APPENDIX A

Site-Specific Planting Plans for Colusa Subreach Tracts

Appendix A. Site-Specific Planting Plans for Colusa Subreach Tracts

This appendix provides detailed descriptions of the active restoration planting plans for each of the seven tracts proposed to be restored to riparian wildlife habitat along the Colusa Subreach. The figures that accompany the descriptions show the proposed plant communities at each tract in the context of the adjacent and nearby remnant riparian habitat. For two of the small tracts, Stegeman and Colusa-North, passive restoration alternatives have also been identified by The Nature Conservancy. The discussion of each restoration tract includes a description of the relationship between the proposed restoration area and the adjoining land ownerships.

To the extent possible, planting of native vegetation would simulate the surrounding natural patterns. Plantings would be placed in arcuate bands to facilitate flood flows and to follow natural terraces and historical traces of fluvial geomorphology. Potential restoration plant communities were selected for each tract based on the characteristics of the remnant riparian vegetation community, as well as the prevalent soils, and estimated elevations. The influence of historic channels and estimated flood frequency at each tract were also considered in selecting the plant communities. The proposed restoration plans were developed using topography data from the U.S. Army Corps of Engineers (USACE) 1997 digital elevation model (DEM) with 2-foot contours, as well as Light Detecting and Ranging (LIDAR) data.

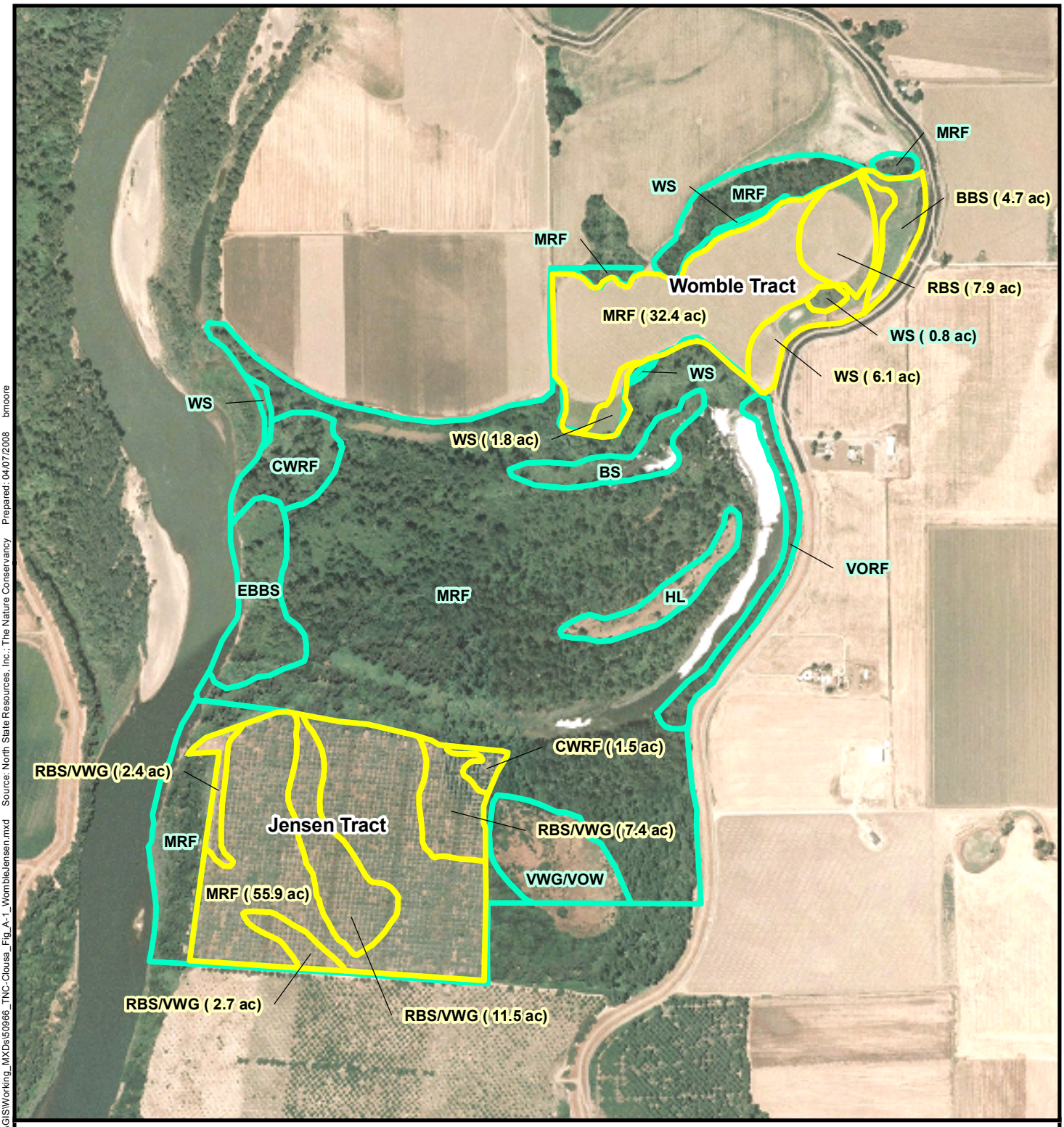
Species composition and distribution frequencies are shown in Tables 1-4 of the baseline assessments prepared for each of the seven tracts; the baseline assessments are available on the Colusa Subreach Planning website at *www.sacramentoriver.org/SRCAF/index.php*.

Womble Tract

Active restoration is proposed to restore native vegetation on 54 acres of the 320-acre Womble Tract. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the Womble Tract are shown on Figure A-1.

The existing patches of mixed riparian forest adjacent to the northern portion of the Womble Tract have required more than 50 years to attain their current size (Hubbell et al. 2006a). This suggests that the development of high-quality habitat would occur slowly (Hubbell et al. 2006a). In addition, the higher elevation of the western two-thirds of the proposed restoration area would probably preclude the amount of flooding required for successful restoration through natural processes (Hubbell et al. 2006a). The higher floodplain could also contribute to an increased risk of infestation by non-native invasive species, such as yellow-starthistle, Johnson grass, and Bermuda grass.

Mixed riparian forest is proposed to be restored to most of the site to connect the existing mixed riparian forest north and south of the restoration area. The mixed riparian forest area is predominantly at a higher elevation than the rest of the site. It has loamier soils and a greater



Proposed Plant Community

Existing Plant Community

Vegetation Interpretation by:
Department of Biological Sciences
CSU Chico, 2005
Orthorectified aerial photography by:
U. S. Department of Agriculture,
National Agriculture Imagery Program (NAIP), 2005

BS - Buttonwillow Scrub
BBS - Blackberry Scrub
CWRF - Cottonwood Riparian Forest
EBBS - Elderberry Savannah/Blackberry Scrub
HL - Herbland
MRF - Mixed Riparian Forest
RBS/VWG - Rose/Baccharis Scrub/Valley Wildrye Grassland
RBS - Rose/Baccharis Scrub
VWG/VOW - Valley Wildrye Grassland/Valley Oak Woodland
VORF - Valley Oak Riparian Forest
WS - Willow Scrub

N

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Feet

File Location: G:\Projects\50966_TNC_Colusa\GIS\Working_MXDs\50966_TNC-Clousa_Fig_A-1_WombleJensen.mxd Source: North State Resources, Inc.; The Nature Conservancy Prepared: 04/07/2008 bmoore

North State Resources, Inc.

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Figure A-1
Proposed and Existing Vegetation, Womble and Jensen Tract Area

depth to the water table and is mainly within the estimated 2- to 4-year floodplain. These characteristics are typical of areas that support mixed riparian forest (Hubbell et al. 2006a).

Rose/baccharis scrub vegetation would be planted in an area adjacent to the eastern edge of the proposed mixed riparian forest. The Womble Baseline Assessment Report (Hubbell et al. 2006a) found evidence of a gravel pit in this part of the site in the 1968 Glenn County Soil Survey (U.S. Department of Agriculture 1968) as well as on a 1952 aerial photo. Soils in this area tend to be coarser-textured and thus drier than surrounding areas and are very slightly mounded. Flooding in this area occurs on average every 2 to 4 years.

Narrow stringers of willow scrub vegetation are proposed to be planted (1) along the eastern edge of the rose/baccharis scrub, widening to the south, and (2) in a small area in the southeast corner of the proposed restoration area. Blackberry scrub would occupy the east end of the proposed restoration site. Both the willow scrub and blackberry scrub restoration areas are subject to ponding annually, as a result of their slightly lower elevation (USACE 1997). The area proposed for restoration as blackberry scrub encompasses an area that historically was occupied by an oxbow lake (Hubbell et al. 2006a). The area coincides with the elevation of surrounding elderberry blackberry scrub and the California blackberry-dominated shrub layer in the northern patch of mixed riparian forest adjacent to the site.

Approximately 14 percent of the proposed restoration area on the Womble Tract abuts existing cropland. The active restoration area abuts agricultural land to the north and west; the land to the east is separated by the flood protection levee and River Road. The majority of the property to the west is annually planted in field crops. The restoration area abuts about 1100 feet of the ownership to the west. Along that joint property line, approximately 350 feet of the boundary is remnant habitat and 750 feet of the boundary is field crops. The adjoining property abuts remnant habitat to the south and west and along most of its northern perimeter. The proposed restoration would result in a relatively small increase in the portion of the cropland perimeter that abuts riparian habitat.

The agricultural property to the north is substantially separated from the Womble Tract by remnant riparian habitat. The common boundary is about 4000 feet in length; three gaps in the vegetation, totaling about 300 feet, would allow the proposed restoration to abut the field crops to the north.

Jensen Tract

Active restoration is proposed to restore native vegetation on 81 acres of the 98-acre Jensen Tract. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the Jensen Tract are shown on Figure A-1.

The patches of existing mixed riparian forest adjacent to the northern portion of the proposed restoration site have required more than 50 years to attain their current size (Hubbell et al. 2006b). This suggests that the development of high-quality habitat would occur very slowly (Hubbell et al. 2006b). In addition, the higher elevation of the proposed restoration site would

likely preclude it from flooding to the degree required for natural process restoration to be successful (Hubbell et al. 2006b). The higher floodplain also contributes to an increased risk of infestation by non-native invasive species such as yellow-starthistle, Johnson grass, and Bermuda grass.

After removal of the existing walnut orchard, most of the site would be converted to mixed riparian forest, which would expand the existing mixed riparian forest north and west of the site. The restoration area is appropriate for riparian forest habitat because of its clay loam soils, the fact that its elevation is similar to that of the remnant vegetation, and its location within the 1- to 2-year floodplain.

The mid-section and portions of the site along the western, southern, and northeast boundaries would be restored to rose/baccharis scrub and valley wildrye grassland. The combination of these two vegetative habitat types would reflect both the composition of the valley wildrye grassland/valley oak woodland found in nearby remnant vegetation as well as the physical factors of the proposed restoration area (Hubbell et al. 2006b). Planting of rose/baccharis scrub vegetation would provide structural and habitat diversity to the site.

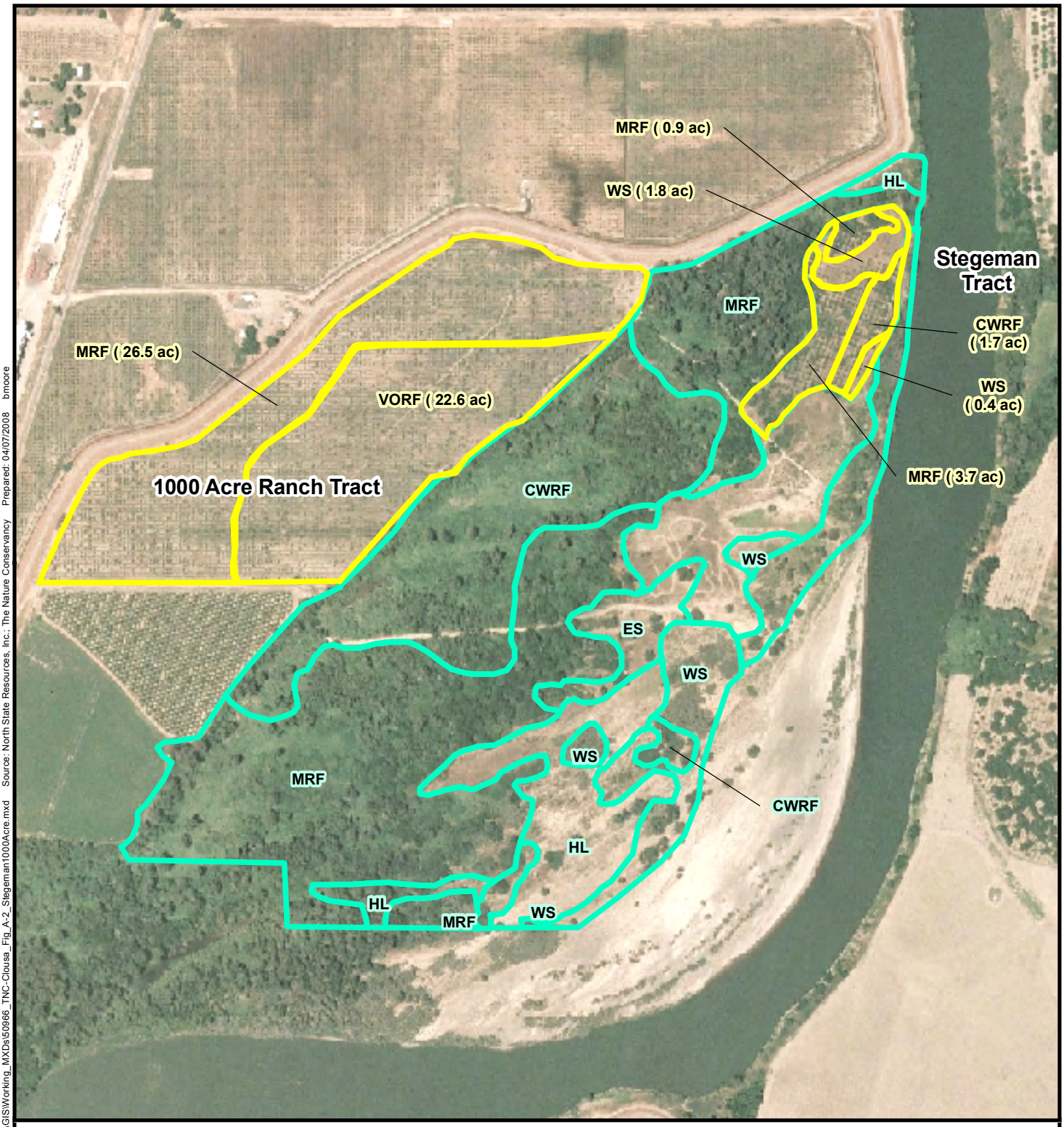
A small pocket of cottonwood riparian forest would be planted in the northeast corner of the proposed restoration site. Restoration of this portion of the site to cottonwood riparian forest would expand the cottonwood forest near the oxbow lake located to the northeast and increase habitat diversity. The higher water table in this portion of the restoration area, the fact that its elevation is similar to that of the adjacent remnant vegetation, and its location in the 2-year floodplain make it conducive to supporting cottonwood riparian forest.

The Jensen Tract abuts agricultural land to the south and riparian habitat the other three sides. Approximately 27 percent of the proposed restoration area is adjacent to existing cropland. The land to the south is a mature walnut orchard with about 2100 feet adjacent to the proposed restoration area. The walnut orchard currently abuts riparian vegetation along its western perimeter and to the east of the proposed restoration area.

Stegeman Tract

Active restoration is proposed to restore native vegetation on 8 acres of the 69-acre Stegeman Tract. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the Stegeman Tract are shown on Figure A-2.

Although the proposed Stegeman Tract restoration site is near the main channel of the Sacramento River and lies primarily lies in the estimated 1- to 2-year floodplain, elevation data (USACE 1997) show that the entire proposed restoration site is higher by at least several feet than the large area of remnant vegetation to the west and south (Hubbell et al. 2006c). This suggests that the proposed restoration site would probably not flood to the degree required for natural process restoration to be successful (Hubbell et al. 2006c). In addition, the Stegeman Tract Baseline Assessment Report found through a comparison of air photos (1999 and 2004) that the



Proposed Plant Community

Existing Plant Community

Vegetation Interpretation by:
Department of Biological Sciences
CSU Chico, 2005
Orthorectified aerial photography by:
U. S. Department of Agriculture,
National Agriculture Imagery Program (NAIP), 2005

BS - Buttonwillow Scrub
BBS - Blackberry Scrub
CWRF - Cottonwood Riparian Forest
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RBS - Rose/Baccharis Scrub
VWG/VOW - Valley Wildrye Grassland/Valley Oak Woodland
VORF - Valley Oak Riparian Forest
WS - Willow Scrub

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Feet

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North State Resources, Inc.

Colusa Subreach Wildlife Habitat Restoration Project

Figure A-2
Proposed and Existing Vegetation, Stegeman and 1000-Acre Ranch Tract Area

proposed restoration site had remained essentially unchanged during the 5-year period assessed and that significant colonization by native species had not occurred (Hubbell et al. 2006a). This means that active intervention (orchard removal and weed control) is warranted in order to prevent the continued infestation of non-native invasive species, such as yellow starthistle, Johnson grass, and Bermuda grass.

Mixed riparian forest would be restored to the north and over much of the western and southern portions of the site where soils were determined by the baseline report (Hubbell et al. 2006c) to be most conducive to tree growth. Willow scrub would be planted in the sandiest areas of the site where poor orchard growth and regular flooding (1- to 2-year intervals) was found to occur (Hubbell et al. 2006c). Willow scrub would also be planted in a small area along the site's eastern boundary. Also in the eastern portion of the site, cottonwood riparian forest would be planted to allow for extension of the existing cottonwood riparian forest habitat throughout the approximate 1-year floodplain. Soils here are coarser textured and thus better drained than those where mixed riparian forest is proposed (Hubbell et al. 2006c).

An alternative to restoration planting of the Stegeman Tract would be passive restoration, which would involve only the removal of the abandoned walnut orchard and initial weed control. This would be a lesser cost option that may be pursued because the restoration area is relatively small, and economies of scale would make the active restoration of the tract more expensive on a cost-per-acre basis. Also, the tract lacks an onsite well to provide a water supply for initial irrigation. This alternative would result in a much slower conversion to native plant communities with increased competition from nonnative invasive species. The inherent limitations of this small restoration site may be overcome if the restoration can be combined with that of the nearby 1000-acre Ranch Tract. It is expected that CDFG will determine in the future whether active or passive restoration of the tract will be pursued.

The proposed restoration on the Stegeman Tract is completely surrounded by existing riparian habitat on state-owned property. The flood protection levee further separates the restoration site from the nearest cropland, a young pecan orchard, which is about 400 feet to the northwest.

1000-Acre Ranch Tract

Active restoration is proposed to restore native vegetation on 49 acres of the 1000-Acre Ranch Tract. The total size of this tract is 60 acres. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the 1000-Acre Ranch Tract are shown on Figure A-2.

Upon removal of the existing prune orchard, a curved band of mixed riparian forest would be planted from the north along the western boundary and over much of the southern portion of the tract, connecting to the existing mixed riparian forest habitat to the east. Although the entire tract was modeled within the 5-year floodplain where valley oak riparian forest would be anticipated, the shallow depth to the water table and the clayey soils of the western portion of the tract make it more appropriate for mixed riparian forest restoration (Hubbell et al. 2006d).

Valley oak riparian forest would be planted in the sandier, coarser-textured soils of the eastern portion of the tract. In this portion, the depth to the water table is greater and the reduced flood interval (approximately every 2 to 4 years) is typical for valley oak riparian forest habitat. Although the area proposed for restoration to valley oak riparian forest is adjacent to remnant cottonwood riparian forest, there are several large valley oaks along its western edge (Hubbell et al. 2006d).

The proposed restoration area on the 1000-Acre Ranch Tract abuts remnant riparian habitat on the east and the flood protection levee on the north and west. Approximately 18 percent of the perimeter is adjacent to cropland. The southern border of the tract abuts a walnut orchard along a boundary of about 1250 feet. The majority of the walnut orchard parcel is existing riparian habitat, and the orchard abuts that onsite riparian habitat to the east.

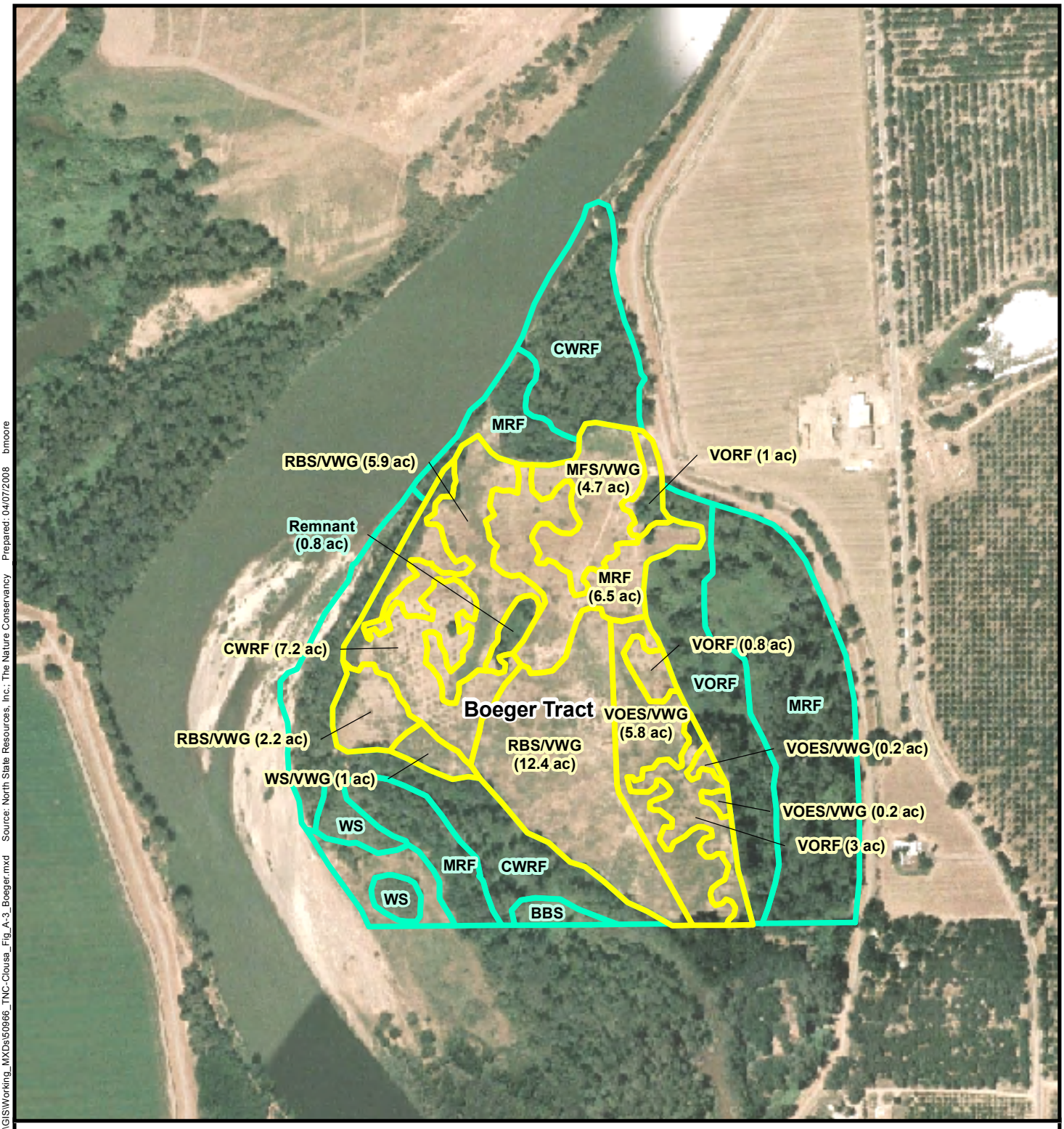
Boeger Tract

Active restoration is proposed to restore native vegetation on 51 acres of the 125-acre Boeger Tract. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the Boeger Tract are shown on Figure A-3.

Although the Boeger Tract is located near the main channel of the Sacramento River, is predominantly in the 1- to 2-year floodplain, and has generally similar elevation (USACE 1997) to the adjacent remnant riparian vegetation, the baseline report prepared for the tract (Hubbell et al. 2007e) determined that natural regeneration in the surrounding vicinity was better suited to lower elevations than those that occur within the proposed restoration area. The proposed restoration area would probably not flood to the degree required for natural process restoration to be successful. The higher floodplain also contributes to an increased risk of infestation by non-native invasive species, such as yellow-starthistle, Johnson grass, and Bermuda grass.

Differences in elevation, soils, and flood potential result in a mosaic pattern of proposed habitat restoration species plantings. Rose baccharis scrub/valley wildrye grassland would be planted in the coarser, drier sandy loam soils that occupy much of the southern and western portions of the site. Although rose/baccharis scrub does not currently occur in the Boeger Tract, species such as California rose and baccharis occur as a major understory component of many of the remnant vegetation communities in the Colusa Subreach project area (Hubbell et al. 2007b). Similarly, valley wildrye grassland, while not found to occur in the Boeger Tract, does occur throughout the Colusa Subreach project area under suitable environmental conditions (e.g., soils, elevation), such as those found within the proposed restoration area. Planting of rose/baccharis scrub/valley wildrye grassland in the proposed restoration area would provide structural and habitat diversity in the proposed restoration area.

Mixed riparian forest plantings in the northern half of the proposed restoration area would expand the existing mixed riparian forest habitat north and east of the site. The wetter, finer-textured clay loams and elevations similar to similar adjacent habitat would be conducive to the establishment of mixed riparian forest.



Proposed Plant Community

Existing Plant Community

Vegetation Interpretation by:
Department of Biological Sciences
CSU Chico, 2005
Orthorectified aerial photography by:
U. S. Department of Agriculture,
National Agriculture Imagery Program (NAIP), 2005

BS - Buttonwillow Scrub
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VWG/VOW - Valley Wildrye Grassland/Valley Oak Woodland
VORF - Valley Oak Riparian Forest
WS - Willow Scrub

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North State Resources, Inc.

Colusa Subreach Wildlife Habitat Restoration Project

Figure A-3
Proposed and Existing Vegetation, Boeger Tract Area

Mule fat scrub/valley wildrye grassland would be planted in the northeast portion of the proposed restoration site. These habitat types would reflect both the physical factors of this part of the site and the herbaceous composition of the mule fat scrub. Combining mule fat scrub with valley wildrye grassland would provide structural and habitat diversity in the proposed restoration area.

Cottonwood riparian forest would be planted in the western half of the proposed restoration site, which would expand the existing forest to the west of the proposed restoration site. This area has clay loam and silty clay loam soils and an elevation that is similar to that of the remnant vegetation; it is in the 1-year floodplain and has a slightly higher water table than the rest of the site (Hubbell et al. 2007e).

Valley oak riparian forest plantings along the eastern proposed restoration site boundary would expand the existing valley oak riparian forest to the east. The elevation of this area is similar to that of the remnant vegetation, and the area is within the estimated 4-year floodplain (Hubbell et al. 2006e). Valley oak savannah/valley wildrye grassland would be planted adjacent to valley oak riparian forest areas. Valley oak savannah often intergrades with valley oak riparian forest and/or woodlands (Hubbell et al. 2006e). With the particular configuration of sandy soils, estimated floodplains, and the adjacent valley oak riparian forest, there is an opportunity to create a forest/savannah/shrubland mosaic that would provide important structural diversity and patchiness for wildlife (Hubbell et al. 2007e).

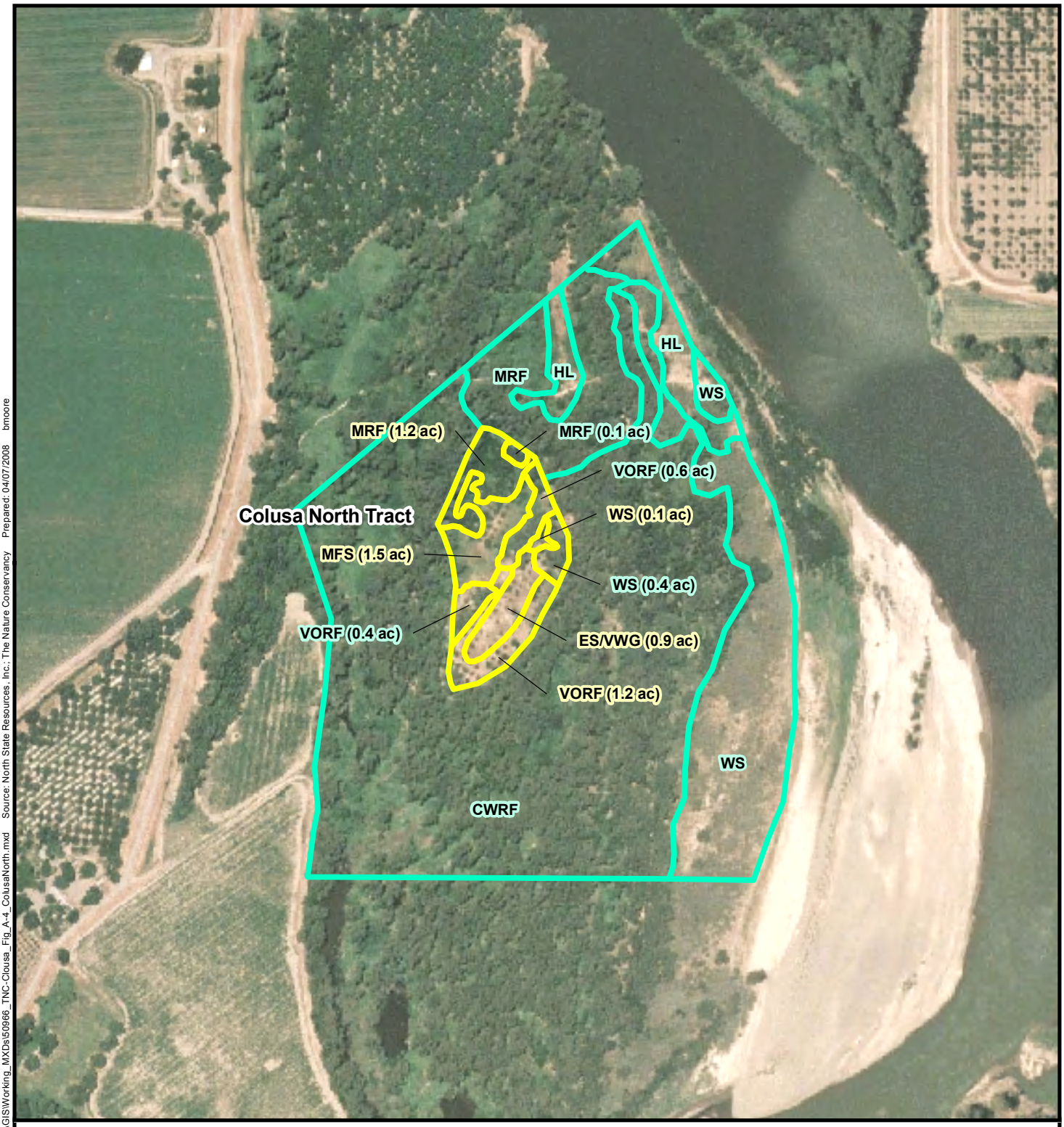
A very small pocket of willow scrub/valley wildrye grassland would be planted in the southwest corner of the proposed restoration site to increase the number of existing willow scrubs. Willow scrub and valley wildrye grassland would be combined to reflect both the physical factors of the proposed restoration area and the herbaceous composition of the willow scrub.

The restoration area on the Boeger Tract does not directly abut existing cropland. Approximately 97 percent of the perimeter abuts remnant riparian habitat, and 3 percent abuts the levee. A young walnut orchard to the north east is separated by the flood protection levee along a 200-foot gap in the riparian vegetation. Riparian vegetation lies across the levee from almost all of the young orchard. A mature walnut orchard to the south is separated by riparian vegetation that averages about 30 feet in width. The orchard is completely surrounded by riparian vegetation, most of it on the same property.

Colusa-North Tract

Active restoration is proposed to restore native vegetation on 5 acres of the 143-acre Colusa-North Tract. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the Colusa-North Tract are shown on Figure A-4.

Mixed riparian forest would be planted adjacent to the existing mixed riparian forest in the northern portion of the site. The elevation and soils, consisting of fine-textured clay and silty clay loam over sandy loam, indicate that this portion of the site will be wetter than the rest of the site and thus more likely to support a mixed riparian forest.



Proposed Plant Community

Existing Plant Community

Vegetation Interpretation by:
Department of Biological Sciences
CSU Chico, 2005
Orthorectified aerial photography by:
U. S. Department of Agriculture,
National Agriculture Imagery Program (NAIP), 2005

BS - Buttonwillow Scrub
BBS - Blackberry Scrub
CWRF - Cottonwood Riparian Forest
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RBS - Rose/Baccharis Scrub
VWG/VOW - Valley Wildrye Grassland/Valley Oak Woodland
VORF - Valley Oak Riparian Forest
WS - Willow Scrub

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Feet

File Location: G:\Projects\50966_TNC_Colusa\GIS\Working_MXDs\50966_TNC-Clousa_Fig_A-4_ColusaNorth.mxd Source: North State Resources, Inc.; The Nature Conservancy Prepared: 04/07/2008 bmoore

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Colusa Subreach Wildlife Habitat Restoration Project

Figure A-4
Proposed and Existing Vegetation, Colusa-North Tract Area

Much of the central portion of the site and the area to the west would be planted with mule fat scrub. Mule fat scrub was found by the Colusa-North Baseline Assessment Report (Hubbell et al. 2007a) to be recruiting extensively within this portion of the site. When combined with valley wildrye grassland, the restored habitat would reflect the herbaceous composition of naturally occurring mule fat scrub habitat.

A majority of the southern portion of the proposed restoration area would be planted to savannah/valley wildrye grassland surrounded on all but its northern end by valley oak riparian forest. Although valley wildrye grassland, dominated by blue wildrye (*Elymus glaucus* ssp. *glaucus*), was not found to occur at the Colusa-North Tract (Hubbell et al. 2007a), it does occur adjacent to the Colusa Subreach project area, adjacent to the Jensen Tract. The baseline report prepared for the Colusa-North Tract (Hubbell et al. 2007a) found the species mix and percentages of existing vegetation in this area (USACE 1997) to be weighted toward mixed riparian forest species more tolerant of dry soils such as valley oak and blue elderberry, both of which occur nearby. The savannah (which, in its natural occurrences typically includes elderberry shrub) and valley wildrye grassland communities would provide structural diversity for the restoration area and thus create different types of habitat within the tract.

Willow scrub would be planted immediately to the north of the proposed savannah/valley wildrye grassland, thus expanding the existing willow scrub found within the tract. Willow scrub combined with valley wildrye grassland reflects both the physical characteristics of the proposed restoration site as well as the herbaceous composition of the willow scrub.

An alternative to restoration planting of the Colusa-North Tract is passive restoration, which would involve the removal of the abandoned walnut orchard and initial weed control. This would be a lesser cost option that could be pursued because the restoration area is relatively small and the tract would be relatively more expensive to restore on a cost-per-acre basis. Additional considerations include the lack an onsite well to provide a water supply for initial irrigation and the need to establish a temporary roadway through existing habitat to the site for active restoration. The Colusa North restoration site is completely surrounded by riparian habitat on state-owned property. It does not abut any agricultural land and is more than 700 feet away from the nearest crops.

Cruise n’ Tarry Tract

The Cruise n’ Tarry Tract is a small restoration site included in the Colusa Subreach project. This discussion assumes one approach calling for partial active restoration. Whether the tract would be restored to riparian habitat is subject to a future decision. For the purposes of this assessment, active restoration is proposed to restore native vegetation on 3 acres of the 10-acre tract. The proposed vegetation communities within the restoration area along with remnant riparian habitat in the general vicinity of the Cruise n’ Tarry Tract are shown on Figure A-5.

Proposed Plant Community

Existing Plant Community

Vegetation Interpretation by:
Department of Biological Sciences
CSU Chico, 2005
Orthorectified aerial photography by:
U. S. Department of Agriculture,
National Agriculture Imagery Program (NAIP), 2005

BS - Buttonwillow Scrub
BBS - Blackberry Scrub
CWRF - Cottonwood Riparian Forest
EBBS - Elderberry Savannah/Blackberry Scrub
HL - Herbland
MRF - Mixed Riparian Forest
RBS/VWG - Rose/Baccharis Scrub/Valley Wildrye Grassland
RBS - Rose/Baccharis Scrub
VWG/VOW - Valley Wildrye Grassland/Valley Oak Woodland
VORF - Valley Oak Riparian Forest
WS - Willow Scrub

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File Location: G:\Projects\50966_TNC_Colusa\GIS\Working_MXDs\50966_TNC-Clousa_Fig_A-5_CruiseNTarry.mxd Source: North State Resources, Inc.; The Nature Conservancy Prepared: 04/07/2008 bmoore

North State Resources, Inc.

Colusa Subreach Wildlife Habitat Restoration Project

Figure A-5
Proposed and Existing Vegetation, Cruise n' Tarry Tract Area

The proposed restoration site's location within the 4-year floodplain suggests that much of the site would probably not flood to the degree required for natural process restoration to be successful. Riverbanks at this site are generally steep and actively eroding. Higher floodplain lands such as those found in much of the Cruise n' Tarry Tract are more likely to become infested with non-native invasive species, such as yellow starthistle, Johnson's grass, and Bermuda grass (Hubbell et al. 2006b).

A majority of the Cruise n' Tarry Tract would not be subject to active restoration, as remnant valley oak riparian forest has established itself. However, restoration would be applied to several smaller areas adjacent to the existing valley oak riparian forest. In the northern part of the proposed restoration site, rose/baccharis scrub would be planted over an area thought to be underlain by a gravel bar. Lack of tree invasion indicates the likelihood of a gravel bar approximately 10 feet below the surface, despite the presence of a clay loam soil surface layer and an approximate 4-year flood return interval.

Willow scrub would be planted along the steep banks of the inlet on the tract since it is adjacent to the water and its low elevation coincides with the elevation of willow scrub onsite and in the remnant riparian vegetation across the river (USACE 1997). This lowland is likely to flood more frequently than the rest of the proposed restoration site, despite being within the 4-year floodplain (Hubbell et al. 2007b). Planting this area with willow scrub would expand the current willow scrub habitat.

Cottonwood riparian forest would be planted in the southwest corner of the proposed restoration site in order to connect an existing patch of adjacent cottonwoods to the existing cottonwood riparian forest found onsite along the inlet. This area's adjacency to the Sacramento River and its elevation coincides with the elevation of cottonwood riparian forest found in the remnant riparian vegetation across the river and in other previously restored habitats along the Sacramento River (Hubbell et al. 2007b). It is further likely that parts of this portion of the proposed restoration area flood more frequently than the estimation of once every 4 years (Hubbell et al. 2007b). Gleyed soils and a high water table support this conclusion, and further indicate the suitability of this portion of the site for restoration as cottonwood riparian forest.

Valley oak riparian forest is the ecologically based recommendation for the southeast portion of the proposed restoration site. Planting of this habitat type in this area would enhance and extend the existing valley oak riparian forest within the Colusa Subreach. Mulberry removal would be necessary to allow for planting of valley oaks. The State of California SB 1334 recommends a mitigation ratio for valley oaks of 5:1 (i.e., five valley oaks for each mulberry removed) or on a per-acre basis using TNC's current ratio of 90 valley oaks/acre (assuming an 80 percent survival rate after three years) (Hubbell et al. 2007b).

The Cruse n' Tarry Tract is a small restoration site that would be relatively more expensive to restore on a cost-per-acre basis. It also lacks an existing water supply source for irrigation. The tract is owned by the Sacramento and San Joaquin Drainage District, a state agency governed by the Central Valley Flood Protection Board (CVFPB). The CVFPB approved a lease of the site to the County of Colusa in December of 2007. The County has expressed a general intent to manage the property for public access to the river although plans for such use have not yet been

developed. At this time it is unknown if the proposed active restoration would be compatible with changes to the site that Colusa County may propose in the future.

The Cruse n' Tarry Tract was included in Colusa Subreach restoration planning at the direction of the CVFPB's former General Manager. At the time, the CVFPB indicated that the state might wish to have the site restored for mitigation purposes. Given the recent lease of the site to Colusa County, the potential for restoration of the site is uncertain. TNC has indicated that restoration of the small site is not a priority and that the restoration plan developed through Colusa Subreach planning will be provided to the State to simply identify the restoration potential of the site. Whether the tract is restored to riparian habitat will be determined by the Central Valley Flood Protection Board and Colusa County in the future. Because plans for the future use or improvement of the tract for recreation purposes by Colusa County have not yet been determined and because such changes not a part of the Colusa Subreach Planning process, recreation improvement changes to the tract are considered speculative and have not been included in this analysis.

The Cruse n' Tarry Tract does not abut any cropland. It is separated from other properties by the flood protection levee on the south and the levee and River Road on the east.