

Table 13. General valley segment trends and conditions, with implications for restoration.

[m, meters]

Chiloquin Canyon	Braymill	Kamkaun Spring
Construction and removal of Chiloquin Dam, historical timber harvest, grazing, local road encroachment; local colonization by reed canary grass	Development and removal of Braymill mill facilities, historical timber harvest, grazing, local road encroachment; decreased channel migration; local colonization by reed canary grass	Confinement by levees and railroad, local channel remeandering; increased channel width, bar area; decreased sinuosity and channel migration rates; frequent avulsions and cutoffs; vegetation removal, decreased short woody vegetation; flood-plain cultivation and grazing
Minimal, although sediment and woody debris associated with 2008 Chiloquin Dam removal may locally affect lower part of segment	Minimal	Confinement of overbank flows; possibly increased incidence of cutoffs and avulsions associated with flood-plain modifications; locally restricted channel migration by levees and bank protection
Natural process regime largely intact; most ecologic goals likely attained by minimizing alterations to geomorphic flood plain, allowing channel migration and riparian vegetation succession; locally dense stands of reed canary grass may slow natural regeneration of short woody vegetation	Similar as for Chiloquin Canyon segment	Natural process regime largely intact; reducing overbank flow confinement by levees, roads, and railroad embankments would promote flood-plain deposition and possibly reduce frequency of avulsions and cutoffs; minimizing bank hardening and promoting channel migration processes would likely increase sinuosity and decrease channel slope over decadal time scales; protection of riparian areas from trampling and excessive browsing likely to increase amount short woody vegetation; channel slope and fluvial energy low, so natural processes slow to modify channel and flood-plain conditions

S'Ocholis Canyon	Buttes of the Gods	Council Butte
Major historical changes		
Decreased channel migration rates; increased tall woody vegetation, decreased short woody vegetation	Confinement by levees and railroad; vegetation removal and flood-plain cultivaton and grazing; increased channel slope; decreased channel migration rates; frequent avulsions and cutoffs; reduced short woody riparian vegetation; local channel remeandering	Extensive confinement by levees, roads and railroad; vegetation removal, and flood-plain leveling; flood-plain and riparian cultivaton and grazing; increased channel slope; decreased channel width, sinuosity, and migration rates; local incision; reduced short woody riparian vegetation; local channel remeandering
Important pro		
Minimal	Confinement of overbank flows; possibly increased incidence of cutoffs and avulsions associated with flood-plain modificatons; locally restricted channel migration by levees and bank protection	Local historical incision may reduce frequency and extent of overbank flows; confinement of overbank flows; possibly increased incidence of cutoffs and avulsions associated with flood-plain modificatons; locally restricted channel migration by levees and bank protection
Restoration		
Natural process regime largely intact; most ecologic goals likely attained by minimizing alterations to geomorphic flood plain, allowing channel migration and riparian vegetation succession; woody debris derived from riparian vegetation in this segment may be important for downstream habitat and channel structure	Similar as for Kamkaun Spring segment although low banks in this reach do not favor colonization of short woody vegetation	Natural process regime largely intact; reducing overbank flow confinement by levees, roads, and railroad embankments likely to promote flood-plain deposition and possibly reduce liklihood of future incision and frequency of avulsions and cutoffs; minimizing bank hardening and promoting channel migration processes would likely increase sinuosity and decrease channel slope; protection of riparian areas from trampling and excessive browsing likely to locally increase amount short woody vegetation although abundant low banks mostly more favorable for riparian herbaceous growth; channel slope and fluvial energy exceptionally low, so natural processes slow to

Beatty-Sycan	Beatty Gap	Upper Valley
<hr/> to flood-plain and channel		
Confinement by levees and railroad; flood-plain leveling, cultivation and grazing; reduced riparian woody vegetation; local channel remeandering	Local incision, likely historical timber harvest; increased channel slope and reduced sinuosity; diminished woody vegetation	Floodplain ditches and levees confine overbank flow; increased channel width; reduced channel slope and sinuosity; local incision; reduced riparian vegetation
<hr/> process changes		
Local historical incision may reduce frequency and extent of overbank flows; confinement of overbank flows; possibly increased incidence of cutoffs and avulsions associated with flood-plain modifications; locally restricted channel migration by levees and bank protection	Local historical incision may reduce frequency and extent of overbank flows; confinement of overbank flows; possibly increased incidence of cutoffs and avulsions associated with flood-plain modifications; local inhibition of channel migration by levees; possible decreased abundance of large in-channel wood	Local historical incision may reduce frequency and extent of overbank flows; confinement of overbank flows; possibly increased incidence of cutoffs and avulsions associated with flood-plain modifications; locally restricted channel migration by levees and bank protection; possible decreased abundance of large in-channel wood
<hr/> implications		
Similar as for Council Butte valley segment	Natural process regime largely intact aside for consequences of local incision; most ecologic goals likely attained by minimizing alterations to geomorphic flood plain, protection from incision, and allowing channel migration and riparian vegetation succession; promoting short and tall woody vegetation grown for this segment may have broader consequences because of the role of large wood generated in this segment for downstream in-channel wood supply; more energetic fluvial environment should result in dynamic channel and flood-plain evolution	Similar as for Council Butte valley segment

South Fork	North Fork	Lower Sycan	Coyote Bucket
Transformed from peat-forming wetland complex to incised and channelized flood plain; extensive channel excavation and straightening (and loss of sinuosity), incision, channel diversion structures; decreased channel width and channel migration rates; substantial incision; vegetation removal and substantial woody vegetation loss	Flood-plain levees, ditches, leveling, cultivation and grazing; in-channel diversions; possible local incision; reduced short woody riparian vegetation	Possible local channel incision, local bank trampling, and road encroachment; some flood-plain levees, cultivation, and grazing; spring diversions; decreased short woody vegetation	Minimal
Conversion from multi-channel wetland to incised single channel; diminished overbank flooding, channel migration; increased sediment entrainment from channel incision and flood-plain erosion; decreased channel interaction with in-channel wood and riparian vegetation	Local historical incision and confinement may reduce frequency and extent of overbank flows; channel migration locally restricted by levees and bank protection; possible decreased abundance of large in-channel wood; longitudinal connectivity reduced by in-channel diversion structures	Local historical incision and confinement may reduce frequency and extent of overbank flows; locally restricted channel migration by levees and bank protection; disturbance of Sycan flood surfaces may enhance bank erosion and sediment delivery to channel	Minimal
Significant historical transformation and incision of this valley segment probably requires active and substantial channel and flood-plain modifications to attain conditions similar to the low-energy wet-meadow environment of early historical observations within decadal time frames; interrelated goals to attain historical conditions would include increasing sinuosity and overbank flooding, reduce flow confinement and bank hardening, facilitate processes promoting channel and flood-plain aggradation, increase riparian vegetation, maintaining high water tables, and perhaps promote beaver colonization	Natural process regime largely intact aside for consequences of local incision and diversion; most ecologic goals likely attained by minimizing alterations to geomorphic flood plain, protection from incision, and allowing channel migration and riparian vegetation succession	Similar as for North Fork, but with specific attention to protecting sandy Sycan flood surfaces from vegetation disturbance and enhanced erosion	Natural process regime largely intact