

## FOREWORD

In the semi-arid environment that characterizes most of California, the narrow riparian strip of moist soil bordering watercourses, seeps, and springs supports the maximum abundance and variety of plant and animal life. This, of course, is most obvious in the desert or on the sagebrush flats in the Great Basin where the surrounding uplands are extremely dry. But apparently it was equally true of the Central Valley in 1844 when Colonel John Fremont traveled southward from Sutter's Fort on the American River, skirting the western foothills of the Sierra Nevada. With each river crossing he eulogized the beauties of the riparian vegetation: "We traveled for 28 miles over the same delightful country as yesterday, and halted in a beautiful bottom at the ford of the Rio de los Mukelemnes. ...The bottoms on the stream are broad, rich, and extremely fertile. ...A showy lupinus of extraordinary beauty, growing four to five feet in height, and covered with spikes in bloom, adorned the banks of the river, and filled the air with a light and grateful perfume." Not only did Fremont have a keen eye for rich soil and bright blossoms, but he commented as well on the numbers of deer and elk seen in the oak parklands and along the edges of the lowland tulares, or marshes. In the South Coast Ranges, the Spanish traveled the broad valleys and established most of their missions in riparian situations. Only in the wet and rugged North Coast Ranges did travelers shun the watercourses, largely because the valleys were V-shaped, with scant bottomlands.

In the process of settlement, the riverbottoms and alluvial terraces were the first areas to be homesteaded and adapted for tillage. Today virtually every acre of the Central Valley bottomlands has been cleared, drained, diked, leveled, or otherwise altered for cultivation. As reported in this volume, less than 10 percent of the original riparian vegetation remains, and over half of this remnant forest and woodland has been logged and otherwise degraded. Similarly, many other major California river valleys have been turned by the plow--the Russian, Napa, Salinas, Santa Maria, Santa Ana, and on--to take advantage of the fertile soils wherever they occur. Thousands of miles of diversion canals have permitted extension of cultivated fields and pastures to areas far removed from streamsides, even well into the desert. At the same time, these diversions have removed large amounts of water from the streams and rivers of origin, often greatly modifying their character. Today there are few arable acres left that are not producing crops or livestock.

The agricultural conquest has made a great contribution to the economy of California, but in the process some natural values have been sacrificed, at times unnecessarily. Riverine ecosystems often are unique, supplying habitats for animal and plant species that are narrowly restricted in their requirements. For example, the Yellow-billed Cuckoo and Bell's Vireo are two birds that nest exclusively in riparian thickets in the Central Valley and adjoining arid areas. The original, uncountably large populations of waterfowl and other wetland-dependent birds have been reduced to a pittance. Those that remain are still associated with and dependent upon the remnant wetlands. Many, like the large herons and egrets, colonize mature riparian trees. Others, like the Greater and Lesser Sandhill Cranes both feed and breed in riparian wetlands.

Aquatic mammals including the otter, beaver, and muskrat frequent streams and billabongs. According to Williams and Kilburn (this volume), of the 502 native species and subspecies of land mammals in California 25 percent (133 taxa) are limited to or largely dependent upon riparian systems. Of these, 21 species and subspecies are especially vulnerable to loss of habitat and are facing potential threats of extinction, principally through destruction of habitat.

Of the 120 species of reptiles and amphibians that occur in California, half of the reptiles and three-fourths of the amphibians are closely associated with riparian situations. And even the fishes in streams are sheltered by streamside vegetation and obtain much food from the insects that live on the banks and indirectly from the leaves and woody materials provided by riparian vegetation.

When riparian vegetation is stripped away and the soil is seeded to monotypic crops, the native riparian ecosystem is effectively destroyed. Water impoundment or diversion can accomplish the same end. Logging and road building have exposed many streams to erosion and desiccation of the bank areas. Perhaps the most subtle but still highly degrading influence on riparian vegetation is unrestricted grazing by domestic livestock. All of the above forms of land exploitation are justifiable within limits. Yet it would seem both desirable and quite possible to preserve shelter strips along streams, wide enough to protect the riverbanks and riparian flora and fauna, but narrow enough to minimize loss of production. Rigorous protection of desert riparian systems, so few in number and so vital to wildlife, would also seem reasonable, especially because of their extreme vulnerability to human-use impacts.

Fortunately, there is an awakening public appreciation of the beauty, interest, and productive values of riverine forests, streamside woodlands, desert washes and oases, and their richly endowed ecosystems. Some of the most appreciated public parks are situated in old-growth riparian stands along the Sacramento and San Joaquin Rivers, Bidwell Park near Chico being an outstanding example. The stimulus of the California Riparian Systems Conference and this resultant volume of thoughtful and informative reports on many aspects of the problem is evidence of that new interest and concern. Hopefully, from this auspicious beginning there will emerge enduring public and private determination to perpetuate the rich values of riparian systems throughout California.

A. Starker Leopold  
13 June 1983