

## HYDROLOGIC INFORMATION IN THE MADREAN BIOGEOGRAPHIC PROVINCE: A BIBLIOGRAPHY FOR PLANNERS, MANAGERS, AND RESEARCH WORKERS

Peter F. Ffolliott,<sup>1</sup> Leonard F. DeBano,<sup>1</sup> Gerald J. Gottfried,<sup>2</sup>  
Malchus B. Baker, Jr.,<sup>2</sup> and Carlton B. Edminster<sup>2</sup>

The hydrology of the Madre-Tertiary of North America is poorly known. Furthermore, scientific literature relative to hydrology and watershed management is largely uncollected and therefore unknown to many planners, managers, and research workers in this region. As a consequence, a bibliography containing about 750 references has been compiled to provide a literature source for managers and researchers concerned with the hydrology and watershed management of the region. This bibliography is part of a larger, more comprehensive bibliography of nearly 5000 references on ecosystem-based management and research in the Madrean Biogeographic Province, including the Madrean Archipelago region of the southwestern United States and northern Mexico (Brown 1982; IUCN 1973).

### Databases Searched

The following computerized and published hardcopy databases were searched for appropriate literature in compiling this bibliography.

- FS INFO
- CAB Abstracts
- AGRICOLA
- BIO SIF Previews
- Life Science Collections
- Southwestern Center for Biological Diversity: Grazing Abstracts
- Riparian Bibliography for New Mexico and the Southwest: Selected Annotations

Published hardcopy databases searched in compiling the bibliography included the following:

- Selected References: The Encinal Woodlands (Ffolliott and Gottfried 1992).
- Livestock Management Effects on Wildlife, Fisheries, and Riparian Areas: A Selected Literature Review (Anderson 1993).

- A Bibliography for the Northern Madrean Biogeographic Province (Ffolliott et al. 1994).
- Papers presented at the Conference on the Biodiversity and Management of the Madrean Archipelago: The Sky Islands of Southwestern United States and Northwestern Mexico, held in Tucson, Arizona, on September 19–23, 1994, are also included in the bibliography, along with the relevant literature cited in these papers (DeBano et al. 1995).
- Annotated bibliography of publications from the Southwest Watershed Research Center (USDA Agricultural Research Service 1995).

Theses and dissertations on topics that are relevant to the Madrean Biogeographic Province, and the literature cited therein, were also reviewed. "Fugitive literature," including office reports, field trip summaries, map references, and other (formally) unpublished but relevant materials are included where appropriate. This literature is most commonly found in special collections of libraries.

### Organization of Bibliography

Citations presented in the larger, more comprehensive bibliography are listed alphabetically in each subject-matter category by author's last name. The citations were placed arbitrarily in a category on the basis of the major emphasis of the work reported upon in the reference. There are 14 categories in the larger bibliography, including the following categories related to hydrology, watershed management, development of water supplies, and combinations thereof:

- Climate and Weather Patterns
- Conservation and Management
- Economics, Policies, Sociology
- Hydrology and Watershed Management
- Riparian Ecosystems
- Soils and Geological Features

<sup>1</sup>School of Renewable Natural Resources, U. of Arizona, Tucson  
<sup>2</sup>Rocky Mtn. Research Station, USDA Forest Serv., Flagstaff, AZ

It might be necessary for a user of the bibliography to search more than one of these categories to compile a list of references for a particular hydrologic topic or subject. For example, references on the effects of a land-use practice (livestock grazing) on a specific component of the hydrologic cycle (surface runoff) can be found in the categories on Conservation and Management, Hydrology and Watershed Management, Range Management and Livestock Grazing, and Riparian Ecosystems. Duplication of a reference in more than one category is possible, although attempts have been made to minimize repetition throughout the bibliography.

Citations presented in the bibliography represent the information presented in the original databases, when the references themselves could not be located in the library. Therefore, some of the citations listed are incomplete. On occasion, pages of volumes in a series are not presented, or symposia editors, technical coordinators, or compilers are not given. Nevertheless, an attempt was made to provide sufficient information in the bibliographic entry to enable the user to search for the document in a library.

The large number of citations in the larger, more comprehensive bibliography, and categories therein, preclude publication of the listing in this paper. However, a sample listing of citations related to hydrology and watershed management is presented in the appendix to show the diversity of topics considered, the range of geographic areas represented, and literature sources reviewed while preparing this bibliography.

The bibliography is available on a World Wide Web page. The address [www.rms.nau.edu/publications/madreal/](http://www.rms.nau.edu/publications/madreal/) provides a direct connection to the bibliography's main menu. Instructions for accessing the bibliography, or selected categories, are contained in this menu.

#### Acknowledgments

The Cooperative Park Studies Unit, U.S. Geological Survey, U.S. Department of the Interior, provided funding to the School of Renewable Natural Resources, University of Arizona, to support the initial effort to compile the larger, more comprehensive bibliography. This initial effort resulted in the publication of a preliminary bibliography of literature pertaining to the Madreal Biogeographic Province (Ffolliott et al. 1994). Subsequent funding to complete the bibliography was provided by the Rocky Mountain Forest and Range Experiment

Station, USDA Forest Service, through the Borderlands Ecosystem Management Program, and the School of Renewable Natural Resources, University of Arizona.

#### Literature Cited

- Anderson, S. 1993. Livestock management effects on wildlife, fisheries, and riparian areas. Humboldt National Forest, USDA Forest Service, Elko, Nevada.
- Brown, D. E., editor. 1982. Biotic communities of the American Southwest—United States and Mexico. *Desert Plants* 4:1-342.
- Ffolliott, P. F., and G. J. Gottfried. 1992. Selected references: The encinal woodlands. In Ffolliott, P. F., G. J. Gottfried, D. A. Bennett, V. M. Hernandez C., A. Ortega-Rubio, and R. H. Hamre, technical coordinators. Ecology and management of oak and associated woodlands: Perspectives in the southwestern United States and northern Mexico. USDA Forest Service, General Technical Report RM-218, pp. 215-224.
- Ffolliott, P. F., G. J. Gottfried, L. F. DeBano, and A. Ortega. 1994. A bibliography for the northern Madreal biogeographic province. School of Renewable Natural Resources, University of Arizona, Tucson.
- DeBano, L. F., P. F. Ffolliott, A. Ortega-Rubio, G. J. Gottfried, R. H. Hamre, and C. B. Edminster, technical coordinators. 1995. Biodiversity and management of the Madreal archipelago: The Sky Islands of southwestern United States and northwestern Mexico. USDA Forest Service, General Technical Report RM-GTR-264.
- IUCN. 1973. A working system for classification of world vegetation. Occasional Paper, International Union for the Conservation of Nature and Natural Resources.
- USDA Agricultural Research Service. 1995. Annotated bibliography of publications from the Southwest Watershed Research Center. Agricultural Research Service, Southwest Watershed Research Center, USDA Agricultural Research Service, Tucson, AZ.

#### APPENDIX

##### Sample Listings of Citations on Hydrology and Watershed Management in the Bibliography

- Adar, E. M., and S. P. Neuman. 1988. Estimation of spatial recharge distribution using environmental isotopes and hydrochemical Data. II. Application to Aravaipa Valley in Southern Arizona, U.S.A. *Journal of Hydrology* 97:279-302.
- Applegate, L. H. 1981. Hydraulic effects of vegetation changes along the Santa Cruz River near Tumacacori, Arizona. MS Thesis, University of Arizona, Tucson.
- Arizona Water Resources Research Ctr. 1978. Groundwater projections for 11 basins. *Arizona Water Resources News Bulletin* 78-3.

- Baker, M. B., Jr., L. F. DeBano, P. F. Ffolliott. 1995. Hydrology and watershed management in the Madrean Archipelago. In DeBano, L. F., P. F. Ffolliott, A. Ortega-Rubio, G. J. Gottfried, R. H. Hamre, and C. B. Edminster, technical coordinators. 1995. Biodiversity and management of the Madrean Archipelago: The Sky Islands of southwestern United States and northwestern Mexico. USDA Forest Service, General Technical Report RM-GTR-264, pp. 329-337.
- Balling, R. C., Jr. 1989. The impact of summer rainfall on the temperature gradient along the United States-Mexico border. *Journal of Applied Climatology* 28: 304-308.
- Bojorquez, L., R. Aguirre, and A. Ortega. 1985. Rio Yaqui watershed, northwestern Mexico: Use and management. In Johnson, R. R., C. D. Ziebell, D. R. Patton, P. F. Ffolliott, and R. H. Hamre, technical coordinators. Conference on riparian ecosystems and their management: Reconciling conflicting uses. USDA Forest Service, General Technical Report RM-120, pp. 475-478.
- Bolin, S. B., and T. J. Ward. 1987. An analysis of runoff and sediment yield from natural rainfall plots in the Chihuahuan Desert. In Aldon, E. F., C. E. Gonzales V., and W. H. Moir, technical coordinators. Symposium on strategies for classification and management of native vegetation for food production in arid zones. USDA Forest Service, General Technical Report RM-150, pp. 196-200.
- Burkham, D. E. 1970. Precipitation, streamflow, and major floods at selected sites in the Gila River drainage basin above Coolidge Dam, Arizona. U.S. Department of the Interior, Geological Survey, Professional Paper 655-B.
- DeBano, L. F., and L. J. Schmidt. 1989. Improving riparian areas through watershed management. USDA Forest Service, General Technical Report RM-182.
- Dunbar, R. 1968. *The Sonoran Desert: Its geography, economy, and people*. University of Arizona Press, Tucson.
- Emmerich, W. E. 1990. Precipitation nutrient inputs in semiarid environments. *Journal of Environmental Quality* 19:621-624.
- Environmental Protection Agency. 1992. Summary: Environmental plan for the Mexican-U.S. border area. Environmental Protection Agency, Washington, D.C.
- Herrenhorn, J. S., and D. A. Woolhiser. 1987. Disaggregation of daily rainfall. *Journal of Hydrology* 95:299-322.
- Instituto Nacional de Estadística Geografía e Informática. 1993. Estudio hidrológico del Estado de Sonora. Instituto Nacional de Estadística Geografía e Informática, Aguascalientes, Aguascalientes, México.
- Johnsen, T. N., Jr., and W. L. Warskow. 1980. Picloram dissipation in a small southwestern stream. *Weed Science* 28:612-615.
- Keppel, R. V., and K. G. Renard. 1962. Transmission losses in ephemeral stream beds. *American Society of Civil Engineers, Journal of the Hydraulics Division* 88(HY5):59-68.
- Harshbarger, J. W., and D. R. Hargis. 1981. Hydrology and mining in the Tucson area. *Mining-Engineering* 33:1611-1616.
- Merz, J. 1986. Tucson water demonstration recharge site. In Beatty, B., and P. A. K. Wilkinson, editors. *Frontiers in geology and ore deposits of Arizona and the Southwest*. Arizona Geological Society Digest 16:480.
- Ortiz-Franco, P., and V. D. Solano. 1991. Determinación de la erodabilidad (susceptibilidad del suelo a ser erosionado) en la Sierra de Chihuahua. Instituto Nacional de Investigaciones Forestales y Agropecuarias, Cuauhtémoc, Chihuahua, México.
- Van Devender, T. R., and W. G. Spaulding. 1979. Development of vegetation and climate in the southwestern United States. *Science* 204:701-710.