Annotated Bibliography of RO and SC

Brand et al. (2013) Projecting avian responses to landscape management along the middle Rio Grande, New Mexico

- Examined management options for RO and SC in NM. Line transects of birds, no repro data but stated repro data needed in future research.
- Cottonwoods with shrubs understory had highest densities of birds.
- Low densities in SC.
- RO had high densities of shrub nesting birds (just counts not nest counts)

Capon et al. (2013) Riparian ecosystems in the 21st century: hotspots for climate change adaptation?

- Riparian systems likely to be highly vulnerable, in absence of human intervention, to climate change.
- But adaptations to climate change also exist.
- Riparian systems vulnerable because driven by climate variables influenced most by humans: hydrology and evapotranspiration, with declines in rainfall/snowfall
- Snow depth and season duration
- Riparian systems have relatively high adaptive capacity overall because they evolved under environmental variability, but they are also constrained by much human alterations

Cerasale and Guglielmo (2010) An integrative assessment of the effects of tamarisk on stopover ecology of a long-distance migrant along the San Pedro River, Arizona

- Higher arthropod in native cottonwood-willow habitat, refueling rate of Wilson's warblers was higher in Tamarisk in AZ.
- Density of other species in warbler competitors higher in native habitat so Wilson's may enjoy competitive release in Tamarisk (Fig. 3)

Collette and Pither (2015) RO biology and ecology and its potential to invade northern NA riparian ecosystems

- Focused on invasion of Canada but does provide good review of species
- Chilling requirement, needs supplemental moisture, regulated rivers, silt loam and clay soils, can tolerate higher salinity and alkalinity
- Mentions changes to N in water

Cooper et al. (1999) Factors controlling the establishment of Fremont cottonwood seedlings on the upper Green River, USA

- Overlap of seed release of cottonwoods and tamarisk in Colorado
- Cottonwood seedlings transplanted under adult tamarisk suffered high mortality
- Cottonwood seedlings were also subject to desiccation when water limiting
- Tamarisk will outcompete cottonwood when water is limiting because more water use efficient
- ** dense stands of tamarisk will preclude or hinder cottonwood establishment by depleting soil moisture and creating shade.

Edwards et al. (2014) RO dispersal by European starlings

- Within 100 years of arrival, RO is 5th most common woody riparian species in western US (need to get Friedman et al. 2005 in Biological Invasions for proper citation)
- Majority of seed consumed were regurgitated within 30 min of feeding
- Higher germination rates of RO seeds if ingested/regurgitated or had pericarp removed by investigators than seeds with fruit intact

Ellis (1995) Bird use of SC and cottonwood vegetation in the middle Rio Grande Valley of NM

- Bird species richness did not differ during any season but composition varied, overlap lowest in spring, more overlap in more (Fig. 1)
- Cottonwood supported more unique species each season (nuthatches and woodpeckers largely absent from cottonwood)
- Chats, blue grosbeak, and common yellowthroats common in SC

Fischer et al. (2012) Bird community response to vegetation cover and composition in riparian habitats dominated by RO

- Study area in southeastern WA
- Used point counts (no repro data) and determined that habitats dominated by RO can support diverse and abundant bird communities, although cavity nesters were sparse.
- Table 1. 10 most common species in summer and winter (good)
- Woody vegetation in their study area was dominated (>80%) by RO so complete removal of RO might negatively impact bird species by reducing vegetation volume
- Suggested that they didn't detect an effect of RO because it dominated the landscape so their fine scale study wouldn't be able to detect regional avoidance of the area by certain species.

Fleishman et al (2003) Effects of floristics, physiognomy and non-native vegetation on riparian bird communities in a Mojave Desert watershed

- Richness was best modeled by total vegetation volume alone
- Species composition between sites was more similar when floristics was more similar and vice versa. Species composition was not correlated with physiognomy
- Composition of bird community is closely related to floristics
- Paper also gives recommendations for management

Friedman et al. (2005) Dominance of non-native riparian trees in western USA

- SC and RO are 3rd and 4th most frequently occurring woody riparian plants
- SO and RO are 2nd and 5th most dominant woody riparian plants

Hultine et al. (2010) Tamarisk biocontrol in the western US: ecological and societal implications

- Saltcedar leaf beetle has shown great success but a formal framework should be established prior to its widespread use

- Releases in 2004 in Colorado Plateau near Moab, UT and by 2008 had impacted tamarisk along 1000 km of Colorado, Green, and Dolores rivers

Hunter et al (1988) Use of exotic SC by birds in arid riparian systems

- NM and TX, bird use (densities, didn't look for nests) of SC high on one study area but low on another study area
- Authors suggested elevational/climatic differences may explain the pattern
- Areas that were much hotter had less use of SC, presumably because SC is less dense and allows more sun in which creates a hotter micro-climate

Katz et al. (2003) Biology, Ecology, and management of RO in western NA.

- Great review paper.

Kerns et al. (2009) Modeling tamarisk habitat and climate change effects in the NW US

- OR, WA, ID
- "Although considerable uncertainty exists regarding future climate change, we project a 2- to 10-fold increase in highly suitable tamarisk habitat by the end of the century."
- Tamarisk is associated with drier and warmer climates.

Knopf and Olson (1984) Naturalization of RO: implications for Rocky Mtn wildlife

- Bird counts and small mammal trapping
- RO supported birds in intermediate species richness and alpha diversity compared to native habitat
- RO will increase the width of lowland riparian areas and will provide additional habitat to shrub dependent species

Lesica and Miles (2004) Beavers indirectly enhance the growth of RO and tarmaisk along eastern MT rivers

- Study areas along Marias, Yellowstone, Bighorn, and Powder River
- Beavers felled cottonwood but rarely RO and Tamarisk. This created sunny corridors along the river that were amenable to invasion by RO and SC.

Lesica and Miles (2001) Natural history and invasion of RO along eastern MT rivers

- Marias and lower Yellowstone River
- RO will establish with increasing frequency in riparian areas, and wet meadows and ditches
- Native forest will be replaced by RO as old cottonwoods die or are taken by beavers on upper terraces.
- However in areas where flooding occurs beyond the zone of beaver activity, cottonwoods will persist.
- However, RO will increase where flooding does not occur.

Lesica and Miles (2001) Tamarisk growth in northern MT (Wetlands)

- Tamarisk invasion began no later than 1960 (Bighorn, Powder, and Yellowstone near northern edge of tamarisk's western North American range

- Tamarisk commonly formed thickets on open, low terraces and along over-flow channels but was less dense beneath a cottonwood canopy (cottonwood seedlings grow faster, shade bad for tamarisk)
- Tamarisk stems routinely died back to the ground, susceptible to harsh events such as freezing
- 4 m or less, tamarisk is poor competitor but opportunistic
- Minimizing the spread of tamarisk in riparian areas in Montana can best be accomplished by managing for cottonwood (including managing grazing of cottonwoods by livestock)

Merritt and Poff (2010) Shifting dominance of riparian Populus and Tamarix along gradients of flow alteration in western NA rivers

- Study area along rivers in the desert SW
- Recruitment of tamarix highest along regulated rivers, recruitment of Populus highest along free-flowing rivers
- Restoration should include removal with flow releases hypothesized to be most effective

Mills et al (1991) Relationship between breeding bird density and vegetation volume

- AZ and NM, examined total vegetation volume and breeding bird density
- Breeding Bird density and TVV highly correlated in AZ (same in NM but less strong)
- Winter bird density and TVV not correlated (once took out seedeaters the correlation became significant in AZ only)

Myers et al. (2000) Eradication revisted: dealing with exotic species

- Eradication complete removal vs area-wide suppression, slowing the spread, and traditional biological control
- Six steps for successful eradication: sufficient resources, clear line of authority, biology of target known, prevent reinvasion, pest must be detectable at low densities, and restoration might be necessary
- Evaluating costs and benefits is difficult

Nagler et al (2011) Distribution and abundance of SC and RO in the western US

- Another good review paper, has good maps that include MT (Fig. 3)

Naiman et al (1993) The role of riparian corridors in maintaining regional biodiversity

- Review on value of riparian
- Riparian corridors are "most diverse, dynamic, and complex biophysical habitats on the terrestrial portion of the Earth."
- Diversity maintained by active natural disturbances operating over wide range of temporal and spatial scales
- The environment must be recognized as a legitimate consumer of water (great quote)

Palmer et al. (2005) Standards for ecologically successful river restoration

- Ecological restoration should be distinguished from other restoration (e.g., recreation)

- Five criteria to achieve ecological restoration: guiding image identified as endpoint, ecological conditions are measurable enhanced, resilience is increased, no lasting harm done, assessment is completed and info made available

Paxton et al. (2011) Tamarisk biocontrol using tamarisk beetles: potential consequences for riparian birds in the SW US

- Control likely to have varying effects on birds based on species and population.
- Species with limited distributions occupying tamarisk dominated areas may be negatively affected

Pearce and Smith (2001) Plains Cottonwood's last stand: can it survive invasion of RO onto the Milk River, Montana floodplain

- Very good natural history info on RO and cottonwood

Pearce and Smith (2003) SC: distribution, abundance, and dispersal mechanisms, northern Montana

- General description of dispersal mechanisms and distribution in MT, also some on control
- Musselshell, Bighorn, Powder River, and Yellowstone Rivers (surveyed in 2000), does give dates of establishment (arrived on middle Yellowstone River in early 1960s)
- Both natural and human transport has spread SC in MT

Rich (2002) Using breeding land birds in the assessment of western riparian systems

- Reports on use of Proper Functioning Condition by BLM, USFS, and NRCS.
- Probably not relevant or necessary to cite.

Rood et al. (2008) Declining summer flows of Rocky Mtn rivers: changing seasonal hydrology and probably impacts on floodplain forests

- Examined flows of rivers from Albert to Wyoming. Yellowstone was one.
- Primary results: slightly increased winter flows (because of warmer winter temps), advancement and more gradual increase of flows in spring, earlier spring peaks, decreased summer flows (especially late summer and early autumn)
- Hypothesize seedling mortality with drops in summer flows, possible disconnect between seed release (temp AND photoperiod related) with flows (temp only)

Rumble and Gobeille (2004) Avian use of successional cottonwood woodlands along the middle Missouri River

- Central SD, cavity nesters will be affected most by loss of cottonwoods from regulated river

Sedgwick and Knopf (1986) Cavity-nesting birds and the cavity-tree resource in plains cottonwood bottomlands

- Cottonwoods important for cavity nesters
- Mgmt implications sections details what types of cottonwood tree characteristics should be maintained

Sedgwick and Knopf (1990) Habitat relationships and nest site characteristics of cavity-nesting birds in cottonwood floodplains

- Same as above but Fig. 3 shows discriminant function space (not really informative but included RHWO). Other species were HOWR, BCCH, EUST, NOFL, and MAKE

Sexton et al (2006) Occurrence, persistence, and expansion of saltcedar populations in the Great Plains of MT

- SC exists in warmest, driest areas now.
- Poor competitor but once established stands unlikely to revert to native
- Introduction into central eastern MT is recent (<40 years)
- SC has affinity for disturbed areas, can increase by vegetative and sexual means

Shafroth et al (1995) Germination and establishment of the native plains cottonwood and exotic RO

- Gives good background on different reproductive strategies between RO and cottonwood
- Cottonwood seedlings need sun and moisture, seeds are small and dispersed by wind and water, and remain viable for only 1-2 weeks, timing of germination is tied to high flows and snowmelt runoff, seedlings require continued moisture to survive
- RO seedlings can grow in shade, seeds are larger, require period of after-ripening, and are dispersed most by birds and other animals

Smith et al (2012) Nesting characteristics of MODO in central NM: response to riparian forest change

- MODO used RO and SC even in presence of native vegetation, no difference in DNS between native and non-native vegetation

Smith and Finch (2013) Use of native and nonnative nest plants by riparian-nesting birds along two streams in NM

- Found nests, good paper throughout
- Cottonwoods used by greatest number of species, particularly in cavity and canopy-nesting guilds
- RO and SC used by the nest greatest number of species

Smith et al (2014) Nest-location and nesting survival of black-chinned hummingbirds in NM

- Showed differences but unsure if relevant unless I find hummingbirds

Sogge et al (2008) Tamarix as habitat for birds: implications for riparian restoration in the southwestern US

- Response to exotic vegetation can range from negative to positive depending on bird species, exotic species, and ecosystem
- Introduced into western US in 1800s

- Many bird species breed in SC and few data suggest a detriment to doing so
- Planning and restoration techniques and monitoring are needed to direct SC management
- Table 2…species that have bred in SC
- ***need extensive research to evaluate fitness (reproduction/survival), physiological condition, and food availability
- If remove SC, what will the replacement habitat cover types be? Need to ask before control

Stoleson and Finch (2001) Breeding bird use of and nesting success in exotic RO in NM

- RO a MINOR component in study area, so results may not apply elsewhere
- MODO, chat, willow flycatcher preferentially nested in RO
- Had similar reproductive success in native vs RO

Stromberg et al (2009) Changing perceptions of change: the role of scientists in Tamarix and river management

- A good account of how clear goals and objectives need to be established before removal

Van Dersal (1938) RO as a wildlife food

- Lists species that ate RO, mostly from studies in NM

Van Riper et al. (2008) Rethinking avian response to Tamarix on the lower Colorado River: A threshold hypothesis

- Great paper: Compared the response of avian communities to differing proportions of native/Tamarix vegetation, point counts, vegetation measurements,
- Quadratic pattern where bird abundance was maximized when native veg was 20-40% of vegetation. Believed because more complex veg structure and possibly more food
- So, complete removal might not be the best option for restoration, paper contains 'Implications for Practice' section

Walker (2008) Floristics and physiognomy determine migrant landbird response to tamarisk invasion in riparian areas

- NM, different measures of community organization were assessed. Results varied by spatial scale
- Used plot based mist net sampling (use in FWP permit), plots 0.2 ha each
- Sampling 1999-2002, 24 plots of 0.2 ha each. Grouped plots into four broadly definited vegetation types based on floristics (native/exotic) and physiognomy (Low and tall growth form) based on 2X2 factorial design: low willow (native, low), tall cottonwood-willow (native, tall), low tamarisk (exotic, low), and tall tamarisk (exotic, tall)\

Zavaleta et al (2001), Viewing invasive species removal in a whole-ecosystem context

- Eradication vs control
- Need pre-eradication assessment to avoid unwanted ecological effects
- Also need post-eradication assessment
- Rapid removal of invasive vegetation that is used by native species without replacing native vegetation might cause declines in native species