New Mexico Environment Department

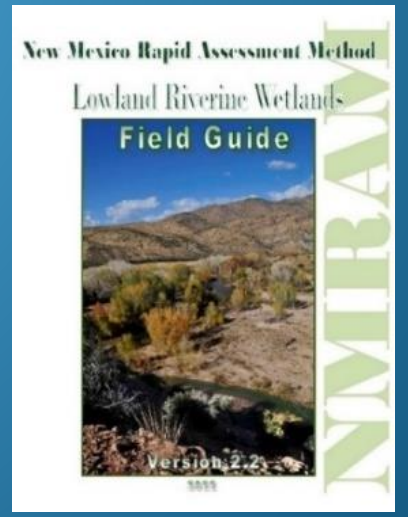
New Mexico Rapid Assessment Method (NMRAM)

Riverine Wetlands

Biotic Metrics Intro – Lowland Field Recon and Mapping

New Mexico Environment Department
Surface Water Quality Bureau
Wetlands Program

Natural Heritage New Mexico
University of New Mexico



Biotic Metrics

1. Relative Native Plant Community Composition
2. Vegetation Horizontal Patch Structure
3. Vegetation Vertical Structure
4. Native Riparian Tree Regeneration
5. Invasive Exotic Plant Species Cover

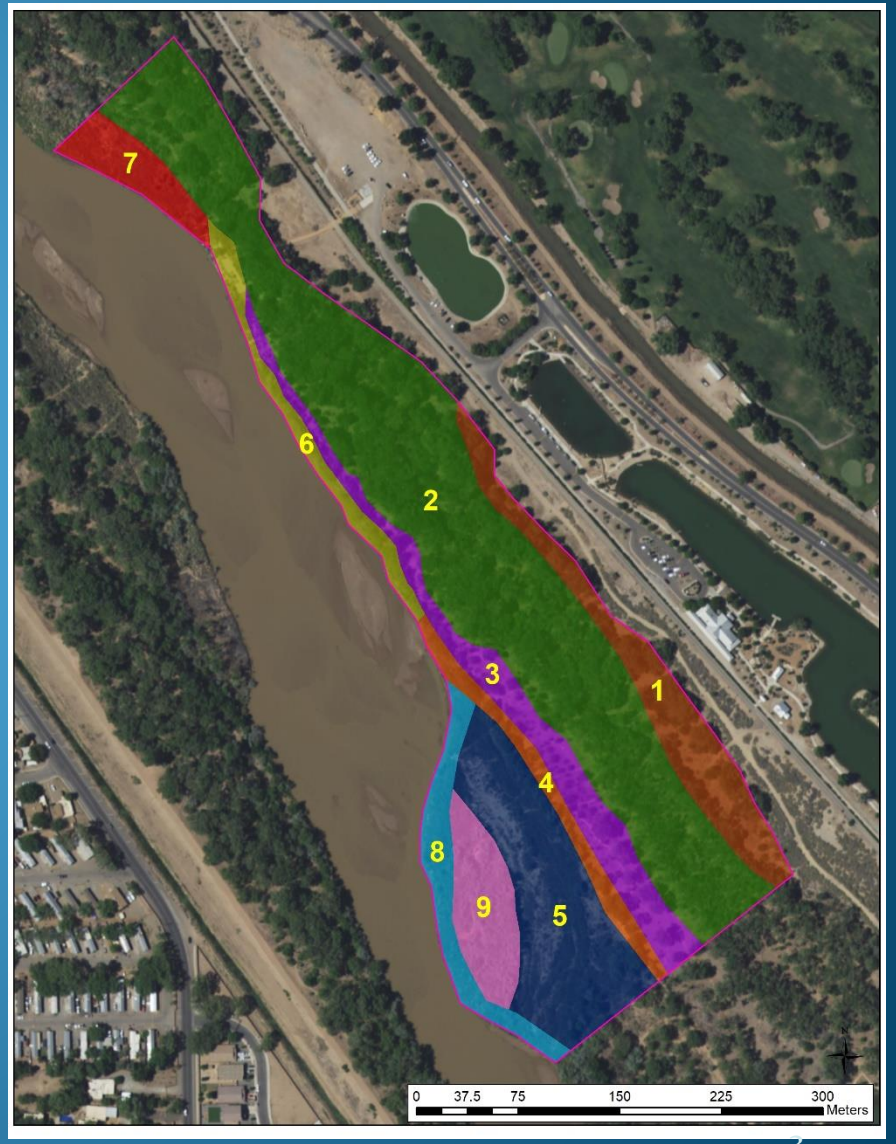
Abiotic Metric

1. Groundwater Index

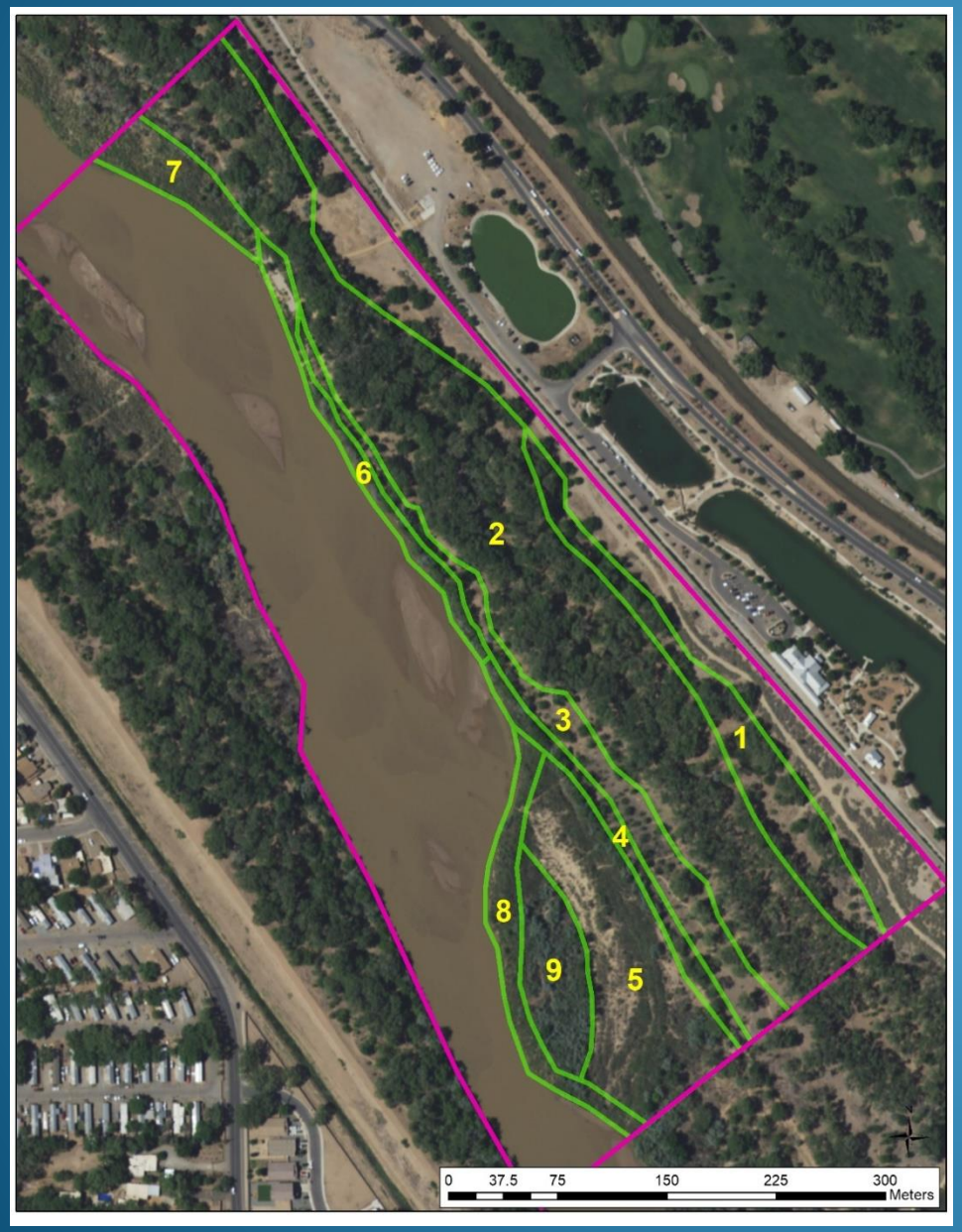
Biotic Field Reconnaissance and Mapping for Lowland

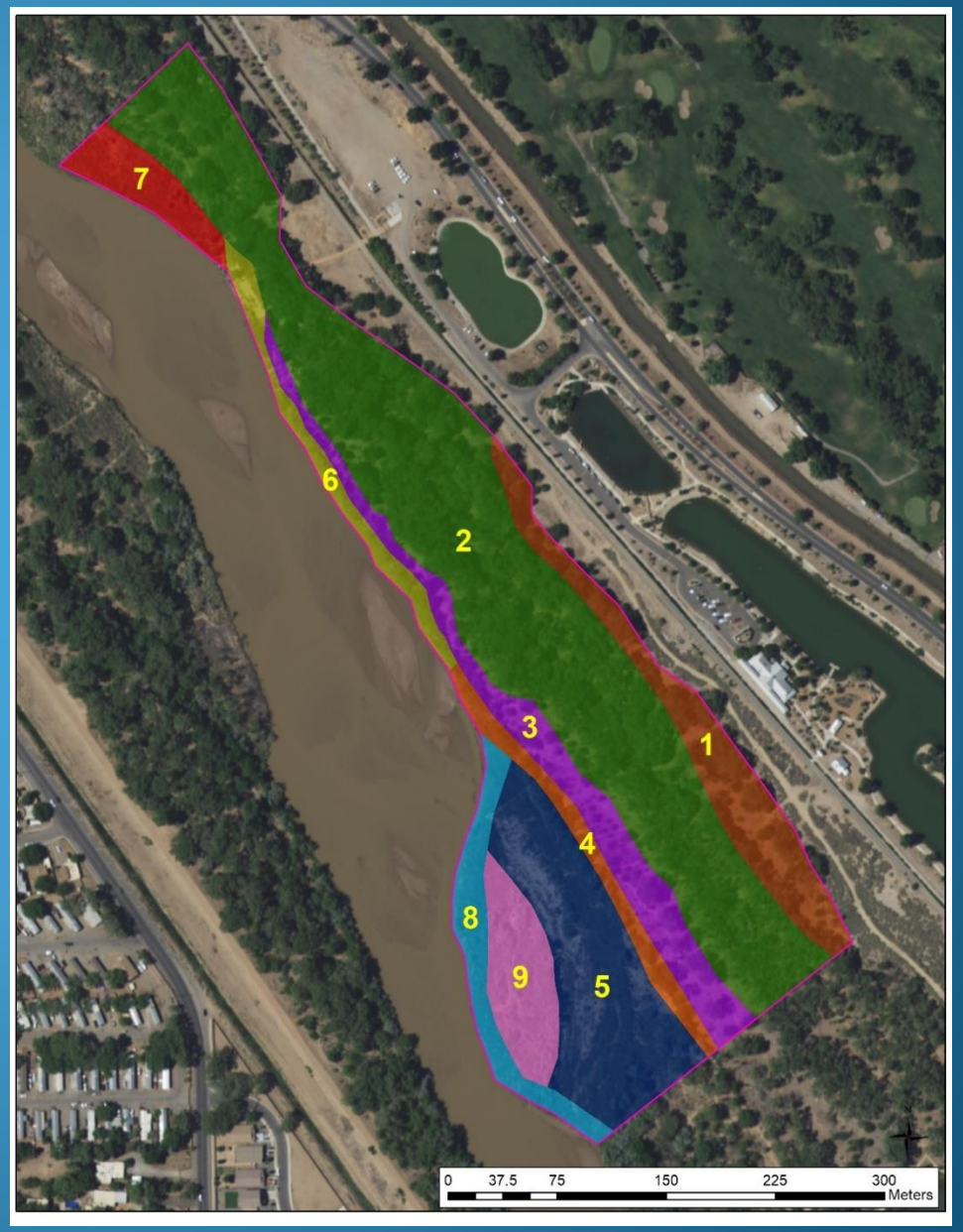
- Field Reconnaissance
  - Map Vegetation Patches
    - Vegetation community patches
    - Minimum map unit – 0.25 ha (25x100 m or 50x50 m, etc.)
  - Record patch relevant data for Biotic metrics
  - Record patch relevant data for Groundwater Index
  - Confirm Landscape assessment

- Select top two dominant species per strata:
  - Tall Woody > 6m (20 ft)
    - Must have >25% total cover within polygon
  - Short Woody < 6m (20 ft)
    - Must have >25% total cover within polygon
  - Herbaceous
    - Must have >10% total cover within polygon



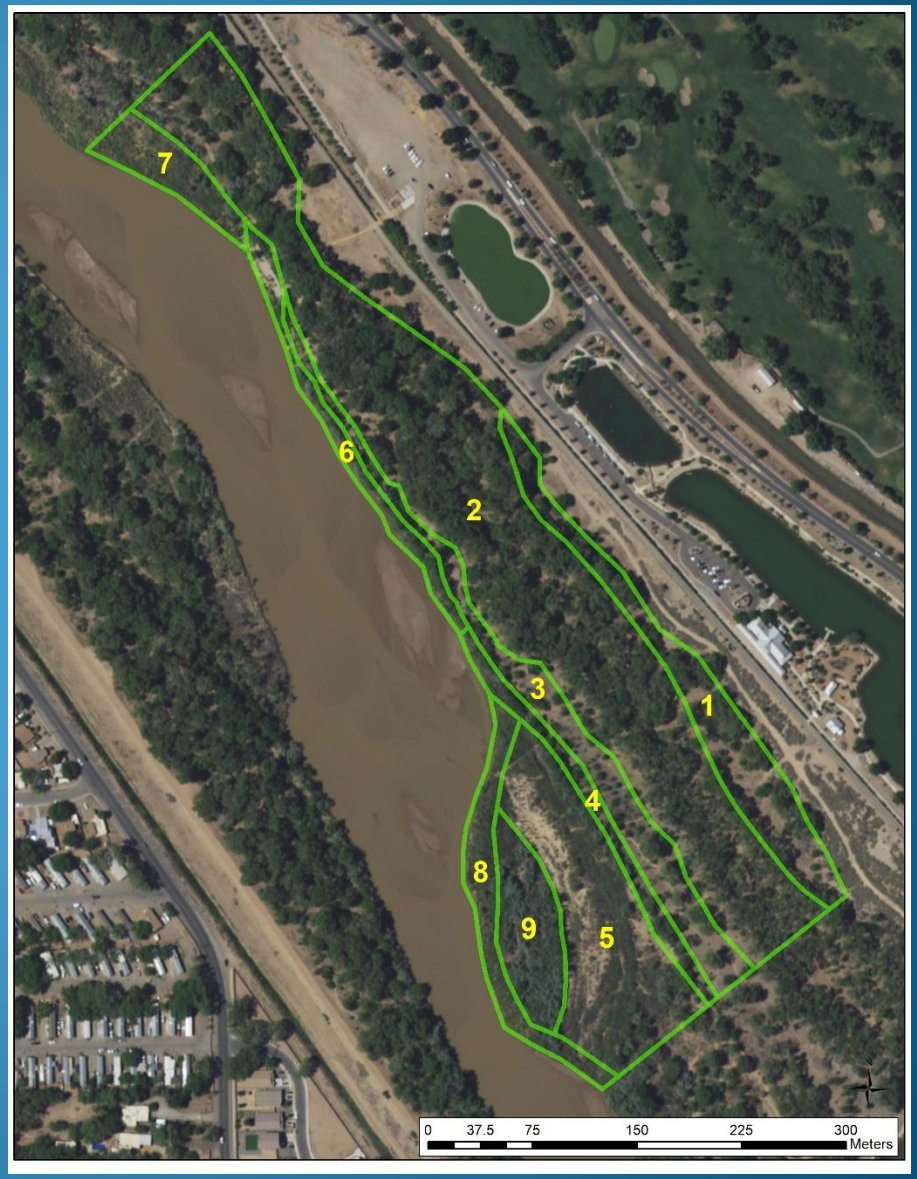
Vegetation Patch Map for Biotic Metrics





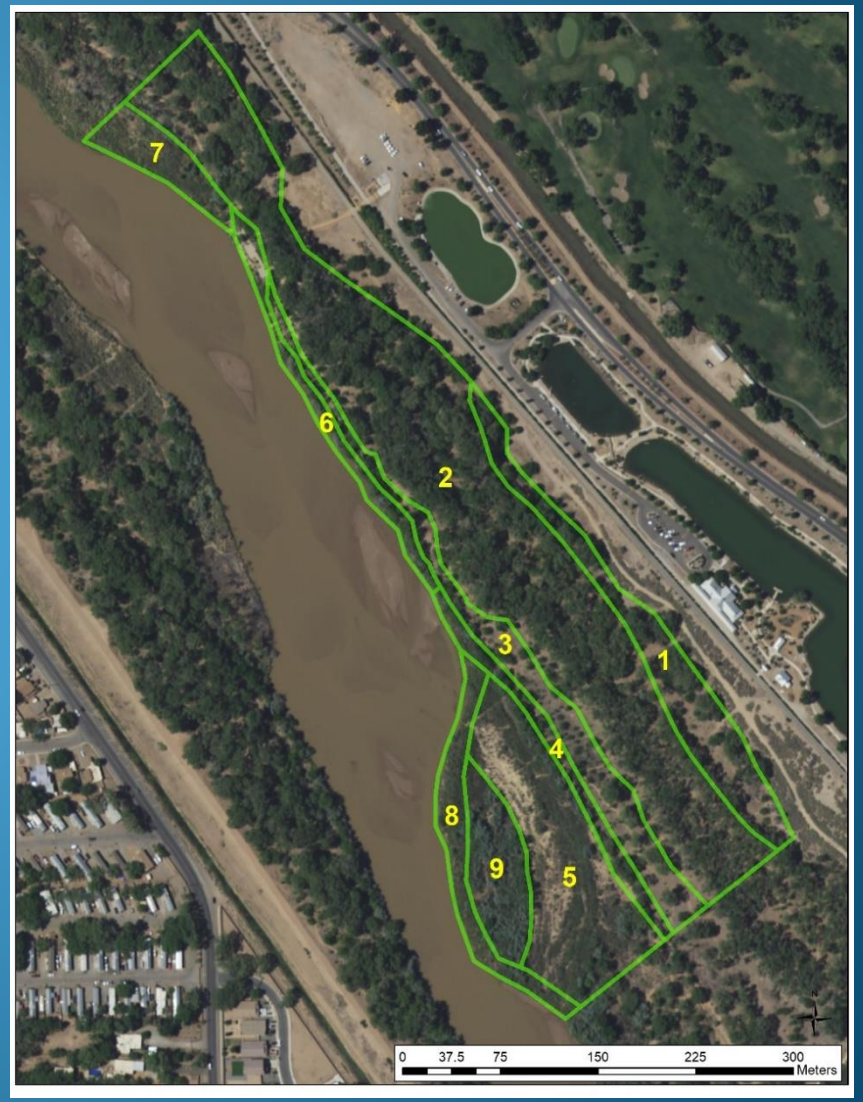
Vegetation Patch Map for Biotic Metrics

- Map each plant community polygon in the SA
  - Determine patches by changes in:
    - Dominant species present
    - Dominant species densities
    - Vegetation strata present
    - Presence and health of Phreatophytes
- Group polygons into community types (CT)
  - Based on strata (height classes)
  - Species dominance (total cover)



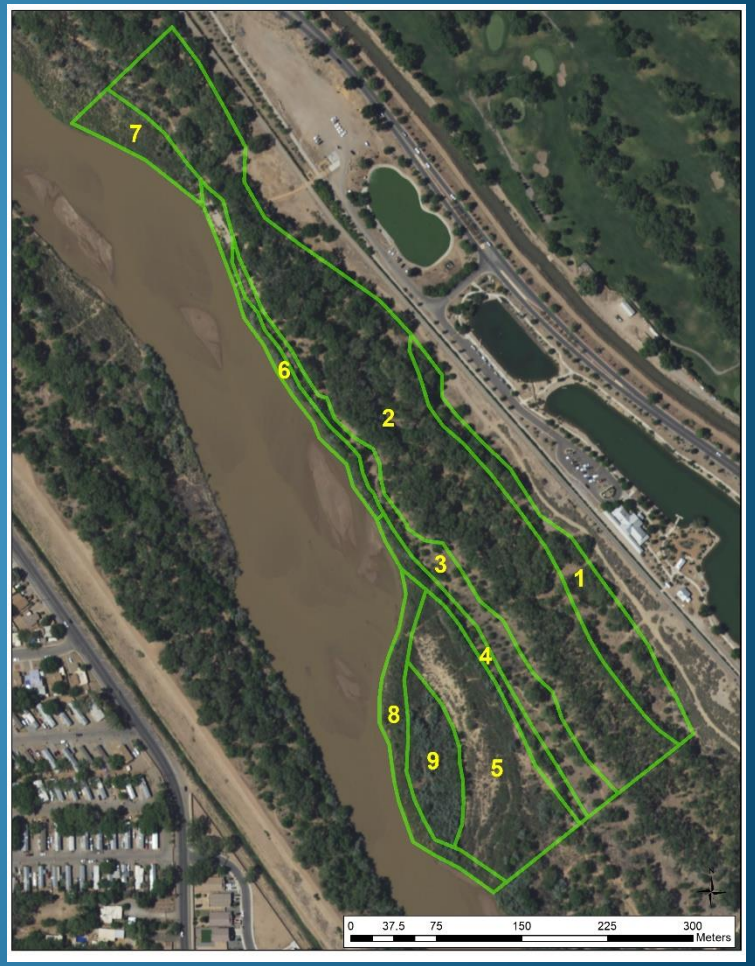
Vegetation Patch Map for Biotic Metrics
Polygon Data – Worksheet 5

- Estimate the % area of SA for each Polygon
- Record Vertical Structure Type
  - Assign VST type based on mix of strata types present
  - Use vertical structure types in Appendix B
  - Vegetation Vertical Structure metric
- Record Native Riparian Tree Regeneration % Cover
  - Total percent for polygon (estimated)
  - Native Riparian Tree Regeneration metric
- Record Invasive Exotic Plant Species % Cover
  - Total percent for polygon (estimated)
  - Invasive Exotic Plant Species Cover metric



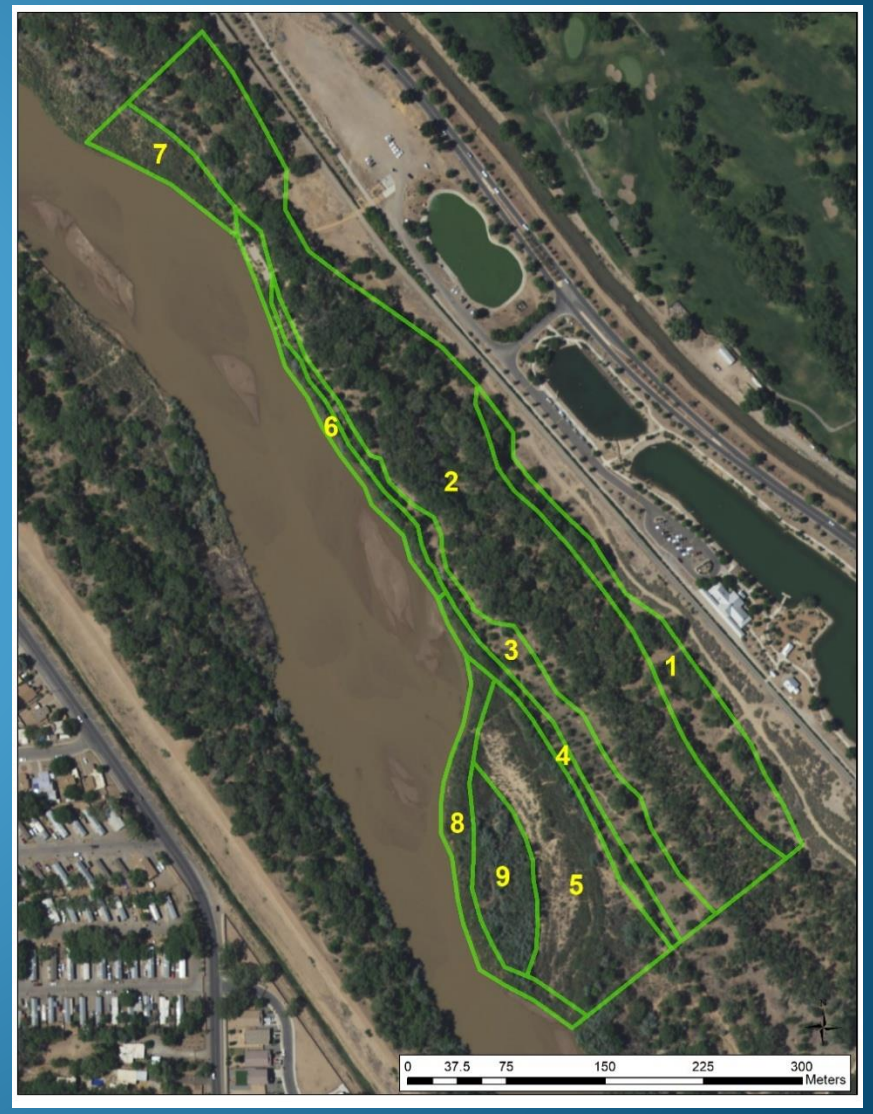
Vegetation Patch Map for Biotic Metrics
Polygon Data – Worksheet 5 (cont.)

- Groundwater Index Metric
  - Record the presence of Phreatophytes by strata:
    - Tall Woody > 6m (20 ft)
    - Short Woody < 6m (20 ft)
      - List of woody phreatophyte species in Table A11d in Appendix B
      - Phreatophyte species composition values Table A11a in Appendix B
      - Standing dead phreatophytes count ***if*** standing dead >25% cover
    - Herbaceous
      - Based on total cover of obligate and/or facultative wetland species
      - Total herbaceous cover needs >10% of polygon to be included
  - Record the health of phreatophytes for Tall and Short Woody strata
    - Use woody phreatophyte health modifier values in Table A11b in Appendix B
- Comments – Very short description of the polygon



Vegetation Patch Map for Biotic Metrics
Community Type (CT) Data – Worksheet 6

- Select top two dominant species per strata:
  - Tall Woody > 6m (20 ft)
  - Short Woody < 6m (20 ft)
  - Herbaceous
  - Record on Worksheet 6
  - Relative Native Plant Community Composition Metric
- Calculate the % area of SA for each CT
  - Add together % area of SA for all polygons assigned to that CT



Biotic Metrics – Tracking Vegetation Patch Data

Polygon 1 – Worksheet 5

Biotic Metrics

Worksheet 5. Vegetation Community Patch Data for Polygons from the SA Biotic Map for Biotic Metrics B3, B4, and B5 and for Abiotic Metric A11. Enter data for each polygon under a unique number assigned from the SA Biotic Map. Estimate the percentage of the SA (%SA) each polygon covers (expressed as decimal). Each polygon is then evaluated with respect to Vegetation Vertical Structure (B3), Native Tree Regeneration (B4), and Invasive Exotic Plant Species Cover (B5) metrics. Enter the Vertical Structure Type (VST) for B3, tree regeneration % cover within the polygon for B4 and the % cover of invasive exotic species for B5. Use the Tables in Appendix B and the Field Guide for metric instructions. For the Groundwater Index metric (A11) select a composition rating for tall woody, short woody or herbaceous using Table A11a in Appendix B if that stratum occurs in the polygon. A health modifier value is also selected from Table A11b for each woody stratum (tall or short) when riparian woody phreatophytes occur in the polygon. The comments box is used for documenting and describing vegetation community patch features.

Polygon No	% SA	B3 Structure Type	B4 Tree Regeneration % Cover	B5 Invasive Exotic Species % Cover	Invasive Exotic Species (List Code(s))	A11 Tall Woody (TW)	A11 Short Woody (SW)	A11 Herbaceous	A11 TW Health Modifier	A11 SW Health Modifier	Comments
1	0.09	VST 1	0	7	ULPU, ELAN, TACH	2	2	1	0.9	0.75	Old exotic treatment area next to levee
2											
3											
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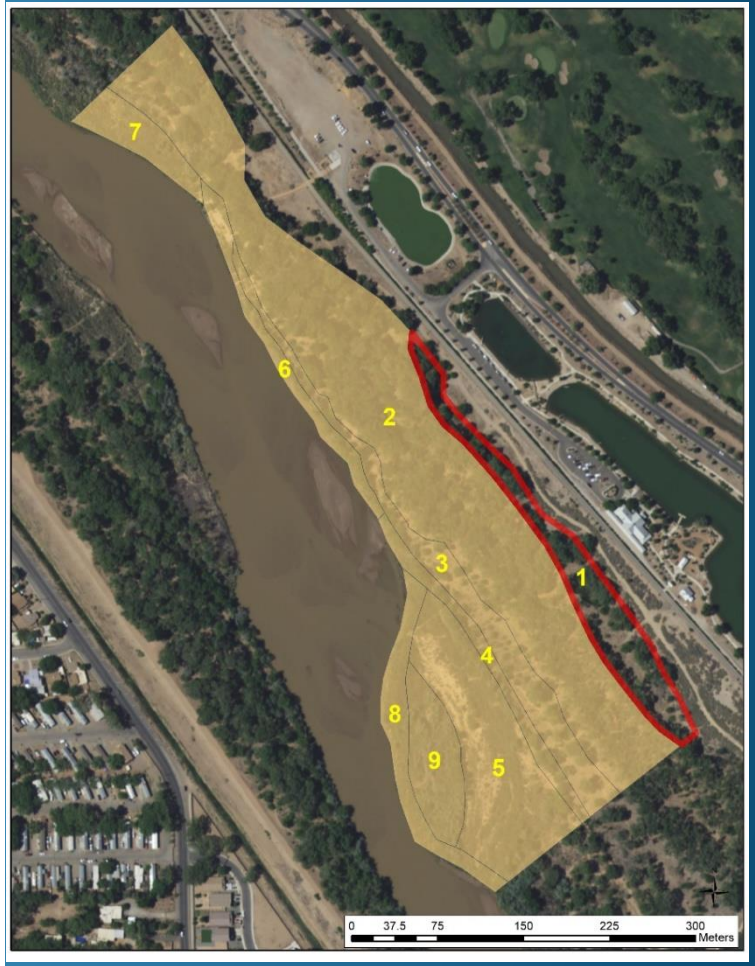
12											
13											



Biotic Metrics – Tracking Vegetation Patch Data

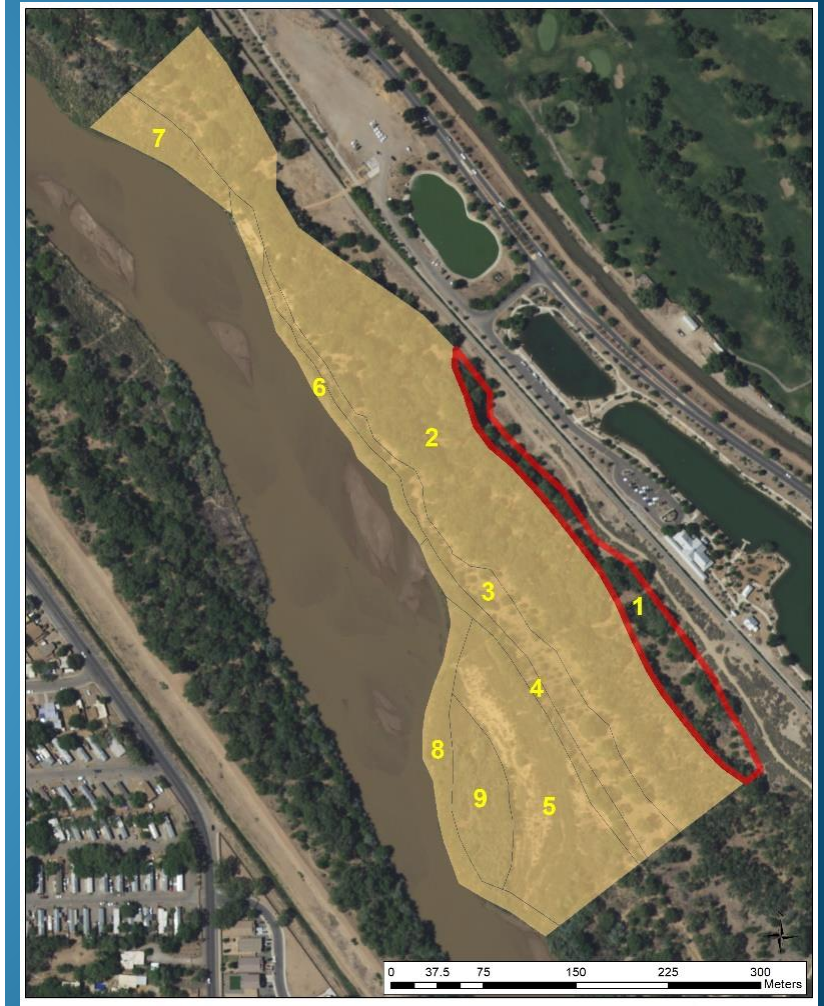
Community Type (CT) A – Worksheet 6

B1 - Relative Native Plant Community Composition

Worksheet 6. CT Plant Species and Polygon Assignments. Starting with CT A, enter the number of the first polygon from Worksheet 5, and the species codes for the two top dominant species in each stratum that appear in the polygon. See footnotes for special instructions. If a species appears in more than one strata, assign the species to the stratum in which it is more abundant. Each polygon from Worksheet 5 is then either assigned to the same CT if it has the same composition, or a new CT is created for the polygon. For polygons with sparse or no vegetation (VST 7) and no dominant plant species, select NO DOM in the Herbaceous/Sparse Stratum under Species 6. Then select E if the polygon is human-disturbed ground (0), U if mixed natural/human disturbance (2), or N if naturally unvegetated (4).

		Tall Woody Stratum [1]				Short Woody Stratum [2]				Herbaceous/Sparse Stratum [3]				CT Score [4]		
CT	Polygon Nos.	Species 1	E N	Species 2	E N	Species 3	E N	Species 4	E N	Species 5	E N	Species 6	E N	Raw[4]	% SA[5]	Wt Score[6]
A	1	PODE3	N	ULPU	E	FOPU2	N	SHAR	N	SPAI	N	CYDA	E	2.3	0.09	0.207
B																
C																
D																
E																
F																
G																
H																
I																
J																
K																
L																
M																
N																
O																
													Final Weighted Score[7]		0.09	0.207

1. Trees and shrubs > 5 m (15 feet) and > 25% total stratum cover; 2. Trees and shrubs ≤5m (15 feet) and >25% total stratum cover; 3. Herbaceous (graminoids and forbs)>10% total stratum cover. [4]Raw Score is from Table B1a (Appendix B); [5]%SA is the percentage of the SA area covered by the CT and expressed as a decimal number; the total area %SA must equal 1; [6]Wt. Score is the product of the Raw Score * % SA; [7]The Final Weighted Score is the sum of the Wt. Scores. Rate the CT Final Weighted Score on Table B1 and enter the Rating for Relative Native Plant Community Composition on the SA Rank Summary Worksheet.



Biotic Metrics – Tracking Vegetation Patch Data

Polygon 2 – Worksheet 5

Worksheet 5. Vegetation Community Patch Data for Polygons from the SA Biotic Map for Biotic Metrics B3, B4, and B5 and for Abiotic Metric A11. Enter data for each polygon under a unique number assigned from the SA Biotic Map. Estimate the percentage of the SA (%SA) each polygon covers (expressed as decimal). Each polygon is then evaluated with respect to Vegetation Vertical Structure (B3), Native Tree Regeneration (B4), and Invasive Exotic Plant Species Cover (B5) metrics. Enter the Vertical Structure Type (VST) for B3, tree regeneration % cover within the polygon for B4 and the % cover of invasive exotic species for B5. Use the Tables in Appendix B and the Field Guide for metric instructions. For the Groundwater Index metric (A11) select a composition rating for tall woody, short woody or herbaceous using Table A11a in Appendix B if that stratum occurs in the polygon. A health modifier value is also selected from Table A11b for each woody stratum (tall or short) when riparian woody phreatophytes occur in the polygon. The comments box is used for documenting and describing vegetation community patch features.

Polygon No	% SA	B3 Structure Type	B4 Tree Regeneration % Cover	B5 Invasive Exotic Species % Cover	Invasive Exotic Species (List Code(s))	A11 Tall Woody (TW)	A11 Short Woody (SW)	A11 Herbaceous	A11 TW Health Modifier	A11 SW Health Modifier	Comments
1	0.09	VST 1	0	7	ULPU, ELAN, TACH	2	2	1	0.9	0.75	Old exotic treatment area next to levee
2	0.48	VST 2	0	10	ELAN, TACH, ULPU, AIAL	3	-	1	0.9		Mature cottonwood forest with a few scattered RIAU, FOPU but <25%, exotic treatment area
3											
4											
5											
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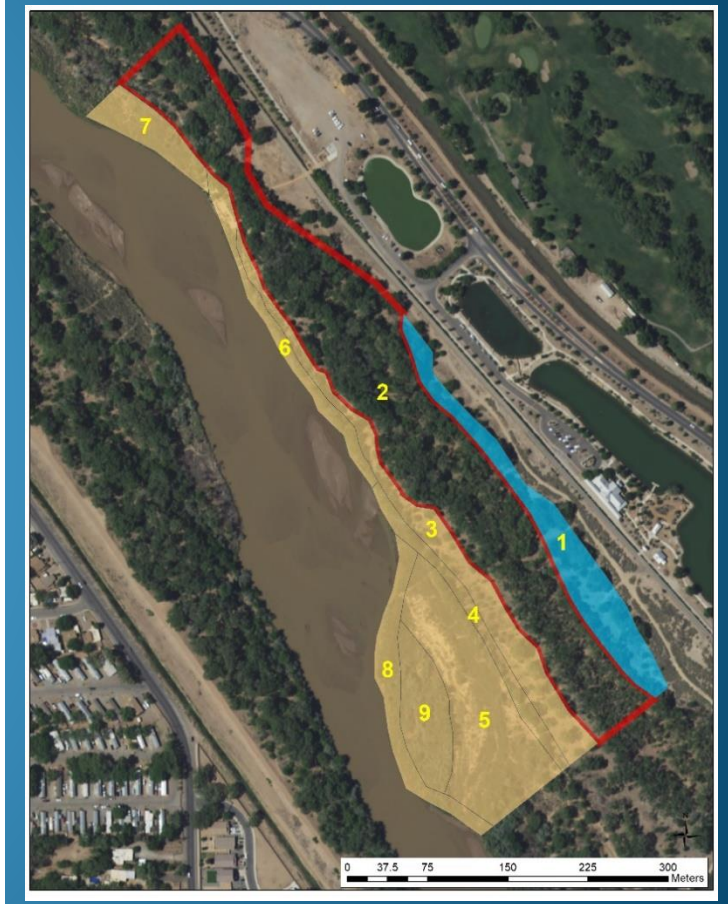


Biotic Metrics – Tracking Vegetation Patch Data

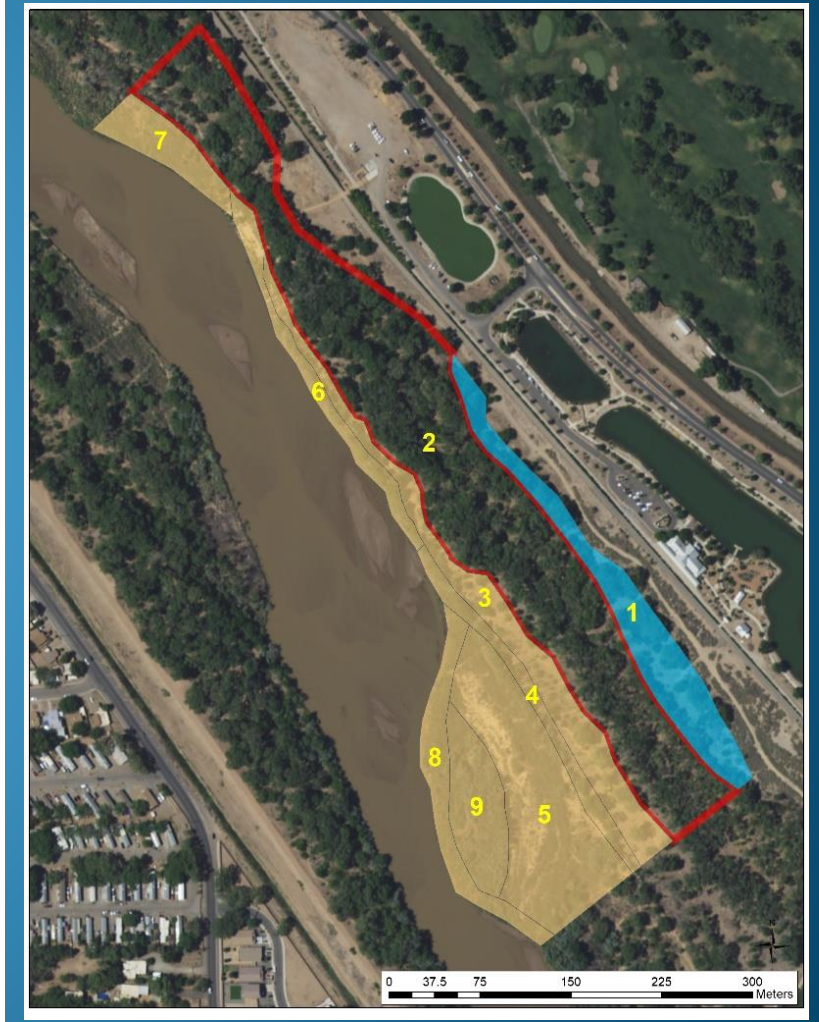
Community Type (CT) B – Worksheet 6

B1 - Relative Native Plant Community Composition

Worksheet 6. CT Plant Species and Polygon Assignments. Starting with CT A, enter the number of the first polygon from Worksheet 5, and the species codes for the two top dominant species in each stratum that appear in the polygon. See footnotes for special instructions. If a species appears in more than one strata, assign the species to the stratum in which it is more abundant. Each polygon from Worksheet 5 is then either assigned to the same CT if it has the same composition, or a new CT is created for the polygon. For polygons with sparse or no vegetation (VST 7) and no dominant plant species, select NO DOM in the Herbaceous/Sparse Stratum under Species 6. Then select E if the polygon is human-disturbed ground (0), U if mixed natural/human disturbance (2), or N if naturally unvegetated (4).

		Tall Woody Stratum [1]				Short Woody Stratum [2]				Herbaceous/Sparse Stratum [3]				CT Score [4]		
CT	Polygon Nos.	Species 1	E N	Species 2	E N	Species 3	E N	Species 4	E N	Species 5	E N	Species 6	E N	Raw[4]	% SA[5]	Wt Score[6]
A	1	PODE3	N	ULPU	E	FOPU2	N	SHAR	N	SPAI	N	CYDA	E	2.3	0.09	0.207
B	2	PODE3	N	MOAL	E					CYDA	E	SPCR	N	2	0.48	0.96
C																
D																
E																
F																
G																
H																
I																
J																
K																
L																
M																
N																
O																
													Final Weighted Score[7]		0.57	1.167

1. Trees and shrubs > 5 m (15 feet) and > 25% total stratum cover; 2. Trees and shrubs ≤5m (15 feet) and >25% total stratum cover; 3. Herbaceous (graminoids and forbs)>10% total stratum cover. [4]Raw Score is from Table B1a (Appendix B); [5]%SA is the percentage of the SA area covered by the CT and expressed as a decimal number; the total area %SA must equal 1; [6]Wt. Score is the product of the Raw Score * % SA; [7]The Final Weighted Score is the sum of the Wt. Scores. Rate the CT Final Weighted Score on Table B1 and enter the Rating for Relative Native Plant Community Composition on the SA Rank Summary Worksheet.

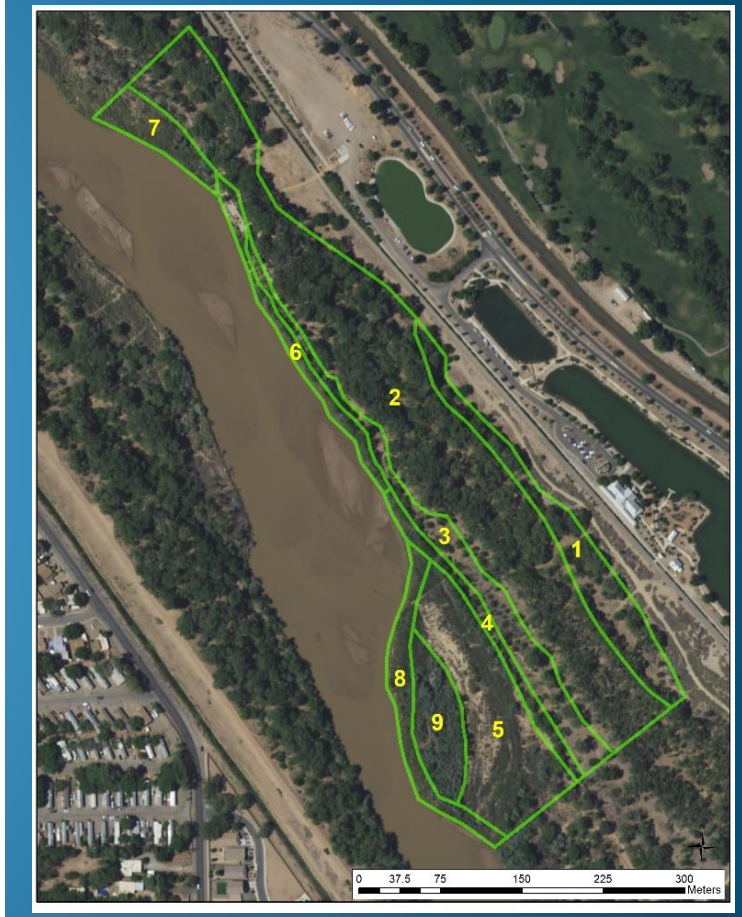


Biotic Metrics – Tracking Vegetation Patch Data

Finished SA – Polygons – Worksheet 5

Worksheet 5. Vegetation Community Patch Data for Polygons from the SA Biotic Map for Biotic Metrics B3, B4, and B5 and for Abiotic Metric A11. Enter data for each polygon under a unique number assigned from the SA Biotic Map. Estimate the percentage of the SA (%SA) each polygon covers (expressed as decimal). Each polygon is then evaluated with respect to Vegetation Vertical Structure (B3), Native Tree Regeneration (B4), and Invasive Exotic Plant Species Cover (B5) metrics. Enter the Vertical Structure Type (VST) for B3, tree regeneration % cover within the polygon for B4 and the % cover of invasive exotic species for B5. Use the Tables in Appendix B and the Field Guide for metric instructions. For the Groundwater Index metric (A11) select a composition rating for tall woody, short woody or herbaceous using Table A11a in Appendix B if that stratum occurs in the polygon. A health modifier value is also selected from Table A11b for each woody stratum (tall or short) when riparian woody phreatophytes occur in the polygon. The comments box is used for documenting and describing vegetation community patch features.

Polygon No	% SA	B3 Structure Type	B4 Tree Regeneration % Cover	B5 Invasive Exotic Species % Cover	Invasive Exotic Species (List Code(s))	A11 Tall Woody (TW)	A11 Short Woody (SW)	A11 Herbaceous	A11 TW Health Modifier	A11 SW Health Modifier	Comments
1	0.09	VST 1	0	7	ULPU, ELAN, TACH	2	2	1	0.9	0.75	Old exotic treatment area next to levee
2	0.48	VST 2	0	10	ELAN, TACH, ULPU, AIAL	3	-	1	0.9		Mature cottonwood forest with a few scattered RIAU, FOPU but <25%, exotic treatment area
3	0.09	VST 5	0	5	ULPU, SARA, ELAN	-	3	3		0.75	Shrubby terrace edge, disturbed, few scattered trees - PODE, MOAL, GLTR. Small patches of Bermuda grass
4	0.03	VST 1	50	20	ULPU, ELAN, TACH, SARA	3	3	3	1.1	1.1	Narrow bank between terrace and bar where there is dense understory still remaining
5	0.15	VST 5	30	2	ULPU, ELAN, SARA	-	4	-		1.1	Side bar patch dominated by willows and young cottonwood that is currently inundated in channels
6	0.03	VST 1	2	70	ULPU, ELAN, TACH, SARA	1	3	3	1	0.9	Terrace edge next to active channel in jetty jacks, mostly dominated by exotic tree species (ULPU, ELAN, etc)
7	0.03	VST 5	10	5	ULPU, AIAL, ELAN, SARA	-	3	3		0.9	Low side bar with shrubs dominated by coyote willow and seep willow, currently flooded
8	0.05	VST 5	5	5	ELAN, SARA	-	4	4		1.1	Edge of large side bar with scattered young cottonwood and dense coyote willow, very few ELAN and MOAL
9	0.05	VST 1	30	30	ELAN, SARA	1	4	-	1	1.1	Patch on side bar with mature Russian olive and mixed understory of coyote willow and young cottonwood. Ravennagrass common.
10											
11											
12											
13											



Biotic Metrics – Tracking Vegetation Patch Data

Finished SA – CTs – Worksheet 6

B1 - Relative Native Plant Community Composition

Worksheet 6. CT Plant Species and Polygon Assignments. Starting with CT A, enter the number of the first polygon from Worksheet 5, and the species codes for the two top dominant species in each stratum that appear in the polygon. See footnotes for special instructions. If a species appears in more than one strata, assign the species to the stratum in which it is more abundant. Each polygon from Worksheet 5 is then either assigned to the same CT if it has the same composition, or a new CT is created for the polygon. For polygons with sparse or no vegetation (VST 7) and no dominant plant species, select NO DOM in the Herbaceous/Sparse Stratum under Species 6. Then select E if the polygon is human-disturbed ground (0), U if mixed natural/human disturbance (2), or N if naturally unvegetated (4).

		Tall Woody Stratum [1]				Short Woody Stratum [2]				Herbaceous/Sparse Stratum [3]				CT Score [4]		
CT	Polygon Nos.	Species 1	EN	Species 2	EN	Species 3	EN	Species 4	EN	Species 5	EN	Species 6	EN	Raw[4]	% SA[5]	Wt Score[6]
A	1	PODE3	N	ULPU	E	FOPU2	N	SHAR	N	SPAI	N	CYDA	E	2.3	0.09	0.207
B	2	PODE3	N	MOAL	E					CYDA	E	SPCR	N	2	0.48	0.96
C	3					SAEX	N	ULPU	E	DISP	N	MUAS	N	2.5	0.09	0.225
D	4	PODE3	N	ELAN	E	SAEX	N			MUAS	N	CAEM2	N	2.4	0.03	0.072
E	5					SAEX	N	PODE3	N					4	0.15	0.6
F	6	ULPU	E	ELAN	E	SAEX	N			CAEM2	N			1.5	0.03	0.045
G	7					SAEX	N	BASA4	N	CAEM2	N	SOAS	E	3.5	0.03	0.105
H	8					SAEX	N			CAEM2	N	AGGI2	E	3.5	0.05	0.175
I	9	ELAN	E			SAEX	N	PODE3	N					1.3	0.05	0.065
J																
K																
L																
M																
N																
O																
													Final Weighted Score[7]		1	2.454

1. Trees and shrubs > 5 m (15 feet) and > 25% total stratum cover; 2. Trees and shrubs ≤5m (15 feet) and >25% total stratum cover; 3. Herbaceous (graminoids and forbs)>10% total stratum cover. [4]Raw Score is from Table B1a (Appendix B); [5]%SA is the percentage of the SA area covered by the CT and expressed as a decimal number; the total area %SA must equal 1; [6]Wt. Score is the product of the Raw Score * % SA; [7]The Final Weighted Score is the sum of the Wt. Scores. Rate the CT Final Weighted Score on Table B1 and enter the Rating for Relative Native Plant Community Composition on the SA Rank Summary Worksheet.