

Montane Riparian Wetlands

In montane regions of the Rocky Mountains and in the highest parts of the Sierra Madre Occidental, a "canyon bottom forest" (Fig. 155) may occur along perennial and near-perennial streams from ca. 2,100-2,300 m down to ca. 1,700 m, and locally to as low as 1,350 m. Narrowleaf Cottonwood (*Populus angustifolia*), maple (*Acer grandidentatum*), Box Elder (*Acer negundo*), alder (*Alnus oblongifolia*) and willows (*Salix* spp.) form a riparian series, in which the trees, shrubs, and grasses of adjacent montane coniferous forest are lesser (yet common) participants (e.g., *Quercus gambelii*, *Pinus ponderosa*, *Abies concolor*, *Populus tremuloides*, *Robinia neomexicana*, *Rhus glabra*, *Blepharoneuron tricholepsis*, etc.). Any of several other riparian short-statured or scrub trees such as Water Birch (*Betula occidentalis*), Rocky Mountain Maple (*Acer glabrum*), American Plum (*Prunus americana*), and Bitter Cherry (*Prunus emarginata*) may be locally important. The vine, Virginia Creeper (*Parthenocissus vitacea*), can add a dash of scarlet to an already colorful autumn woods. An analogous series of Black Cottonwood (*Populus trichocarpa*), White Alder (*Alnus rhombifolia*), Bigleaf Maple (*Acer macrophyllum*), and willow (*Salix scouleriana*) finds limited representation along montane streams in some higher Southern California mountains (Sierran riparian deciduous forest).

The dominant aspect of many of these montane stream-sides, however, is often one of shrubbery (= scrubland). This may be a result of the singular presence of younger age classes of riparian trees and/or the heavy and sometimes exclusive representation of one or several shrub willows (*Salix irrorata*, *S. lasiolepis*, etc.). Other riparian scrub species such as Blueberry Elder (*Sambucus glauca*), Red-osier Dogwood (*Cornus stolonifera*), Thin-leaf Alder (*Alnus tenuifolia*), or hawthorn (*Crataegus* spp.) may complement or essentially replace the willows.

The Beaver (*Castor canadensis*) is perhaps the best known montane riparian resident, and Raccoon (*Procyon lotor*) commonly finds its upper elevational limits here. In wider parts of canyons with streamside stands of sedge-grass ciénega, microtine rodents (*Microtus* spp.) often are common. Some of the more densely wooded streamside within Rocky Mountain and Madran conifer forests are important to the distribution of White-tailed Deer (*Odocoileus virginianus*) and Wild Turkey (*Meleagris gallopavo*). The Water Ouzel or Dipper (*Cinclus mexicanus*) is a most characteristic nesting bird. Bleak in winter, these habitats are important in other seasons to a number of colorful migratory songbirds such as the Lazuli Bunting (*Passerina amoena*), Yellow Warbler (*Dendroica petechia*), Black-headed Grosbeak (*Pheucticus melanocephalus*), and Yellow-breasted Chat (*Icteria virens*). Other characteristic birds are the Broad-tailed Hummingbird (*Selasphorus platycercus*), Belted Kingfisher (*Megaceryle alcyon*), Warbling Vireo (*Vireo gilvus*) and Western Flycatcher (*Empidonax difficilis*).

A list of indicative or well represented montane reptiles would include the garter snakes (*Thamnophis elegans*, *T. couchi*, *T. cyrtopsis*, *T. eques*), the Narrow-headed Garter Snake (*T. rufipunctatus*), and Alligator Lizard (*Gerrhonotus kingi*). Amphibians may be represented in the appropriate mountains by either of several treefrogs (*Hyla arenicolor*, *H. regilla*, *H. eximia*) and in California by the mountain Yellow-legged Frog (*Rana mucosa*). Salamanders are the Tiger Salamander in the north, and the Tarahumara Salamander



Figure 155. Rocky Mountain montane riparian forest. "Canyon bottom" habitat along Workman Creek in the Sierra Ancha Experimental Forest, Sierra Ancha Mountains, Gila County, Arizona. Deciduous trees are mostly Big-tooth Maple (*Acer grandidentatum*), Arizona Alder (*Alnus oblongifolia*), Narrow-leaf Cottonwood (*Populus angustifolia*) and Gambel Oak (*Quercus gambelii*). Ponderosa Pine (*Pinus ponderosa*) and White Fir (*Abies concolor*) are prevalent conifers from the adjacent coniferous forest. The shrub-vine Canyon Grape (*Vitis arizonica*) is an important participant in forest openings. Elevation ca. 1,950 m.

(*Ambystoma rosaceum*) in the Sierra Madre Occidental of northwestern México.

Waters of this zone are inhabited by relatively few species of "cold water" fishes. Prior to widespread introductions of Rainbow Trout, most montane streams above 1,800 m were populated by locally endemic species of trouts such as *Salmo apache* in Arizona, *S. gilae* in Arizona and New Mexico, and in the cold-temperate segments of the Sierra Madre Occidental in Mexico, one or more yet-to-be-described species of *Salmo* and the Mexican Golden Trout (*S. chrysogaster*). Many of these native populations are now reduced or extirpated through hybridization with *S. gairdneri* and predation/competition interactions by other introduced salmonids

(Rinne et al., 1981). Another widely introduced species, the European Brown Trout (*Salmo trutta*), descends to somewhat lower elevations where it may be accompanied by the local species of mountain-sucker (genus *Pantosteus*) and such suckers of the genus *Catostomus* that are appropriate to the watershed. Minnows such as spinedace (*Lepidomeda* spp.) and Speckled Dace (*Rhinichthys osculus*) are in the Colorado River basin, and Longnose Dace (*R. cataractae*) occurs in the Rio Grande system. Introduced fishes other than trouts are relatively uncommon in our higher elevation waters, with the exception of the Golden Shiner (*Notemigonus crysoleucus*) in Arizona (Minckley, 1973), which has created substantial management problems by overpopulating fishing lakes.