

## 5.0 Consultation, Coordination, and Public Involvement

---



This chapter details the consultation and coordination between the Bureau of Reclamation and other State, Federal, and local agencies, Native American tribes, and the public in the preparation of this environmental impact statement (EIS). Since the Notice of Intent to prepare this EIS was published in June 2000, input has been actively solicited from a broad range of public constituencies as part of the ongoing public involvement process. Comments and involvement in the planning for and preparation of the Flaming Gorge EIS were generally sought through two broad efforts: communication and consultation with a variety of Federal, State, and local agencies, Native American tribes, and interest groups; and the formal EIS scoping process and draft EIS comment process, both of which invited input from the general public.

---

### 5.1 CONSULTATION AND COORDINATION WITH OTHER AGENCIES AND ORGANIZATIONS AND NATIVE AMERICAN TRIBES

In June and July 2000, Reclamation invited a number of State and Federal agencies and the Northern Ute Tribe to become cooperating agencies in the preparation of this EIS. The eight agencies that agreed to become cooperating agencies for this EIS are listed in section 1.2. Reclamation has hosted periodic cooperating agency meetings throughout the preparation of this EIS, to ensure that all of the agencies were informed of and involved in the issues and analyses related to the EIS. Other interested

tribes, government agencies, and public organizations and individuals have been kept informed on the status and progress of EIS preparation, as requested.

In July 2000, Reclamation initiated consultation under various cultural resource laws, Executive orders, and regulations with the following tribes: the Southern Ute Tribe, the Ute Mountain Tribe, the Northern Ute Tribe, the Northwest Band Shoshone Tribe, the Wind River Shoshone Tribe, the Hopi Tribe, the Paiute Indian Tribe of Utah, the Kaibab Paiute Tribe, the Pueblo of Nambe, the Pueblo of Zia, the Pueblo of Laguna, and the Pueblo of Zuni. Consultation with interested tribes has been an ongoing process and included a briefing on the EIS for the Northern Ute Business Council and a field visit with representatives of the Wind River Shoshone Tribe. None of the tribes expressed concerns regarding either traditional cultural properties or sacred sites within the area of potential effect.

---

## 5.2 PUBLIC INVOLVEMENT

Section 1.3 details the scoping process for this EIS. As stated during the scoping hearings, meetings with Reclamation staff were available to the interested public throughout the period of EIS scoping and preparation. Throughout the preparation of this EIS, the Flaming Gorge EIS Home Page on the Upper Colorado Region, Bureau of Reclamation Web site has been updated and available to all with Internet access. In November 2001, a newsletter regarding the development of the EIS was sent to those on the EIS mailing list.

The draft EIS was mailed to the interested public for review and comment in early September 2004, and a Notice of Availability of the draft EIS was published in the *Federal Register* on September 10, 2004. The 60-day review and comment period for the draft EIS ended on November 15, 2004.

During the public comment period, five public hearings were held to receive oral comments on the draft EIS: Moab, Utah, October 12, 2004; Salt Lake City, Utah, October 13, 2004; Rock Springs, Wyoming, October 19, 2004; Dutch John, Utah, October 20, 2004; and Vernal, Utah, October 21, 2004. All written and oral comments received during the comment period were considered in preparing the final EIS. These comments, along with Reclamation's responses, may be found in the separate volume, Comments on the Draft Environmental Impact Statement and Responses.

This final EIS, like the draft EIS, has been mailed to the over 600 agencies, organizations, and individuals on the mailing list (see section 5.3 below), and notice of its availability has been published in the *Federal Register*. It has also been made available on the Flaming Gorge EIS Web page. A Record of Decision, to be prepared no sooner than 30 days after publication of this final EIS, will also be published in the *Federal Register*, mailed to the interested public, and posted on the Flaming Gorge EIS Web page.

---

## 5.3 DISTRIBUTION LIST

This EIS has been sent to the following agencies, groups, and individuals for their information and review. Those who commented on the draft EIS are noted with an asterisk (\*).

### Federal Agencies

Advisory Council on Historic Preservation  
Department of Agriculture  
    USDA Forest Service  
    Natural Resources Conservation  
    Service  
Department of Army  
    Corps of Engineers

Department of Energy  
Office of Policy, Safety, and  
Environment  
\*Western Area Power Administration  
Argonne National Laboratory  
Department of the Interior  
Bureau of Indian Affairs  
Bureau of Land Management  
\*National Park Service  
\*U.S. Fish and Wildlife Service  
U.S. Geological Survey  
\*Environmental Protection Agency  
Office of Management and Budget

## **U.S. Congressional Delegation**

Colorado  
Representative John Salazar, 3<sup>rd</sup> District  
Senator Wayne Allard  
Senator Ken Salazar  
Utah  
Representative Chris Cannon, 3<sup>rd</sup> District  
Representative Rob Bishop, 1<sup>st</sup> District  
Representative James Matheson,  
2<sup>nd</sup> District  
Senator Bob Bennett  
Senator Orrin Hatch  
Wyoming  
Representative Barbara Cubin  
Senator Mike Enzi  
Senator Craig Thomas

## **American Indian Tribal/National Governments**

Kaibab Paiute Indian Reservation, Pipe  
Spring, Arizona  
Northern Ute Tribe of the Uintah and Ouray  
Reservation, Fort Duchesne, Utah  
Pueblo of Zuni, Zuni, New Mexico

## **State Legislators**

Colorado  
Representative Al White, District 57,  
Denver  
Senator Jack Taylor, District 8, Denver  
Utah  
Representative John G. Mathis,  
District 55, Naples

Representative Gordon E. Snow,  
District 54, Roosevelt  
Representative David Ure, District 53,  
Kamas  
Senator Beverly Evans, Altamont  
Senator Allen M. Christenson,  
North Ogden  
Wyoming  
Representative John M. Hastert,  
District 39, Green River  
Representative Mick Powers, District 18,  
Lyman  
Representative Marty Martin, District 48,  
Rock Springs  
Representative Stephen Watt, District 17,  
Rock Springs  
Representative Bill Thompson,  
District 60, Green River  
Representative Pete Jorgenson,  
District 16, Rock Springs  
Senator Tex Boggs, District 13,  
Rock Springs  
Senator Stan Cooper, District 14,  
Kemmerer  
Senator Rae Lynn Job, District 12

## **State Agencies**

Arizona  
Governor  
Arizona Department of Water Resources,  
Phoenix  
Colorado  
Governor  
Local Affairs Department/Division of  
Local Government, Department of  
Law, Denver  
\*Colorado Department of Natural  
Resources, Denver  
Utah  
Governor  
Department of Natural Resources, Salt  
Lake City  
\*Governor's Office of Planning  
and Budget, Salt Lake City  
\*Office of the Attorney General, Salt  
Lake City  
State of Utah Trust Lands, Salt Lake City  
State Parks and Recreation, Salt Lake  
City

- \*Utah Associated Municipal Power Systems, Salt Lake City
- Utah Division of Water Resources, Salt Lake City
- Utah Division of Wildlife Resources, Salt Lake City
- Utah Farm Bureau Federation, Payson
- Utah State Clearing House, Salt Lake City
- Utah State University, Logan, Utah
- \*Utah State University Extension, Vernal

Wyoming

- \*Governor
- Wyoming Department of Environmental Quality, Cheyenne
- Wyoming Department of State Parks and Cultural Resources, Cheyenne
- Wyoming Division of Economic and Community Development, Cheyenne
- \*Wyoming Game and Fish, Cheyenne, Wyoming, and Green River, Utah
- Wyoming Office of Federal Land Policy, Cheyenne
- \*Wyoming State Engineer's Office, Cheyenne
- \*Wyoming State Geological Survey, Laramie
- Wyoming State Historic Preservation Office, Cheyenne

## Local Agencies

- \*Daggett County Commission, Manila, Utah
- Uintah Basin Association of Governments, Roosevelt, Utah
- \*Rock Springs Chamber of Commerce, Rock Springs, Wyoming
- Sweetwater Commission, Green River, Wyoming
- \*Town of Manila, Utah
- \*TriCounty Health Department, Vernal, Utah
- \*Uintah County Commission, Vernal, Utah
- \*Uintah County Mosquito Abatement District, Vernal, Utah
- Uintah County Public Lands, Vernal, Utah

## Irrigation Districts and Water Users Organizations

Carbon Water Conservancy District, Helper, Utah

- \*Central Utah Water Conservancy District, Orem, Utah
- Colorado River Board of California, Glendale, California
- Colorado River Commission of Nevada, Las Vegas, Nevada
- \*Colorado River Energy Distributors Association (CREDA), Tempe, Arizona
- \*Colorado River Water Conservation District, Glenwood Springs, Colorado
- Colorado River Water Users Association, Coachella Valley Water District, Coachella, California
- Colorado Water Conservation Board, Denver, Colorado
- \*Duchesne County Water Conservancy District, Roosevelt, Utah
- Metropolitan Water District of Southern California, Los Angeles, California
- Moon Lake Water Users Association, Roosevelt, Utah
- Provo River Water Users Association, Orem, Utah
- \*Sweetwater County Conservation District, Rock Springs, Wyoming
- Upper Colorado River Commission, Salt Lake City, Utah
- Utah Water Users Association, Murray, Utah

## Libraries

Colorado

- Denver Public Library, Denver
- Mesa County Public Library, Grand Junction
- Norlin Library, University of Colorado, Boulder

Utah

- Daggett County Library, Manila
- Duchesne County Library, Roosevelt
- Grand County Library, Moab
- Green River City Library, Green River
- Harold B. Lee Library, Brigham Young University, Provo
- J. Reuben Clark Law School, Brigham Young University, Provo
- Merrill Library, Utah State University, Logan
- Salt Lake City Public Library, Salt Lake City

Uintah County Library, Vernal  
Ute Indian Tribe Library, Fort Duchesne  
Wyoming  
Hay Library, Western Wyoming  
Community College, Rock Springs  
Rock Springs Library, Rock Springs  
Sweetwater County Library, Green River  
White Mountain Library, Rock Springs

### **Interested Organizations**

Action Network Activist, Eden Prairie,  
Minnesota  
American Fisheries Society, Garden City,  
Utah  
American Rivers, Lincoln, Nebraska;  
Washington, DC  
Basin Sports, Vernal, Utah  
Boyle Engineering, Lakewood, Colorado  
\*Burnell Slauch Ranch, Jensen, Utah  
Cedar Springs Marina, Flaming Gorge, Utah  
Clipper Publishing Company, Bountiful, Utah  
Colorado Energy Distributors Association,  
Tempe, Arizona  
Colletts Recreation Service  
Cooper Printing and Publishing, Magna, Utah  
Dinosaur Expeditions, Park City, Utah  
Dinosaurland Travel Board, Vernal, Utah  
Don Hatch River Expeditions, Vernal, Utah  
\*Eagle Outdoors Sports, Kayesville, Utah  
Eagle Outfitters Inc., Layton, Utah  
Engineering and Planning Consultants,  
Loveland, Colorado  
Flaming Gorge Chapter-PFUSA, Rock  
Springs, Wyoming  
Flaming Gorge Corporation, Manila, Utah  
Flaming Gorge Lodge, Dutch John, Utah  
Flaming Gorge Yacht Club, Bountiful, Utah  
Foundation of North American Wild Sheep,  
Salt Lake City, Utah  
\*Franson Noble Engineering, Provo, Utah  
Future Resources, Vernal, Utah  
Grand Canyon Monitoring and Research  
Center, Flagstaff, Arizona  
Grand Canyon River Guides, Flagstaff,  
Arizona  
Grand Canyon Trust, Flagstaff, Arizona  
Green River Drifters Inc., Dutch John, Utah  
\*Green River Outfitters, Dutch John, Utah  
\*Green River Outfitter and Guides  
Association, Dutch John, Utah

Holiday Expeditions, Salt Lake City, Utah  
Interstate Stream Commission, Santa Fe,  
New Mexico  
JBR Environmental Consultants, Murray,  
Utah  
\*Living Rivers, Colorado Riverkeeper, Moab,  
Utah  
National Parks Conservation Association,  
Visalia, California; Long Branch,  
New Jersey  
\*Old Moe Guide Service, Dutch John, Utah  
Questar, Rock Springs, Wyoming  
Pinedale Roundup, Pinedale, Wyoming  
Quad/Photo, New York, New York  
Red Canyon Lodge, Dutch John, Utah  
Rocky Mountain Elk Foundation, Missoula,  
Montana  
Southwest Rivers, Flagstaff, Arizona  
Sweetwater Economic Development  
Association, Rock Springs, Utah  
The Nature Conservancy, Boulder, Colorado;  
Arlington, Virginia; Madison, Wisconsin  
\*Thunder Ranch, LLC, Jensen, Utah  
Tidal View, West Tremont, Maine  
\*Trout Bum 2, Park City, Utah  
\*Trout Creek Flies, Dutch John, Utah  
\*Trout Unlimited, Salt Lake City, Utah  
\*Uintah Mountain Club, Vernal, Utah  
Utah Associated Municipal Power  
Systems, Salt Lake City, Utah  
Utah Council Trout Unlimited, South Weber,  
Utah  
Utah Farm Bureau Federation, Payson, Utah  
Utah Habitat Council, Salt Lake City, Utah  
Utah Municipal Power Agency, Spanish Fork,  
Utah  
Utah Rivers Council, Salt Lake City, Utah  
Utah Water Project Trout Unlimited, Sandy,  
Utah  
\*Utah Waters, Salt Lake City, Utah  
\*Water Consult Engineering and Planning  
Consultants, Loveland, Colorado  
\*Western Resource Advocates and  
The Nature Conservancy, Boulder,  
Colorado  
\*Western Rivers Flyfisher, Salt Lake City,  
Utah  
White Water Canoe Colorado, Greeley,  
Colorado

## Interested Individuals

\*G. Howard Abplanalp, Vernal, Utah  
Brad Adams, Greensboro, North Carolina  
\*Deloy Adams, Dutch John, Utah  
\*Lew Albright  
\*John and Mickey Allen, Rangely, Colorado  
\*Mark Allen, Orem, Utah  
Jeanelle Adamson, Rock Springs, Wyoming  
Patrick Adcock, Norfork, Arkansas  
Evan Albright, San Luis Obispo, California  
Cheryl Alfakyani, Melrose, Maryland  
Thomas Allgaier, Palm Bay, Florida  
Joe Alston, Page, Arizona  
\*Dick Apedalle  
Michael H. Anderson, Sr., Ohatchee,  
Alabama  
Warren Anderson, Rock Springs, Wyoming  
Nicholas Angarone, Hamilton, New Jersey  
Angelde Armendi, Miami, Florida  
Dave Armstrong, Salt Lake City, Utah  
Cheryl Arredondo, Apache Junction, Arizona  
Jim Aton, Cedar City, Utah  
Gina Baker, Star City, Indiana  
Scott Baker, Draper, Utah  
D. Barbero, Rock Springs, Wyoming  
\*Justin Barker, Pleasant Grove, Utah  
\*Lynn Barlow  
Terry Barnes, Jr., Funkstown, Maryland  
Scott Barnes, Redlands, California  
M. Dale Barningham, Bountiful, Utah  
Cliff Barrett, Stansbury Park, Utah  
Kevin Barry, Carlsbad, California  
G. Basham-Barnes, Rogers, Arkansas  
Karl Bass, Glen Gardner, New Jersey  
Marcia Battles, Pontiac, Michigan  
Yasmin Bauer, Houston, Texas  
Tony R. Bavry, Columbus, Ohio  
Mark Belles, Rowlett, Texas  
Nathan Bennett, Selinsgrove, Pennsylvania  
Rebecca Bennett, Delhi, Louisiana  
Tina Bennington, Manila, Utah  
\*Enos Bennion, Brigham City, Utah  
Marilyn Bennion, Brigham City, Utah  
Harriet N. Bensen, Long Branch, New Jersey  
Rich Bergmann, Orlando, Florida  
Jennifer Berry, Aiken, South Carolina  
Robert Blackiston, Sewell, New Jersey  
Jason Boccaccio, Arvada, Colorado  
Charles Bock, Layton, Utah  
Paul Borokhov, Chatham, New Jersey  
\*Nancy Bostick-Ebbert, Vernal, Utah

Chris Boswell, Green River, Utah  
Chandra Boyle, Glendale, California  
Robert Bramwell, Green River, Wyoming  
David R. Brandner, Green River, Wyoming  
Dale Brazeel, Rock Springs, Wyoming  
\*Dennis Breer, Dutch John, Utah  
\*Allen Brisk  
Hayden Brockett, New Britain, Connecticut  
\*Alan Bronston  
Carol Brown, Conneaut, Ohio  
\*Michael Brown, Riverton, Utah  
Nathan Brown, San Antonio, Texas  
Vicki Brown, Ukiah, California  
\*Bob Brownlee, Golden, Colorado  
John Broz MD, Twin Falls, Idaho  
Sarah Bruss, Brunswick, Maine  
\*Scott Brunk  
Karen Budd, Placerville, California  
Melissa Buhler, St. Petersburg, Florida  
Martha Bushnell, Boulder, Colorado  
Gary and Joan Butterfield, Kemmerer,  
Wyoming  
\*Ted Butterfield  
\*Reneé Henderson Buzarde, Dutch John,  
Utah  
\*Bryan Campbell  
Ron Carey, Green River, Wyoming  
Bret Carlson, Salt Lake City, Utah  
\*Jay P. Carlson  
Dustin Carlson, Salt Lake City, Utah  
Michael Carpenter, Tucson, Arizona  
Colin Carr-Hall, Roseville, California  
Steven Chadwick, West Jordan, Utah  
Ray Channell, Decatur, Georgia  
David Chapman, Green River, Wyoming  
Susan Child, Cheyenne, Wyoming  
Todd Christensen, Orem, Utah  
Steve Cichowski, Freeman, Missouri  
\*Mel Cisneros  
William Coan, Rockford, Illinois  
Tina Cohenour, Edgewood, New Mexico  
Kathleen Colburn, Oxford, Alabama  
Gay Collar, Green River, Wyoming  
Rob Coln, Durango, Colorado  
Michael Conheady, Rochester, New York  
\*Randall M. Connett, Centennial, Colorado  
Diane Conway, Boston, Massachusetts  
David Cooper, Ph.D., Fort Collins, Colorado  
John Coulson, Berkley, Michigan  
Lisa Covell, Silver Spring, Maryland  
W.H. Craig, Manchester, Michigan  
Alison Criscitiello, Brunswick, Maine

Barry Cutler, North Hollywood, California  
Richard Davis, Jr., Oliver Springs, Tennessee  
\*Robert W. Day, Albuquerque, New Mexico  
Kristin DeJohn, Acton, Massachusetts  
Jay Denis, Melrose, Massachusetts  
James Denison, Long Beach, California  
Guy Denton, Vernal, Utah  
James Derzon, Falls Church, Virginia  
\*James DeSpain, Telford, Pennsylvania  
Lisa DeVaney, Portland, Oregon  
Ruth Dickinson, South Hadley,  
Massachusetts  
Wright Dickinson, Maybell, Colorado  
Charles A. Dillard, Seattle, Washington  
Marilyn Dinger, Kaysville, Utah  
Autumn Marie Dion, Penns Grove,  
New Jersey  
Marlin Dixon, Cumming, Georgia  
Jeff and Brenda Dodd, Rock Springs,  
Wyoming  
Janet Doi, Maryland Heights, Missouri  
William Dolenc, Rock Springs, Wyoming  
Lynn Dorsett, Scottsdale, Arizona  
Rachel Dowell, Bexley, Ohio  
\*Frank Doyle, Denver, Colorado  
Nicholas Dracka, Grosse Ile, Michigan  
David Dredge, Salt Lake City, Utah  
Christopher Drumright, Murfreesboro,  
Tennessee  
Michael Dunn, Ogden, Utah  
\*Paul J. Ebbert, Vernal, Utah  
Carole and Gerry Edlund, Renton,  
Washington  
Marilyn Edlund, Renton, Washington  
Jean Eisenhower, Pearce, Arizona  
Tom Elder, Vernal, Utah  
\*Bryan Eldredge  
Matt Ellsworth, Geneva, New York  
\*Jeff Erkenbeck, San Diego, California  
Rich Etchberger, Vernal, Utah  
Beverly Evans, Altamont, Utah  
Andrew Fahlund, Washington, DC  
Gary Farnsworth, Green River, Wyoming  
Gina Fedon, Olathe, Kansas  
Bette-Burr Fenley, Pittsboro, North Carolina  
Adrienne Fernandez, Monroe, Connecticut  
Amanda Finch, Green River, Wyoming  
\*Kurt Finlayson  
\*Richard Fitzgerald  
Joe Fitzgibbon, Seattle, Washington  
John Flores, Green River, Wyoming  
Bobbie Flowers, New York, New York

Ken and Julie Ford-Maloney, Huntington  
Beach, California  
Nancy and George Forgette, Schuylerville,  
New York  
Tyler Forman, Phoenix, Arizona  
Diane M. Foster, Reliance, Wyoming  
Vincent Frazzetta, Milford, Connecticut  
\*Robert Freestone, Naperville, Illinois  
Preston Frischknecht, Salt Lake City, Utah  
Jeffri Frontz, Columbus, Ohio  
Kimberly Frost, Salt Lake City, Utah  
Chris Fuess, Olympia, Washington  
Daniel Fuka, Durango, Colorado  
Curt Funk, Green River, Wyoming  
David Gable, Rock Springs, Wyoming  
Tamala Gage, Roscommon, Michigan  
John and Ruby Gale, Roosevelt, Utah  
Nanette Gamble, Dutch John, Utah  
David Garbett, Sandy, Utah  
Lydia Garvey, Rosebud, South Dakota  
Kelly Geldreich, Encinitas, California  
Peter Germuska, Gainesville, Florida  
\*Bruce Gibbs, Arvada, Colorado  
Frank Gifford, Rockbridge, Ohio  
Keith Gilroy, Upland, California  
Steve Glazer, Crested Butte, Colorado  
James Goff, Jensen, Utah  
Ross Grainger, Woodside, California  
Stephen Graves, Brookings, Oregon  
Brian Gravlin, Monroe, North Carolina  
James Gray, Ransomville, New York  
Greg Grimes, Marietta, Ohio  
Mara Grossman, Brunswick, Maine  
Claire Grygotis, Falmouth, Virginia  
\*Kerry M. Gubits, Littleton, Colorado  
Chris Hall, Green River, Wyoming  
Clark Hall, Vernal, Utah  
Judith Hallberg, Middletown, New Jersey  
Chad M. Halsey, Ypsilanti, Michigan  
Brandon Haltiwanger, West Columbia, South  
Carolina  
Mike Hamilton, Rock Springs, Wyoming  
Dave Hanks, Rock Springs, Wyoming  
Benjamin Hanley, Ft. Defiance, Arizona  
\*J. Dean Hansen, Vernal, Utah  
Odilia Hanson, Rock Springs, Wyoming  
Bruce E. Harang, Asheville, North Carolina  
Benjamin Harkema, Holland, Michigan  
James Harnden, West Bloomfield, Michigan  
Siobhan Harrington, St. Louis, Missouri  
\*Virginia Harrington, Vernal, Utah  
\*Corey Harris, Bountiful, Utah

Gene Hart, Seattle, Washington  
Rachel Hart, Washington, DC  
\*Janet Hartford, Green River, Wyoming  
Don Hartley, Rock Springs, Wyoming  
Andrew Hartsig, Salt Lake City, Utah  
Bob Hasenick, Santa Rosa, California  
Sam Haslem, Hayden, Colorado  
Sam Haslem, Jensen, Utah  
Gilbert Hassinger, Denver, Colorado  
Rae Ann Hassler, West Bend, Wisconsin  
Christina Hatzakis, Huntsville, Alabama  
\*Craig W. Hauser  
Irvin Haws, Vernal, Utah  
\*Rick Hayes, Carbondale, Colorado  
Emmett Heath, Dutch John, Utah  
John Hennessy, Jr., Parkside, Pennsylvania  
Stephen Herrington, El Dorado Springs,  
Colorado  
\*Jeffrey Himsl, Sandy, Utah  
Matt Hoberg, Kennett Square, Pennsylvania  
Gary Holbert, Rock Springs, Wyoming  
Lynn Holdsworth, Elkland, Pennsylvania  
Heidi Holeman, Lake Placid, Florida  
Lynn B. Hoppie, Mesa, Arizona  
Tina Horowitz, Philadelphia, Pennsylvania  
Maria Horton, Hoover, Alabama  
Jeff Howard, Castro Valley, California  
Marty Howard, Salt Lake City, Utah  
Roger Hunt, Price, Utah  
\*Jack Hunter  
\*Dale Huskey  
Eve Hutchison, Vici, Oklahoma  
Marguerite Ingalsbe, Portland, Oregon  
John Isaacson, Rock Springs, Wyoming  
Brent Israelsen, Salt Lake City, Utah  
Michael Jacobus, Holyoke, Massachusetts  
Les Jameson, Harselle, Alabama  
Lonny F. Jennings, Superior, Wyoming  
Rae Lynn Job, Rock Springs, Wyoming  
Randall Johnson, Sandy, Utah  
\*Bob Johnston, Henderson, Nevada  
Roger Jones, Rock Springs, Wyoming  
Virgil Jones, Coachella, California  
\*Don E. Jorgensen  
\*Dora J. Jorgensen  
Christopher Juday, Brookfield, Illinois  
G. Richard Judd, Spanish Fork, Utah  
Jeff Judkins, Lander, Wyoming  
Dedjoravon Jutaz, New York, New York  
\*Wade Kafkaloff, South Pasadena, California  
Diane Kahan, Los Angeles, California  
Anjanette Kalb, Laramie, Wyoming

Gregory Karpf, Studio City, California  
\*Bruce Kautz, Colorado Springs, Colorado  
Jennifer Kelley, Los Angeles, California  
Elizabeth Kiilerich, Nashville, Tennessee  
George Killat, Midland, Michigan  
Marisa Kilman, Davenport, Florida  
Melody Kirk-Wagner, Bellevue, Washington  
Mary Koch, Walla Walla, Washington  
William Koenig, Casper, Wyoming  
Joshua Kollat, North Jackson, Ohio  
Robert Konig, Flagstaff, Arizona  
Nathan Kosub, Brunswick, Maine  
Tom Krackeler, Oakland, California  
Ursula Krentz, Green River, Wyoming  
Dick Kriest, Rock Springs, Wyoming  
\*Ted E. Kulongoski, Arcata, California  
\*Heather Kuoppamaki, Arcata, California  
Steve Kuyon, Girard, Pennsylvania  
Jeff Laforteza, Long Beach, California  
Owen Lammers, Moab, Utah  
Scott Lammers, Mt. Prospect, Illinois  
Laura Lane, Owasso, Oklahoma  
Shane Larsen, Salt Lake City, Utah  
John Lee, South Jordan, Utah  
Victoria Lehman, Waldorf, Maryland  
Donald Leitch, Jackson, New Jersey  
Adam Lerrick, Rock Springs, Wyoming  
Adam Lerrick, Barrytown, New York  
Todd Liebelt, Rock Springs, Wyoming  
David Lillie, Boulder, Colorado  
Richard Linsenmann, Valparaiso, Indiana  
Bob Linville, Dutch John, Utah  
Dave and Luella Littlefield, Kemmerer,  
Wyoming  
Curt A. Livingston, Dennisport,  
Massachusetts  
Elisha Long, Indiana, Pennsylvania  
Noah Long, Brunswick, Maine  
Julia Loomis, Banks, Arkansas  
David Loucks, Rock Springs, Wyoming  
Charles M. Love, Rock Springs, Wyoming  
Rayland and Linda Loveless, Lyman,  
Wyoming  
Dan Luecke, Boulder, Colorado  
M.H. Lund, Ogden, Utah  
Robert Lynam, Rock Springs, Wyoming  
Robert Lynch, Phoenix, Arizona  
Patrick Mack II, Green River, Wyoming  
Dan Maddigan, Liberty, Pennsylvania  
Timothy Mahar, Destin, Florida  
Mark Mainieri, Granville, Ohio  
Wade Malloy, Green River, Wyoming



Ken Maloney, Huntington Beach, California  
 Cynthia Marentette, Dolph, Arkansas  
 Bob Marshall, Alpine, Utah  
 \*Scott A. Marshall, Aurora, Colorado  
 \*Jeff Martin  
 Kathleen Masterson, Brunswick, Maine  
 Alan A. Matheson, Jr., Sandy, Utah  
 Jennifer Mathews, Baton Rouge, Louisiana  
 Mary Mathews, Lake Forest, Illinois  
 Linda Matthews, Murray, Utah  
 Mark Matthies, Tumwater, Washington  
 Dan and Jane Mazzoni-Maddigan, Library,  
 Pennsylvania  
 Dennis McAfee, Rock Springs, Wyoming  
 Sharon McConnell, Ferndale, Michigan  
 Doug McCuddy, Green River, Utah  
 David R. McDonough, Green River,  
 Wyoming  
 Michael McFarland, Fresno, California  
 Janelle McGahee, Dearing, Georgia  
 \*Jerry McGarey  
 Margaret McGinnis, Hull, Massachusetts  
 Don and Sharyn McKenzie, Rock Springs,  
 Wyoming  
 Robert McLean, Eden, Utah  
 Joe Meagher, Houston, Texas  
 Michael Meeks, Memphis, Tennessee  
 \*Patrick M. Mehle, Rock Springs, Wyoming  
 Geraldine Mellon, Hazel, Kentucky  
 Karla Linn Merrifield, Kent, New York  
 Linda Messatzzia, South Hampton,  
 Pennsylvania  
 Mark Meyer, Dutch John, Utah  
 Dwight and Rosemary Mickey, Reliance,  
 Wyoming  
 Bill Miller, Cheyenne, Wyoming  
 \*Norman Miller  
 William Mills, Reston, Virginia  
 \*Richard L. Mimms  
 Jenny Mocol, Mankato, Minnesota  
 \*Arthur D. Moeller, West Valley City, Utah  
 Maya Moiseyev, San Francisco, California  
 Mardell Moore, Seattle, Washington  
 Tracy Moore, Las Vegas, New Mexico  
 Hana Morin, Odessa, Texas  
 Rebecca Morris, Camden, Delaware  
 Moe Morrow, Rock Springs, Wyoming  
 Rose Mosbey, Rock Springs, Wyoming  
 Tara Murphy, Whiting, New Jersey  
 Keir Mussen, Annandale, Virginia  
 Daniel Muzquiz, Princeton, North Carolina  
 Phayth Myer, Greensboro, North Carolina

\*Mark Naccarato, Holladay, Utah  
 Thea Necker Wachter, Denver, Colorado  
 W. Lynn Nelson, Vernal, Utah  
 Landon Neustadt, Buellton, California  
 Ray Newman, Rock Springs, Wyoming  
 Burno Niccoli, Dutch John, Utah  
 Ruth Niswander, Davis, California  
 Francis J. Noell, III, Bozeman, Montana  
 Kevin Nothnagel, Canton, Michigan  
 Yesenia Nunez, Austin, Texas  
 Dagmar Nye, Anchorage, Alaska  
 Gwendolyn Nyman, Los Angeles, California  
 Dorothy E. O'Connel, Fairplay, Colorado  
 Bridgid 'Connor, Brunswick, Maine  
 Jenny O'Connor, Brunswick, Maine  
 \*Sean P. O'Connor  
 Jack O'Neill, Chatham, New Jersey  
 William Ohlsen, Salt Lake City, Utah  
 Gary Oliver, Abilene, Texas  
 Scott Olsen, Tulsa, Oklahoma  
 Jane Olson, Sidney, Montana  
 Bruce Omacka, Port St. Louie, Florida  
 David Orr, Knoxville, Tennessee  
 Tom Ortega, Rock Springs, Wyoming  
 Christopher M. Ostermueller, Aspinwall,  
 Pennsylvania  
 Jessica Owley, Oakland, California  
 Pat Pacheco, Rock Springs, Wyoming  
 David Page, Telluride, Colorado  
 \*Mauria Pappagallo, Arcata, California  
 \*Ed Park, Aliso Viejo, California  
 \*Lex Patterson, Ogden, Utah  
 Terry Patterson, Knoxville, Tennessee  
 Cathrine Payson, Brunswick, Maine  
 Ray Pecolar, Rock Springs, Wyoming  
 Sandra Pendleton, Kingston, Washington  
 Al Permut, Louisville, Colorado  
 Joseph Perry, Rock Springs, Wyoming  
 Dennis and Ruth Ann Petersen, Midvale,  
 Utah  
 Todd Peterson, Saranac Lake, New York  
 Alexandra Pharmakidis, Providence, Rhode  
 Island  
 H. Blaine Phillips, II, Vernal, Utah  
 Mike Phillips, Page, Arizona  
 Steve Pierson, West Jordan, Utah  
 Norm Piner, Rock Springs, Wyoming  
 Jan Plew, Rock Springs, Wyoming  
 Claire Poertner, Debary, Florida  
 Alisa Polk, Baton Rouge, Louisiana  
 Annette Ponnock, Narberth, Pennsylvania

Irene Porter-Hunter, Philadelphia, Pennsylvania  
\*Chet Preston  
\*Tom Prettyman, Redondo Beach, California  
Darrell T. Price, Rock Springs, Wyoming  
Jim Probst, Green River, Wyoming  
William J. Puller, Bluffton, South Carolina  
Kayen Pyatt, Rock Springs, Wyoming  
Dean Quinton, Rock Springs, Wyoming  
Mathew Rabbitt, Florissant, Missouri  
Nancy Rader, Berkeley, California  
\*Jairo Ramirez, Denver, Colorado  
Andy Randall, Rock Springs, Wyoming  
Jonathan Ratner, Pinedale, Wyoming  
M.D. Ray, Garland, Texas  
Chad L. Reed, Manila, Utah  
Jennifer Reed, Louisville, Kentucky  
Kristin Reed, San Francisco, California  
Cachale Rees, Rock Springs, Wyoming  
Cherie Rees, Vienna, Virginia  
Lachale Rees, Rock Springs, Wyoming  
Harry Reinard, Green River, Wyoming  
Erol Rey, Milwaukee, Wisconsin  
Bill Richards, Littleton, Colorado  
Penney Richardson, San Francisco, California  
Rick Johnson, Flagstaff, Arizona  
Erin Riddle, Ithaca, New York  
Kelly R. Riedel, South Euclid, Ohio  
Felicia and Bob Ritz, Rockledge, Florida  
Melissa Roberts, Seattle, Washington  
Alexander Rodosevich, Dutch John, Utah  
Paul Rodriguez, Amherst, Massachusetts  
\*Steven Romney, Vernal, Utah  
Reeta Roo, Sebastopol, California  
Megan Ropiak, Bangor, Maine  
Gila Rosenfeld, Monsey, New York  
Melba Rowland, Taylors, South Carolina  
Michael Rudzki, Dallas, Texas  
\*Robert E. Rutkowski, Topeka, Kansas  
\*Peter Sagara, Santa Fe, New Mexico  
Zugmunt Samiec, Rock Springs, Wyoming  
Lewis Sandbeck, Port Orchard, Washington  
Christine Sandvik, Groton, Massachusetts  
Luke Schankel, Marietta, Ohio  
Jeanne Schieferstein, Smithtown, New York  
Jack Schmidt, Ph.D., Logan, Utah  
Cheryl Schwarz, Westminster, Maryland  
Pam Schwebel, Cedar Park, Texas  
Bob Scott, Rock Springs, Wyoming  
Amy Seaberg, Grand Rapids, Michigan  
Karen Shaler, Greensburg, Pennsylvania  
Sally-Ann Shedd, Philadelphia, Pennsylvania

Dan Shedden, Green River, Wyoming  
Marcia Sheppard, Iowa City, Iowa  
Yevgenya Shevtsov, Los Angeles, California  
\*Cris and Amanda Shiffler, Provo, Utah  
Robert Shipley, Weed, California  
Hal Simpson, Denver, Colorado  
Shelly Skoog-Smith, Goleta, California  
Lynn Sleight, Duchesne, Utah  
David Sligh, Signal Mountain, Tennessee  
Lynne Slightom, Springfield, Illinois  
Brian Smith, Redwood Valley, California  
\*Jay Smith, Denver, Colorado  
Judy Smith, Fort Collins, Colorado  
\*Les Smith, Fort Collins, Colorado  
Todd Smith, Boulder, Colorado  
Gary Sparks, Green River, Wyoming  
Christean Spies, Pequabuck, Connecticut  
\*Kent Spittler  
Richard Spotts, Ashland, Wisconsin  
Tim D. Steidle, Castle Rock, Colorado  
Jim Steitz, Forest Lake, Minnesota  
Kenny Stewart, Vernal, Utah  
\*Wayne Stewart  
Bob Storti, Spring Hill, Florida  
Phil Strobel, Denver, Colorado  
\*Steven Strong, Vernal, Utah  
Brian Sussman, Rolling Meadows, Illinois  
Mary Elizabeth Swartz, Hammond, Louisiana  
Deanna Tachna, Birmingham, Michigan  
Bill Talraferro, Rock Springs, Wyoming  
\*Jeffrey W. Talus  
Lauretta Tanner, Green River, Wyoming  
Les Tanner, Green River, Wyoming  
Brooke Taylor, Charlotte, North Carolina  
\*Jerry Taylor, Manila, Utah  
\*John I. Taylor, Boulder, Colorado  
Matt Taylor, Reisterstown, Maryland  
David Tetreault, Catoosa, Oklahoma  
Ron Thigpen, Raleigh, North Carolina  
Julie Thollaug, Mortara, California  
\*James W. Thompson, Salt Lake City, Utah  
Marthalie Thurston-Lee, Hobe Sound, Florida  
Patrick and Robin Tierney, Half Moon Bay, California  
\*Melissa Trammell, Salt Lake City, Utah  
Kristina Trotta, Cross River, New York  
Les Turner, Green River, Wyoming  
Wayne Urie, Payson, Utah  
Diana Utsman, Sugar Land, Texas  
Judy Valentine, Rock Springs, Wyoming  
Shawna Van Kurin, Campbell, New York  
Scott Vaughn, Sandy, Utah

Alex Vernon, Norcross, Georgia  
 Michael Vicos, Riverdale, Georgia  
 Sharon Vieyra, Vernal, Utah  
 Bruce Vomacka, Port St. Louie, Florida  
 Bill and Marilyn Voorhies, Port St. Louie,  
 Florida  
 Esther Wagner, Cincinnati, Ohio  
 Margaret A. Wagner, Erwin, North Carolina  
 Greg Walcher, Denver, Colorado  
 S. Wales, Rock Springs, Wyoming  
 Jason Walker, College Station, Texas  
 Kristine Walker, Roseville, California  
 Viola Wallace, Olathe, Kansas  
 Richard D. Wallin, Sandy, Utah  
 J.T. Walmsley, Lewiston, New York  
 Delores Ward, Farmington, Missouri  
 Ed Warner, Grand Junction, Colorado  
 \*Phil Waters, Evergreen, Colorado  
 J. Wazny, Grand Blanc, Michigan  
 David Webster, Vernal, Utah  
 Jim Wechsler, Salt Lake City, Utah  
 Keith Wegen, Louisville, Colorado  
 Dave Wegner, Durango, Colorado  
 Joe Weichman, Santa Monica, California  
 \*Bryan Weight  
 Rachel Weksler, Laramie, Wyoming  
 Anne Wentz, MD, Beaver Creek Avon,  
 Colorado  
 Miriam Westbrook, Edgemoor, South  
 Carolina  
 Lauren Whaley, Brunswick, Maine  
 David Whitman, Vernal, Utah  
 Bill Wichers, Cheyenne, Wyoming  
 \*Edmond Wick, Fort Collins, Colorado  
 Myra Wilensky, San Diego, California  
 Mike Wilkinson, Rock Springs, Wyoming  
 Stacy Williams, Dutch John, Utah  
 Jennifer Willis, Cincinnati, Ohio  
 \*Jim Wilson, Delaware, Ohio  
 \*Marshall Wilson, Copper Mountain,  
 Colorado  
 James Wolff, Pittsburg, Kansas  
 Michael Woodruff, Pippsburg, Maine  
 \*Crista Worthy, Pacific Palisades, California  
 Ronnie Wright, St. Pete Beach, Florida

Tenly Wurglite, Burnswick, Maine  
 Nathan Wyeth, Chevy Chase, Maryland  
 Susan Yaukey, Boulder, Colorado  
 Megan Young, Charlotte, North Carolina  
 Raleigh Zellers, Albuquerque, New Mexico  
 Rosemarie Zellers, Albuquerque,  
 New Mexico  
 Robert Zinn, Mullica Hill, New Jersey

## Media

Cache Citizen, Logan, Utah  
 Casper Star Tribune, Green River, Wyoming  
 Daily Rocket-Miner, Rock Springs, Wyoming  
 Daily Spectrum, St. George, Utah  
 Deseret News, Salt Lake City, Utah  
 Hilltop Times, Hill Air Force Base, Utah  
 Journal Publications, Springville, Utah  
 KVEL Radio 920, Vernal, Utah  
 Lakeside Review, Layton, Utah  
 Logan Herald Journal, Logan, Utah  
 Millard County Chronicle Progress, Delta,  
 Utah  
 Newtah News Group, American Fork, Utah  
 Orem-Geneva Times, Orem, Utah  
 Park Record, Park City, Utah  
 Provo Daily Herald, Provo, Utah  
 Richfield Reaper, Richfield Utah  
 Salt Lake City Weekly, Salt Lake City, Utah  
 Salt Lake Tribune, Salt Lake City, Utah  
 San Juan Record, Monticello, Utah  
 Spanish Fork Press, Spanish Fork, Utah  
 Sun Advocate, Price, Utah  
 The Event News Weekly, Salt Lake City,  
 Utah  
 The Leader, Tremonton, Utah  
 The Ogden Standard Examiner, Ogden, Utah  
 The Orem Daily Journal, Springville, Utah  
 The Times Independent, Moab, Utah  
 Tooele Transcript Bulletin, Tooele, Utah  
 Uintah Basin Standard, Roosevelt, Utah  
 Vernal Express, Vernal, Utah  
 Wave Publishing, Heber City, Utah

# List of Preparers



This environmental impact statement was prepared by the Bureau of Reclamation, Upper Colorado Region, Provo Area Office. The names of persons who prepared various sections, provided extensive background information, or participated to a significant degree in preparing the document are listed below.

## U.S. Department of the Interior Bureau of Reclamation Provo Area Office

| Name and Title   | Education and Professional Experience  | EIS Responsibility   |
|--|--|--|
| Barbara Blackshear<br>Archaeologist                          | MA, Anthropology/<br>Archaeology<br>Federal Service:<br>13 Years   | Team Leader,<br>Cultural Resources;<br>Paleontological<br>Resources; Native<br>American Consultation |
| Peter Crookston<br>Environmental<br>Protection<br>Specialist | BIS, Zoology,<br>Mathematics,<br>Chemistry<br>MS, Wildlife<br>Management<br>Federal Service:<br>14 Years | Manager,<br>FGEIS Program  |
| W. Russ Findlay<br>Fish and Wildlife<br>Biologist            | MS, Wildlife and<br>Range Resource<br>Management<br>Federal Service:<br>13 Years                         | Ecological Resources   |
| Preston Paul<br>Frischknecht<br>Biologist                    | BS, Environmental<br>Studies and Biology<br>Federal Service:<br>2 Years                                  | Maps; Graphics;<br>Ecological Resources;<br>Aquatic Animals  |
| Jared Hansen<br>Hydraulic Engineer                           | MS, Civil Engineering<br>Licensed Professional<br>Engineer<br>Federal Service:<br>12 Years               | Public Safety  |
| Beverley Heffernan<br>Environmental<br>Protection Specialist | AB, History<br>Federal Service:<br>19 Years  | Executive Summary<br>and Portions of<br>Chapters 1-4   |
| Jim Jensen<br>Landscape Architect                            | BLA, Licensed<br>Landscape Architect<br>Licensed Land<br>Surveyor<br>Federal Service:<br>27 Years        | Recreation   |

**U.S. Department of the Interior  
Bureau of Reclamation  
Provo Area Office (continued)**

| <b>Name and Title</b>  | <b>Education and Professional Experience</b>   | <b>EIS Responsibility</b>          |
|--|--|------------------------------------|
| Jonathan Jones<br>Supervisory Resource Management Specialist | BS, Civil Engineering<br>Licensed Professional Engineer<br>Federal Service, 16 Years | Water Rights                       |
| David Krueger<br>Supervisory Civil Engineer                  | BS, Civil Engineering<br>Federal Service: 25 Years                                   | Alternate Team Leader;<br>Land Use |
| Joan Liechty<br>Writer-Editor                                | MA, English<br>Federal Service: 26 Years   | Technical Writer-Editor            |
| Dick Marvin<br>Realty Specialist                             | BS, Industrial Education<br>Federal Service: 22 Years                                | Land Use                           |
| Don Merrill<br>Public Involvement Specialist                 | Federal Service: 18 Years  | Public Involvement                 |
| Steve Noyes<br>Civil Engineer                                | MS, Civil Engineering<br>Licensed Professional Engineer<br>Federal Service: 34 Years | Water Quality                      |
| Kate O'Hare<br>Program Specialist                            | Federal Service: 37 Years  | Public Involvement                 |
| Justin Record<br>Water Rights Coordinator                    | MS, Civil Engineering<br>Licensed Professional Engineer<br>Federal Service: 2 Years  | Water Rights                       |
| Edward Vidmar<br>Manager, Resource Management Division       | BS, Civil Engineering<br>Licensed Professional Engineer<br>Federal Service: 23 Years | Reservoir Operations/Safety        |

**Bureau of Reclamation  
Denver Office  
Technical Service Center**

| <b>Name and Title</b>                       | <b>Education and Professional Experience</b>  | <b>EIS Responsibility</b>                          |
|---|---|--|
| Patty Alexander<br>Technical Editor         | Federal Service: 21 Years   | Editorial Review, Design,<br>Desktop Publishing    |
| Susan Black<br>Social Science Analyst       | BA, Economics<br>Federal Service: 21 Years  | Indian Trust Assets;<br>Environmental Justice      |
| Rob M Davis<br>Agricultural Economist       | PhD, Agricultural Economics<br>Federal Service: 10 Years                              | Agricultural Impacts                               |
| Earl Ekstrand<br>Resource Economist         | PhD, Resource Economics<br>Federal Service: 11 Years                                  | Economic Analysis of Hydropower<br>and Air Quality |
| Bob Hamilton<br>Manager, Economics Group    | MS, Economics<br>Federal Service: 27 Years  | Economic Impacts and Hydropower<br>Impacts         |
| Joseph Lyons<br>Hydraulic Engineer          | MS, Hydrology<br>Federal Service: 22 Years  | Team Leader, Water Resources                       |
| Jonathan Platt<br>Resource Economist        | MS, Natural Resource Economics<br>Federal Service: 17 Years                           | Team Leader, Socioeconomics<br>Recreation          |
| Mohammed Samad<br>Hydraulic Engineer        | PhD, Civil Engineering<br>Licensed Professional Engineer<br>Federal Service: 15 Years | Sediment Transport Analysis                        |
| Darrell Welch<br>Outdoor Recreation Planner | BA, Resource Management and<br>Development<br>Federal Service: 21 Years               | Recreation   |

**Bureau of Reclamation  
Upper Colorado Region**

| <b>Name and Title</b>  | <b>Education and Professional Experience</b>  | <b>EIS Responsibility</b>                           |
|--|---|---|
| Arlo Allen<br>Upper Colorado Region Power<br>Office Manager      | BS, Electrical Engineering<br>Management and Policy<br>Federal Service: 36 Years  | Operations and Maintenance;<br>Hydropower           |
| Karen Barnett<br>Wildlife Biologist                              | BS, Biology/Botany<br>Federal Service: 10 Years   | Riparian/Wetland; Endangered<br>Species             |
| Jane Blair<br>Civil Engineer                                     | MS, Civil Engineering<br>Licensed Professional Engineer<br>Federal Service: 25 Years  | Operations and Maintenance;<br>Emergency Operations |
| Warren Blanchard<br>Manager, Flaming Gorge Field<br>Division     | Flaming Gorge Dam Manager,<br>7 Years<br>Federal Service: 32 Years  | Team Leader, Operations and<br>Maintenance          |
| Rick Clayton<br>Hydraulic Engineer                               | BS, Civil Engineering<br>BS, Economics<br>Water Resources Operations/<br>Hydrologic Modeling, 5 Years<br>Federal Service: 7 Years                               | Reservoir Operations/Hydrology                      |
| Nancy Coulam<br>Lead Environmental Protection<br>Specialist      | PhD, Anthropology<br>Federal Service: 16 Years  | Cultural Resources                                  |
| Amy T. Cutler<br>Hydraulic Engineer                              | ME, Civil Engineering<br>Federal Service: 6 Years   | Reservoir Temperature Modeling                      |
| Andrew Gilmore<br>Hydraulic Engineer                             | MS, Civil Engineering<br>Water Resources Operations/<br>Hydrologic Modeling, 5 Years<br>Federal Service: 5 Years  | Hydrology   |
| Bonnie Heath<br>Realty Specialist, Land Management               | Federal Service: 30 Years   | Team Leader, Land Use                               |
| Lisa Iams<br>Upper Colorado Region Internet<br>Project Manager   | BS, Communications<br>Federal Service: 13 Years   | Development/Maintenance of<br>FGEIS Web Site        |
| Jayne Kelleher<br>Writer-Editor                                  | Federal Service: 26 Years, Including<br>14 Years as a Writer-Editor   | Lead Technical Writer                               |
| Dennis Kubly<br>Lead Supervisory Biologist                       | MA, Zoology<br>Private Environmental Consultant,<br>5 Years<br>Research Biologist for Arizona Game<br>and Fish Department, 15 Years<br>Federal Service: 5 Years | Water Quality and Fish                              |
| Fred Liljegren<br>Outdoor Recreation Planner                     | BLA Landscape Architecture &<br>Environmental Planning<br>Federal Service: 30 Years   | Recreation Safety                                   |
| Jerry Miller<br>Water Quality Scientist                          | BS, Geology/Chemistry<br>Federal Service: 25 Years  | Water Quality and Water Temperature                 |
| Brian Parry<br>Program Manager                                   | JD, Native American Affairs<br>MS, Human Resources Management<br>Federal Service: 18 Years  | Indian Trust Asset                                  |
| Randall Peterson<br>Manager, Environmental Resources<br>Division | BS, Civil Engineering<br>Federal Service: 26 Years  | Environmental Resources Review and<br>Oversight     |
| Tom Scoville<br>Environmental Protection Specialist              | BA, Biology<br>Federal Service: 26 Years  | Team Leader, Health and Safety;<br>Disease Vectors  |
| David Speas<br>Fishery Biologist                                 | BS, Liberal Studies<br>MS, Wildlife and Fishery Science<br>Research Biologist, Arizona Game<br>and Fish Department, 7 Years<br>Federal Service: 1 Year          | Fisheries and Wildlife                              |

**U.S. Department of the Interior  
Fish and Wildlife Service**

| <b>Name and Title</b>             | <b>Education and Professional Experience</b>                 | <b>EIS Responsibility</b> |
|-----------------------------------|--|---------------------------|
| Thomas Chart<br>Fishery Biologist | BS, MS Fish and Wildlife Biology<br>Federal Service: 6 years | Fisheries and Wildlife    |

**U.S. Department of Agriculture  
Forest Service**

| <b>Name and Title</b>                              | <b>Education and Professional Experience</b>                     | <b>EIS Responsibility</b>     |
|--|--|-------------------------------|
| Brent Hanchett<br>Landscape Architect              | BLA<br>Licensed Landscape Architect<br>Federal Service: 35 Years | Visual Resources              |
| Garth Heaton<br>Consultant, Ashley National Forest | BS, Forestry and Forest Recreation<br>Federal Service: 31 Years  | Recreation and Socioeconomics |

**Department of Energy  
Western Power Administration**

| <b>Name and Title</b>   | <b>Education and Professional Experience</b>  | <b>EIS Responsibility</b>                    |
|---|---|--|
| Mary Barger<br>Federal Preservation Officer   | BA, Anthropology<br>Federal Service: 26 Years | Cultural Resources                           |
| Clayton Palmer<br>Manager, Environmental and<br>Resource Planning (Western's<br>Colorado River Storage Project<br>Office) | MA, Economics<br>Federal Service: 16 Years    | Hydropower Generation;<br>Financial Analysis |

**Department of Energy  
Argonne National Laboratory  
(Operated by University of Chicago)**

| <b>Name and Title</b>   | <b>Education and Professional Experience</b>             | <b>EIS Responsibility</b>                                  |
|---|--|--|
| Tomas D Veselka<br>Energy Systems Engineer (Employed<br>by University of Chicago) | MS, Meteorology<br>Professional Experience: 24 Years     | Economic Analysis of Hydropower                            |
| Matthew Mahalik<br>Software Developer (Employed by<br>University of Chicago)      | BS, Computer Science<br>Professional Experience: 5 Years | Computer Simulation Development,<br>Testing, and Execution |

**Operation of Flaming Gorge Dam  
Final Environmental Impact Statement  
Conversion Tables**

**U.S. Customary to Metric**

| <b>Multiply</b>                 | <b>By</b> | <b>To Obtain</b>  |
|---------------------------------|-----------|-------------------|
| inches(inches)                  | 25.4      | millimeters       |
| inches (inches)                 | 2.54      | centimeters       |
| feet (ft)                       | 0.3048    | meters            |
| miles (mi)                      | 1.609     | kilometers        |
| square feet (ft <sup>2</sup> )  | 0.0929    | square meters     |
| acres                           | 0.4047    | hectares          |
| square miles (mi <sup>2</sup> ) | 2.590     | square kilometers |
| gallons (gal)                   | 3.785     | liters            |
| cubic feet (ft <sup>3</sup> )   | 0.02832   | cubic meters      |
| acre-feet                       | 1,233.0   | cubic meters      |
| pounds (lb)                     | 0.4536    | kilograms         |
| tons (ton)                      | 0.9072    | metric tons       |

Temperature in degrees Fahrenheit (°F) can be converted to  
degrees Celsius (°C) as follows: °C = 5/9 (°F - 32)

**Metric to U.S. Customary**

|                                      |           |              |
|--------------------------------------|-----------|--------------|
| millimeters (mm)                     | 0.03937   | inches       |
| centimeters (cm)                     | 0.3937    | inches       |
| meters (m)                           | 3.281     | feet         |
| kilometers (km)                      | 0.6214    | miles        |
| square meters (m <sup>2</sup> )      | 10.76     | square feet  |
| square kilometers (km <sup>2</sup> ) | 0.3861    | square miles |
| hectares (ha)                        | 2.471     | acres        |
| liters (L)                           | 0.2642    | gallons      |
| cubic meters (m <sup>3</sup> )       | 35.31     | cubic feet   |
| cubic meters (m <sup>3</sup> )       | 0.0008110 | acre-feet    |
| grams (g)                            | 0.03527   | ounces       |
| kilograms (kg)                       | 2.205     | pounds       |
| metric tons (t)                      | 1.102     | tons         |

Temperature in degrees Celsius (°C) can be converted to  
degrees Fahrenheit (°F) as follows: °F = 1.8 (°C) + 32

**Other Useful Conversion Factors**

|                             |         |                   |
|-----------------------------|---------|-------------------|
| acre-feet                   | 43,560  | cubic feet        |
| acre-feet                   | 325,851 | gallons           |
| cubic feet per second (cfs) | 1.98    | acre-feet per day |



# Glossary

---



## A

**Acre-foot:** The volume of water that would cover 1 acre, 1 foot deep.

**Age-0, age 1:** The first and second full years of life, respectively.

## B

**Base load:** Demand level of a utility that is continuous throughout the season.

**Biological opinion:** A document stating the opinion of the U.S. Fish and Wildlife Service or National Oceanic and Atmospheric Administration – Fisheries (NOAA Fisheries) on whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

**Bypass tubes:** Two 8-foot diameter conduits through Flaming Gorge Dam that are used to release water in addition to the releases made through the powerplant. These conduits, each with a rated capacity of 2,000 cfs each, are controlled by hollow jet valves that control the flow.

## C

**Candidate species (candidate):** A plant or animal species for which the U.S. Fish and Wildlife Service or NOAA Fisheries has on file sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened.

**Capacity:** The amount of electric power for which a generating unit is rated by the manufacturer.

**Cavitation:** A physical process that can occur when water flows across a surface at high velocity.

**Consumer surplus:** A measure of recreation value based on the increment of recreator willingness-to-pay over and above the incurred cost per visit.

**Control area:** An area comprised of an electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas, and contributing to frequency regulation of the interconnection.

**Critical habitat:** Specific geographic areas, whether occupied by a listed species or not, that are essential for its conservation and that have been formally designated by rule published in the *Federal Register*.

**Cubic foot per second (cfs):** Rate of streamflow; a cubic foot of water passing a reference section in 1 second of time; 1 cfs = 0.0283 cubic meters per second.

**Cultural resources:** Any buildings, sites, districts, structures, or objects significant in history, architecture, archaeology, culture, or science.

**Cyanobacteria:** Blue green algae.

## E

**Economic benefits:** Economic benefits attempt to measure changes in societal or national welfare based on net value concepts, including consumer surplus and producer profitability.

**Employment:** Total of hourly wage, salary, and self-employed jobs (part-time and full-time), measured in terms of jobs, not full-time equivalents.

**Endangered species:** An animal or plant species in danger of extinction throughout all or a significant portion of its range.

**Energy:** Electric capacity generated and delivered over time, usually measured in kilowatthours.

**Entrainment:** Process by which fish or plankton are transported by strong water currents.

## F

**Facility availability approach:** A methodology used to calculate reservoir recreation visitation. The approach evaluates changes in visitation as a function of changing facility availability as water levels fluctuate.

**Facility substitution:** The potential for recreators to move between facilities at a site as a given facility becomes unusable.

**Federal Register (FR):** The official daily publication for actions taken by the Federal Government, such as rules, proposed rules, and notices of Federal agencies and organizations, as well as Executive orders and other Presidential documents.

**Formal consultation:** The required process under section 7 of ESA between the U.S. Fish and Wildlife Service or NOAA Fisheries and a Federal agency or applicant conducted when a Federal agency determines its action is likely to adversely affect a listed species or its critical habitat; used to determine whether the proposed action is likely to jeopardize the continued existence of listed species or adversely modify critical habitat. This determination is stated in a biological opinion.

## G

**Gigawatt (GW):** 1,000 megawatts or 1 billion watts.

**Gigawatthour (GWh):** A unit equal to 1,000 megawatthours.

## H

**Historic properties:** Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the *National Register of Historic Places* maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe and that meet the *National Register of Historic Places* criteria.

## I

**Indian tribe:** An Indian tribe, band, nation, or other organized group or community, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

**Inflow:** Water that flows into a body of water. The amount of water entering a reservoir expressed in acre-feet per day or cubic feet per second.

**Input-Output (IO) analysis:** IO estimates regional economic impacts based on a region's interindustry trade linkages. The analyses present changes in total economic impact as measured by the sum of direct effects (impacts to initially affected industries), indirect effects (impacts to industries providing inputs to directly impacted industries), and induced effects (impacts from employees spending wages within the region), all caused by the initial change in demand.

**Insectivorous:** Feeding on insects.

**Invertebrate:** Animals lacking a spinal column.

## J

**Jeopardy biological opinion:** A U.S. Fish and Wildlife Service or NOAA Fisheries section 7 biological opinion determining that a Federal action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.

**Jeopardize the continued existence of:** To engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

## K

**Kilowatt (KW):** Unit of electric power (capacity) equal to 1,000 watts, or 1.34 horsepower.

**Kilowatthour (KWh):** Basic unit of electric energy equaling an average of 1 kilowatt of power applied over 1 hour.

## L

**Larvae:** Plural form of larva; the early, immature form of any animal.

**Limnology:** The study of freshwater ecosystems.

**Linear interpolation approach:** A procedure used in the recreation analysis to calculate visitation and value. The procedure uses percentages based on five data points (low end thresholds, current conditions, preferred conditions, high end kink conditions, and high end thresholds), measured in terms of river flows/reservoir water levels, visitation, and valuation. If an alternative's flows fall 75 percent of the way between current and preferred flow conditions, the procedure calculates visitation

and value to also fall 75 percent of the way between the current and preferred visitation and value data points.

**Listed species:** A species, subspecies, or distinct population segment that has been added to the Federal list of endangered and threatened wildlife and plants.

**Littoral:** Pertaining to the shore.

**Littoral zone:** The zone or strip of land along the shoreline between the high and low water marks. That portion of a body of freshwater extending from the shoreline lakeward to the limit of occupancy of rooted plants.

## M

**Mean sea level:** Average level of the ocean between high and low tide.

**Megawatt (MW):** 1,000 kilowatts or 1 million watts.

**Megawatthour (MWh):** A unit equal to 1,000 kilowatthours.

**Mesic:** Characterized by moderately moist conditions; neither too wet nor too dry.

## N

**National Register of Historic Places (NRHP):** A federally maintained register of districts, sites, buildings, structures, architecture, archaeology, and culture.

**Net present value:** The total current value determined from a comparison of costs and benefits from different time periods, such that all dollar amounts are discounted to present time, using an appropriate discount rate. The sum of the present value of the costs is subtracted from the sum of the present value of the benefits to determine the net present value. The appropriate discount rate is the

rate that equates the value of a dollar in the present time with the value of a dollar in another time.

**Non-jeopardy biological opinion:** A U.S. Fish and Wildlife Service or NOAA Fisheries section 7 biological opinion that determines that a Federal action is not likely to jeopardize the existence of a listed species or result in the destruction or adverse modification of critical habitat.

**Nonrenewable resources:** Resources such as prehistoric campsites which will not be regenerated in the future. These resources are finite.

## P

**Paleocene:** Relating to the oldest series or epoch of the Tertiary period (57,000,000 to 65,000,000 year B.P.).

**Paleontology:** Study of life in past geological periods by means of fossil remains.

**Passerine birds:** Songbirds of perching habits.

**Penstock:** A pipeline or conduit designed to withstand pressure surges leading from a forebay or reservoir to power-producing turbines or pump units. Conduit used to convey water under pressure to the turbines of a hydroelectric plant. A pressurized pipeline or shaft between the reservoir and hydraulic machinery.

**Piscivorous:** Feeding on fishes.

**Planktonic:** Relating to small plant and animal organisms that float or drift in great numbers in freshwater or saltwater.

**Power:** Electrical capacity generated, expressed in kilowatts.

**Powerplant capacity:** Maximum flow that can pass through the turbines, given a full reservoir.

**Preference:** Priority access to Federal power by public bodies and cooperatives.

**Preference customers:** Publicly owned systems and nonprofit cooperatives that, by law, have preference over investor-owned systems for purchase of power from Federal projects.

**Profitability:** Total revenue minus operating costs.

## R

**Ramp rate (ramping):** The rate of change in instantaneous output from a powerplant. The ramp rate is managed to prevent undesirable effects due to rapid changes in loading or discharge. Changes in ramp rate often are implemented to protect habitat and the public from undesirable effects caused by large, sudden changes in riverflows.

**Reasonable and prudent alternative (RPA):** A recommended alternative action identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that the U.S. Fish and Wildlife Service or NOAA Fisheries believes would not jeopardize the continued existence of listed species or the destruction or adverse modification of designated critical habitat.

**Reasonable and prudent measure (RPM):** An action that the U.S. Fish and Wildlife Service or NOAA Fisheries believes necessary or appropriate to minimize the impacts (the amount or extent) of incidental take caused by an action that was subject to consultation.

**Recovery:** The process by which the decline of an endangered or threatened species is stopped or reversed, or threats to its survival neutralized so that its long-term survival in

the wild can be ensured, and it can be removed from the list of threatened and endangered species.

**Recovery plan:** A document drafted by the U.S. Fish and Wildlife Service, NOAA Fisheries, or other knowledgeable individual or group that serves as a guide for activities to be undertaken by Federal, State, or private entities in helping to recover and conserve endangered or threatened species.

**Recreation value per visit:** Recreator benefits or values per visit are represented by consumer surplus, measured by estimating recreator willingness-to-pay in excess of costs per visit.

**Recreation valuation:** Recreation valuation reflects the sum of individual recreator benefits or values aggregated across users of a site.

**Recreation visit:** A recreation visit reflects a round trip excursion from a recreator's primary residence for the main purpose of recreation.

**Recreation visitation:** Sum of recreation visits across users of a site.

**Recruitment:** Survival of young plants and animals from birth to a life stage less vulnerable to environmental change.

**Redd:** The nest that a spawning female salmon digs in gravel to deposit her eggs. Depression in riverbed or lakebed dug by fish to deposit eggs.

**Regional economic impacts:** Regional economic impacts attempt to measure changes in total economic activity within a specified geographic region, stemming from changes within region expenditures. Regional economic impacts are typically described using such general measures as total industry output, labor income, and employment.

**Resource indicator:** A quantification (measurement) of any environmental consequence arising from the implementation of flow and temperature recommendations that would indicate the presence of certain environmental conditions.

**Resource issue:** An effect or perceived effect, risk, or hazard on a physical, biological, social, or economic resource within the affected environment.

## S

**Sacred site:** See Executive Order 13007. Any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion, provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.

**Spot price:** Market price of energy at a given moment at a point of exchange.

**Sympatric:** Occurring in the same area.

## T

**Tailwater:** The water in the natural stream immediately downstream from a dam. The elevation of water varies with discharge from the reservoir. Applied irrigation water that runs off the lower end of a field.

**Take:** To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

**Terms and conditions:** Required actions described in an Incidental Take Permit under section 10 or Incidental Take Statement intended to implement the reasonable and prudent measures under section 7.

**Threatened species:** An animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

**Total industry output:** Dollar value of production (sales revenues and gross receipts) from all industries in the region. Total industry output includes the value of inter-industry trade of intermediate goods prior to final manufacture and sale.

**Total labor income:** Employment income derived at the workplace including wages and benefits (employee compensation) plus self-employed income (proprietary income).

**Traditional cultural property (TCP):** A site or resource that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community.

## U

**Unregulated inflow:** Within the context of Flaming Gorge Reservoir, the naturally occurring inflows to Flaming Gorge Reservoir if Fontenelle Dam and other diversions did not exist upstream.

## V

**Vertebrate:** Animal species with a spinal column.

# Bibliography

---



Aldrich, T., 1992. Letter from T. Aldrich, of the Utah Department of Natural Resources, Waterfowl Program, Salt Lake City, Utah, to R.A. Van Lonkhuyzen of Argonne National Laboratory. Argonne, Illinois, November 2, 1992.

Allred, T.M., and J.C. Schmidt, 1999. "Channel Narrowing by Vertical Accretion Along the Green River Near Green River, Utah" *in* *GSA Bulletin*, December 1999, vol. 111, No. 12, pp. 1757-1772.

American Mosquito Control Association, Inc., 1990. Cited at <www.mosquito.org>, copyright date of 2003.

Anderson, D.C., and D.J. Cooper, 2000. "Plant Herbivore-Hydroperiod Interactions: Effects of Native Mammals on Floodplain Tree Recruitment" *in* *Ecological Applications*, vol. 10, pp. 1384-1399.

Anderson, R.A., 2002. *Riverine Fish Flow Investigations*, Federal Aid Project F-289-R5 Job Progress Report. Colorado Division of Wildlife, Fish Research Section, Fort Collins, Colorado.

Andrews, E.D., 1986. "Downstream Effects of Flaming Gorge Reservoir on the Green River, Colorado and Utah" *in* *Geological Society of America Bulletin*, vol. 97, pp. 1012-1023.

Andrews, J.W. and R.R. Stickney, 1972. "Interactions of Feeding Rates and Environmental Temperature on Growth, Food Conversion, and Body Composition of Channel Catfish" *in* *Transactions of the American Fisheries Society*, vol. 101(1), pp. 94-99.

Angradi, T.R. and D.M. Kubly, 1993. "Effects of atmospheric exposure on chlorophyll a, biomass and productivity of the epilithon of a tailwater river" *in* *Regulated Rivers: Research and Management*, vol. 8, pp. 345-358.

- Annear, T.A., 1980. "A Characterization of Yampa and Green River Ecosystems," Masters of Science thesis. Utah State University, Logan, Utah.
- Aquatic Species Nuisance Task Force, 1994. *Findings, Conclusions, and Recommendations of the Intentional Introductions Policy Review: Report to Congress*. Aquatic Nuisance Species Task Force, U.S. Fish and Wildlife Service, Washington, DC.
- Arizona Game and Fish Department, 1993. *Glen Canyon Environmental Studies Phase II 1992 Annual Report*, prepared for the Bureau of Reclamation, Glen Canyon Environmental Studies. Arizona Game and Fish Department, Phoenix, Arizona.
- \_\_\_\_\_, 1994. Glen Canyon Environmental Studies Phase II, 1993 Annual Report, (Draft Report), prepared for Bureau of Reclamation. Arizona Game and Fish Department, Phoenix, Arizona.
- Armbruster, M.J., 1990. *Characterization of Habitat Used by Whooping Cranes During Migration*, Biological Report 90(4). U.S. Fish and Wildlife Service, Washington, DC, May.
- Aukerman, R., and E. Schuster, 2002. *Green River Recreation In-Stream Flow and Flaming Gorge Reservoir Drawdown Assessment*. U.S. Department of the Interior, Bureau of Reclamation in cooperation with U.S. Department of Agriculture Forest Service.
- Axtell, J., 1981. *The European and the Indian: Essays in the Ethnohistory of Colonial North America*. Oxford University Press, Oxford.
- Backiel, T. and K. Stegman, 1968. "Temperature and Yield in Carp Ponds" *in Proceedings of the World Symposium on Warm Water Pond Fish Culture*, FAO Fish Report 44, vol. 4, pp. 334-342.
- Banks, J.L., 1964. "Fish Species Distribution in Dinosaur National Monument During 1961-1962," Masters thesis. Colorado State University, Fort Collins, Colorado.
- Barnes, F.A., 1991. "Update – Rivera's 1765 Expedition" *in Canyon Legacy* vol. 10, p. 31.
- Barton, J.D., 1999. Fort Davey Crockett. <<http://eddy.media.utah.edu/medsol/UCME/t/FORTDAVEYCROCKETT.html>>. December 2, 1999.
- Beckstead, J.H., 1991. *Cowboying: A Tough Job in a Hard Land*. University of Utah Press, Salt Lake City, Utah.
- Bedame, P.V. and M.J. Hudson, 2003. *Reintroduction and Monitoring of Hatchery-Reared Bonytail in the Colorado and Green Rivers: 1996-2001*, Project 25 Final Report to the Upper Colorado River Endangered Fish Recovery Program, Utah Division of Wildlife Resources, Moab, Utah.
- Bell, A. Undated. Green River Flooded Bottomlands and Backwater Habitat Mapping. Memorandum from A. Bell, Bureau of Reclamation, to M. Pucherelli, Bureau of Reclamation.
- Bell, A., D. Berk, and P. Wright, 1998. "Green River Flooded Bottomlands Mapping for Two Water Flows in May 1996 and One Water Flow in June 1997," Technical Memorandum No. 8260-98-07. Bureau of Reclamation, Technical Services Center, Denver, Colorado.
- Berry, C.R., Jr., 1988. "Effects of Cold Shock on Colorado Squawfish Larvae" *in The Southwestern Naturalist*, vol. 33, pp. 193-197.
- Bestgen K.R., D.W. Byers, G.B. Haines, and J.A. Rice, 1997. *Recruitment Models for Colorado Squawfish: Tools for Evaluating Relative Importance of Natural and Managed Processes*, Final Report of Colorado State University Larval Fish Laboratory. U.S. National Park Service Cooperative Parks Study



- Unit and U.S. Geological Survey  
Midcontinent Ecological Science Center,  
Fort Collins, Colorado.
- Bestgen, K.R., G.B. Haines, R. Brunson,  
T. Chart, M. Trammell, R.T. Muth,  
G. Birchell, K. Christopherson, and  
J.M. Bundy, 2002. "Status of Wild  
Razorback Sucker in the Green River  
Basin, Utah and Colorado, Determined  
from Basinwide Monitoring and Other  
Sampling Programs," Colorado State  
University Larval Fish Laboratory  
Contribution No. 126. Upper Colorado  
River Endangered Fish Recovery  
Program, Denver, Colorado.
- Bestgen, K.R., and L.W. Crist, 2000.  
*Response of the Green River Fish  
Community to Construction and Re-  
regulation of Flaming Gorge Dam, 1962–  
1996*, Final Report to Colorado River  
Recovery Implementation Program  
Project Number 40, Larval Fish  
Laboratory Contribution 109. Colorado  
State University, Fort Collins, Colorado.
- Bestgen, K.R., R.T. Muth, and M.A.  
Trammell, 1998. *Downstream Transport  
of Colorado Squawfish Larvae in the  
Green River Drainage: Temporal and  
Spatial Variation in Abundance and  
Relationships with Juvenile Recruitment*,  
Final Report of Colorado State University  
Larval Fish Laboratory. To the Upper  
Colorado River Endangered Fish  
Recovery Program, Denver, Colorado.
- Bezzerides, N. and K. Bestgen, 2002. *Status  
Review of Roundtail Chub *Gila robusta*,  
Flannelmouth Sucker *Catostomus  
latipinnis*, and Bluehead Sucker  
*Catostomus discobolus* in the Upper  
Colorado River Basin*, Final Report.  
Colorado State University, Larval Fish  
Lab Contribution 118.
- Binns, A., F. Eiserman, F.W. Jackson,  
A.F. Regenthal, and R. Stone, 1964.  
"The Planning, Operation, and Analysis  
of the Green River Fish Control Project."  
Utah State Department of Fish and Game,  
Wyoming Game and Fish Commission.
- Birchell, G.J., K. Christopherson, C. Crosby,  
T.A. Crowl, J. Gourley, M. Townsend,  
S. Goeking, T. Modde, M. Fuller, and  
P. Nelson, 2002. *The Levee Removal  
Project: Assessment of Floodplain  
Habitat Restoration in the Middle Green  
River*, Final Report, Publication  
No. 02-17. Utah Division of Wildlife  
Resources to the Upper Colorado River  
Endangered Fish Recovery Program, Salt  
Lake City, Utah.
- Birken, A., 2004. "Processes of Tamaix  
Invasion and Floodplain Development  
During the 20<sup>th</sup> Century Along the Lower  
Green River, Utah," Masters of Science  
thesis, Colorado State University,  
Fort Collins, Colorado.
- Blanchard, W., 1999. Personal  
communication, Flaming Gorge  
Environmental Impact team meeting,  
early 1999.
- Blinn, D.W., J.P. Shannon, and L.E. Stevens,  
1992. *The Effects of the Glen Canyon  
Dam on the Aquatic Foodbase in the  
Colorado River Corridor in Grand  
Canyon, Arizona*, Glen Canyon  
Environmental Studies Technical Report.  
Northern Arizona University, Flagstaff,  
Arizona.
- Blinn, D.W., J.P. Shannon, L.E. Stevens, and  
J.P. Carder, 1995. "Consequences of  
Fluctuating Discharge for Lotic  
Communities," *in Journal of the  
American Benthological Society* vol. 14,  
pp. 233-248.
- Bogan, M.A., et al., 1983. "Baseline Studies  
of Riparian Vertebrates of the Yampa and  
Green River Corridors Within Dinosaur  
National Monument, June and July,  
1982." U.S. Fish and Wildlife Service,  
Fort Collins, Colorado, in cooperation  
with the U.S. National Park Service,  
Rocky Mountain Region, Denver,  
Colorado, March 3, 1983.
- Bolke, E.L., and K.M. Waddell, 1975.  
*Chemical Quality and Temperature in  
Water in Flaming Gorge Reservoir*,

- Wyoming and Utah, and the Effect of Reservoir on the Green River.* Geological Survey Water Supply Paper 2039-A. U.S. Government Printing Office, Washington, DC, 26 pp.
- Brannon, E.L., 1991. "Trout Culture" *in* *Culture of Salmonid Fishes*, R.R. Stickney, editor. CRC Press, Inc, Boca Raton, Louisiana, pp. 21-56.
- Brayton, S. and K. Armstead, 1997. *Stocking Success as a Function of Discharge in the Flaming Gorge Tailwater, Utah. 1996-1997*, Final Report, Publication No. 97-18. Utah Division of Wildlife Resources, Northeast Regional Office, Salt Lake City, 26 pp.
- Breternitz, D.A., 1965. *Archaeological Survey in Dinosaur National Monument, Colorado-Utah, 1963-Multilith report*. Submitted to National Park Service, Midwest Region, Omaha, Nebraska.
- Bruder, J.S., and L.E. Rhodes (editors), 1991. "Kern River Pipeline Cultural Resources Data Recovery Report, Wyoming Segment," Draft Report. Dames and Moore, Phoenix, Arizona, submitted to Federal Energy Regulatory Commission, Washington, DC.
- Burdick, B.D., 2002. "Monitoring and Evaluating Various Sizes of Domestic Reared Razorback Sucker Stocked in the Upper Colorado and Gunnison Rivers: 1995–2001," Draft Report. Prepared for the Upper Colorado River Endangered Fish Recovery Program by the U.S. Fish and Wildlife Service, Grand Junction, Colorado
- Bureau of Land Management, 1990. "Diamond Mountain Resource Management Plan, Management Situation Analysis," unpublished working document. Diamond Mountain Resource Area, Vernal District, Vernal, Utah.
- Bureau of Reclamation, 1963. "Designer's Operating Criteria, Flaming Dam Powerplant and Switchyard, Flaming Gorge Unit, Green Division, Colorado River Storage Project," November 1963.
- \_\_\_\_\_, 1995. *Operation of Glen Canyon Dam Colorado River Storage Project, Coconino County, Arizona, Final Environmental Impact Statement*. Upper Colorado Region, Salt Lake City, Utah.
- \_\_\_\_\_, 2000. *Colorado River Interim Surplus Criteria Final Environmental Impact Statement*. Lower Colorado Region, Boulder City, Nevada.
- Byers, D.W., R.T. Muth, and M.S. Farmer, 1994. *Experimental Evidence of Competition Between Larvae of Colorado Squawfish and Fathead Minnow*, Final Report of Colorado State University Larval Fish Laboratory. To Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Callaway, D., J. Janetski, and O.C. Stewart, 1986. "Ute in Great Basin," edited by Warren L. D'Azevedo *in* *Handbook of North American Indians, Volume 11*, W.G. Sturtevant, general editor. Smithsonian Institution, Washington, DC.
- Carlander, K., 1977. "Smallmouth Bass" *in* *Handbook of Freshwater Fish Biology*, vol 2. Iowa State University Press, Ames, Iowa, pp. 152-191.
- Carlson, C.A., and R.T. Muth, 1989. *The Colorado River: Lifeline of the American Southwest*, Canadian Special Publication of Fisheries and Aquatic Sciences, vol. 106, pp. 220-239.
- Carothers, S.W., and C.O. Minckley, 1981. *A Survey of the Fishes, Aquatic Invertebrates, and Aquatic Plants of the Colorado River and Selected Tributaries from Lees Ferry to Separation Rapids*, Final Report to the Water and Power Resources Service. Museum of Northern Arizona, Flagstaff, Arizona.
- Carron, J.C., 2003. "Flaming Gorge Temperature Model Update." Hydrosphere Consultants, Inc., Boulder, Colorado.

- Cater, J.D., R.A. Gruebel, and S. Chandler, 2001. *Flaming Gorge Dam Flow Recommendations: Historic Properties*. Prepared for the Bureau of Reclamation, Upper Colorado Region, Provo Area Office, Provo, Utah.
- Cavalli, P.A., 1999. *Fish Community Investigations in the Lower Price River, 1996-1997*, Final Report. Utah Division of Wildlife to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- \_\_\_\_\_, 2000. *An Evaluation of the Effects of Tusher Wash Diversion Dam on Movement and Survival of Juvenile and Subadult Native Fish*, Final Report. Utah Division of Wildlife to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado
- Centers for Disease Control and Prevention, 2001. "Fact Sheet: Western Equine Encephalitis." July 13, 2001.
- \_\_\_\_\_, 2001. "CDC Answers Your Questions About St. Louis Encephalitis." July 13, 2001.
- \_\_\_\_\_, 2003. West Nile Virus 2003 Human Cases, by clinical syndrome as of November 19, 2003, 3 a.m. Mountain Standard Time, August 19, 2003.
- Cavalli, P.A., 2000. *An Evaluation of the Effects of Tusher Wash Diversion Dam on Movement and Survival of Juvenile and Subadult Native Fish*, Final Report. Utah Division of Wildlife to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado
- Chart, T.E., and S.J. Cranney, 1993. *An Evaluation of Hatchery Reared Bonytail Chub (Gila Elegans) Released in the Green River of Utah: 1988-1989*, Publication No. 93-12. Utah Division of Wildlife Resources to the Bureau of Reclamation, Salt Lake City, Utah.
- Chart, T.E. and L.D. Lentsch, 1999. *Flow Effects on Humpback Chub (Gila Cypha) in Westwater Canyon*, Final Report. Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- \_\_\_\_\_, 2000. *Reproduction and Recruitment of Gila spp. and Colorado Pikeminnow (Ptychocheilus lucius) in the Middle Green River 1992-1996*, Final Report. Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Chart, T.E., D.P. Svendsen, and L.D. Lentsch, 1999. *Investigations of Potential Razorback Sucker (Xyrauchen texanus) and Colorado Pikeminnow (Ptychocheilus lucius) Spawning in the Lower Green River, 1994 and 1995*, Final Report. Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Chen, T.H., 1976. "Cage Culture of Channel Catfish in a Heated Effluent for a Power Plant, Thomas Hill Reservoir," PhD. Dissertation. University of Missouri, Columbia, 98 pp.
- Christopherson, K., G. Birchell and T. Modde, 2004. *Larval Razorback Sucker and Bonytail Survival and Growth in the Presence of Nonnative Fish in the Stirrup Flood Plain Wetland*, Final Report. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Clark, Ray, 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. Council on Environmental Quality, Office of the President.
- Clayton, Rick and A. Gilmore, 2002. *Flaming Gorge Flaming Gorge Draft Environmental Impact Statement Hydrologic Modeling Report*. On file, Bureau of Reclamation, Upper Colorado Region, Provo Area Office, Provo, Utah.

- Cleverly, J.R., S.D. Smith, A. Sala, and D.A. Devitt, 1997. "Invasive Capacity of *Tamarix ramosissima* in a Mojave Desert Floodplain: the Ole of Drought" *in* *Oecologia*, 1997, vol. 111, pp. 12-18.
- Cluer, B. and L. Hammack. 1999. Hydraulic analysis of Green River flows in Dinosaur and Canyonlands National Park Units: preliminary results dated February 19, 1999. National Park Service, Water Rights Branch, Water Resources Division, Fort Collins, Colorado.
- Cooper, D.J., 1999. Written communication, December 21, 1999.
- \_\_\_\_\_, 2002. Written communication, July 18, 2002.
- \_\_\_\_\_, 2003. Written communication.
- Cooper, D.J., D.C. Andersen, and R.A. Chimner, 2003. "Multiple Pathways for Woody Plant Establishment on Floodplains at Local to Regional Scales" *in* *Journal of Ecology*, vol. 91, pp. 182-196.
- Cooper, D.J., C. Arp, and D.C. Andersen, 1999a. *Importance of 1997 Flaming Gorge Dam Bypass Flows for Native Ecosystem Maintenance Along the Green River in Browns Park and Lodore Canyon, Colorado*. Report to the Bureau of Reclamation.
- Cooper, D.J., D.M. Merritt, D.C. Andersen, and R.A. Chimner, 1999. "Factors Controlling the Establishment of Fremont Cottonwood Seedlings on the Upper Green River, USA" *in* *Regulating Rivers: Research Management*, vol. 15, pp. 419-440.
- Cranney, J.S., and W.K. Day, 1993. *Green River Otter Reintroduction 1992 Progress Report*. Utah Division of Wildlife Resources, Northeast Region Office, June 1993.
- Creasman, S.D., and L.J. Scott, 1987. "Texas Creek Overlook: Evidence for Late Fremont (Post A.D. 1200) Occupation in Northwest Colorado" *in* *Southwestern Lore*, vol. 53 (4), pp. 1-16.
- Crowl, T.A., J.L. Gourley, and M. Townsend, 2002. "Invertebrate and Productivity Responses" *in* *The Levee Removal Project: Assessment of Floodplain Habitat Restoration in the Middle Green River*, Final Report, Publication No. 02-17. Utah Division of Wildlife Resources to the Upper Colorado River Endangered Fish Recovery Program, Salt Lake City, Utah.
- Crowl, T.A., J.A. Gourley, M. Townsend, and S.A. Goeking, 2000. *The Levee Removal Project*, Final Report. To the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin.
- Day, K.C. and D. Dibble, 1963. "Archaeological Survey of the Flaming Gorge Reservoir Area, Wyoming-Utah," University of Utah Anthropological Papers Number 65 (Upper Colorado Series 9). Salt Lake City, Utah.
- Day, K.S., K.D. Christopherson, and C. Crosby, 1999. "An Assessment of Young-of-the-Year Colorado Pikeminnow (*Ptychocheilus Lucius*) Use of Backwater Habitats in the Green River, Utah," Upper Colorado River Endangered Fish Recovery Program Project No. FG-33, Final Report *in* *Flaming Gorge Studies: Assessment of Colorado Pikeminnow Nursery Habitat in the Green River*, Publication No. 99-30. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- \_\_\_\_\_, 2000. "Backwater use by young of the year chub (*Gila spp.*) and Colorado pikeminnow (*Ptychocheilus lucius*) in Desolation and Gray Canyons of the Green River, Utah." Report B *in* *Reproduction and Recruitment of Gila spp. and Colorado Pikeminnow in the Middle Green River*, Final Report. Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

- DeBlieux, D.D., M.C. Hayden, and J.I. Kirkland, 2002. *Paleontological Sensitivity Assessment for Flaming Gorge Reservoir and the Green River Corridor in Northwestern Utah*. Bureau of Reclamation, Upper Colorado Region, Provo Area Office, Provo, Utah.
- Dexter, W.D., 1965. "Some Effects of Rotenone Treatment on the Fauna of the Green River, Wyoming." *Proceedings of the Annual Conference of the Western Association of State Game and Fish Commissions*, vol. 45, pp. 193-197.
- Dunn, R.A., L.M. Smith, H.H. Allen, and H.M. Taylor, 1996. *Managing Historic Properties in Drawdown Zones at Corps of Engineers Reservoirs: Three Case Studies*, Technical Report EL-96-14. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Eason, N.J., 1992. Letter from N.J. Eason of the National Park Service, Dinosaur National Monument, Dinosaur, Colorado to R.A. Van Lonkhuyzen of Argonne National Laboratory, Argonne, Illinois, September 30, 1992.
- Elbrock, B., 2004. Personal communication. Flaming Gorge Dam plant supervisor. Information on highest historic release from Flaming Gorge Reservoir.
- Evermann, B.W., and C. Rutter, 1895. "The Fishes of the Colorado Basin." *U.S. Fish Commission Bulletin*, vol. 14(1894), pp. 473-486.
- FLO Engineering, Inc., 1996. *Green River Flooded Bottomlands Investigation, Ouray Wildlife Refuge and Canyonlands National Park, Utah*. Final Report of FLO Engineering, Inc. to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Friedman, J.M., and G.T. Auble, 1999. "Mortality of Riparian Box Elder From Mobilization and Extended Inundation" *in Regulating Rivers: Resource Management*, vol 15, pp. 463-479.
- Funk, J.L. and W.L. Pflieger, 1975. "Courtois Creek, a Smallmouth Bass Stream in the Missouri Ozarks" *in Black Bass Biology and Management*, H. Clepper, editor, Sport Fish Institute, Washington, DC., pp 224-237.
- Gaufin, A.R., G.R. Smith, and P. Dotson, 1960. "Aquatic Survey of the Green River and Tributaries Within the Flaming Gorge Reservoir Basin, Appendix A" *in Ecological Studies of the Flora and Fauna of Flaming Gorge Reservoir Basin, Utah and Wyoming*, A.M. Woodbury, editor, University of Utah Anthropological Papers 48, pp. 139-162.
- Gido, K.B. and D.L. Propst, 1999. "Habitat Use and Association of Native and Nonnative Fishes in the San Juan River, New Mexico and Utah," *in Copeia* (Gainseville), May, vol. 2, pp. 321-332.
- Gipson, R.D. and W.A. Hubert, 1993. "Spawning-site Selection by Kokanee Salmon Along the Shoreline of Flaming Gorge Reservoir, Wyoming-Utah," *in North American Journal of Fisheries Management*, vol. 13, pp. 475-482.
- Gosse, J.C., 1982. *Microhabitat of Rainbow and Cutthroat Trout in the Green River below Flaming Gorge Dam*, Volume 1, Aqua-Tech Biological Consulting Firm, Contract No. 81-5049, Logan, Utah, Final Report. To Utah Division of Wildlife Resources, Salt Lake City, Utah.
- Gourley, J.L., and T.A. Crowl. 2002. "Pelagic Primary Productivity in an Arid Zone Temperate River: the Green River, Utah" *in The Levee Removal Project: Assessment of Floodplain Habitat Restoration in the Middle Green River*, Final Report, Publication No. 02-17. To the Upper Colorado River Endangered Fish Recovery Program, Utah Division of Wildlife Resources, Salt Lake City, Utah,

- Grabowski, S.J., and S.D. Hiebert, 1989. *Some Aspects of Trophic Interactions in Selected Backwaters and the Main Channel of the Green River, Utah, 1987-1988*, Final Report. Bureau of Reclamation Research and Laboratory Services Division, Applied Sciences Branch, Environmental Sciences Section, Denver, Colorado, to Upper Colorado Regional Office, Salt Lake City, Utah.
- Graf, W.L., 1978. "Fluvial Adjustment to the Spread of Tamarisk in the Colorado Plateau Region" *in Geological Society of America Bulletin*, vol. 89, pp.1491-1501.
- Grams, P.E., and J.C. Schmidt, 1999. "Geomorphology of the Green River in the Eastern Uintah Mountains, Dinosaur National Monument, Colorado and Utah" *in Varieties of Fluvial Form*, A.J. Miller, editor. John Wiley and Sons, New York, New York.
- \_\_\_\_\_, 2002. "Streamflow Regulation, Multi-Level Plain Formation, and Riparian Vegetation: Channel Narrowing on the Aggrading Green River in the Eastern Uinta Mountains, Colorado and Utah" *in Geomorphology*.
- Grams, P.E., J.C. Schmidt, and T. Naumann, 2002. "Geomorphic Adjustment of the Green River and Habitat Distribution of the Ute Ladies'-Tresses Orchid in Red Canyon and Browns Park, Colorado and Utah," Draft Final Report. January 9.
- Haines, B. and T. Modde, 2002. *Humpback Chub Monitoring in Yampa Canyon, 1998-2000*, Final Report Project No. 22a4. U.S. Fish and Wildlife Service, Vernal, Utah.
- Haines, G., and H.M. Tyus, 1990. "Fish Associations and Environmental Variables in Age-0 Colorado Squawfish Habitats, Green River, Utah" *in Journal of Freshwater Ecology*, vol. 5(4), pp. 427-435, December.
- Hamman, R.L., 1981. "Spawning and Culture of Colorado Squawfish in Raceways" *in Progressive Fish Culturist*, vol. 43, pp. 173-177.
- \_\_\_\_\_, 1982. "Spawning and Culture of Humpback Chub" *in Progressive Fish Culturist*, vol. 44, pp. 213-215.
- Harvey, M.D., R.A. Mussetter, and E.J. Wick, 1993. "A Physical Process Biological-Response Model for Spawning Habitat Formation for the Endangered Colorado Squawfish" *in Rivers*, vol. 4, pp 114-131.
- Harvey, M.D., and R.A. Mussetter, 1994. *Green River Endangered Species Habitat Investigations*. Resource Consultants and Engineers, Fort Collins, Colorado, RCE Ref. No. 93-166.02.
- Hawkins, J., and T.P. Nelser. 1991. *Nonnative Fishes of the Upper Colorado River Basin: An Issue Paper*, Final Report. Colorado State University Larval Fish Laboratory to the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Hlohowskyj, I., and J.W. Hayse, 1995. *Potential Effects of Four Flaming Gorge Dam Hydropower Operational Scenarios on the Fishes of the Green River, Utah and Colorado*, Argonne National Laboratory Report No. ANL/EAD/TM-11. Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.
- Holden, M., 1992. Letter from Holden of Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah, to J.W. Hayse of Argonne National Laboratory, Argonne, Illinois; information for Western Area Power Administration Environmental Impact Statement, Utah. October 30, 1992.
- Holden, P.B, 1991. "Ghosts of the Green River: Impacts of Green River Poisoning on Management of Native Fishes" *in Battle Against Extinction: Native Fish Management in the American Southwest*,

- W.L. Minckley and J.E. Deacon, editors. University of Arizona Press, Tucson, Arizona, pp. 43-54.
- Holden, P.B., and L.W. Crist, 1981. *Documentation of Changes in the Macroinvertebrate and Fish Populations in the Green River Due to Inlet Modification of Flaming Gorge Dam*, Final Report PR-16-5. BIO/WEST, Inc., Logan, Utah.
- Holden, P.B., and C.B. Stalnaker, 1975. "Distribution and Abundance of Fishes in the Middle and Upper Colorado River Basins, 1967-1973" *in Transactions of the American Fisheries Society*, vol. 104, pp. 217-231.
- Hokanson, K.E., C.F. Kleiner, and T.W. Thorsland, 1977. "Effects of Constant Temperature and Diel Fluctuations on Growth, Mortality, and Yield of Juvenile Rainbow Trout, *Salmo gairdneri*" *in Journal of the Fisheries Research Board of Canada*, vol. 34, pp. 639-648.
- Holling, C.S., editor, 1978. *Adaptive Environmental Assessment and Management*. John Wiley and Sons, Inc., New York, New York.
- Holmer, R.N., 1979. *Final Report: Split Mountain Cultural Study Tract*. University of Utah, Department of Anthropology, Archaeological Center, Salt Lake City, Utah, submitted to the Bureau of Land Management, Vernal, Utah.
- Howe, F., 1992. Letter from F. Howe, Utah Department of Natural Resources, Division of Wildlife Resources, Nongame Avian Program, Salt Lake City, Utah, to R.A. Van Lonkhuyzen of Argonne National Laboratory. Argonne, Illinois, October 30.
- \_\_\_\_\_, 2000. *Southwestern willow flycatcher and yellow-billed cuckoo surveys along the Green River (Sand Wash-Swaseys Beach) Utah, 1997-1999*, Utah Division of Wildlife Resources, Publication No. 00-8. Report to the Bureau of Reclamation and Bureau of Land Management, 32 pp.
- Howe, F.P., and M. Hanberg, 2000. *Willow Flycatcher and Yellow-Billed Cuckoo Surveys Along the Green and San Juan Rivers in Utah, 2000*, Utah Division of Wildlife Resources, Publication No. 00-31. Report to the Bureau of Reclamation and Bureau of Land Management, 53 pp.
- Hudson, M., 2003. Phone conversation. Utah Division of Wildlife Resources, Moab, Utah, August 19, 2003.
- Huffman, D.K., 1992. Letter from D.K. Huffman, Dinosaur National Monument, Dinosaur, Colorado, to R.L. Van Lonkhuyzen of Argonne National Laboratory. Argonne, Illinois, October 28.
- Hughes, J.M., 1999. "Yellow-Billed Cuckoo" *in The Birds of North America*, No. 418, 1999, A. Poole and F. Gill, editors. Cornell Laboratory of Ornithology and the Academy of Natural Sciences.
- Irving, D.B., and B.D. Burdickm, 1995. *Reconnaissance Inventory and Prioritization of Existing and Potential Bottomlands in the Upper Colorado River Basin, 1993-1994*, Final Report. U.S. Fish and Wildlife Service to the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Irving, D.B. and K. Day, 1996. *Bottomland property inventory between Pariette Draw and Split Mountain on the Green River, Utah, 1995*, Final Report. U.S. Fish and Wildlife Service and the Utah Division of Wildlife Resources, Vernal, Utah, to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Irving, D.B., and T. Modde, 2000. "Home-Range Fidelity and Use of Historic Habitat by Adult Colorado Pikeminnow

- (*Ptychocheilus lucius*) in the White River, Colorado and Utah” in *Western North American Naturalist*, vol. 60(1), pp. 16-25.
- Jackle, M.D., and T.A. Gatz, 1985. “Herpetofaunal Use of Four Habitats of the Middle Gila River Drainage, Arizona” in *Riparian Ecosystems and Their Management: Reconciling Conflicting Uses*, R.R. Johnson et al., technical coordinators, Forest Service General Technical Report RM-120, pp. 355-358.
- Johnson, J.E., R.P. Kramer, E. Larson, and B.L. Bonebrake, 1987. *Flaming Gorge Tailwater Fisheries Investigations: Trout Growth, Harvest, Survival, and Microhabitat Selection in the Green River of Utah, 1978–1982*, Final Report Publication No. 87-13. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- Johnson, M.J., A. Brand, H. English, C. Michaud, and B. Moore, 1999. *Southwestern Willow Flycatcher and Yellow-Billed Cuckoo Surveys Along the Colorado and Green Rivers, Utah (Park Boundaries – Colorado-Green Confluence): 1999*, Final Report. To the Utah Division of Wildlife Resources (Contract No. 976465), Colorado Plateau Field Station/Northern Arizona University, 34 pp.
- Jordan, D.S., 1891. *Report of Explorations in Utah and Colorado During the Summer of 1889, with an Account of Fishes Found in Each of the River Basins Examined*, Bulletin of the U.S. Fish Commission, vol. 9, pp. 1-40.
- Kaeding, L.R., and D.B. Osmundson, 1988. “Interaction of Slow Growth and Increased Early-Life Mortality: An Hypothesis on the Decline of the Colorado Squawfish in the Upstream Regions of Its Historic Range” in *Environmental Biology of Fishes*, vol. 22 (4), pp. 287-298.
- Karp, C.A., and H.M. Tyus, 1990a. “Behavioral Interactions Between Young Colorado Squawfish and Six Fish Species” in *Copeia*, pp. 25-34.
- \_\_\_\_\_, 1990b. “Humpback Chub (*Gila cypha*) in the Yampa and Green Rivers, Dinosaur National Monument, with Observations on Roundtail Chub (*G. robusta*) and Other Sympatric Fishes” in *Great Basin Naturalist*, vol. 50, pp. 257-264.
- Kjos, C.G., 1992. “Bald Eagle Numbers Continue to Rise” in *Endangered Species Technical Bulletin*, vol. 17(1-2), pp. 3-4. U.S. Fish and Wildlife Service.
- Kitcheyan, C., 2003. “Movement, Migration, and Habitat Use of Colorado Pikeminnow in Lodore Canyon.” Presentation at Upper Colorado River Endangered Fish Recovery Program: 24<sup>th</sup> Annual Researchers Meeting, January 15-16, 2003, Grand Junction, Colorado.
- Kubly, D.M., 1990. “The Endangered Humpback Chub (*Gila Cypha*) in Arizona: a Review of Past Studies and Suggestions for Future Research,” Draft Report. Prepared by Arizona Game and Fish Department for the Bureau of Reclamation, Salt Lake City, Utah.
- Larson, G., 2004. “Hydrogeomorphic Controls on Tamrisk’s Distribution in Dinosaur National Monument: Comparing the Effects of Regulated and Unregulated Flow Regimes.” Masters of Science thesis, Utah State University, Logan, Utah.
- Lenihan, D.J., T.L. Carrell, S. Fosberg, L. Murphy, S.L. Rayl, and J.A. Ware, 1981. *The Final Report of the National Reservoir Inundation Study*, vol. 1 and 2. U.S. Department of the Interior, National Park Service, Southwest Cultural Resource Center, Santa Fe, New Mexico.
- Lentsch, L.D., R.T. Muth, P.D. Thompson, B.G. Hoskins, and T.A. Crowl, 1996. *Options for Selective Control of*



- Nonnative Fishes in the Upper Colorado River Basin*, Final Report. Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Lilieholm, R.J., and R.S. Krannich, 2001. 2000 Statewide Survey of Utah Anglers. Utah State University, Logan, Utah.
- Lyons, J.K., M.J. Pucherelli, and R.C. Clark, 1992. "Sediment Transport and Channel Characteristics of a Sand-bed Portion of the Green River below Flaming Gorge Dam, Utah, U.S.A." *in Regulated River: Research and Management*, vol. 7, pp. 219-232.
- MacRae, P.S.D. and D.A. Jackson, 2001. "The Influence of Smallmouth Bass (*Micropterus dolomieu*) Predation and Habitat Complexity on the Structure of Littoral Zone Fish Assemblages" *in Canadian Journal of Fisheries and Aquatic Sciences*, vol. 58, pp. 342-351.
- Madsen, David B., 1989. *Exploring the Fremont*. University of Utah Occasional Publication No. 8. Utah Museum of Natural History, Salt Lake City.
- Maiolie, M, and S. Elam, 1998. *Kokanee Entrapment Loss at Dworshak Reservoir, Dworshak Dam Impacts Assessment and Fisheries Investigation Project, Annual Progress Report*. January-December, 1996. Report to Bonneville Power Administration, Contract No. 1987BP35167, Project No. 198709900, 18 electronic pages.
- Marsh, P.C., 1985. "Effect of Incubation Temperature on Survival of Embryos of Native Colorado River Fishes" *in The Southwestern Naturalist*, vol. 30, pp. 129-140.
- Martin, J.A., P.E. Grams, M.T. Kammerer, J.C. Schmidt, 1998. *Sediment Transport and Channel Response of the Green River in the Canyon of Lodore Between 1995–1997, Including Measurements During High Flows*, Dinosaur National Monument, Colorado, Draft Final Report, Utah State University Cooperative Agreement CA 1268-1-9006 and CA-1425-97-FC-40-21560. Prepared for the National Park Service and Bureau of Reclamation, 190 pp.
- Martinez, P., 2003. "A Look at the Smallmouth Bass Scenario in the Yampa River Basin." Presentation at Upper Colorado River Endangered Fish Recovery Program: 24<sup>th</sup> Annual Researchers Meeting, January 15-16, 2003, Grand Junction, Colorado.
- Matson, R.G., 1991. *The Origins of Southwestern Agriculture*. University of Arizona Press, Tucson.
- McAda, C.W., 1983. "Colorado Squawfish, *Ptychocheilus Lucius* (Cyprinidae), with Channel Catfish, *Ictalurus Punctatus* (Ictaluridae), Lodged in Its Throat" *in The Southwestern Naturalist*, vol. 28(1), pp. 119-120.
- \_\_\_\_\_, 2002. *Subadult and Adult Colorado Pikeminnow Monitoring; Summary of Results, 1986–2000*, Final Report Recovery Program Project No. 22. U.S. Fish and Wildlife Service, Grand Junction, Colorado.
- McAda, C.W., and L.R. Kaeding, 1989. "Relations Between Maximum-Annual River Discharge and the Relative Abundance of Age-0 Colorado Squawfish and Other Fishes in the Upper Colorado River." U.S. Fish and Wildlife Service, Grand Junction, Colorado.
- McAda, C.W., and R.J. Ryel, 1999. *Distribution, Relative Abundance, and Environmental Correlates for Age-0 Colorado Pikeminnow and Sympatric Fishes in the Colorado River*, Final Report, Project No. 45. Upper Colorado River Endangered Fish Recovery Program.

- McAda, C.W. and R.S. Wydoski, 1980. *The Razorback Sucker, Xyrauchen texanus, in the Upper Colorado River Basin, 1974-1976*, Technical Papers 99. U.S. Fish and Wildlife Service.
- Mehls, S.F., 1987. *Dinosaur National Monument Historic Resources Study*. Western Historical Studies, Inc., Boulder, Colorado.
- Meismer, S. and M. Trammell, 2002. "Nonnative Cyprinid Removal in the Lower Green and Colorado Rivers, Utah," Draft Report. Utah Division of Wildlife Resources, Moab, Utah.
- Merritt, D.M., and D.J. Cooper, 2000. "Riparian Vegetation and Channel Change in Response to River Regulation: A Comparative Study of Regulated and Unregulated Streams in the Green River Basin, U.S.A." *in Regulated Rivers: Research and Management*, vol. 16, pp. 543-564.
- Miller, J., 1984. *Intermountain West Reservoir Limnology and Management Options*, Lake and Reservoir Management, EPA 440/4/84-001. U.S. Environmental Protection Agency, Washington, DC, pp. 272-276.
- Miller, J., 2002. Bureau of Reclamation Upper Colorado River Regional Water Quality Scientist, personal communication following the Flaming Gorge Reservoir limnological survey in October 2002.
- Miller, J., 2004. Bureau of Reclamation Upper Colorado River Regional Water Quality Scientist, personal communication.
- Miller, R.R., 1963. "Is Our Native Underwater Life Worth Saving?" *in National Parks Magazine*.
- Minckley, W.L., 1991. "Native Fishes of the Grand Canyon Region: an Obituary?" *in Colorado River Ecology and Dam Management*. Proceedings of a Symposium, May 24-25, 1990, Santa Fe, New Mexico. National Academy Press, Washington, DC, pp. 124-177.
- Minckley, W.L., and G.K. Meffe, 1987. "Differential Selection for Native Fishes by Flooding in Streams of the Arid American Southwest" *in Ecology and Evolution of North American Stream Fish Communities*, W.J. Matthews and D.C. Heins, editors. University of Oklahoma Press, Norman, Oklahoma, pp. 93-104.
- Minckley, W.L., P.C. Marsh, J.E. Brooks, J.E. Johnson, and B.L. Jensen, 1991. "Management Toward Recovery of the Razorback Sucker" *in Battle Against Extinction: Native Fish Management in the American West*, W.L. Minckley and J.E. Deacon, editors. University of Arizona Press, Tucson, Arizona, pp. 303-357.
- Minnesota IMPLAN Group, Inc., 2000. IMPLAN Professional, Version 2.0, User's Guide, Analysis Guide, Data Guide. Stillwater, Minnesota.
- Modde, T., 1993. Telecommunication from T. Modde of the U.S. Fish and Wildlife Service, Vernal, Utah, to I. Hlohowskyj of Argonne National Laboratory, Argonne, Illinois. August 17, 1993.
- Modde, T., and K., Christopherson, 2003. Personal communication, Recovery Program Biology Committee meeting. September 22, 2003.
- Modde, T., D.A. Young, and D.L. Archer, 1991. *Evaluation of Factors Influencing Population Characteristics and Habitat Utilization of Trout in the Flaming Gorge Tailwater, 1987-1989*, Publication No. 91-10, Flaming Gorge Tailwater Studies. Utah Division of Wildlife Resources, Salt Lake City, Utah.

- Modde, T., K.P. Burnham, and E.J. Wick, 1996. "Population Status of the Razorback Sucker in the Middle Green River" in *Conservation Biology*, vol. 10, pp. 110-119.
- Modde, T., and D.B. Irving, 1998. "Use of Multiple Spawning Sites and Seasonal Movements by Razorback Suckers in the Middle Green River, Utah" in *North American Journal of Fisheries Management*, vol. 18, pp. 318-326.
- Modde, T., and E.J. Wick, 1997. *Investigations of Razorback Sucker Distribution, Movements and Habitats Used During Spring in the Green River, Utah*, Final Report. U.S. Fish and Wildlife Service, Vernal, Utah, to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Moeller, K.L., L.M. Malinowski, and J.F. Hoffecker. *Analysis of Potential Impacts of Flaming Gorge Dam Hydropower Operations on Archaeological Sites*. Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois.
- Molony, B., 2001. *Environmental Requirements and Tolerances of Rainbow Trout (*Oncorhynchus mykiss*) and Brown Trout (*Salmo trutta*) With Special Reference to Western Australia: A Review*, Fisheries Research Report No. 130. Department of Fisheries, Government of Western Australia.
- Mueller, G., 1995. "A Program for Maintaining the Razorback Sucker in Lake Mohave," in *American Fisheries Society Symposium*, vol. 15, pp. 127-135.
- Muth, R.T., G.B. Haines, S. Meismer, E.J. Wick, T.E. Chart, D.E. Snyder, J.M. Bundy, 1998. *Reproduction and Early Life History of Razorback Sucker in the Green River, Utah and Colorado, 1992-1996*, Final Report. Colorado State University Larval Fish Laboratory to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Muth, R.T., 1995. "Development of a Standardized Monitoring Program for Basin-wide Evaluation of Restoration Activities for Razorback Sucker in the Green and Upper Colorado River Systems," Draft Report. Submitted to the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Muth, R., L. Crist, K. La Gory, J. Hayse, K. Bestgen, T. Ryan, J. Lyons, and R. Valdez, 2000. *Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam*, Final Report. To the Upper Colorado River Endangered Fish Recovery Program, Project FG-53, September 2000.
- NatureServe, 2001. "Spiranthes diluvialis - Sheviak, Ute Ladies'-Tresses," NatureServe Explorer: An online encyclopedia of life [web application], Version 1.6. Arlington, Virginia, <<http://www.natureserve.org/explorer>>, accessed September 13, 2002.
- Nesler, T.P., 2002. *Interactions Between Endangered Fishes and Introduced Gamefishes in the Colorado River, Colorado, 1986-1991*, Final Report, Colorado River Recovery Implementation Program Project No. 91-29. Colorado Division of Wildlife, Fort Collins, Colorado.
- Nesler, T.P., K. Christopherson, J.M. Hudson, C.W. McAda, F. Pfeifer, and T. Czapla, 2003. *An Intergrated Stocking Plan for Razorback Sucker, Bonytail, and Colorado Pikeminnow for the Upper Colorado River Endangered Fish Recovery Program: Addendum to State Stocking Plans*. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado, 12 pp.
- Nevada Natural Heritage Program, 2001. "Spiranthes diluvialis Sheviak, Ute Ladies'-Tresses, Rare Plant Fact Sheet."

- Orchard, K.L., and J.C. Schmidt, 2000. "A Geomorphic Assessment of the Availability of Potential Humpback Chub Habitat in the Green River in Desolation and Gray Canyons, Utah," Report A *in Flaming Gorge Studies: Reproduction and Recruitment of Gila spp. and Colorado Pikeminnow (Ptychocheilus lucius) in the Middle Green River*, Final Report. Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Osmundson, D.B., 1999. *Longitudinal Variation in Fish Community Structure and Water Temperature in the Upper Colorado River*, Final Report Recovery Implementation Program Project No. 48-A. U.S. Fish and Wildlife Service, Grand Junction, Colorado.
- Osmundson, D.B., and L.R. Kaeding, 1991. *Recommendations for Flows in the 15-Mile Reach During October–June for Maintenance and Enhancement of Endangered Fish Populations in the Upper Colorado River*, Final Report. U.S. Fish and Wildlife Service, Colorado River Fishery Project, Grand Junction, Colorado.
- Osmundson, D.B., R.J. Ryel, and T.E. Mourning, 1997. "Growth and Survival of Colorado Squawfish in the Upper Colorado River" *in Transactions of the American Fisheries Society*, vol. 126, pp. 687-698.
- Papoulias, D. and W.L. Minckley, 1990. "Food limited survival of larval razorback sucker, *Xyrauchen texanus*, in the laboratory" *in Environmental Biology of Fishes*, vol. 29, pp. 73-78.
- Papoulias, D. and W. L. Minckley. 1992. "Effects of food availability on survival and growth of larval razorback suckers in ponds" *in Transactions of the American Fisheries Society*, vol. 121, pp. 340-355.
- Paulin, K.M., C.M. Williams, and H.M Tyus. 1989. *Responses of Young Razorback Sucker and Colorado Squawfish to Water Flow and Light Intensity*, Final Report. U.S. Fish and Wildlife Service Colorado River Fishery Project, Vernal, Utah
- Pearson, W.D., R.H. Kramer, and D.R. Franklin, 1968. "Macroinvertebrates in the Green River Below Flaming Gorge Dam, 1964-1965 and 1967" *in Proceedings of the Utah Academy of Science, Arts, and Letters*, vol. 45, pp. 148-167.
- Peterson, C.S., 1998. Livestock Industry. <<http://eddy.media.utah.edu/medsol/UCME/LIVESTOCK.html>>, accessed August 28, 1998.
- Pflieger, W.L., 1975. *The Fishes of Missouri*. Missouri Department of Conservation, Jefferson City, Missouri.
- Poff, N.L., J.D. Allan, M.B. Bain, J.R. Karr, K.L. Prestegard, B.D. Richter, R.E. Sparks, and J.C. Stromberg, 1997. "The Natural Flow Regime: a Paradigm for River Conservation and Restoration" *in BioScience*, vol. 47, pp. 769-784.
- Pollack, M.M., 1998. "Plant Species Richness in Riparian Wetlands – a Test of Biodiversity Theory." January 1998.
- Pucherelli, M., and A. Bell, 1999. Mapping provided by the Bureau of Reclamation Remote Sensing and Geographic Information Group, Denver, Colorado. This data contains sensitive cultural resource information belonging to the U.S. Government and is not available for public release.
- Pucherelli, M.J., R.C. Clark, and R.D. Williams, 1990. *Mapping Backwater Habitat on the Green River as Related to the Operation of Flaming Gorge Dam Using Remote Sensing and GIS*. Bureau of Reclamation, vol. 90 (18), pp. 1-11.

- Purdy, W.M., 1959. *An Outline of the History of the Flaming Gorge Area*, University of Utah Anthropological Papers No. 37, Upper Colorado Series No. 1. Salt Lake City, Utah.
- Rakowski, C.L., and J.C. Schmidt, 1999. "The Geomorphic Basis for Colorado Pikeminnow Nursery Habitat in the Green River Near Ouray, Utah," Report A *in* *Flaming Gorge Studies: Assessment of Colorado Pikeminnow Nursery Habitat in the Green River*, Trammell, M.A., and seven other authors. Publication No. 99-30. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- Reed, A.D., 1994 "The Numic Occupation of Western Colorado and Eastern Utah During the Prehistoric and Protohistoric Periods" *in* *Across the West: Human Population Movement and the Expansion of the Numa*, D.B. Madsen and D. Rhode, editors. University of Utah Press, Salt Lake City, Utah.
- Rhodenbaugh, M., and V. Newton, 2001. *Ethnographic Overview for the Flaming Gorge Dam Environmental Impact Statement: Native American Contacts and the Identification of Traditional Cultural Places*, SWCA Archaeological Report No. 01-134. SWCA Environmental Consultants, Salt Lake City, Utah, submitted to the Bureau of Reclamation, Upper Colorado Region, Provo Area Office, Provo, Utah.
- Roberts, N.K., and B.D. Gardner, 1964. "Livestock on Public Lands" *in* *Utah Historical Quarterly*, vol. 32(3), pp. 285-300.
- Robins, W.H. and H.R. MacCrimmon, 1974. *The Black Bass in America and Overseas*. Biomanagement and Research Enterprises, Sault Ste. Marie, Ontario, 196 pp.
- Romney, Steve, Dr., 2002. Personal communication, May 22, 2002. Followup call on August 7, 2002.
- Rood, R.J., and M.C. Pope, 1993. "1992 Archaeological Excavations Along the Kern River Gas Transmission Line, Southwestern Wyoming: Data Recovery at Sites 48UT1447, 48UT786, and 48UT186," Contract No. 1188RLB026. Alpine Archaeological Consultants, Inc., submitted to Kern River Gas Transmission Company, Salt Lake City, Utah.
- Rose, K.L., 1992. Letter from K.L. Rose of the U.S. Fish and Wildlife Service, Grand Junction, Colorado, to I. Hlohowskyj of Argonne National Laboratory, Argonne, Illinois. January 8, 1992.
- Schirer, D.L., 1998a. Fort Duchesne, <<http://eddy.media.utah.edu/medsol/UCME/f/DUCHESNE.html>>, accessed August 28, 1998.
- \_\_\_\_\_, 1998b. Fort Thornburgh, <<http://eddy.media.utah.edu/medsol/UCME/f/FORTTHORNBURGH.html>>, accessed August 28, 1998.
- Schneidervin, R., 2003. Personal communication. Utah Division of Wildlife Resources, Flaming Gorge Project Leader, March 11, 2003.
- Schnurr, P.M., 1992. Letter from P.M. Schnurr of the Colorado Department of Natural Resources, Division of Wildlife, Denver, Colorado, to R.A. Van Lonkhuyzen of Argonne National Laboratory. Argonne, Illinois. October 29, 1992.
- Schroeder, A.H., 1965. "A Brief History of the Southern Utes" *in* *Southwestern Lore*, vol. 30 (4), pp. 53-78.
- Schroedl, A.R., 1991. "Paleo-Indian Occupation in the Eastern Great Basin and Northern Colorado Plateau" *in* *Utah Archaeology*, vol. 4(1), pp. 1-15.
- \_\_\_\_\_, 1977. "The Paleo-Indian Period on the Colorado Plateau" *in* *Southwestern Lore*, vol. 43(3), pp. 1-9.

- Scott, W.B. and E.J. Crossman, 1973. "Freshwater Fishes in Canada" *in* *Journal of the Fisheries Research Board of Canada*, Bulletin 184, 966 pp.
- Shafroth, P.B., G.T. Auble, and M.L. Scott, 1995. "Germination and Establishment of Native Plains Cottonwood (*Populus deltoides* Marshall subsp. *monilifera*) and the Exotic Russian-Olive (*Elaeagnus angustifolia* L.)" *in* *Conservation Biology*, vol. 9, pp. 1169-1175.
- Sigler, W.F., 1958. *The Ecology and Use of Carp in Utah*. Utah State University Agricultural Experimental Station Bulletin 405, 63 pp.
- Sigler, W.F., and J.W. Sigler, 1996. *Fishes of Utah: a Natural History*. University of Utah Press.
- Simms, S.R., 1990. "Fremont Transitions" *in* *Utah Archaeology*, vol. 3(1), pp. 1-18.
- Simon, J.R., 1946. *Wyoming Fishes*, Wyoming Game and Fish Department Bulletin vol. 4, pp. 1-129.
- Smith, G.R., 1966. *Distribution and Evolution of the North American Catostomid Fishes of the Subgenus, Pantosteus, Genus Catostomus*, miscellaneous publication of the Museum of Zoology, University of Michigan, vol. 129, pp. 1-132.
- Smith, P.W., 1979. *The Fishes of Illinois*, Illinois State Natural History Survey. University of Illinois Press, Urbana, Illinois.
- Sogge, M.K., R.M. Marshall, S.J. Sferra, and T.J. Tibbetts, 1997a. *A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol*, Technical Report, NPS/NAUCPRS/TR-97/12.
- Sogge, M.K., T.J. Tibbetts, and J.R. Petterson, 1997b. "Status and Breeding Ecology of the Southwestern Willow Flycatcher in Grand Canyon" *in* *Western Birds*, vol. 28, pp. 142-157.
- Stanford, J.A., J.V. Ward, W.J. Liss, C.A. Frissell, R.N. Williams, J.A. Lichatowich, and C.C. Coutant, 1996. "A General Protocol for Restoration of Regulated Rivers" *in* *Regulated Rivers: Research and Management*, vol. 12, pp. 391-414.
- Stevens, L.E., and G.L. Waring, 1986. *Effects of Post-Dam Flooding on Riparian Substrates, Vegetation, and Invertebrate Populations in the Colorado River Corridor in Grand Canyon, Arizona*. Glen Canyon Environmental Studies, Bureau of Reclamation, 166 pp.
- Stevenson, J.P., 1987. *Trout Farming Manual*, Second Edition. Fishing News Books, Farnham, 259 pp.
- Strand, R.I., and E.L. Pemberton, 1982. *Reservoir Sedimentation, Technical Guideline for Bureau of Reclamation*. U.S. Department of the Interior, Bureau of Reclamation, Sedimentation and River Hydraulics Group, Denver, Colorado, 48 pp.
- Sturtevant, William C., 1986. *Handbook of North American Indians, Great Basin, Volume 11*. Smithsonian Institution, Washington, DC.
- Talbot, R.K., and J.D. Wilde, 1989. "Giving Form to the Formative: Shifting Settlement Patterns in the Eastern Great Basin and Northern Colorado Plateau" *in* *Utah Archaeology*, pp. 3-18.
- Tennent, W.L., 1981. *John Jarvie of Brown's Park*, Number 7. Bureau of Land Management, Salt Lake City, Utah.
- Teuscher, D. and C. Luecke, 1996. "Competition Between Kokanees and Utah Chub in Flaming Gorge Reservoir" *in* *Transactions of the American Fisheries Society*, vol. 125, pp. 505-511.
- Todd, Chauncie, 2003. Personal communication. Ashley National Forest. Information and documentation on

- 50-mile survey on the shoreline of Flaming Gorge Reservoir completed in 2003.
- Trammell, M.A., et al., 1999. *Flaming Gorge Studies: Assessment of Colorado Pikeminnow Nursery Habitat in the Green River*, Publication No. 99-30. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- Trammell, M.A., R. Valdez, H. Johnstone, and L. Jonas, 2002. *Non-Native Fish Control in Backwater Habitats in the Colorado River*, Final Report. SWCA, Inc., Environmental Consultants, Flagstaff, Arizona.
- Truesdale, J.A., 1991. *Archaeological Investigations at Two Sites in Dinosaur National Monument: 42UN1724 and 5MF2645*. U.S. Department of the Interior, National Park Service, Rocky Mountain Region, Division of Cultural Resources Management, Selection Series, Denver, Colorado.
- Tyus, H.M., 1987. "Distribution, Reproduction, and Habitat Use of the Razorback Sucker in the Green River, Utah, 1979-1986" *in Transactions of the American Fisheries Society*, vol. 116, pp. 111-116.
- \_\_\_\_\_, 1990. "Potamodromy and Reproduction of Colorado Squawfish in the Green River Basin, Colorado and Utah" *in Transactions of the American Fisheries Society*, vol. 119, pp. 1035-1047.
- \_\_\_\_\_, 1991. "Movements of and Habitat Use of Young Colorado Squawfish in the Green River, Utah" *in Journal of Freshwater Ecology*, vol. 6, pp. 43-51.
- Tyus, H. M., and J. Beard, 1990. "Esox Lucius (Esocidae) and Stizostedion Vitreum (Percidae) in the Green River Basin, Colorado and Utah" *in Great Basin Naturalist*, vol. 50, pp. 33-39.
- Tyus, H.M., B.D. Burdick, R.A. Valdez, C.M. Haynes, T.A. Lytle, and C.R. Berry, 1982. "Fishes of the Upper Colorado River Basin: Distribution, Abundance, and Status" *in Fishes of the Upper Colorado River System: Present and Future*, W.H. Miller, H.M. Tyus, and C.A. Carson, editors. Western Division, American Fisheries Society, Bethesda, Maryland, pp. 12-70.
- Tyus, H.M., R.L. Jones, and L.M. Trincam 1987. *Green River Rare and Endangered Fish Studies, 1982-1985*, Final Report. U.S. Fish and Wildlife Service Colorado River Fishes Monitoring Project, Vernal, Utah.
- Tyus, H.M., and C.A. Karp, 1989. *Habitat Use and Streamflow Needs of the Rare and Endangered Fishes, Yampa River, Colorado*. U.S. Fish and Wildlife Service Biological Report, vol. 89(14), pp. 1-27.
- \_\_\_\_\_, 1990. "Spawning and Movements of Razorback Sucker, Xyrauchen Texanus, in the Green River Basin of Colorado and Utah" *in Southwestern Naturalist*, vol. 35, pp. 427-433.
- \_\_\_\_\_, 1991. *Habitat Use and Streamflow Needs of Rare and Endangered Fishes, Green River, Utah*, Biological Report, vol. 89(14), pp. 1-27. U.S. Fish and Wildlife Service, Vernal Utah.
- Tyus, H.M., C.W. McAda, and B.D. Burdick, 1982. *Green River Fishery Investigations: 1979-1981*, Final Report. To the U.S. Fish and Wildlife Service and the Bureau of Reclamation, Salt Lake City, Utah.
- Tyus, H.M., and G.B. Haines, 1991. "Distribution, Habitat Use, and Growth of Young Colorado Squawfish in the Green River Basin, Colorado and Utah" *in Transactions of the American Fisheries Society*, vol. 120, pp. 79-89.

- Tyus, H.M. and J.F. Saunders III, 1996. "Nonnative Fishes in the Upper Colorado River Basin and a Natural Ecosystems and a Strategic Plan for Control of Nonnatives in the Upper Colorado River Basin," report to Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin. University of Colorado, Boulder, Colorado.
- \_\_\_\_\_, 2001. *An Evaluation of the Role of Tributary Streams for Recovery of Endangered Fishes in the Upper Colorado River Basin, with Recommendation for Future Recovery Actions*, Final Report, Project No. 101. Upper Colorado Endangered Fish Recovery Program, Center for Limnology, University of Colorado at Boulder, Boulder, Colorado, 121 pp.
- Tyus, H.M., and N.J. Nikirk, 1990. "Abundance, Growth, and Diet of Channel Catfish, *Ictalurus punctatus*, in the Green and Yampa Rivers, Colorado and Utah" in *Southwestern Naturalist*, vol. 35(2), pp. 188-198.
- University of Wyoming, and Utah Cooperative Fish and Wildlife Research Unit, 1991. *Assessment of Spawning-Habitat Mitigation in the Green River and the Potential Influence of Reservoir Drawdown on Kokanee Reproduction in the Flaming Gorge Reservoir System, Wyoming-Utah*. Completion Report for the Bureau of Reclamation, Laramie, Wyoming, and Logan, Utah.
- Upper Colorado River Endangered Fish Recovery Program. 2002. Nonnative Fish Control Workshop; Summary, Conclusions, and Recommendations. Prepared by the Program Director's Office, Upper Colorado River Endangered Fish Recovery Program, Lakewood, Colorado.
- U.S. Census Bureau, 2000. United States Census 2000. Internet site: <www.census.gov>. U.S. Department of Commerce.
- \_\_\_\_\_, 1990 and 2000. Census 1990 and 2000.
- \_\_\_\_\_, 1994. Census of Agriculture – 1992. U.S. Department of Commerce. Washington, DC.
- \_\_\_\_\_, 1999. Census of Agriculture - 1997. U.S. Department of Commerce. Washington, DC.
- U.S. Department of Energy, 1995. *Impacts of Western Area Power Administration's Power Marketing Alternatives on Electric Utility Systems*, ANL/DIS/TM-10. Argonne National Laboratory, Decision and Information Sciences Division, March 1995.
- \_\_\_\_\_. *Relationships Between Western Area Power Administration's Power Marketing Program and Hydropower Operations at Salt Lake City Area Integrated Projects*, ANL/DIS/TM-11. Argonne National Laboratory, Decision and Information Sciences Division.
- U.S. Department of Energy, Western Area Power Administration, 1996. *Salt Lake City Area Integrated Projects Electric Power Marketing Final Environmental Impact Statement*, Volume II: Sections 1-16, DOE/EIS-0150. Salt Lake City, Utah, January 1996.
- \_\_\_\_\_, 1996. *Salt Lake City Area Integrated Projects Electric Power Marketing Final Environmental Impact Statement*, Volume III, Appendix A, DOE/EIS-0150. Salt Lake City, Utah.
- \_\_\_\_\_, 1996. *Salt Lake City Area Integrated Projects Electric Power Marketing, Final Environmental Impact Statement*, Volume IV, Appendixes B–D, DOE/EIS-0150. Salt Lake City, Utah, January 1996, pp B1-21.
- U.S. Environmental Protection Agency, 1998. "A Biopesticide Fact Sheet: *Bacillus Thuringiensis* subspecies *Israelensis* Strain EG2215." October 1998.



- U.S. Fish and Wildlife Service, 1977. "American Peregrine Falcon Recovery Plan (Rocky Mountain and Southwest Populations)." Washington, DC, August 3, 1992.
- \_\_\_\_\_, 1992a. "Final Rule to List the Plant *Spiranthes diluvialis* (Ute Ladies'-Tresses) as a Threatened Species." *Federal Register*, vol. 57, pp. 2048-2054
- \_\_\_\_\_, 1992b. Final Biological Opinion on the Operation of Flaming Gorge Dam. Fish and Wildlife Service, Mountain-Prairie Region, Denver, Colorado, November 25, 1992.
- \_\_\_\_\_, 1995. "Final Rule Determining Endangered Status for Southwestern Willow Flycatcher." February 27, 1995, *Federal Register*, vol. 60, pp. 10694-10715.
- \_\_\_\_\_, 1997. "Final Determination of Critical Habitat for the Southwestern Willow Flycatcher." *Federal Register*, vol. 62, pp. 39129-39147.
- \_\_\_\_\_, 2001. "Twelve-Month Finding for a Petition to List the Yellow-Billed Cuckoo (*Coccyzus Americanus*) in the Western Continental United States." July 25, 2001, *Federal Register*, vol. 66, No. 143, pp. 38611-38626
- \_\_\_\_\_, 2002a. "Bonytail (*Gila Elegans*) Recovery Goals: Amendment and Supplement to the Bonytail Chub Recovery Plan." U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.
- \_\_\_\_\_, 2002b. "Colorado Pikeminnow (*Pychocheilus Lucius*) Recovery Goals: Amendment and Supplement to the Colorado Squawfish Recovery Plan." U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.
- \_\_\_\_\_, 2002c. "Humpback Chub (*Gila Cypha*) Recovery Goals: Amendment and Supplement to the Humpback Chub Recovery Plan." U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.
- \_\_\_\_\_, 2002d. "Razorback Sucker (*Xyrauchen Texanus*) Recovery Goals: Amendment and Supplement to the Razorback Sucker Recovery Plan." U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.
- \_\_\_\_\_, 2003. "Final Recovery Plan for Southwestern Willow Flycatcher." March 5, 2003, *Federal Register*, vol. 68, p. 10485.
- Utah Department of Agriculture and Food, 1996. *Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report*. Salt Lake City, Utah.
- \_\_\_\_\_, 1997. *Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report*. Salt Lake City, Utah.
- \_\_\_\_\_, 1998. *Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report*. Salt Lake City, Utah.
- \_\_\_\_\_, 1999. *Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report*. Salt Lake City, Utah.
- \_\_\_\_\_, 2000. *Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report*. Salt Lake City, Utah. Website at <<http://www.r6.fws.gov/crrip/arpts/2000/rsch/22c-00.pdf>>.
- Utah Division of Wildlife Resources, 1992. *The Reintroduction of River Otter to the Green River, Utah: Progress Report II*. A cooperative study between Utah Division of Wildlife Resources, Non-Game Section; Brigham Young University; U.S. Forest Service, Ashley

- National Forest; and Bureau of Land Management. Salt Lake City, Utah, May 1992.
- \_\_\_\_\_, 2002. "Ute Ladies'-Tresses, *Spiranthes diluvialis* Fact Sheet."
- Utah State University Cooperative Extension, 1997. Utah Crop Enterprise Budgets. Logan, Utah.
- Valdez, R.A., 1990. *The Endangered Fishes of Cataract Canyon*, Final Report. BIO/West, Inc. to the Bureau of Reclamation, Salt Lake City, Utah.
- Valdez, R.A. and G.C. Clemmer, 1982. "Life History and Prospects for Recovery of the Humpback and Bonytail Chub" *in Fishes of the Upper Colorado River System: Present and Future*, W.H. Miller, H.M. Tyus, and C.A. Carlson, editors. Western Division, American Fisheries Society, Bethesda, Maryland, pp. 109-119.
- Valdez, R.A., and M. Hugentobler (editors), 1993. *Characterization of the Life History and Ecology of the Humpback Chub (Gila Cypha) in the Grand Canyon*, Annual Report 1992. BIO/WEST Report No. TR-250-06 to the Bureau of Reclamation, Logan, Utah, 168 pp. plus appendices.
- Valdez, R.A., and W.J. Masslich, 1989. *Winter Habitat Study of Endangered Fish - Green River: Wintertime Movement and Habitat of Adult Colorado Squawfish and Razorback Suckers*, Report No. 136-2. BIO/WEST Inc., Logan, Utah, April.
- Valdez, R.A. and P. Nelson. 2004. *Green River Subbasin Floodplain Management Plan*, Final Report. To the Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado, Project No. C-6.
- Vanicek, C.D., 1967. "Ecological Studies of Native Green River Fishes Below Flaming Gorge Dam, 1964-1966," Doctoral dissertation. Utah State University, Logan, Utah
- Vanicek, C.D., and R.H. Kramer, 1969. "Life History of the Colorado Squawfish, *Ptychocheilus Lucius*, and the Colorado Chub, *Gila Robusta*, in the Green River Dinosaur National Monument 1963-1966" *in Transactions of the American Fisheries Society*, vol. 98, pp. 193-208.
- Vanicek, C.D., R.H. Kramer, and D.R. Franklin, 1970. "Distribution of Green River Fishes in Utah and Colorado Following Closure of Flaming Gorge Dam" *in Southwestern Naturalist*, vol. 14, pp. 297-315.
- Vinson, M., 1998. *Aquatic Macroinvertebrate Assemblages Downstream of Flaming Gorge Dam*, Final Report. Bureau of Land Management National Aquatic Monitoring Center, Fisheries and Wildlife Department, Utah State University, Logan, Utah, to the Bureau of Reclamation and Utah Division of Wildlife Resources, Salt Lake City, Utah.
- \_\_\_\_\_, 2004. Personal communication, Department of Aquatic, Watershed, and Earth Resources. Utah State University, correspondence date March 18, 2004.
- Walters, C., 1986. *Adaptive Management of Renewable Resources*. Macmillan Press, New York, New York.
- Ward, J., and T. Naumann, 1998. Ute Ladies'-Tresses Orchid (*Spiranthes Diluvialis Sheviak*) Inventory. Dinosaur National Monument and Browns Park National Wildlife Refuge.
- Ware, J., 1989. *Archaeological Inundation Studies: Manual for Reservoir Managers*, Contract Report EL-89-4. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

- Waters, Michael R., 1992. *Principles of Geoarchaeology: A North American Perspective*. The University of Arizona Press, Tucson, Arizona.
- Wilder, G., 1998. Browns Park.  
<[http://eddy.media.utah.edu/medsol/UCME/b/BROWNS\\_PARK.html](http://eddy.media.utah.edu/medsol/UCME/b/BROWNS_PARK.html)>,  
accessed August 1998.
- Williams, C.A., 2000. "A Comparison of Floodplain Hydrology and Cottonwood Water Relations on a Regulated and Unregulated River in Northwestern Colorado," Masters of Science thesis. Colorado State University, Ft. Collins, Colorado, 183 pp.
- Wiltzius, W.J., 1978. *Some Factors Historically Affecting the Distribution and Abundance of Fishes in the Gunnison River*, Final Report. Colorado Division of Wildlife to the Bureau of Reclamation.
- Woodling, J., 1985. *Colorado's Little Fish, a Guide to the Minnows and Other Lesser Known Fishes in the State of Colorado*. Colorado Division of Wildlife, Denver, Colorado, June 1985.

# Index

---



## A

Acre-feet 16, 23, 28, 36, 40, 48, 149, 235, 236, 273, 274

Age 0, age 1 84, 85, 273

Air quality 44, 120, 228, 229

Air quality description 120

Air quality summary 120, 228

Annual generation 41, 151

## B

Base load 273

Bypass tubes 7, 27, 29, 30, 34, 57, 243, 244, 273

## C

Capacity 2, 10, 11, 29, 30, 32-34, 36, 48, 49, 53, 57, 60-62, 116, 117, 125, 132, 134, 152, 156, 158, 159, 162-164, 171, 176, 273

Cavitation 34, 273

Control area 10, 11, 62, 273

Colorado River Storage Project (CRSP) 1-6, 9, 10, 12, 17, 22-24, 26, 42, 48, 56, 60, 61, 64, 151, 152

CRSP electric rates 151, 152

Cultural resources 13, 14, 18, 43, 99, 100-106, 189-192, 240, 241, 256, 258, 274

Cyanobacteria 157, 274

## E

Economic benefits 41, 148, 151, 211, 213, 233, 274

Electricity price 41, 42, 148, 152

Electric rates 151, 152

Employment 16, 61, 115, 116, 211, 217, 218, 220, 274  
Energy 4, 7, 10, 41, 49, 61, 75, 76, 82, 96, 106, 148, 149, 151, 152, 163, 164, 190, 228, 238, 256, 258, 259, 274  
Entrainment 34, 35, 156, 157, 165, 235-237, 246, 248-251, 274

## **F**

Facility availability approach 110, 194, 195, 205, 206, 208, 209, 218, 274  
Facility substitution 195, 196, 201, 274  
Flaming Gorge generation 41, 60, 151

## **G**

Gigawatt 41, 60, 151, 274  
Gigawatthour (GWh) 41, 42, 60, 151, 235, 274

## **H**

Historic properties 99, 100, 189-192, 252, 274  
Hydropower 5, 15, 37-39, 41, 42, 45, 60-62, 147, 149, 211, 213, 228, 231, 233, 234  
Hydropower cumulative effects 233, 234  
Hydropower financial analysis 41, 42  
Hydropower economic analysis 41, 42  
Hydropower generation 5, 37, 38, 39, 60, 62, 148, 213  
Hydropower operation 62  
Hydropower system modeling 41

## **I**

Indian tribe 60, 66, 99, 106, 107, 192, 256-258, 274

Input-output analysis 214, 274  
Insectivorous 91, 275  
Invertebrate 69, 73, 76, 78, 91, 93, 192, 275

## **K**

Kilowatt (KW) 152, 275  
Kilowatthour (KWh) 42, 61, 151, 152, 275

## **L**

Labor income 116, 117, 211, 218  
Larvae 26, 33, 71-73, 79, 80, 82-84, 144, 167, 169, 170, 246-250, 275  
Limnology 13, 275  
Linear interpolation 110, 194, 216  
Linear interpolation approach 110, 275  
Littoral 275  
Littoral zone 275

## **M**

Macroinvertebrate 73, 76, 78, 93, 158, 159, 164, 165  
Mean sea level (msl) 50, 110, 111, 190, 200, 203, 225, 229, 275  
Megawatt (MW) 49, 60, 151, 228, 275  
Megawatthour (MWh) 49, 228, 275  
Mesic 96, 275

## **N**

National Register of Historic Places (NRHP) 99, 100-105, 190-192, 274, 275  
Net present value (NPV) 41, 42, 147, 151, 235, 275  
Nonrenewable resources 99, 106, 275

## P

- Paleocene 275
- Paleontology 241, 275
- Paleontological resources 105, 106, 192, 231, 241
- Passerine birds 91, 276
- Piscivore 165
- Piscivorous 76, 276
- Plankton 50, 276
- Planktonic 157, 276
- Power 2, 4-5, 7-10, 13, 15, 26, 29, 30, 34, 41, 42, 48, 60-62, 89, 110, 111, 114, 118, 130, 148, 149, 151, 152, 198, 200, 202, 203, 205-209, 213, 228, 229, 234, 257, 259, 276
- Powerplant 3-5, 9-11, 13-15, 23, 27, 29, 30, 32-34, 36, 41, 42, 48, 49, 53, 54, 56, 57, 60, 61, 88, 115, 120, 125, 132, 134, 148, 149, 151, 156, 158, 159, 162-164, 228, 234, 244, 245, 276
  - Powerplant capacity 29, 30, 32-34, 36, 53, 57, 60, 115, 132, 134, 156, 158, 159, 162-164, 276
- Preference 78, 163, 174, 211, 223, 224, 246, 276
  - Preference customers 276
- Profitability 213, 276

## R

- Ramp rate 29, 37-39, 149, 276
- Ramping 9, 62, 149, 276
- Recreation 4, 8, 9, 13-15, 17, 19, 23, 42, 44, 45, 50, 64, 66, 87, 98, 107-111, 114-117, 121, 130, 154-156, 193-218, 220, 223, 226, 229-231, 242, 257, 258, 259
  - Recreation value per visit 193, 276
  - Recreation valuation 202, 207, 276
  - Recreation visit 110, 217, 276

## Recreation (continued)

- Recreation visitation 107, 108, 110, 111, 193-196, 198, 202, 204, 206, 213, 215, 216, 218, 242, 276
- Recruitment 14-16, 67, 72, 74, 76, 79, 83, 156, 276
- Redd 75, 163, 164, 276
- Regional economic impact 211, 213-216, 218, 276
- Reservoir elevation 28, 30, 35, 49, 50, 55, 116, 126-132, 139, 140, 149, 154, 156, 158, 190, 196, 209, 226
- Resource indicator 13, 276
- Resource issue 13, 276

## S

- Sacred site 18, 99, 256, 277
- Spot price 41, 148, 277
- Sympatric 277

## T

- Tailwater 5, 9, 69, 73, 75, 126, 149, 164, 238, 245, 246, 277
- Total industry output 116, 117, 211, 218, 277
- Total labor income 211, 277
- Traditional cultural property 256, 277

## U

- Unregulated inflow 277

## V

- Vertebrate 91, 93, 106, 277

## W

- Water release 1, 2, 5, 26, 33, 48, 49, 56, 60-62, 148, 149, 182, 187, 192, 232, 243-245

**Operation of Flaming Gorge Dam  
Final Environmental Impact Statement  
Acronyms and Abbreviations**

|   |  |
|---|--|
| APE                                       | area of potential effect   |
| ATU                                       | annual thermal units   |
| BLM                                       | Bureau of Land Management  |
| CFR                                       | Code of Federal Regulations  |
| cfs                                       | cubic feet per second  |
| CRFSTC                                    | Colorado River Forecasting Service Technical Committee   |
| CRSP                                      | Colorado River Storage Project   |
| CUP                                       | Central Utah Project   |
| EIS                                       | environmental impact statement   |
| ESA                                       | Endangered Species Act   |
| FGNRA                                     | Flaming Gorge National Recreation Area   |
| 2000 Flow and Temperature Recommendations | <i>Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam</i> |
| FR  | <i>Federal Register</i>  |
| GWh                                       | gigawatthour   |
| IMPLAN                                    | Impact analysis for PLANning   |
| km  | kilometer  |
| kWh                                       | kilowatthour   |
| m <sup>3</sup> /s                         | cubic meters per second  |
| msl                                       | mean sea level   |
| MW  | megawatt   |
| NEPA                                      | National Environmental Policy Act  |
| NERC                                      | North American Electrical Reliability Council  |
| NPV                                       | net present value  |
| NRHP                                      | <i>National Register of Historic Places</i>  |
| P.L.                                      | Public Law   |
| PRS                                       | Power Repayment Study  |
| Reclamation                               | Bureau of Reclamation  |
| Recovery Action Plan                      | <i>1993 Recovery Implementation Program Recovery Action Plan</i>   |
| Recovery Program                          | Upper Colorado River Endangered Fish Recovery Program  |
| RPA                                       | Reasonable and Prudent Alternative   |
| Secretary                                 | Secretary of the Interior  |
| SHPO                                      | State Historic Preservation Office   |
| SLCA/IP                                   | Salt Lake City Area Integrated Projects  |
| UDWR                                      | Utah Division of Wildlife Resources  |
| U.S.                                      | United States  |
| U.S.C.                                    | United States Code   |
| USDA Forest Service                       | United States Department of Agriculture Forest Service   |
| USGS                                      | United States Geological Survey  |
| Western                                   | Western Area Power Administration  |
| YOY                                       | young-of-the-year  |
| §   | section  |
| °C  | degrees Celsius  |
| °F  | degrees Fahrenheit   |
| %   | percent  |