

Managed Wetland Water Use

In the California Water Plan Update

Statewide Water Analysis Network Meeting

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September 24, 2007

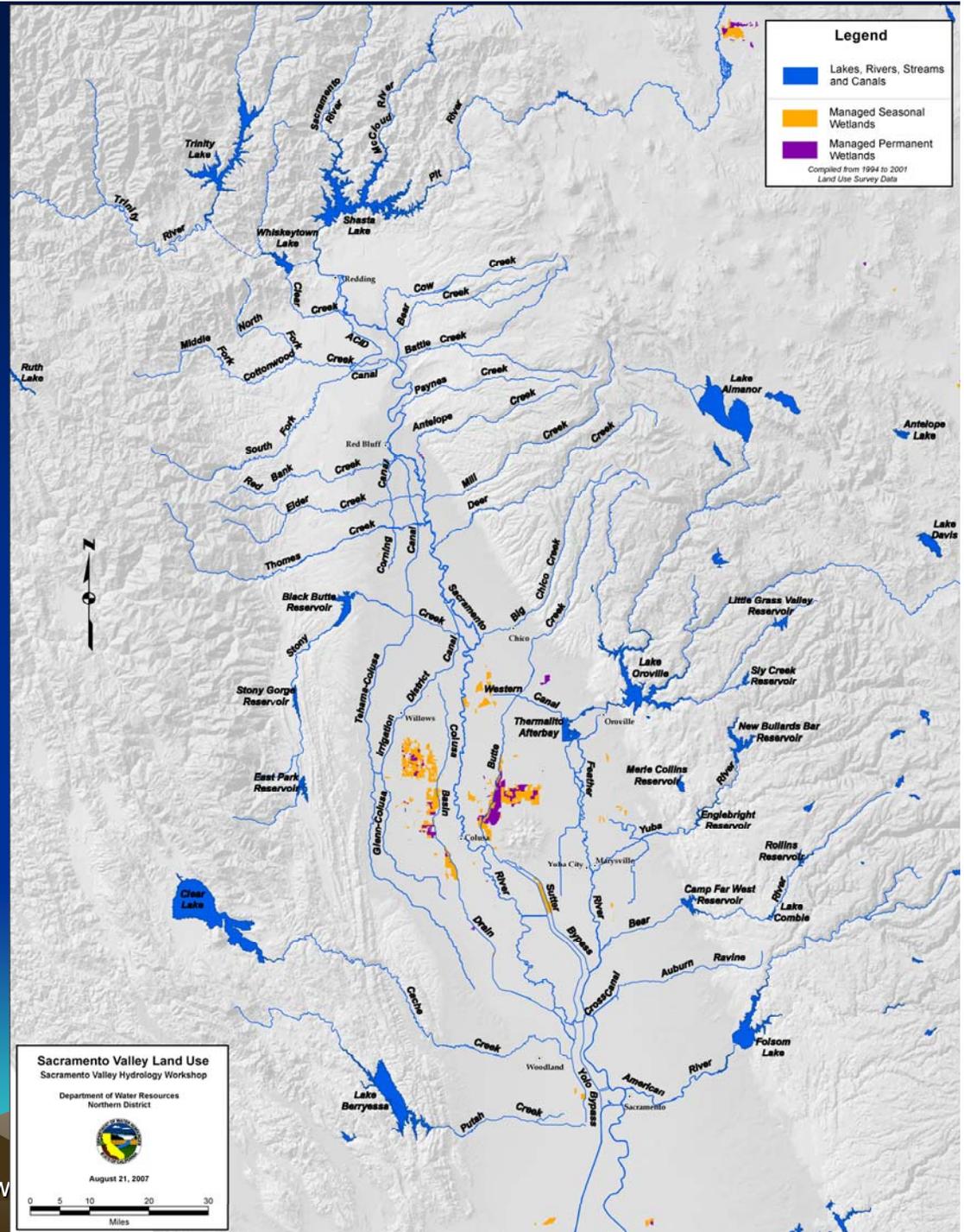


Overview

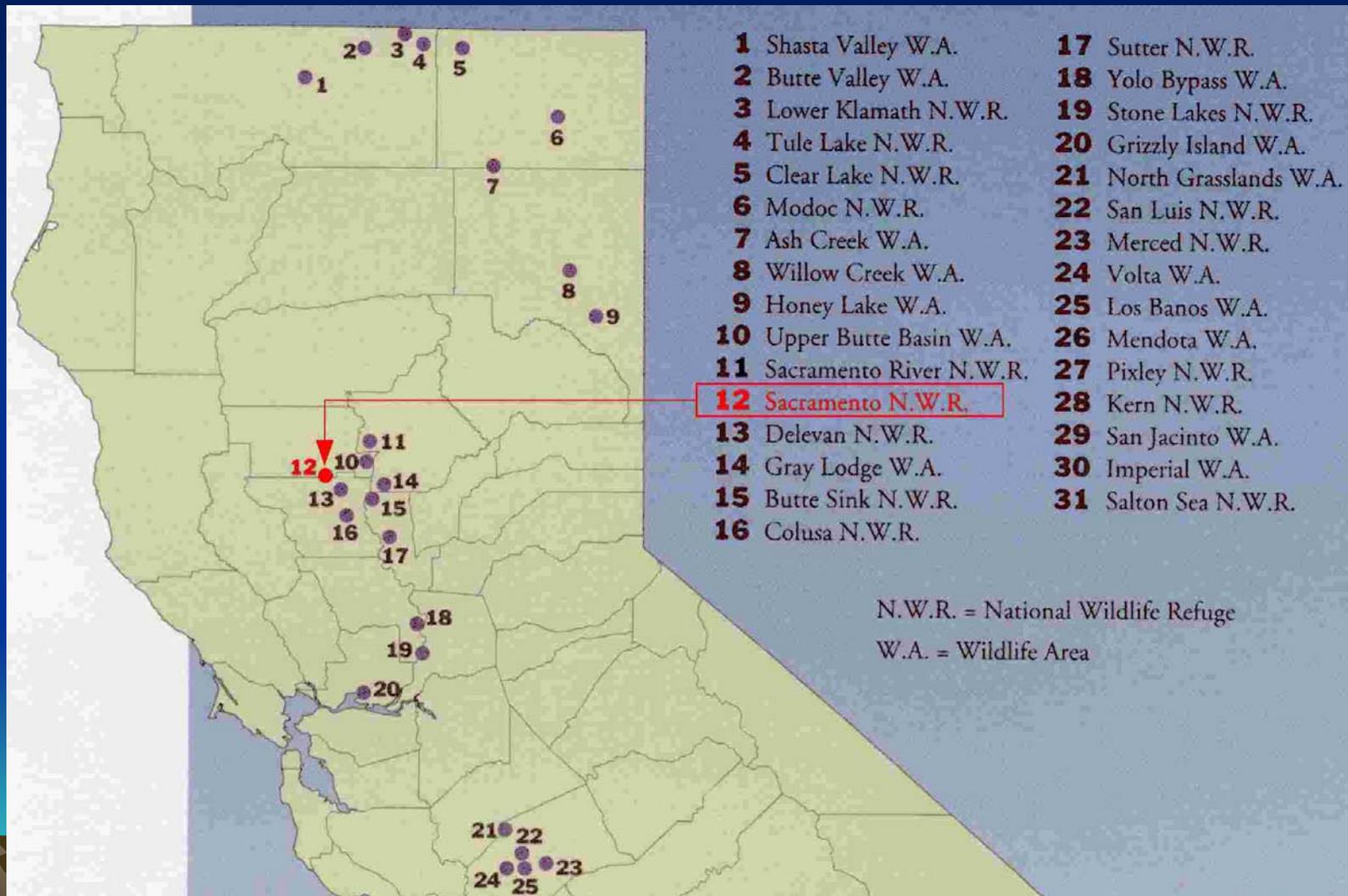
- Quantifying managed wetland water use
- Water Portfolio Components
- Process map
- Managed Wetlands Spreadsheet Template
- Water Plan activities
- Analytical tool development
- Parking lot issues
- Data needs
- Potential partnerships

Managed Wetlands

- Habitat Type by Field
 - Land Use Surveys
 - Refuge Managers
- Aggregated by DAU-County
- Determine Water Portfolio parameters

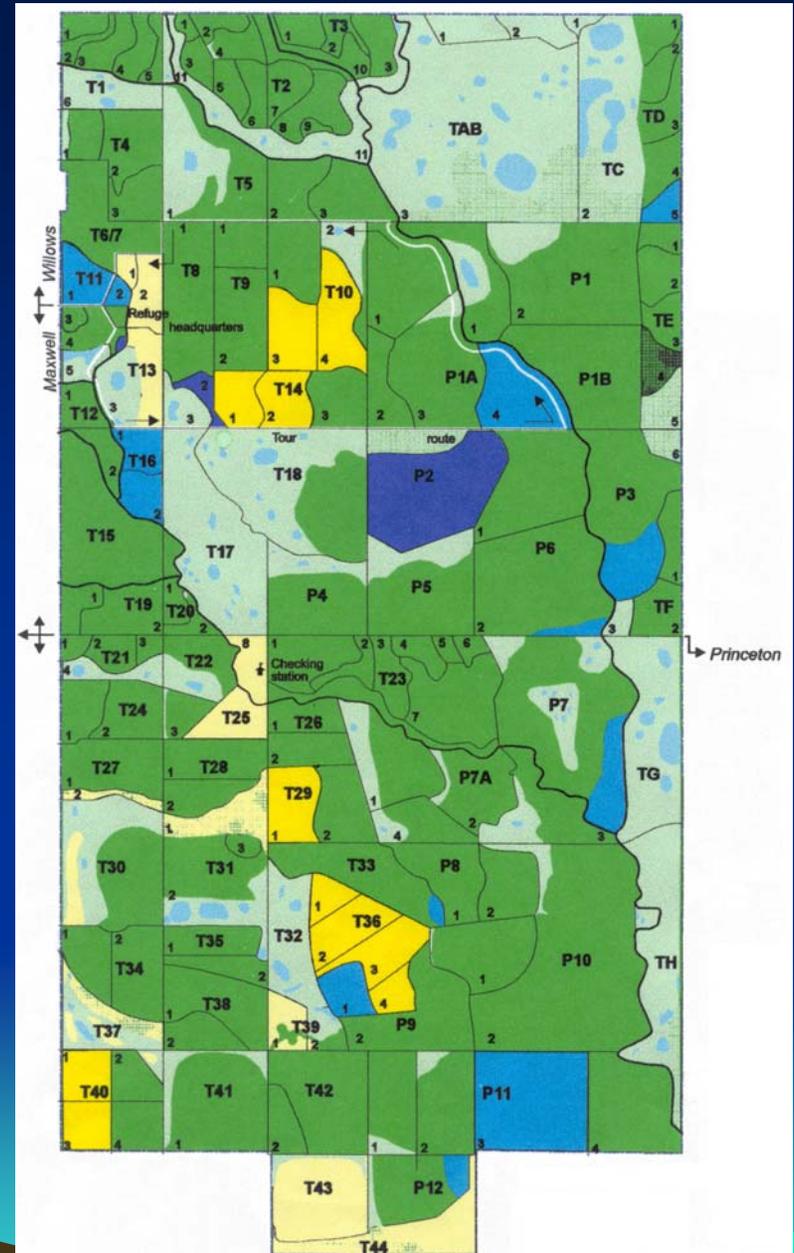


Publicly-Owned Fresh Water Wetlands



Managed Wetland Habitat Types

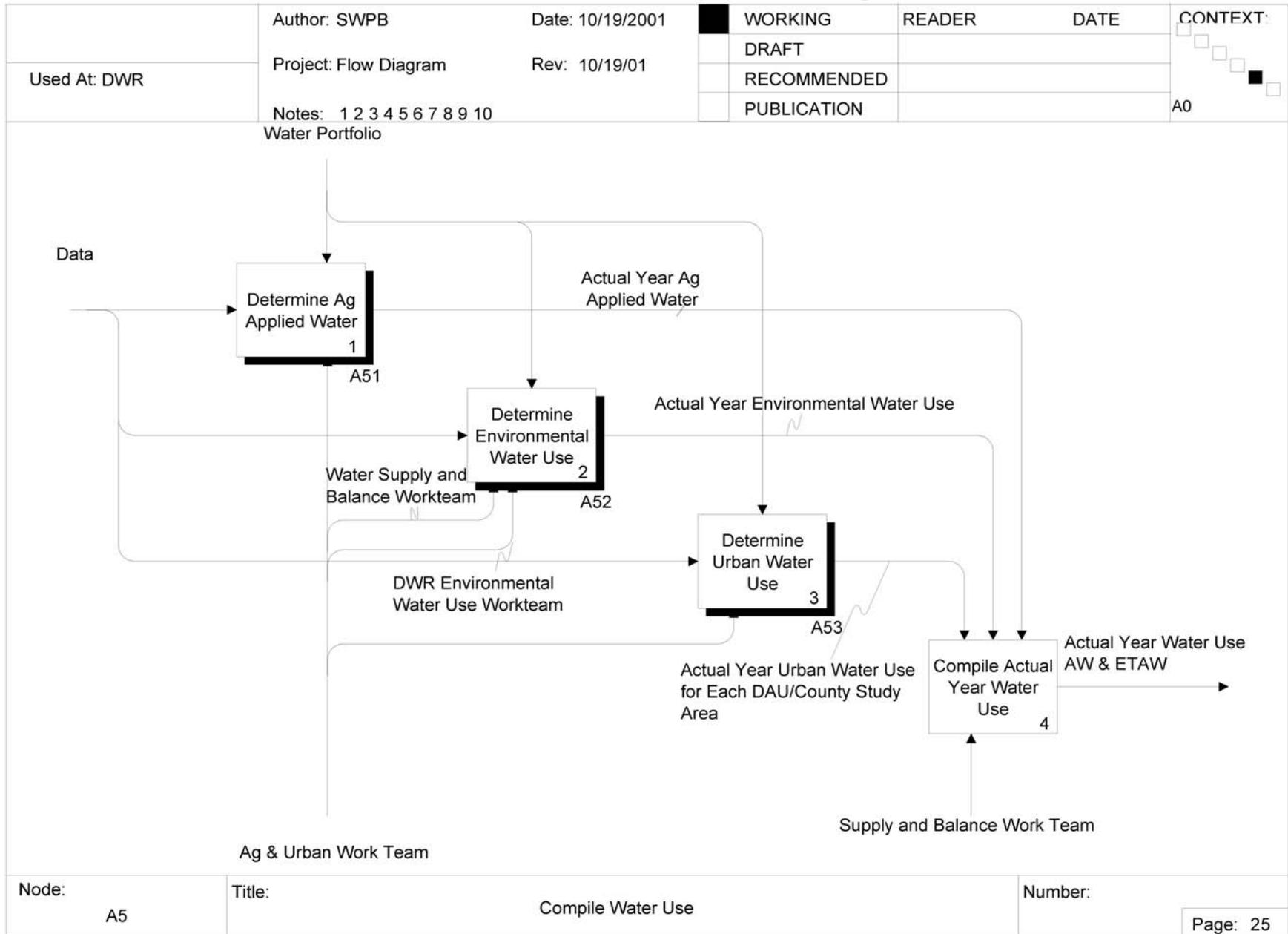
- Upland
- Permanent Ponds
- Seasonally Flooded Marsh
- Summer Water
- Watergrass Production
- Rice



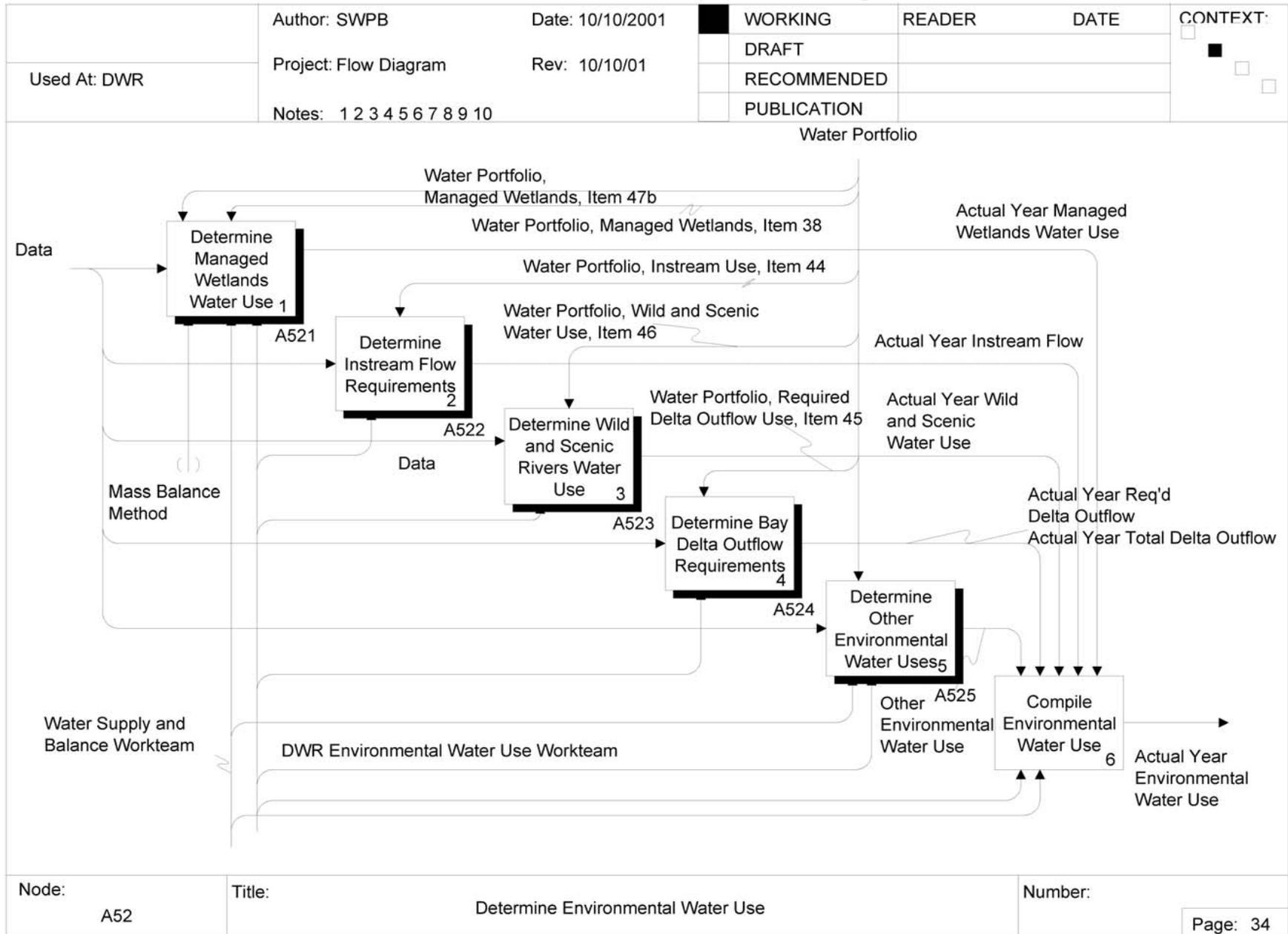
Components of Managed Wetland Water Use

- Evapotranspiration (ET)
- Evapotranspiration of Applied Water (ETAW)
- Effective Precipitation (EP)
- Applied Water
 - Total Water Use
 - Use by Water Source type (e.g., surface water, groundwater) if available

IDEF0 Process Diagram

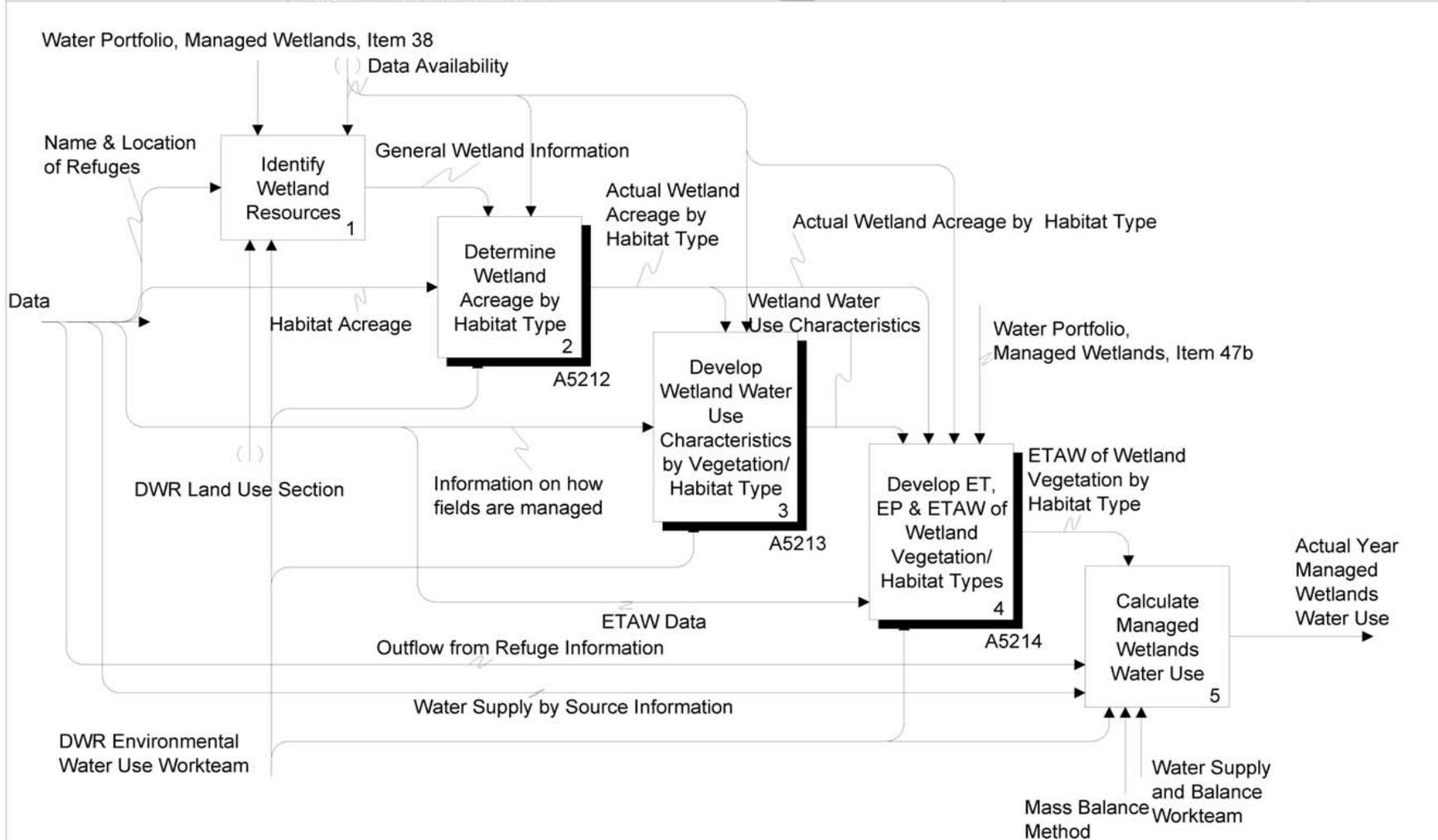


IDEF0 Process Diagram



IDEF0 Process Diagram

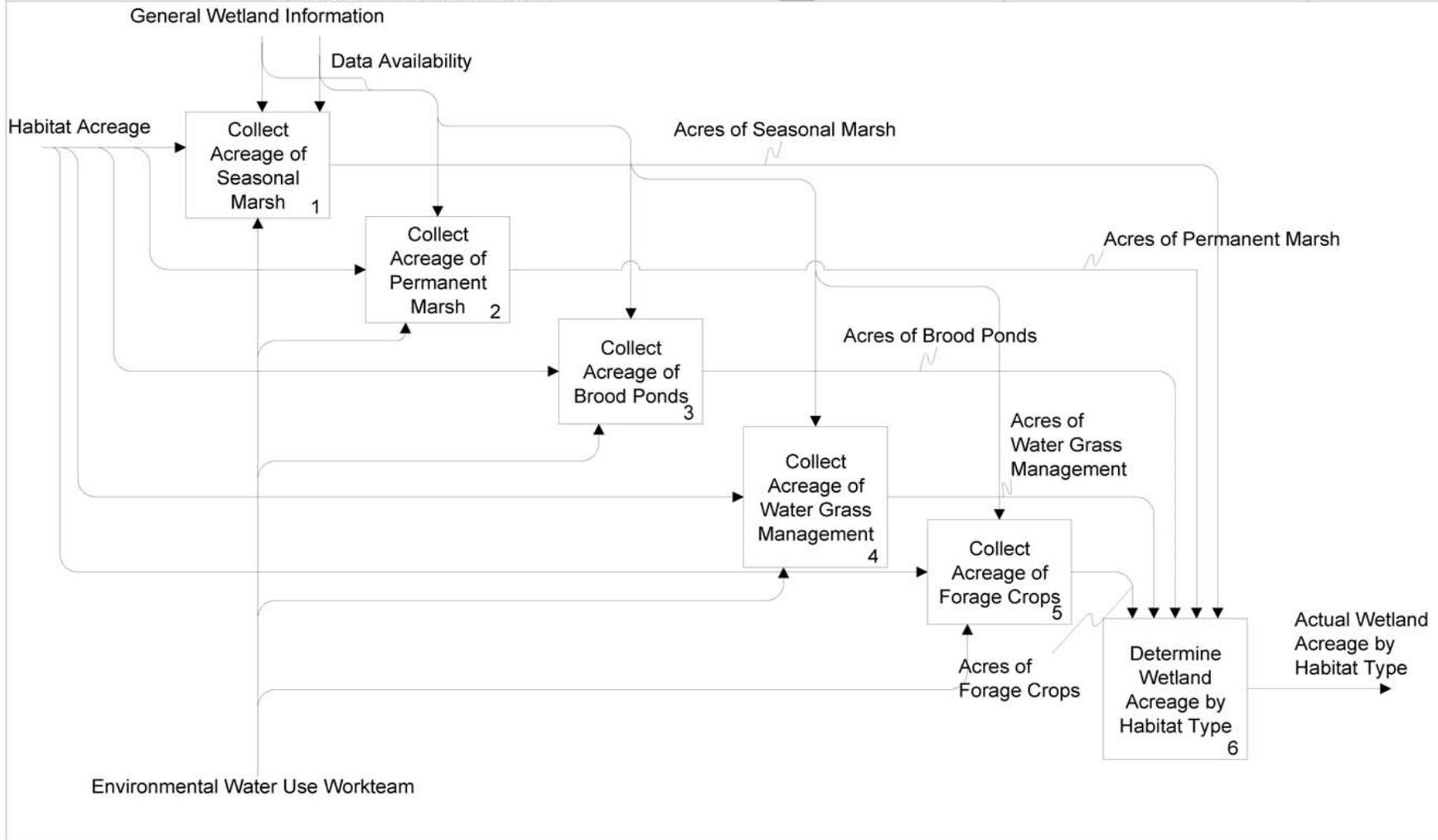
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Project: Flow Diagram	Rev: 10/10/01	<input type="checkbox"/> DRAFT			
Used At: DWR		<input type="checkbox"/> RECOMMENDED			
Notes: 1 2 3 4 5 6 7 8 9 10		<input type="checkbox"/> PUBLICATION			



Node: A521	Title: Determine Managed Wetlands Water Use	Number:	Page: 35
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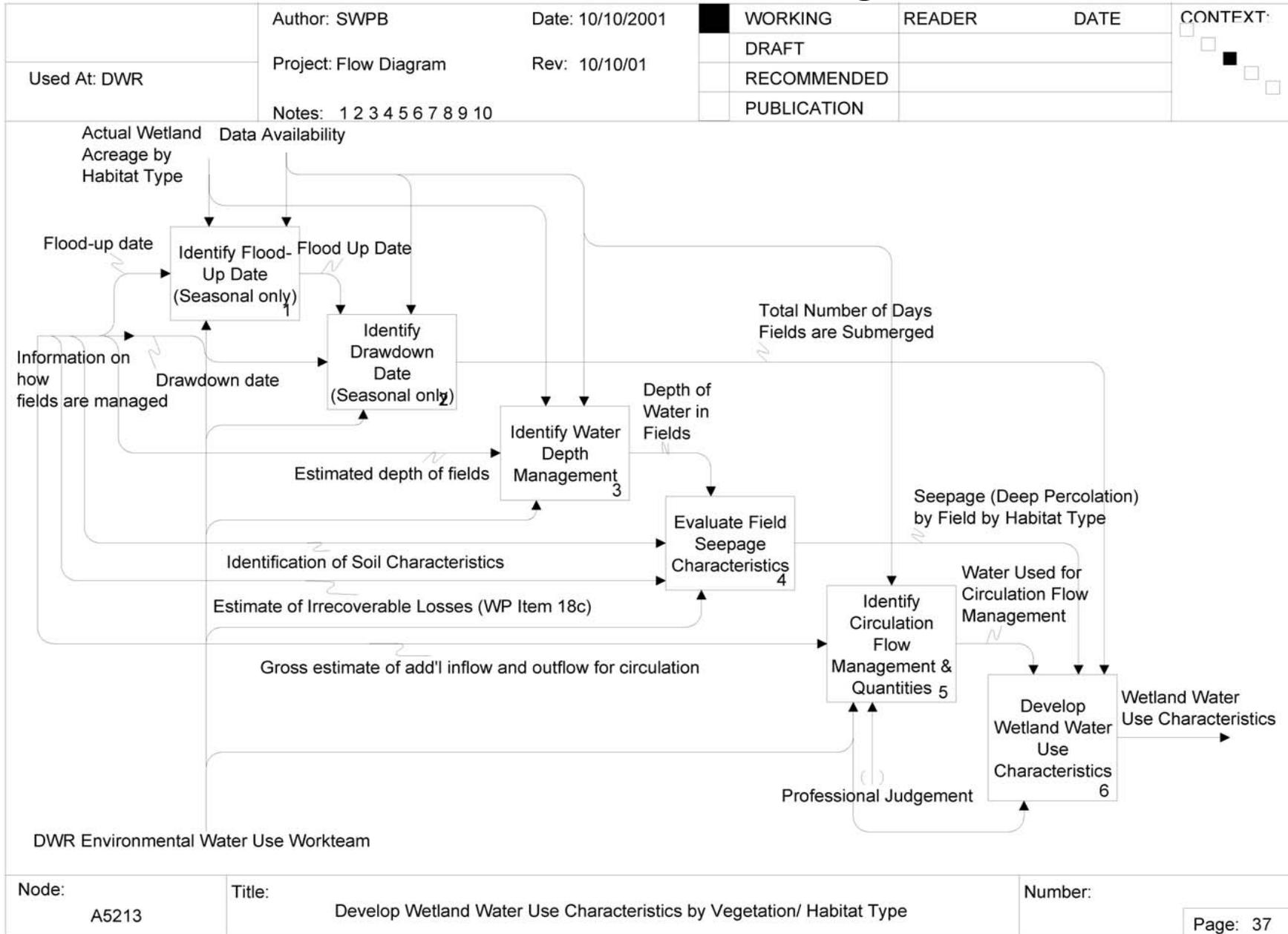
IDEF0 Process Diagram

Used At: DWR	Author: SWPB	Date: 10/10/2001	<input checked="" type="checkbox"/> WORKING	READER	DATE	CONTEXT: <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Project: Flow Diagram	Rev: 10/10/01	<input type="checkbox"/> DRAFT			
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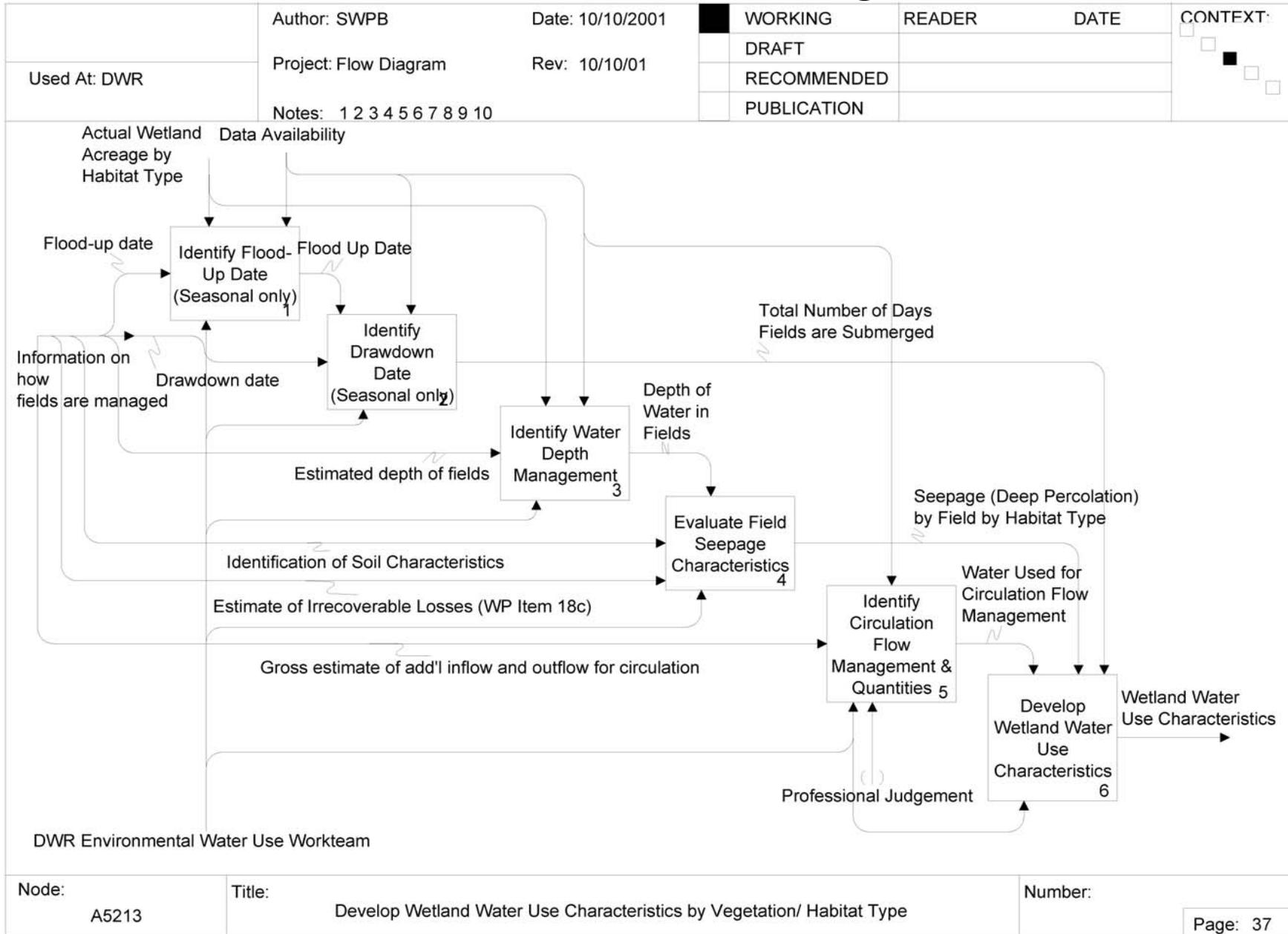


Node: A5212	Title: Determine Wetland Acreage by Habitat Type	Number:	Page: 36
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IDEF0 Process Diagram



IDEF0 Process Diagram



Managed Wetlands Spreadsheet Template

- Monthly time-step spreadsheet computes volumes of the following parameters:
 - Effective Precipitation (EP)
 - Evapotranspiration (ET)
 - Habitat Coefficients x Evaporative Demand
 - Evapotranspiration of Applied Water (ETAW)
 - $ETAW = ET - EP$
 - Flood-up depths (F) and dates
 - Draw-down dates
 - Circulation flows (C) for waterfowl disease management
 - On-field percolation (P) rates
 - Irrigation application (I) for vegetation management
- $Applied\ Water\ (AW) = ETAW + F + C + P + I$

Spreadsheet Output

Sacramento National Wildlife Refuge Water Year 2000 Summary

Habitat Type	Flood-up/ Drawdown Date	Acreage	Habitat Coefficient	Unit ET	ET Volume	Precip. Volume	Flood-up Volume		Percolation		Circulation		Habitat Irrigation	Applied Water	ETAW	Unit Applied Water	Unit ETAW
							Habitat Water Depth	Flood-up Volume	Soil Percolation Rate	Volume	Circulation Rate	Volume					
		Ac		In	AF	AF	in	AF	in/day	AF	cfsAc	AF	AF	AF	AF	AF/AC	AF/AC
Permanent Ponds	All Year	168			753	178		0		220		712	0	1304	642	7.8	3.8
Permanent Ponds	All Year	64			288	68		0		96		347	0	652	246	10.2	3.8
0	0	0			0	0		0		0		0	0	0	0		
0	0	0			0	0		0		0		0	0	0	0		
Seasonal Marsh	Aug - Mar	1630			4721	1733		2038		1477		1972	0	6827	3656	4.2	2.2
Seasonal Marsh	Sep	9			5	9		11		1		3	0	20	5	2.2	0.6
Seasonal Marsh	Sep - Feb	1630			2744	1733		2038		1055		1471	0	5633	1932	3.5	1.2
Seasonal Marsh	Sep - Mar	1630			3344	1733		2038		1266		1471	0	5633	2423	3.5	1.5
Seasonal Marsh	Oct - Mar	1630			2403	1733		2038		1055		986	0	4039	1525	2.5	0.9
0	0	0			0	0		0		0		0	0	0	0		
Watergrass	Sep - Apr	255			965	272		319		231		308	159	1299	788	5.1	3.1
Watergrass	Sep - Apr	44			78	48		55		6		13	28	161	75	3.7	1.7
Watergrass	Sep - Apr	256			916	272		320		231		310	160	1446	761	5.6	3.0
0	0	0			0	0		0		0		0	0	0	0		
Summer Water	Oct - Jul	275			1120	292		344		324		999	0	2182	937	7.9	3.4
Summer Water	Jul -1/2 Apr	18			37	20		0		12		33	0	50	25	2.8	1.4
Summer Water	Jul -1/2 Apr	49			188	50		61		54		178	0	392	157	8.0	3.2
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		0		0	0	0	0		
0	0	0			0	0		0		0		0	0	0	0		
Total		7658			17562	8141		9262		6028		8803		29638	13172	3.9	1.7

Summary	AW	ETAW
Oct	8,731	2,852
Nov	3,321	0
Dec	0	1,396
Jan	0	0
Feb	0	0
Mar	722	1,497
Apr	541	1,376
May	660	769
Jun	1,146	792
Jul	687	543
Aug	3,896	802
Sep	9,934	3,145
Total	29638	13172

Supply	GCID Canals	GCID Drains	Total
Oct	6648	1034	7682
Nov	3808	954	4762
Dec	0	0	0
Jan	0	0	0
Feb	0	0	0
Mar	240	0	240
Apr	720	0	720
May	502	0	502
Jun	618	0	618
Jul	638	0	638
Aug	2454	364	2818
Sep	5533	876	6409
Total	21161	3228	24389

Supply	AF	Reuse	s/g ratio
Estimated Total Water Supply	24,389		
Reuse of Total Water Supply	5,249	17.71%	
Groundwater			
Feather River			
Butte Creek			
Rice Drainage			
Colusa Basin Drain			
Sacramento River - Riparian			
Sacramento River - CVP	24,389		
Local Creek			

Fall (Oct-Mar) AW 12,774
 Season (Apr-Sep) AW 16,864
 Fall (Oct-Mar) ETAW 5,745
 Season (Apr-Sep) ETAW 7,427

Water Plan Activities

- Deliverables
 - Managed Wetland Acreage
 - Applied Water
 - ETAW, ET, and EP
- Update 2005 accomplishments
 - 1998, 2000, and 2001 water portfolio data
- Update 2009 planned activities
 - 1999, 2002, 2003, 2004, and 2005 water portfolio data

Analytical Tool Development

- Incorporate managed wetlands as a module into California Agricultural Water Use Model
 - Utilize rootzone soil moisture accounting
 - Use common Precipitation and Evaporative demand data through database
 - Data easily aggregated via Model's database
 - Improve habitat vegetation irrigation calculations
- Requires expanded California Agricultural Water Use Model to incorporate smaller units than a DAU/County
 - Managed wetland data are computed by refuge or privately managed wetland grouping
 - Generally smaller than DAUs
 - In some cases, multiple managed wetlands per DAU

Update 2005 Parking Lot Issues

- Comprehensive analytical framework
- Gap analysis
- Additional annual water portfolio data
- QA/QC for Water Plan data
- Improved data transparency
- Climate change impacts

Data needs

- Managed wetland habitat acreage data
 - Refuges
 - Private wetland
- Habitat coefficients
- Flood-up / drawn-down dates
- Habitat management regimes
- Measured applied water by field

Potential Partnerships

- UC Cooperative Extension
- Refuge managers
 - USFWS, CDFG
- Ducks Unlimited
- California Waterfowl Association
- Water Districts/Agencies
- ???

Managed Wetland Water Use

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Questions?

