 53711-6223
608-270-2400 (FAX 608-270-2415)

DIAGNOSTIC SERVICES CASE REPORT

Case: #15654, 001-007

Epizoo: 97-138

RHT: LHC

Submitter:

Karine Sande
San Luis NWR
PO Box 2176
Los Banos, CA 93635

Specimen description/identification:

001-002: Ross' Goose.
003-006: American Coot.
007: American Wigeon.

Date Submitted: 01/30/98

Location: Arena Plains Unit - Merced
NWR, Merced Co., CA.

General Diagnosis: Avian cholera: 001, 003, 007.
Accessions: 002, 004-006 were not necropsied.

Comments: Lesions consistent with avian cholera were seen at necropsy of the birds necropsied (001, 003, 007) and *Pasteurella multocida* was isolated from the livers of these birds.

Final Report (02/17/98)
date

Note: Copies of this report have been sent to:

USFWS Regional Office (RO-1)

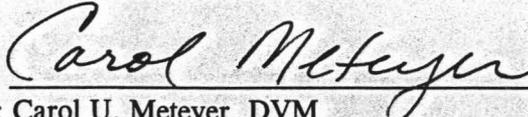
Attention:

Migratory Bird Coordinator

F & W Enhancement: Endangered Species

F & W Enhancement: Environmental Contaminants Coordinator

ARD Refuges and Wildlife


Pathologist: Carol U. Meteyer, DVM
Diplomate, American College of Veterinary Pathologists



If you have questions regarding this case, contact: Lynn Hayes Creekmore, DVM, MS
at 608-270-2400. Include above Case Number. Diagnostic findings may not be used for publication without the
pathologist's knowledge and consent.

THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

Wildlife Investigations Laboratory
1701 Nimbus Road, Suite D
Rancho Cordova, California 95670
(916) 358 - 2790

February 4, 1998

LABORATORY REPORT

FINAL REPORT

No. N-007-98

Date Died: #1-14: 12/29/97

#15-18: 1/12/98

Date Received: 1/14/98

Date Necropsied: 1/14/98

Animal: #1 American Coot- Male Adult #2 American Coot- Female Adult #3 American Coot- Female Adult
#4 Ruddy Duck- Female Adult #5 American Widgeon-Fem. Adult #6 Gadwall- Female Adult
#7 American Coot-Female Adult #8 American Coot-Male Adult #9 N. Shoveller - Male Adult
#10 N. Shoveller-Male Adult #11 American Widgeon- Male Adult #12 Ruddy Duck- Fem. Adult
#13 Canvasback- Male Adult #14 Black-necked Stilt- Male Adult #15 American Coot-Male Adult
#16 American Coot-Male Adult #17 American Coot- Male Adult #18 Pied-billed Grebe-Male Adult

Condition: #1-14: Frozen carcasses-fair post-mortem condition; #15-18: Fresh carcasses- adequate post-mortem condition.

✓ Collector: Greg Gerstenberg

Address: Dept of Fish and Game, 1551 Greenwood Way, Los Banos, CA 93635

Remarks: Bird die-off at the South Grasslands, including the Gadwall, Mud Slough, Los Banos Sewer Ponds, and O'Neill Forebay areas began 12/20/97; as of 1/12/98, 4,000 birds of various species had been collected with mortality estimates possibly twice that number.

Results of Examination

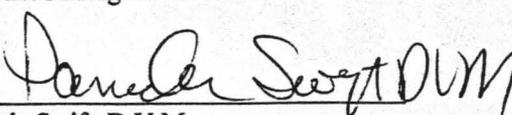
EXTERNAL - There are no external wounds or parasites on any animal.

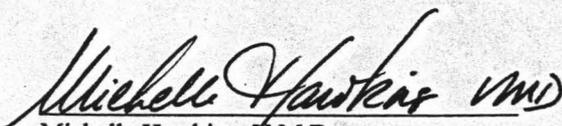
INTERNAL - #1,4,6,9,10,12,18: petechial hemorrhages following the vasculature of the heart and in the heart muscle itself. #1,2,3,5,6,7,8,10,11,12,13,14,15,16,17,18 have petechial hemorrhages and tan/yellow pinpoint foci on the surface of the liver that extends into the liver tissue on cut surface. The right ventral liver lobe is enlarged twice the normal size in #11. #4,8,9,10,11,12,13,14,15,16,17,18 show congestion and enlargement of the spleen. There is a cestode present in the large intestine of 14.

SPECIMENS TAKEN & RESULTS - 1) Blood smears from heart blood of frozen carcasses #2,5,7,8,12 show bipolar bacterial rods on Wright's stain which are suggestive of *Pasteurella multocida*. 2) Cultures from liver swabs from the fresh carcasses #15-18 grew pure cultures of *Pasteurella multocida*, the bacterial agent responsible for avian cholera.

DIAGNOSIS - Avian cholera caused by the bacterial agent *Pasteurella multocida*.

Wildlife Investigations Laboratory
Wildlife Management Division

By: 
Pamela Swift, D.V.M.
Wildlife Veterinarian


Michelle Hawkins, N.M.D.
Veterinarian

MH:paf

Laboratory Report N-007-98

February 4, 1998

Page Two

cc: National Wildlife Health Research Center
Dr. Lynn Creekmore
Madison, Wisconsin

Department of Fish and Game
San Joaquin Valley - Southern Sierra Region
Mr. Rod Goss, Senior Wildlife Biologist, Supervisor
Fresno, California

Department of Fish and Game
Mr. Dan Connelly
Sacramento, California