Ecological site group 16-2
Ecological Site Group 2

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Key Characteristics

None specified

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Climate

This is a three state model with the first state having two community phases, the second state having two community phases, and the third state having a single community phase. This group consists solely of R016XA002CA.

Vegetation dynamics

This is a three state model with the first state having two community phases, the second state having two community phases, and the third state having a single community phase. This group consists solely of R016XA002CA.

Major Land Resource Area

MLRA 016X
California Delta

Stage

Provisional

Contributors

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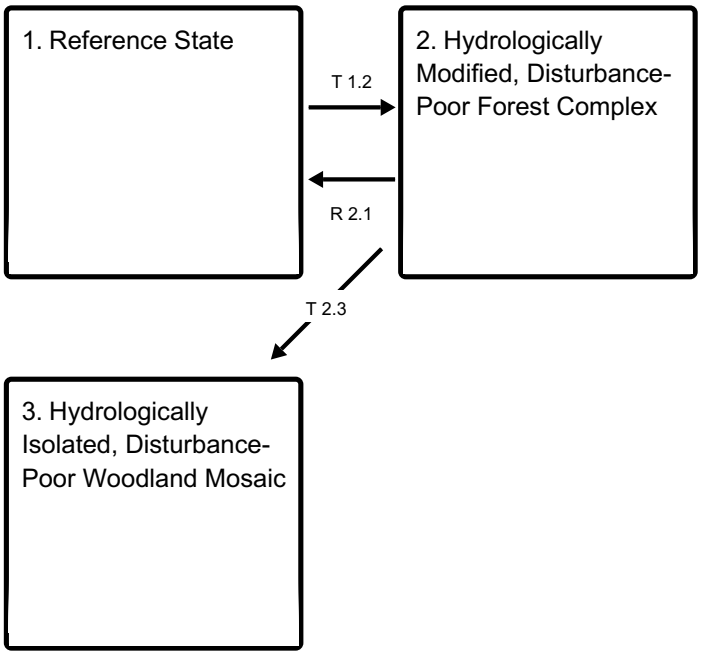
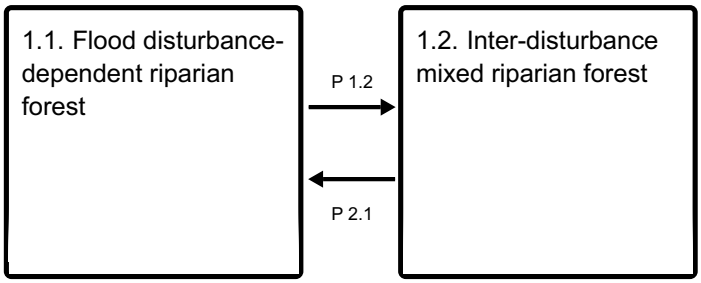
State and transition model

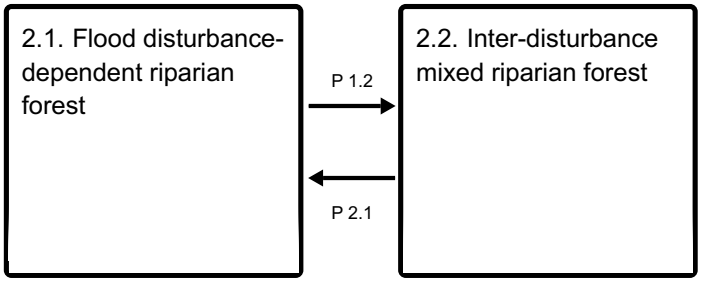
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State

The species composition of the two community phases of the reference state are poorly documented in relation to the site and are better understood at the scale of riverine fluvial dynamics as a diverse mosaic of riparian forest vegetation types. This reference state consists two community phases, 1.1 which represents a recently disturbed, inundated and/or deposited soil dominated by pioneering upland and facultative wetland vegetation, and community phase 1.2 representing a less recently disturbed complex of tree species. Not surprisingly, this vegetation of community phase 1.2 represents the continuous accumulation of organic material in the soil from onsite vegetation contributions leading to

the histosol classification of the representative soils. While most of the LRU has been subjected to significant hydrologic alteration, echoes of these two community phases remain observable in areas which were deemed too economically difficult to reclaim for agricultural purposes or where such efforts to reclaim the land failed and the preexisting hydrology exerted itself.

Community 1.1
Flood disturbance-dependent riparian forest

Immediate flood zone community phase. Alder, willow, cottonwood and other fast growing disturbance-dependent facultative wetland species dominate in typically even-aged cohorts.

Community 1.2
Inter-disturbance mixed riparian forest

Disturbance-delayed community phase/mixed riparian forest. Cottonwood, sycamore, elderberry, wild rose, and blackberry dominate in mixed-age stands. Valley oak and Northern California walnut likely occur at the highest elevation of this ecological site in their highest densities.

Pathway P 1.2
Community 1.1 to 1.2

Prolonged periods between flood events lead to declining dominance of short-lived flood disturbance-dependent species and increases diversity of upland shrubs and long-lived trees.

Pathway P 2.1
Community 1.2 to 1.1

Periodic flooding removes all but the deepest rooted trees and results in even-aged cohorts of flood disturbance-dependent species.

State 2
Hydrologically Modified, Disturbance-Poor Forest Complex

This state represents conditions consistent with altered flood frequency, timing and intensity and is the representative state. Less frequent flood pulses and lower elevation of flood levels have disrupted historic patterns of vegetation and their diversity. Novel species such as *Arundo donax* opportunistically occur within the lowest elevations of the ecological site, occasionally to the exclusion of native vegetation and Juglans sp. significantly increasing in extent and density across the drier portions of the ecological site (P. Kirk in Vaghti and Grecko). The shift in the disturbance regime and the elevation of

flood waters has resulted in the reduced width of nearly exclusive cottonwood stands which typically occupied the elevations between recently disturbed low elevation and upper elevation mixed riparian forest; the latter community type becoming more extensive than historically present where the historic floodplain has remained intact. The potential of full restoration of this ecological site is greatly reduced due to major direct alteration to the soils of the site and the proximity to economically important infrastructure which almost certainly would be directly affected as this ecological site occurs at the highest elevations of the MLRA. Hypothetically, there is potential to restore limited extents of the ecological site through the strategic restoration of hydrology as part of a comprehensive solution for addressing hydrology across the MRLA. Operationally, vegetation enhancement is socially and economically more viable considering total long term costs.

Community 2.1
Flood disturbance-dependent riparian forest

Willow and cottonwood are clearly dominant species while giant reed (Arundo) is recognized as a problem in some areas contiguous to this ecological site and the LRU primarily along levees.

Community 2.2
Inter-disturbance mixed riparian forest

Walnut species and oak species codominant in this community phase with some sycamore present. Cottonwood may be present in the ecotone between disturbance-isolated portions of the ecological site but is largely a minor species in this community phase. Understory species includes black berry, elderberry, wild rose and other shrubs.

Pathway P 1.2
Community 2.1 to 2.2

Prolonged periods between flood events lead to declining dominance of short-lived flood disturbance-dependent species and increases diversity of upland shrubs and long-lived trees.

Pathway P 2.1
Community 2.2 to 2.1

Periodic flooding removes all but the deepest rooted trees and results in even-aged cohorts of flood disturbance-dependent species.

State 3
Hydrologically Isolated, Disturbance-Poor Woodland Mosaic

This state represents the highest degree of alteration of the ecological site primarily

through direct alteration of the ecological site and nearly complete hydrologic isolation. Retrieval of natural levee soils for construction of additional levees, transportation infrastructure and general isolation from flood disturbance have resulted in a discontinuous oak woodland with a largely Mediterranean annual grass understory. While hypothetically restoration may be possible, politically and economically vegetation enhancement in the form of ongoing invasive species control and cyclical direct plantings of oak species may be the only way to retain the hallmark species of the historic conditions.

Transition T 1.2
State 1 to 2

Natural flood regime is altered somewhat extending the period between peak flood events and dramatically reducing the frequency and elevation of what would be natural moderate flood events.

Restoration pathway R 2.1
State 2 to 1

Removal of barriers to natural hydrology and flood disturbance.

Transition T 2.3
State 2 to 3

Elimination of flood disturbance of the ecological site through permanent isolation from river hydrology.

Citations