

Appendix F: GIS Metadata

The coverages utilized in the GIS created for this project (including certain figures in the report) were attained from three sources: the California Department of Water Resources-Northern District; the Geographical Information Center, California State University, Chico; and The Nature Conservancy Sacramento River Project. The metadata or information to obtain the metadata for coverages attained from each source are listed below:

CALIFORNIA STATE UNIVERSITY, CHICO
GEOGRAPHICAL INFORMATION CENTER (GIC)
**SACRAMENTO RIVER RIPARIAN VEGETATION COVERAGE DRAFT
METADATA**
February, 2000

NOTES TO USERS: By accepting this Sacramento River Riparian Vegetation (SRRV) GIS data, the user agrees to the following terms:

- * Interested parties please contact the Director of Geographical Information Center, California State University, Chico, Chico, CA, 95929-0425, (530) 898-5969,
email:cwnelson@csuchico.edu
- * Graphic or textual representations of this data shall include appropriate references to the source, authors, and agencies.
- * The data shall not be amended, edited, or revised, nor shall it be used inappropriately to produce inaccurate, incomplete, or misleading analyses, reports, or maps.

PROJECT NAME: Sacramento River Riparian Mapping

PROJECT COORDINATORS: Chuck Nelson, Geographical Information Center, California State University, Chico; Stacey Cepello, California Department of Water Resources - Northern District; and Jim Nelson, Craig Martz, and John Seperek, California Department of Fish and Game - Region 1.

LAYER NAMES:
nvriparian

DESCRIPTION:

The Sacramento River Riparian Mapping Project developed to inventory and map riparian lands along the Sacramento River and its major tributaries. The study area was confined to streams in the Sacramento Valley, CA. and mapping ended in the foothill canyons on both sides of the Valley.

The project was funded in four phases. Phase 1 included southern Shasta County

and was funded using 1086 money from the Department of Water Resources (DWR). Phase 2 included Tehama County and was also funded by DWR. Phase 3 included Butte County and was a joint effort by DWR and the U.S. Bureau of Reclamation. Phase 4 included the Sacramento River mainstem to Suisun Bay, the Feather, American, Yuba, and Bear Rivers, Butte Sink, the Sutter Bypass, and Stony, Cache, and Putah Creeks on the west side; funded by a CalFed Category 3 grant.

VITAL STATISTICS

Datum:NAD 27

Projection: Universal Transverse Mercator (UTM)

Units: Meters

Source media: Color infrared aerial photography

Source dates, scales, file size(.shp files only), and no. of data records:

1. Keswick Dam to Tehama County line, 1991, nominal scale RF= 1:9,600, 15.1 Mb., 2398 data records.
2. Tehama County, 1993, nominal scale RF= 1:12,000, 14.7 Mb., 4578 data records.
3. Butte County, Glenn County side of Sacramento River, 1994, nominal scale RF= 1:12,000, 18.3 Mb., 3127 data records.
4. Sacramento River mainstem - Butte County line to American River, 1996, nominal scale of RF= 1:12,000, 1.4 Mb., 717 data records.
5. Lower Stony Creek to Black Butte Dam, 1996, nominal scale RF= 1:12,000, 1.5 Mb., 980 data records.
6. Lower Butte Creek from Butte County line, Butte Sink, 1996,nominal scale RF= 1:12,000, 3.0 Mb., 2050 data records.
7. Sutter Bypass, Butte Slough, 1996, nominal scale RF=1:12,00, sutterbypass 1.52 Mb., 825 data records.
8. Tisdale Weir, 1996, nominal scale RF= 1:12,000, 52.7 Kb., 17 data records.
9. Feather R. from Verona to Butte County line and Yuba R, 1996, nominal scale RF=1:12,000, 3.54 Mb., 1818 data records.
10. Feather River from Butte County line to Oroville, 1997,nominal scale RF= 1:12,000, 1.75 Mb., 958 data records.
11. Yuba R. to Hwy. 20 bridge, 1996, nominal scale RF=1:12,000; 1.0 Mb., 518 data records.
12. Bear River - Feather River to Camp Far West Reservoir, 1996, nominal scale RF= 1:12,000, 737 K., 402 data records.
13. American River - American River to Folsom Lake, 1996, nominal scale RF= 1:12,000, 1.8 Mb., 1191 data records.
14. Sacramento R. from American R. to Suisun Bay,1998, nominal scale RF= 1:12,000, 2.4 Mb., 1257 data records.
15. Cache Creek - Cache Creek from Capay Valley to Yolo Bypass, 1998, nominal scale RF= 1:12,000, 3.1 Mb., 2076 data records.
16. Putah Creek - Putah Creek from Montecello Dam to Yolo Bypass, 1998, nominal scale RF= 1:12,000, 1.2 Mb., 758 data records.
17. Consolidated file, 72.5 Mb., 24,894 data records.

Capture method: Shasta, Tehama, and Butte were hand digitized from mylar overlays of riparian vegetation over airphoto enlargements. Remaining areas were produced from ortho-rectified RF 1:12,000 color infrared scans digitized in ArcView.

Files produced: ArcView shape files

Coverage type: Polygon for vegtype and arcs for stream segments

DESCRIPTION OF RIPARIAN CATEGORIES

BS Blackberry Scrub. $\geq 80\%$ coverage by blackberry vegetation.

CF Great Valley Cottonwood Riparian Forest. $\geq 80\%$ Cottonwood by canopy cover - One year old or greater. CF represents the earliest successional sere. These forests are dominated by cottonwood (*Populus fremontii*) and one or more tree willows (*Salix gooddigii variabilis*, *S. laevigata*, and *S. lasiandra* are most common) California Grape (*Vitis californica*) is the only conspicuous vine.

EUC Eucalyptus. *Eucalyptus globulus*. Blue Gum. Found in fairly monospecific stands (one species only) on heavily modified banks. Eucalyptus tends to shade out competitors. NOTE: 1998 coverages only.

GR Giant Reed. *Arundo donax*. Grass < 8 meters. A very invasive plant that reduces and replaces native species. NOTE: 1998 coverages only.

HL Herbland Cover. Composed of annual and perennial grasses and forbs. Must be enclosed by riparian vegetation or the stream channel.

M Valley Freshwater Marsh. Valley freshwater marshes are dominated by perennial emergent monocots. Coverage may be very high, approaching 100%. Cattails (*Typha* spp.) or tule (*Scripus* spp.) usually are the dominants, often forming monotonous swards that are sparingly punctated with additional taxa such as sedges (*Carex* spp.), cane (*Phragmites australis*), or blue vervain (*Verbena hastata*).

MF Great Valley Mixed Riparian Forest. In this unit neither willows nor cottonwoods dominate - also contains a mixture of more upland, later successional species that may include valley oak (*Quercus lobata*) at less than 60% canopy coverage, black walnut (*Juglans* spp.), ash (*Fraxinus latifolia*), tree of heaven (*Ailanthus altissima*), and sycamore (*Platanus racemosa*).

NL No label. In some of our older maps we used NL to depict non-riparian areas surrounded by riparian types. It was a way to show that the label was not missed. It has been dropped in recent coverages, however.

RS Great Valley Riparian Scrub. Young primary succession

TAM.Tamarisk. "Saltcedar" *Tamarix chinensis*. Invasive shrub found in open areas along the river. Originally introduced as an ornamental and for erosion control, Tamarisk has become an undesirable weed. Plants spread by seed and cuttings and grow rapidly. NOTE: 1998 coverages only.

VO Valley Oak (*Quercus lobata*) $\geq 60\%$ canopy cover - must be contiguous or have longest axis greater than the distance from riparian vegetation.

Habitat types:

D Disturbed. This unit identifies areas that are undergoing major disturbances and are now either completely devoid of riparian vegetation or contain only small remnants of it.

DR Disturbed riparian. This unit identifies a past disturbance, primarily dredge tailings with cottonwoods (*Populus fremontii*) the dominant species and other riparian vegetation types having established since the disturbance.

G Gravel and Sand Bars - These appear as open, unvegetated areas in air photos, but ground truthing reveals several annual and short-lived perennial species of sun-loving herbs, grasses and suffrutescent subshrubs. The vegetation coverage is less than 50%.

OW Open Water. This mapping unit constitutes water, either standing or moving, and does not necessarily imply vegetation.

METHODOLOGY:

- Shasta, Tehama, and Butte County coverages - The Shasta, Tehama, and Butte County coverages are complete since the entire Sacramento River and its tributaries containing significant riparian vegetation are represented. Vegetation types were identified from color infrared airphotos. The vegetation categories were polygoned using color infrared aerial photographs at a scale of RF 1:9600 (Shasta) or RF 1:12,000 (Tehama and Butte) as stereo pairs. Interpreted information was transferred to RF 1:4800 horizontally controlled ratio-rectified black and white enlargements. There were 155 enlargements. The vegetation information from each was digitized into a separate coverage and transformed individually (for the best transformation results) to TIGER road and stream maps.

Individual coverages were appended together by their distinct flight line number. Flight line sections were appended to compose the final coverage. While relative accuracy is RF 1:4800, positional accuracy varies. Coverages were controlled to U.S. Bureau of Census TIGER line files that meet USGS 1:24,000 scale accuracy standards in urban areas and 1:100,000 scale standards in rural areas. This means that the position of any TIGER feature has an average error of

about 24 feet in urban areas, and about 100 feet in rural areas. Our eventual goal is to improve positional accuracy to 1:24,000 throughout the coverage.

-Remaining coverages - The remaining coverages south of the Butte County line were flown at a scale of RF 1:12,000. Color infrared airphoto prints were scanned and orthorectified using 1:24,000 USGS DEM's and SPOT satellite imagery. Ortho images were brought into ArcView. Vegetation was interpreted and digitized on-screen in ArcView. Unlike Shasta, Butte and Tehama coverages, only the major tributary streams were included.

PETERSON ADDITION RIPARIAN VEGETATION SERIES

AGS - California Annual Grassland

Annual grasses and herbs are dominant in the ground layer; bromes, ryegrasses, oats, mustards, star-thistle, clovers, lupines, and filaree (listed in order of dominance) are present. Emergent shrubs and trees are present. Grass < 1 meter is continuous or open.

Observed Associated Species:

Bromes, bindweed, bunchgrass, bentgrasses, Bermuda grass, jungle- rice, barnyard grass, purple lovegrass, nitgrass, barley, ryegrasses, dallisgrass, Kentucky bluegrass, rabbit's foot grass, johnsongrass, bur chervil, hedge-parsley, horseweed, yellow star-thistle, chicory, western goldenrod, weedy cudweed, gumweed, old-man-of-spring, cocklebur, mustards, Shepherd's purse, clovers, red-stemmed filaree, Klamathweed, mints, pokeweed, plantains, docks, and purple-stemmed jimson-weed.

ALM - Almond

Almond is present in the tree canopy. The dominant tree species are almond and valley oak with Oregon ash and California walnut subdominant.

Observed Associated Species:

Box elder, elderberry, valley oak, pecan, Hinds walnut, red gum, Oregon ash, peach, cherry plum, rose, Himalayan blackberry, California blackberry, arroyo willow, California wild grape, Virgin's bower, and Virginia creeper.

AW - Arroyo Willow

Arroyo willow is the sole or dominant shrub or tree in the canopy with red willow, shining willow, sandbar willow, and box elder subdominant.

Observed Associated Species:

Red willow, shining willow, sandbar willow, Fremont cottonwood, Mexican elderberry, mugwort, rose, box elder, valley oak, Hinds walnut, Himalayan blackberry, California blackberry, Gooding's black willow, cherry plum, California wild grape, sharp and curly dock, willow-weed, and other under story grasses and herbs (see plant list).

BKW - Black Willow

Black willow is the sole dominant shrub or tree in the canopy with Hinds walnut and box elder subdominant.

Observed Associated Species:

Black willow, Hinds walnut, box elder, California wild grape, arroyo willow, Fremont cottonwood, and Mexican elderberry.

BM - Bulrush Marsh

Bulrushes are sole dominants in the herbaceous canopy.

Observed Associated Species:

Broadleaf cattail, California bulrush, common three-square, common tule, narrowleaf cattail, and river cattail.

BOX - Box Elder

Box elder is the dominant tree in the canopy with Fremont cottonwood and Oregon ash the subdominants.

Observed Associated Species:

Fremont cottonwood, Oregon ash, Hinds walnut, arroyo willow, and Himalayan blackberry.

BS - Blackberry Scrub

Himalayan and or California blackberry are the dominant canopy cover. Subdominants may be any major tree or shrub species found in the area.

Observed Associated Species:

Box elder, valley oak, Hinds walnut, almond, Fremont cottonwood, Gooding's black willow, and arroyo willow.

BWL - Black Willow

Black willow is the dominant tree in the canopy; Fremont cottonwood, Mexican elderberry, box elder, Hind's walnut, and valley oak are sub dominants.

Observed Associated Species:

Gooding's black willow, Fremont cottonwood, Mexican elderberry, box elder, Hind's walnut, valley oak, arroyo willow, California wild grape, and mulefat.

CAS - California Sycamore

California sycamore is the dominant canopy cover tree with Fremont cottonwood the subdominant.

Observed Associated Species:

Fremont cottonwood, arroyo willow, box elder, valley oak, California wild grape, and Mexican elderberry.

FCW - Fremont Cottonwood

Fremont cottonwood is the dominant tree in the canopy with box elder and Hinds walnut the subdominant.

Observed Associated Species:

Box elder, English walnut, Hinds walnut, California wild grape, Himalayan blackberry, Oregon ash, arroyo willow, Gooding's black willow, edible fig, California pipevine, California manroot, and mugwort.

HWN - Hind's Walnut

Hind's walnut is the dominant tree in the canopy with box elder and valley oak the subdominants.

Observed Associated Species:

Box elder, valley oak, Mexican elderberry, Hinds walnut, arroyo willow, Fremont cottonwood, Mexican elderberry, mugwort, California pipevine, California manroot, California wild grape, California and Himalayan blackberry, and Oregon ash.

VO - Valley Oak

Valley oak is the dominant tree in the canopy. Subdominants are arroyo willow, almond, box elder, and Oregon ash.

Observed Associated Species:

Arroyo willow, almond, box elder, Oregon ash, California blackberry, Himalayan blackberry, Hoary Creek nettle, curly dock, pokeweed, and Mexican elderberry.

MUG - Mugwort

Mugwort is the dominant herb in the ground layer; cocklebur, mustard, curly doc, annual grasses, filaree, yellow star thistle, and old man of spring are present

Observed Associated Species:

Arroyo willow, black willow, California sycamore, Fremont cottonwood, Mexican elderberry, mulefat, valley oak, Oregon ash, Hind's walnut, cocklebur, mustard, curly doc, annual grasses, filaree, yellow star thistle, old man of spring, California and Himalayan blackberry, and almond.

VO - Valley Oak

Valley oak is the dominant tree in the canopy. Subdominants are arroyo willow, Hind's walnut, almond, box elder, and Oregon ash.

Observed Associated Species:

Arroyo willow, almond, box elder, Oregon ash, California blackberry, Himalayan blackberry, Hoary Creek nettle, curly dock, pokeweed, and Mexican elderberry.

NONVEGETATIVE CLASSIFICATIONS

G - Gravel (river wash)

NL - Polygon Not Listed (agriculture, urban, or other human use)

OW - Open Water

HOW TO OBTAIN MORE INFORMATION

The SRRM data may be obtained either electronically, or by mail. To obtain the data electronically, please email cwnelson@csuchico.edu or call Chuck Nelson (530) 898-5969.

* Provide your name, affiliation, address, telephone number, fax number, and

email address.

* Briefly describe how you will use the data.

To obtain the data by mail on CD-ROM, please do the following (there will be a service charge for developing and mailing the CD-ROM):

Send a written request containing the above information requested and a billing address to:

Chuck Nelson, Director
Geographical Information Center
California State University, Chico
Chico, CA 95929-0425
(530)898-5969
email: cwnelson@csuchico.edu

Department of Water Resources - Northern District
Sacramento River GIS
Version of Monday, April 30, 2001

The Sacramento River GIS was developed by DWR in cooperation with the Senate Bill 1086 Advisory Council. Its primary purpose is to assist with carrying out the objective of the Upper Feather River Fisheries and Riparian Habitat Management Plan, which is to reestablish a continuous riparian ecosystem along the Sacramento River between Keswick and Verona. It is intended to help with locally based decision-making, assisting both scientists and laypeople in understanding and analyzing land use and vegetation patterns, flooding, erosion, and channel dynamics on the river.

The metadata for this GIS is nearly 50 pages in length, and is beyond the scope of that which can be printed here. However, an Adobe PDF format file containing this information is included on the GIS Project CD-ROM, created for this report. It can also be obtained by contacting the Project Contact:

Stacy Cepello - DWR Northern District
2440 Main Street
Red Bluff, CA 96080
(530) 529-7352
cepello@water.ca.gov

The Nature Conservancy Sacramento River Project
2-Dimensional Hydraulic Model Data

The model was created for TNC by Ayres Associates, and the results summarized in a report titled “2-Dimensional Hydraulic Modeling of the upper Sacramento River, River Miles 194-202, Glenn and Butte Counties, CA, December 7, 2001.”

The model was run at a flow of 195,000 cfs, distributed accordingly: Sacramento River 170,000 cfs, Stony Creek 15,000 cfs and Big Chico Creek 10,000 cfs. All runs were done using data from the flood of January 1995, and land use/land cover was kept as 1995 “existing conditions.”

For further information, contact:
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