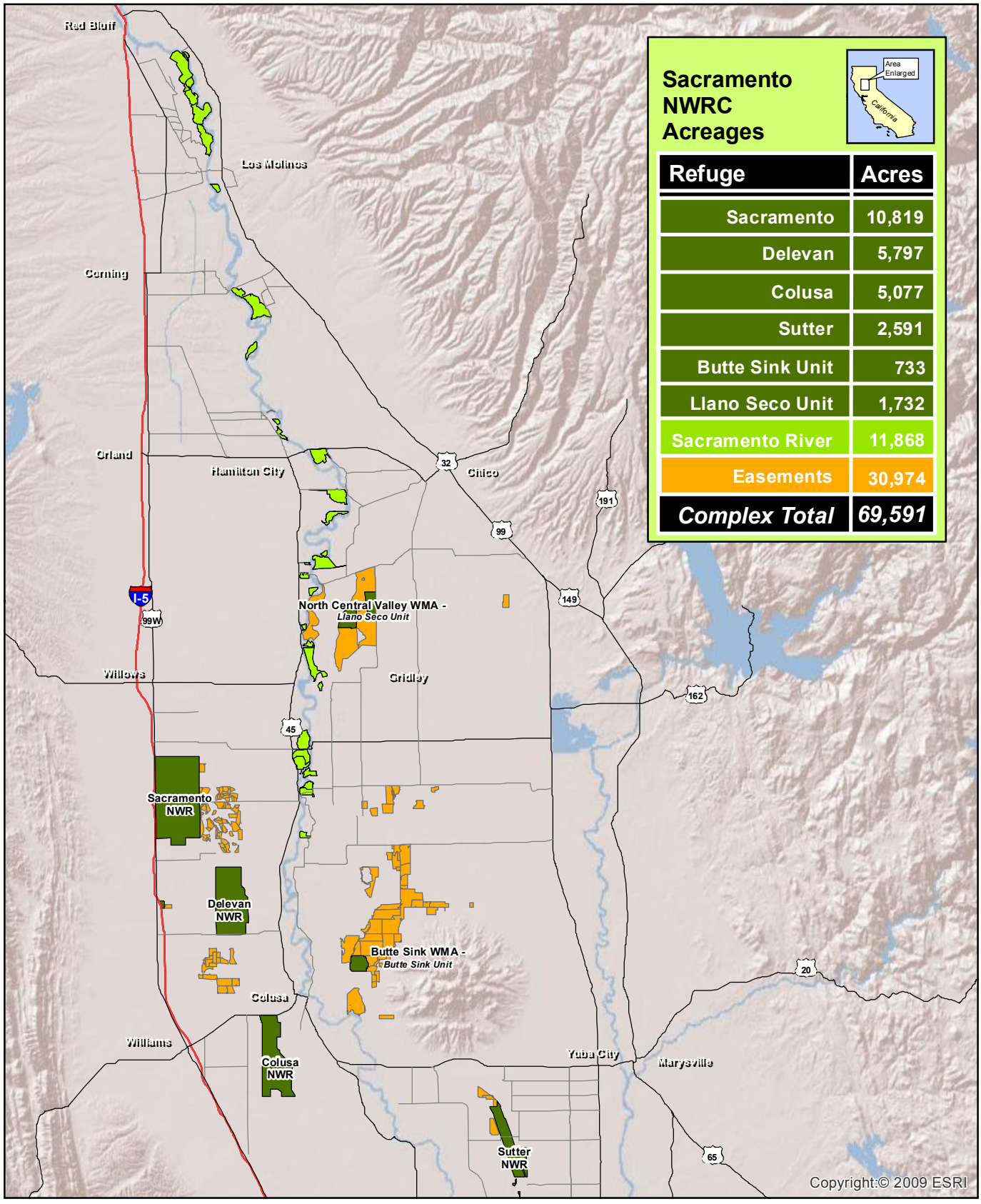
U.S. Fish & Wildlife Service

Sacramento National Wildlife Refuge Complex

USFWS Fee Title and Conservation Easements

Summary of Acreage



Sacramento NWRC Acreages

Refuge	Acres
Sacramento	10,819
Delevan	5,797
Colusa	5,077
Sutter	2,591
Butte Sink Unit	733
Llano Seco Unit	1,732
Sacramento River	11,868
Easements	30,974
Complex Total	***69,591***

Produced by Sacramento NWRC
Projection: UTM Zone 10N
Datum: NAD 83
February 2014

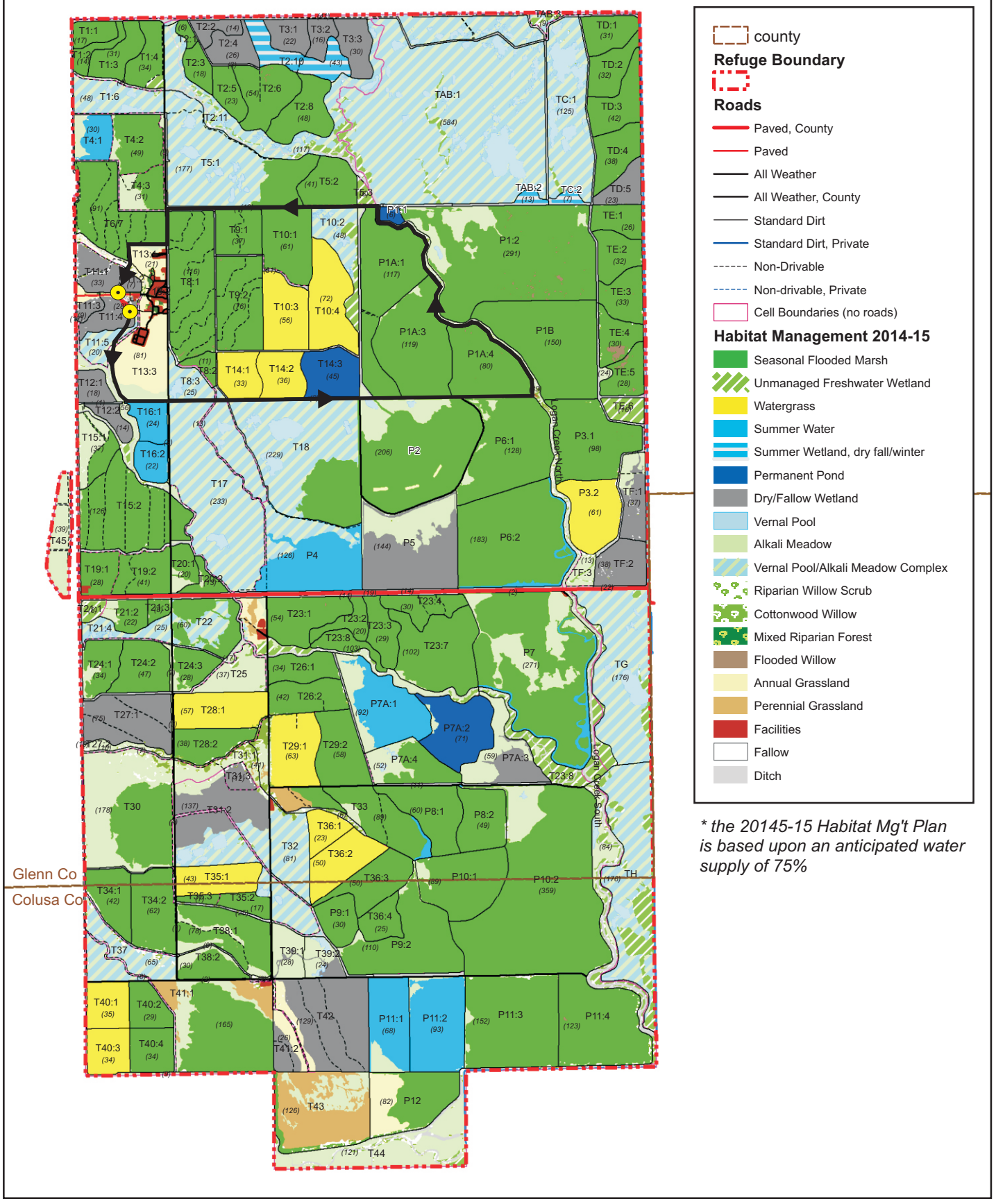
0 4.25 8.5 17 Miles

0 4.75 9.5 19 Kilometers

N

U.S. Fish & Wildlife Service

Sacramento National Wildlife Refuge
Habitat Management 2014-15*



** the 20145-15 Habitat Mg't Plan is based upon an anticipated water supply of 75%*

Produced by Sacramento NWRC
Projection: UTM Zone 10N
Datum: NAD 83

0 0.25 0.5 1 Miles

0 0.25 0.5 1 Kilometers

N

REFUGE: SAC UNIT: P1A CELL: 1-3 WORK PRIORITY: 1

CELL PARAMETERS:

PRIMARY HABITAT OBJECTIVE: SEASONALLY FLOODED MARSH TOTAL HABITAT ACRES: 236

Seasonal Flooded Marsh	Water-grass	Summer Water	SW - dry winter	Perm Pond	Unmg'd Flooded Wetland	Vernal Pool	Dry Wetland	VP Alkali Meadow Complex	Alkalli Meadow	Annual Grassland	Perennial Grassland	Irrigated Pasture	Vernally Wet Annual Grassland	Riparian Willow Scrub	Cotton-wood Willow	Flooded Willow	Mixed Riparian Forest	Valley Oak Savanna	Valley Oak Riparian Forest	Facility	Ditch	Other
232	0	0	0	0	0	0.0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0

HABITAT MANAGEMENT:

PLANNED

DRAWDOWN:
DRAWDOWN DATE: 5/1/2014
DRAWDOWN RATE: S
UNITS REQ. DOWN 1st: NONE

IRRIGATION: No

FLOODUP:
FLOOD DATE: 9/15/2014
UNITS REQ. FLOOD 1st: NONE

REQUIRED HABITAT TREATMENTS:

TREATMENT:	OBJECTIVE:	ACRES
Disc 3 or more times	Control primrose	1
Mow prior to seed-set	Reduce cocklebur	10
Overwater burn	Reduce cattails/tules	20
Spray Roundup	Reduce tall wheat	0.1
Disc 3 or more times	Reduce cattails/tules	3

	ISLANDS:	LANES:	CHECKS
DISC?			
MOW?	Y	Y	

OF WCS's TO REPLACE: 0

ACTUAL

DRAWDOWN:
DATE BOARDS PULLED:_____
DRAWDOWN DATE (AT 90% DOWN): _____
DRAWDOWN RATE: _____ Slow=S, Rapid=R, St=Stage

IRRIGATION:
BEGIN IRRIG. DATE: _____
DATE COVERED: _____
END IRRIG. DATE: _____ (AT 90% DOWN)

FLOODUP:
FLOOD DATE (when 1st turned in): _____
DATE COVERED: _____

REQUIRED HABITAT TREATMENTS:

TREATMENT:	SUCCESSFUL?	ACRES:
Disc 3 or more times	Yes / No / Partial / Unk	
Mow prior to seed-set	Yes / No / Partial / Unk	
Overwater burn	Yes / No / Partial / Unk	
Spray Roundup	Yes / No / Partial / Unk	
Disc 3 or more times	Yes / No / Partial / Unk	

	ISLANDS	LANES:	CHECKS
DISCED?	Y / N	Y / N	Y / N
MOWED?	Y / N	Y / N	Y / N

WCS"s REPLACED : _____

SPECIAL MANAGEMENT CONSIDERATIONS:

SFM = seasonal flooded marsh
SW = summer water (semi-permanent wetland)
WG = watergrass (irrigated seasonal marsh)
PP = permanent pond

SW/PP history (12 SW). SET DAM 1 for POSSIBLE floodwater events in JAN. & FEB & set up units ACCORDINGLY. Order water in advance so cell 3 floodup is not delayed. Cell 2 became part of cell 1 due to levee taken out in 1998. Parts of cell 1 are excellent shorebird habitat & important roost sites for white-faced ibis. AVOID SOIL DISTURBANCE TO N END of cell 3 (feather edge). Photo blind located s. end of cell 3. After mid-Nov. keep water levels lower. Major WFIB night roost on shallow flat in C1. Had great response from bird use & veg. with summer water. Last RX burn (overwater) on 3/13/14.

SPECIFIC PROJECTS:

	Priority?	DONE?
1. REHAB ISLANDS AS NEEDED	☑	Y / N
2. Service radial arm gates on Dam 1	☑	Y / N
3. Primrose control - Disk north end of cell 1 near inlet	☑	Y / N
4. Cattail/Tule control - Re-disk lanes/pockets on the n. end of cell 1	☑	Y / N
5. Tall wheat control (s. end X-dike between cells 1 and 3) - Spray w/Roundup	☐	Y / N
6. Mow viewing lanes along auto tour route	☐	Y / N
7. Overwater Burn (west side) - Reduce thatch buildup for cattail/tule control	☐	Y / N
8. Channel & pothole thick tule areas on w. side after burn	☑	Y / N
9.	☐	Y / N
10.	☐	Y / N

COMMENTS / PROBLEMS:

Summary of Planned Habitat Acres*

07-May-14

Sacramento NWR Complex

Year: 20145

	Wetland									Upland								Riparian										
REFUG	Seasonal Flooded Marsh	Water-grass	Summer Water	Summer Wetland, dry winter	Perm-anent Pond	Dry Wet-land	Managed Wetland Total	Unmg'd Flooded Wetland	Wetland Total	Vernal Pool	Alkali Meadow	V. Pool/ Alkali Meadow Complex	Annual Grass-land	Peren. Grass-land	Irrig. Pasture	Vernally Wet Annual Grassl.	Upland Total	Rip. Willow Scrub	Cotton-wood Willow	Mixed Riparian Forest	Flooded Willow	Valley Oak Savan-nah	Valley Oak Rip. Forest	Riparian Total	Faci-lity	Ditch	Other	TOTAL
	0	0	0	0	0	0	**0**	0	**0**	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	**0**	0	0	0	**0**
BTS	618	0	0	0	0	0	**618**	0	**618**	0	0	0	39	0	0	0	**39**	3	10	1	17	0	0	**31**	0	0	0	**688**
CLS	2686	305	96	44.1	100	340	**3571**	106	**3677**	63	480	133	432	77	0	0	**1185**	30	0	28	3	0	0	**61**	15	152	0	**5090**
DEL	3004	690	304	0	7	512	**4518**	48	**4566**	15	359	124	353	128	0	0	**979**	42	0	1	4	0	0	**47**	5	234	0	**5832**
LS	743	0	0	0	16	0	**759**	27	**786**	13	0	0	306	212	174	76	**781**	20	0	22	6	59	0	**106**	4	0	0	**1676**
SAC	5027	548	409	54.12	120	708	**6867**	220	**7087**	186	974	1835	156	125	0	0	**3276**	87	26	5	11	0	0	**129**	42	365	25	**10924**
SUT	968	855	0	0	4	0	**1826**	129	**1956**	0	0	0	138	129	0	0	**267**	33	10	283	35	0	30	**391**	4	89.4	8	**2716**
TOTALS	**13046**	**2398**	**809**	**98**	**246**	**1560**	**18158**	**531**	**18689**	**275**	**1813**	**2092**	**1425**	**671**	**174**	**76**	**6527**	**214**	**46**	**340**	**76**	**59**	**30**	**765**	**70**	**841**	**33**	**26925**

* Source of planned habitat acres are from the Refuge Complex GIS. They differ from official total acreages for individual Refuges, because they do not include all roads, canals, and other unmanaged areas.

Sacramento NWR Complex Waterfowl Survey Summary

Refuge	Sacramento	Delevan	Colusa	Sutter	Butte Sink	Llano Seco	GRAND TOTALS
Date	10/6/2014	10/8/2014	10/6/2014	10/3/2014	10/7/2014	10/8/2014	
% of Wetlands Flooded	72%	70%	41%	14%	97%	0%	
Coot	15,000	5,850	1,137	400	2,226	0	24,613
Tundra Swan	0	0	0	0	0	0	0
Sandhill Crane	0	280	326	0	15	0	621
White-fronted goose	132,450	134,600	27,185	27,500	14,850	0	336,585
White goose	2,600	720	16	0	0	0	3,336
Western Canada goose	224	24	75	0	0	80	403
Aleutian Canada goose	0	0	0	0	0	0	0
Cackling Canada goose	10	8	7	0	0	0	25
TOTAL GEESE	135,284	135,352	27,283	27,500	14,850	80	340,349
Mallard	13,190	7,400	1,853	5,750	659	20	28,872
Pintail	92,900	105,860	30,030	113,360	29,665	40	371,855
Gadwall	16,730	12,590	1,483	1,030	1,980	20	33,833
Wigeon	10,850	6,350	2,058	1,030	5,868	10	26,166
Green-winged teal	36,650	32,300	375	900	657	10	70,892
Cinnamon teal	410	140	24	0	0	0	574
N. shoveler	25,580	14,900	5,664	1,030	4,948	0	52,122
Wood duck	70	100	2	0	2	0	174
other dabblers	0	0	0	0	0	0	0
TOTAL DABBLERS	196,380	179,640	41,489	123,100	43,779	100	584,488
Ring-necked duck	1,200	450	188	50	340	0	2,228
Ruddy duck	100	150	2	0	83	0	335
Bufflehead	0	0	0	0	0	0	0
Redhead	0	0	0	0	0	0	0
Canvasback	0	0	0	0	0	0	0
Lesser scaup	0	0	0	0	0	0	0
other divers	0	0	0	0	0	0	0
TOTAL DIVERS	1,300	600	190	50	423	0	2,563
TOTAL DUCKS	197,680	180,240	41,679	123,150	44,202	100	587,051
PERCENTAGES	33.7	30.7	7.1	21.0	7.5	0.0	

Year 2013-14

ESTIMATED WATER USE (CVPIA) - Sacramento NWR Complex

Month	Sacramento NWR										Delevan NWR
	26.2	Dam 1				Dam 2	Dam 3	35.1 C	25.1	Total	
		E	W	S	T						
March	1,372	0	620	104	724	0	36	0	139	2,271	1,259
April	672	0	480	0	480	0	0	0	0	1,152	796
May	1,048	62	424	0	486	0	16	0	0	1,550	1,326
June	1,297	30	600	0	630	0	30	0	0	1,957	1,578
July	877	24	620	0	644	0	0	0	0	1,521	548
August	2,575	306	546	235	1,087	0	0	0	176	3,838	2,348
September	5,495	395	660	105	1,160	630	352	0	640	8,277	4,270
October	4,723	229	1,070	82	1,381	258	456	0	360	7,178	4,461
November	3,813	120	180	38	338	0	369	0	373	4,893	2,918
December	2,576	38	175	182	395	0	175	0	203	3,349	1,999
January	2,393	0	77	128	205	0	173	0	337	3,108	2,210
February	1,116	0	36	22	58	0	189	0	34	1,397	214
Total	27,957	1,204	5,488	896	7,588	888	1,796	0	2,262	40,491	23,927

Dam 1 East, South and West not reported to Glenn-Colusa Irrigation District - only report total (T)

COMMENTS: Water deliveries to Delevan NWR shut-off on 2/4/2014 for remainder of water year.

Year 2013-14

ESTIMATED WATER USE (CVPIA) - Sacramento NWR Complex (continued)

Month	Colusa NWR								Sutter NWR			
	Hwy 20 Pump	Main Pump	West Lat. Pump	64.1 E	64.1 W	64.1 T	64.1 C	J Drain	Total	Sutter Ext.	North Lift Pump	N. East Main Canal	Total
March	54	0	0			593	0	0	647	192	558	620	1,370
April	12	0	0			437	0	0	449	260	0	300	560
May	168	0	0			789	0	0	957	186	1,116	930	2,232
June	133	3	0			904	0	0	1,040	186	756	620	1,562
July	129	0	0			400	0	0	529	124	0	0	124
August	74	0	0			607	0	0	681	60	0	0	60
September	34	0	0	727	1,499	2,226	0	0	2,260	1,050	0	0	1,050
October	243	0	0			3,235	0	0	3,478	496	216	330	1,042
November	58	0	0	1,090	1,218	2,308	0	0	2,366	480	1,080	900	2,460
December	74	0	0	1,061	1,057	2,118	0	0	2,192	124	558	620	1,302
January	76	0	0	962	1,179	2,141	0	0	2,217	186	558	620	1,364
February	9	0	0	181	347	528	0	0	537	84	270	90	444
Total	1,064	3	0	0	0	16,286	0	0	17,353	3,428	5,112	5,030	13,570

Not reported to Glenn-Colusa Irrigation District

COMMENTS:

Source: Report on Refuge Water Supply Investigations
US DOI/BOR, March 1989.

TABLE S-1

REFUGE WATER SUPPLY NEEDS

Refuge	Level 1 (ac-ft)	Level 2 (ac-ft)	Level 3 (ac-ft)	Level 4 (ac-ft)
Modoc NWR	18,550	18,550	19,500	20,550
Sacramento NWR	0	46,400	50,000	50,000
Delevan NWR	0	20,950	25,000	30,000
Colusa NWR	0	25,000	25,000	25,000
Sutter NWR	0	23,500	30,000	30,000
Gray Lodge WMA	8,000	35,400	41,000	44,000
Total Sacramento Valley	26,550	169,800	190,500	199,550
Grassland RCD[a]	50,000	125,000	180,000	180,000
Volta WMA	10,000	10,000	13,000	16,000
Los Banos WMA	6,200	16,670	22,500	25,000
Kesterson NWR	3,500	3,500	10,000	10,000
San Luis NWR	0	13,350	19,000	19,000
Merced NWR	0	13,500	16,000	16,000
Mendota WMA	25,463[b]	18,500	24,000	29,650
Pixley NWR	0	1,280	3,000	6,000
Kern NWR	0	9,950	15,050	25,000
Total San Joaquin Valley	95,163[b]	211,750	302,550	326,650
TOTAL	**121,713[b]**	**381,550**	**493,050**	**526,200**

Water Supply Level 1: Existing firm water supply

Water Supply Level 2: Current average annual water deliveries

Water Supply Level 3: Full use of existing development

Water Supply Level 4: Optimum management

(a) As of 1985, Grassland Resource Conservation District no longer receives agricultural drainage flows due to water quality concerns.

(b) Only 18,500 ac-ft can be delivered to Mendota WMA without modifications of existing facilities.