

The TNC has identified four additional parcels, totaling over 1,000 acres, upstream from the Lower San Pedro sites, near Cascabel, Arizona. Southwestern willow flycatcher surveys were conducted on one parcel in 1993 and 10 birds were encountered; however, no nests were documented. These four sites are listed due to their restoration potential, primarily. They include some of the best remaining native riparian habitat in the lower basin of the San Pedro River. Response of native riparian species to restoration activities on adjacent BLM lands indicate a high potential of restoring willow flycatcher habitat on these four parcels. Land values are slightly less in the Cascabel area, ranging from \$600 to \$1,500 per acre (TNC, 1998).

### **Virgin River**

Nesting southwestern willow flycatchers have been documented along the Lower Virgin River on the Overton Wildlife Management Area, managed by Nevada Division of Wildlife, and on National Park Service property at the Virgin River Delta (McKernan and Braden, 1998). Approximately 620 acres of occupied, potential or restorable habitat lies on privately owned land between these two protected areas. Twenty-six individual owners own 36 separate parcels within this stretch of the Virgin River. Land values range from \$450 to \$1,500 per acre (TNC, 1998).

Approximately one half of the area between Overton Wildlife Management Area and Lake Mead National Recreation Area is currently under BLM management. By obtaining the privately owned property within this area, state and federal agencies would have management responsibility from approximately two miles below Riverside Bridge to Lake Mead, a 15 mile stretch of the Lower Virgin River. Access to this area could easily be restricted during the willow flycatcher breeding season, thus protecting nesting birds from disturbance.

### **SUMMARY**

This report has been submitted to the MSCP in accordance to RPA#11 of the BO on Reclamation's routine operation and maintenance of the Lower Colorado River (USFWS, 1997). RPA#11 directs Reclamation to submit a plan to the MSCP for funding and implementation of a long-term program to restore, enhance, and protect southwestern willow flycatcher breeding habitat along the Lower Colorado River. In order to determine the amount of habitat needed for compliance of RPA#11, an estimate of historical habitat was necessary. An analysis of 1938 aerial photography, historical journals, historical photographs, surveyor plats, and historical maps indicated approximately 89,200 acres of potentially suitable willow flycatcher breeding habitat between the Grand Canyon and the Southerly International Boundary between the US and Mexico. This estimate is a "snapshot in time" and must be placed in context with the natural flood cycles and human-caused disturbances along the Lower Colorado River at this time. Analysis of these other factors indicates that 89,200 acres was, in all likelihood, at the high end of the natural range of potential habitat.

Southwestern willow flycatcher surveys, conducted by San Bernardino County Museum, estimate over 6,045 acres of occupied willow flycatcher breeding habitat along the Lower Colorado River in 1998. Analysis of vegetation type maps indicate another approximately 11,197 acres of potentially suitable but unoccupied habitat between Davis Dam and the SIB.

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## *Limitations of this study*

Estimating historical habitat with limited data is, at best, a rough estimate. Many assumptions must be made in order to derive any acreage figure. It is important to remember that the 89,200 acres of historical habitat is in actuality an estimate of the amount of cottonwood-willow vegetation community present along the Lower Colorado River immediately preceding the completion of Hoover Dam in 1935. It is impossible to determine how many of these acres were actually occupied by breeding southwestern willow flycatchers. It is unlikely that willow flycatchers occupied all 89,000 acres at any one time. This figure is an estimate of potentially suitable southwestern willow flycatcher breeding habitat as it is understood today.

Assumptions made when determining the number of historical acres are discussed in the summary of estimation of historical habitat on page 30. In an effort to define historical habitat as objectively as possible, Reclamation had these assumptions peer reviewed by over twenty biologists and ecologists prior to the initiation of this project, including the southwestern willow flycatcher recovery team. Comments and suggestions were incorporated when necessary.

Analysis of San Bernardino County Museum survey data and 1994 vegetation type maps show over 15,000 acres of occupied and potentially suitable but unoccupied habitat along the Lower Colorado. There is debate amongst the scientific community on whether enough is known about willow flycatcher breeding habitat to actually delineate potentially suitable but unoccupied habitat. If all the important parameters needed by flycatchers are present in suitable but unoccupied habitat, then other factors, such as problems on the wintering grounds or migration corridors, predation, parasitism, or pesticides, must be limiting flycatcher numbers in such a way that immigration to suitable but unoccupied sites is not possible. Studies are underway to try to answer some of these questions.