

U.S. Department of the Interior
Bureau of Reclamation
Upper Colorado Basin Region



Glen Canyon Dam Adaptive Management Program

Glen Canyon Dam Adaptive Management Work Group Meeting

**Wednesday, February 10, 2021
9:30 a.m. – 4:30 p.m. MST**

**Thursday, February 11, 2021
9:30 a.m. – 4:30 p.m. MST**

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Administrative Items

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Meeting Packet Order

Tabs	Documents
	Packet Cover/Meeting Information
Administrative Items	<ul style="list-style-type: none"> • Meeting Packet Order • Federal Register Notice • WebEx Participant Information • AMWG Ground Rules • Facilitator Bio
AMWG Supporting Documents	<ul style="list-style-type: none"> • AMWG & TWG Committee Membership List • AMWG Charter • AMWG Operating Procedures
Draft Agenda	<ul style="list-style-type: none"> • Agenda for February 10 – 11, 2021 Meeting
Draft Minutes & Action Items	<ul style="list-style-type: none"> • Draft Minutes from August 2020 Meeting • Draft Minutes from November 2020 Meeting • Action Item Tracking Report
Supplemental Materials	<ul style="list-style-type: none"> • Potential GCDAMP & Other Meetings in 2021 • Dr. Petty Memo – Program Guidance • TWP Process Document • LTEMP ROD Table 4 – Experimental Treatments

Federal Register Notice:

<https://www.federalregister.gov/documents/2020/12/21/2020-27998/public-meeting-of-the-glen-canyon-dam-adaptive-management-work-group>

For updates, please see: <https://www.usbr.gov/uc/progact/amp/amwg.html>

Participant WebEx Information

Topic: AMWG – Day 1

Wednesday, February 10, 2021 – 9:30 am, Mountain Standard Time

Event Number: 199 831 1809

Event Password: AMWG1

Event Address:

<https://bor.webex.com/bor/j.php?MTID=m6513447f6eb67d4cb453d7da63567e84>

Phone #: 415-524-5035

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Topic: AMWG – Day 2

Thursday, February 11, 2021 – 9:30 am, Mountain Standard Time

Event Number: 199 461 4466

Event Password: AMWG2

Event Address:

<https://bor.webex.com/bor/j.php?MTID=md00e5758d11f9cd0ad3e39d4a5f6709d>

Phone #: 415-524-5035

Glen Canyon Dam Adaptive Management Work Group

Ground Rules

- ✚ Arrive on time OR 10-15 minutes early to confirm WebEx connectivity and check your mic and audio settings.
- ✚ Remain MUTED when not actively speaking. Turn down cell phone ringers and other background sounds.
- ✚ Commit to FULL participation.
- ✚ Do homework before meeting begins.
- ✚ Take private and/or sidebar conversations outside/offline.
- ✚ Wait to be recognized before speaking. Always state your name and affiliation before making a comment.
- ✚ Show respect for others.
- ✚ Be concise. Stick to the topic.
- ✚ Save new business for the appointed time
- ✚ Help keep the meeting on schedule

J. Michael Harty

Principal/Senior Mediator
Kearns & West, Inc.



J. Michael Harty is a Principal and Senior Mediator for Kearns & West, and brings over 20 years of direct experience in the field of conflict management, mediation, facilitated decision making, and public outreach and engagement to those roles. Mike has substantive experience with water rights, water quality, conjunctive water management, groundwater, flood risk management, oceans, mining, ecosystem restoration, endangered species, and technical information issues, and has worked with numerous local, state, and federal agencies both internally and in multi-agency contexts. Mike oversees the Kearns & West Sacramento regional office located in Davis, California. He was a practicing attorney for eight years prior to shifting his focus full time to conflict resolution and collaborative decision making.

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AMWG Supporting Documents

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Glen Canyon Dam Adaptive Management Work Group

Committee Membership List

(Updated: 02/02/2021)

SECRETARY'S DESIGNEE	ALTERNATE SECRETARY'S DESIGNEE	Designated Federal Officer
Wayne Pullan (Acting) Regional Director Upper Colorado Basin Regional Office Bureau of Reclamation 125 S. State Street, Room 8100 Salt Lake City, UT 84138 T: (801) 524-3606 F: (801) 524-3855 EM: wpullan@usbr.gov	VACANT	Daniel Picard, Alternate Deputy Regional Director Upper Colorado Basin Regional Office Bureau of Reclamation 125 S. State Street, Room 8100 Salt Lake City, UT 84138 T: (801) 524-3602 F: (801) 524-3855 EM: dpicard@usbr.gov

Federal Agencies:

1-BUREAU OF RECLAMATION	
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2-BUREAU OF INDIAN AFFAIRS	
Charles "Chip" Lewis (member) Western Regional Office 2600 N. Central Avenue, 4 th Floor Phoenix, AZ 85004-3050 T: (602) 379-6782 F: (602) 379-3837 EM: charles.lewis@bia.gov	Garry J. Cantley (alternate) Western Regional Office 2600 N. Central Avenue, 4 th Floor Phoenix, AZ 85004-3050 T: (602) 379-6750 x1257 F: (602) 379-3837 EM: garry.cantley@bia.gov

3-NATIONAL PARK SERVICE (Grand Canyon National Park)	
Jan Balsom (member) Grand Canyon National Park PO Box 129 Grand Canyon, AZ 86023 T: (928) 638-7758 F: (928) 638-7815 EM: jan_balsom@nps.gov	Billy Shott (alternate) Glen Canyon National Recreation Area PO Box 1507 Page, AZ 86040 T: (928) 608-6200 EM: billy_shott@nps.gov

4-U.S. FISH AND WILDLIFE SERVICE	
Jeff Humphrey (member) Arizona Ecological Services Office 9828 North 31 st Avenue, Suite C3 Phoenix, AZ 85051 T: (602) 889-5946 EM: jeff_humphrey@fws.gov	Kirk Young (alternate) Arizona Fish & Wildlife Conservation Office 2500 S. Pine Knoll Drive Flagstaff, AZ 86001 T: (928) 556-2124 F: (928) 556-2125 EM: kirk_young@fws.gov

Native American Tribes:

5-HUALAPAI TRIBE	
Peter Bungart (member) Hualapai Department of Cultural Resources PO Box 310 Peach Springs, AZ 86434 T: (928) 769-2234 F: (928) 769-2235 EM: pbungart@circaculture.com	Richard Powskey (alternate) Hualapai Tribal Council PO Box 179 Peach Springs, AZ 86434 T: (928) 769-2267 F: (928) 769-2532 EM: richard.powskey@hualapai-nsn.gov
6-HOPI TRIBE	
Jakob Maase (member) Hopi Cultural Preservation Office PO Box 123 Kykotsmovi, AZ 86039 EM: jmaase1@k-state.edu	Stewart Koyiyumptewa (alternate) Hopi Cultural Preservation Office PO Box 123 Kykotsmovi, AZ 86039 EM: skoyiyumptewa@hopi.nsn.us
7-NAVAJO NATION	
Richard Begay (member) Navajo Nation Heritage and Historic Preservation PO Box 7440 Window Rock, AZ 86515 T: (928) 871-7000 EM: r.begay@navajo-nsn.gov	Terilyn "Kim" Yazzie (alternate) Navajo Nation Dept. of Fish & Wildlife PO Box 7440 Window Rock, AZ 86515 Cell: (505) 402-9098 Work: (928) 871-7069 NZD Fax: (505)960-6657 EM: kyazzie@nndfw.org
8-PUEBLO OF ZUNI	
Arden Kucate (member) PO Box 339 1203-B State Highway 53 Zuni, NM 87327 T: (505) 782-7000 EM: arden.kucate@ashiwi.org	Clyde Yatsattie (alternate) PO Box 339 1203-B State Highway 53 Zuni, NM 87327 T: (505) 782-7000 EM: Clyde.Yatsattie@ashiwi.org
9-SOUTHERN PAIUTE CONSORTIUM	
VACANT (member)	VACANT (alternate)
10-SAN JUAN SOUTHERN PAIUTE TRIBE	
VACANT (member)	

Seven Basin States:

11-ARIZONA

Clint Chandler (member)
 Arizona Department of Water Resources
 Water Planning and Permitting Division
 1110 W. Washington Street, Suite 310
 Phoenix, AZ 85007
 T: (602) 771-8412 F: (602) 771-8681
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VACANT

12-CALIFORNIA

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 Colorado River Board of California
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 Glendale, CA 91203
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Christopher Harris (alternate)
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13-COLORADO

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14-NEVADA

Sara Price (member)
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Peggy Roefer (alternate)
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15-NEW MEXICO

Arianne Singer (member)
 New Mexico Interstate Stream Commission
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Paul Harms (alternate)
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16-UTAH	
Todd Adams (member) Utah Division of Water Resources 1594 West North Temple, Suite 3710 Salt Lake City, UT 84114 T: (801) 538-7250 EM: toddadams@utah.gov	VACANT (alternate)

17-WYOMING	
Steven W. Wolff (member) Interstate Streams Division 122 W. 25 th Street Cheyenne, WY 82002-0370 T: (307) 777-1942 F: (307) 777-5451 EM: steve.wolff@wyo.gov	Charlie Ferrantelli (alternate) Wyoming State Engineer's Office 122 West 25 th Street Cheyenne, WY 82002 T: (307) 777-6151 EM: charlie.ferrantelli@wyo.gov

Environmental Groups:

18-GRAND CANYON WILDLANDS COUNCIL	
Larry Stevens (member) 2410 East Route 66 Flagstaff, AZ 86004 T: (928) 380-7724 EM: larry@grandcanyonwildlands.org	VACANT (alternate)

19-AMERICAN RIVERS / National Parks Conservation Association	
Matt Rice (member) 1536 Wynkoop, Ste 321 Denver, CO 80202 T: 303-454-3395 E: mrice@americanrivers.org	VACANT (alternate)

Recreation Interests:

20-GRAND CANYON RIVER GUIDES	
David Brown (member) 257 East 200 South, Ste 200 Salt Lake City, UT 84111 T: (801) 694-1228 EM: dbrown@swca.com	VACANT (alternate)

21-FLY FISHERS INTERNATIONAL / TROUT UNLIMITED	
John Jordan (member) 4510 E. Joshua Tree Lane Paradise Valley, AZ 85253 T: (602) 840-4224 EM: jcjordan1@cox.net	John Hamill (alternate) 1254 N. Fox Hill Road Flagstaff, AZ 86004 C: (928) 606-4234 EM: hamilldsrt50@msn.com

Federal Power Purchase Contractors:

22-COLORADO RIVER ENERGY DISTRIBUTORS ASSOCIATION (CREDA)	
Leslie James (member) 10429 S. 51 st Street, Suite 230 Phoenix, AZ 85044 T: (480) 477-8646 F: (480) 477-8647 EM: creda@creda.cc	Edward Gerak (alternate) Arizona Power Authority 1810 West Adams Street Phoenix, AZ 85007 T: (602) 368-4265 F: (602) 253-7970
23-UTAH MUNICIPAL POWER AGENCY	
Kevin Garlick (member) Utah Municipal Power Agency (UMPA) 696 W. 100 S. Spanish Fork, UT 84660 T: (801) 798-7849 EM: kevin@umpa.energy	Clifford Barrett (alternate) 845 Lakeview Stansbury Park, UT 84074-1912 T: (435) 882-0164 EM: cibarre@q.com

Other Stakeholders:

24-ARIZONA GAME AND FISH DEPARTMENT	
Chris Cantrell (member) Fisheries Branch 5000 W. Carefree Highway Phoenix, AZ 85086-5000 T: (602) 942-3000 EM: ccantrell@azgfd.gov	James deVos (alternate) Wildlife Management Division 5000 W. Carefree Highway Phoenix AZ 85086-5000 T: (623) 236-7302 EM: jdevos@azgfd.gov
25-DEPARTMENT OF ENERGY (DOE) – WESTERN AREA POWER ADMINISTRATION (WAPA)	
VACANT	Brian Sadler (alternate) Western Area Power Administration 299 S. Main Street, Suite 200 Salt Lake City, UT 84111 T: (801) 524-5506 EM: sadler@wapa.gov

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Glen Canyon Dam Adaptive Management Program Technical Work Group Membership List

(Updated: 2/2/2021)

TWG Chairperson	TWG Vice Chairs
Seth Shanahan (10/1/16) Southern Nevada Water Authority 100 City Parkway, Suite 700 Las Vegas, NV 89106 T: 702-822-3314 F: 702-822-3308 EM: seth.shanahan@snwa.com	VACANT Lee Traynham Bureau of Reclamation

Federal Agencies:

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3-NATIONAL PARK SERVICE (Grand Canyon National Park)	
Jan Balsom (member, 11/3/10) Office of the Superintendent - GCNP PO Box 129 (Street: 20 South Entrance Road) Grand Canyon, AZ 86023 T: 928-638-7758 F: 928-638-7815 EM: jan_balsom@nps.gov	Brian Healy (alternate, 11/16/15) Grand Canyon National Park 1824 South Thompson Street, Suite 200 Flagstaff, AZ 86001 T: 928-638-7453 F: 928-638-7492 EM: Brian_Healy@nps.gov

4-NATIONAL PARK SERVICE (Glen Canyon National Recreation Area)	
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5-U.S. FISH AND WILDLIFE SERVICE	
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Native American Tribes:

6-HUALAPAI TRIBE	
Carrie Cannon (member, 9/16/20) P.O. Box 310 Peach Springs, AZ 86434	Peter Bungart (alternate, 9/16/20) P.O. Box 310 Peach Springs, AZ 86434 T: 928-769-2223 EM: Peter.bungart@hualapai-nsn.gov

7-HOPI TRIBE	
Jakob Maase (member, 1/8/20) P.O. Box 123 Kykotsmovi, AZ 86039 Cell: 913-448-8962 Jmaase1@k-state.edu	VACANT

8-NAVAJO NATION	
VACANT	Kim Yazzie (alternate, 8/24/17) Navajo Nation Dept of Fish & Wildlife PO Box 7440 Window Rock, AZ 86515 T: 928-871-7152 Cell: 505-402-9098 EM: kyazzie@nndfw.org

9-PUEBLO OF ZUNI	
Kurt Dongoske (member, 11/3/10) Zuni Heritage & Historic Preservation Ofc. PO Box 1149 Zuni, NM 87327 T: 505-782-4814 T: 928-289-9259 (AZ Ofc) EM: kdongoske@cablone.net	VACANT

10-SOUTHERN PAIUTE CONSORTIUM	
VACANT	VACANT

11-SAN JUAN SOUTHERN PAIUTE TRIBE	
P.O. Box 2656 Tuba City, AZ 86002 T: 928-283-1066	

Seven Basin States:

12-ARIZONA	
VACANT	<p>Craig McGinnis (alternate, 1/31/19) Arizona Department of Water Resources 1110 W. Washington Street, Suite 310 Phoenix, AZ 85007 T: 602-771-0201 F: 602-771-8681 EM: cmcginnis@azwater.gov</p>
13-CALIFORNIA	
<p>Chris Harris (member, 11/3/2010) Colorado River Board of California 770 Fairmont Avenue, Suite 100 Glendale, CA 91203 T: (818) 500-1625 ext. 308 F: (818) 543-4685 EM: charris@crb.ca.gov</p>	<p>Jessica Neuwerth (alternate, 7/7/15) Colorado River Board of California 770 Fairmont Avenue, Suite 100 Glendale, AZ 91203-1035 T: 815-500-1625 x339 EM: jneuerth@crb.ca.gov</p>
14-COLORADO	
<p>Michelle Garrison (member, 12/18/19) Colorado Water Conservation Board 1313 Sherman St., Rm. 721 Denver, CO 80203 303-866-3441 x3213 Michelle.garrison@state.co.us</p>	<p>D. Randolph Seaholm (alternate, 11/3/10) Colorado Water Conservation Board 6085 Nile Circle Golden, CO 80403 T: 303-278-3064 EM: seaholmdr@gmail.com</p>
15-NEVADA	
<p>Seth Shanahan (member, 10/1/16) Southern Nevada Water Authority 100 City Parkway, Suite 700 Las Vegas, NV 89106 T: 702-822-3314 F: 702-822-3308 EM: seth.shanahan@snwa.com</p>	<p>Peggy Roefer (alternate, 6/6/16) Colorado River Commission of Nevada 555 E. Washington Avenue, Suite 3100 Las Vegas, NV 89101 T: 702-486-2669 EM: proefer@crc.nv.gov</p>
16-NEW MEXICO	
<p>Paul Harms (member, 11/3/10) NM Interstate Stream Commission PO Box 25102 Santa Fe, NM 87504 T: 505-827-1150 F: 505-827-6188 EM: paul.harms@state.nm.us</p>	<p>Christina Noftsker (alternate, 9/12/18) NM Interstate Stream Commission PO Box 25102 Santa Fe, NM 87504 T: 505-827-_____ F: 801-531-9705 EM: christina.noftsker@state.nm.us</p>
17-UTAH	
VACANT	VACANT

18-WYOMING	
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Environmental Groups:

19-GRAND CANYON WILDLANDS COUNCIL	
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20-AMERICAN RIVERS / NATIONAL PARKS CONSERVATION ASSOCIATION	
Kevin Dahl (member, 8/20/14) NPCA, Southwest Region 738 N. 5 th Avenue, Suite 222 Tucson, AZ 85705 T: 520-624-2014 C: 520-603-6430 EM: kdahl@npca.org	VACANT

Recreation Interests:

21-GRAND CANYON RIVER GUIDES	
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22-FLY FISHERS INTERNATIONAL / TROUT UNLIMITED	
Jim Strogen (member, 12/11/17) Trout Unlimited 401 W. Christopher Point Payson, AZ 85541 T: 480-242-2569 EM: jimstrog@gmail.com	Bill Persons (alternate, 11/21/17) Fly Fishers International 14621 North 22 nd Lane Phoenix, AZ 85023 T: EM: bpersons51@gmail.com

Federal Power Purchase Contractors:

23-COLORADO RIVER ENERGY DISTRIBUTORS ASSOCIATION (CREDA)	
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24-UTAH MUNICIPAL POWER AGENCY (UMPA)	
Clifford Barrett (member, 11/3/10) 845 Lakeview Stansbury Park, UT 84074-1912 T: 435-882-0164 EM: cibarre@q.com	VACANT

Other Stakeholders:

25-ARIZONA GAME AND FISH DEPARTMENT	
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26-DEPARTMENT OF ENERGY (DOE) – WESTERN AREA POWER ADMINISTRATION (WAPA)	
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**U.S. Department of the Interior
Bureau of Reclamation
Glen Canyon Dam Adaptive Management Work Group**

CHARTER

- 1. Committee's Official Designation.** Glen Canyon Dam Adaptive Management Work Group (AMWG).
- 2. Authority.** The Grand Canyon Protection Act (Act) of October 30, 1992, Public Law 102-575; Federal Advisory Committee Act (FACA), as amended, 5 U.S.C. Appendix 2.
- 3. Objectives and Scope of Activities.** The Glen Canyon Dam Adaptive Management Program (AMP) provides for monitoring the results of the operating criteria and plans adopted by the Secretary of the Interior (Secretary), and for research and studies to suggest appropriate changes to those plans and operating criteria.

The AMP includes the AMWG. The AMWG provides advice and recommendations to the Secretary relative to the operation of Glen Canyon Dam. The Secretary's Designee is the Assistant Secretary for Water and Science who serves as the Chair. The AMWG recommends suitable monitoring and research programs and makes recommendations to the Secretary. The AMWG may recommend research and monitoring proposals outside the Act which complement the AMP process, but such proposals will be funded separately, and shall not deter from the focus of the Act.

Under Section 1802(a) of the Act, "[t]he Secretary shall operate Glen Canyon Dam in accordance with the additional criteria and operating plans specified in Section 1804 [of the Act] and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including but not limited to, natural and cultural resources and visitor use." Under Section 1802(b) of the Act, "[t]he Secretary shall implement this section [of the Act] in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in *Arizona v. California*, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River basin."

- 4. Description of Duties.** The duties or roles and functions of the AMWG are in an advisory capacity only. They are, as applicable, to:
 - a. Establish AMWG operating procedures.
 - b. Advise the Secretary in meeting environmental and cultural commitments including those contained in the Record of Decision for the Glen Canyon Dam Long-Term Experiment and Management Plan Final Environmental Impact Statement and subsequent related decisions.

- c. Recommend the framework for the AMP policy, goals, and direction.
- d. Recommend resource management objectives for development and implementation of a long-term monitoring plan, and any necessary research and studies required to determine the effect of the operation of Glen Canyon Dam on the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including but not limited to, natural and cultural resources, and visitor use.
- e. Review and provide input on the report identified in the Act to the Secretary, the Congress, and the Governors of the Colorado River Basin States. This annual report includes discussion on dam operations, the operation of the AMP, status of resources, and measures taken to protect, mitigate, and improve the resources defined in the Act.
- f. Annually review long-term monitoring data to provide advice on the status of resources and whether the AMP goals and objectives are being met.
- g. Review and provide input on all AMP activities undertaken to comply with applicable laws, including permitting requirements.

All current and future Executive Orders, Secretary's Orders, and Secretarial memos should be included for discussion and recommendation as they are released. At the conclusion of each meeting or shortly thereafter, provide a detailed recommendation report, including meeting minutes, to the DFO.

- 5. Agency or Official to Whom the Committee Reports.** The AMWG reports to the Secretary through the Secretary's Designee.
- 6. Support.** The logistical and support services for the meetings of the AMWG will be provided by the Bureau of Reclamation.
- 7. Estimated Annual Operating Costs and Staff Years.** The estimated annual operating costs associated with supporting the AMWG's functions are \$400,000, including all direct and indirect expenses. It is estimated that four FTE's will be required to support the AMWG.
- 8. Designated Federal Officer.** The DFO is the Bureau of Reclamation, Upper Colorado Region, Regional Director who is a full-time Federal employee appointed in accordance with Agency procedures. The DFO or alternate will approve or call all AMWG and subcommittee meetings, prepare and approve all meeting agendas, attend all AMWG and subcommittee meetings, adjourn any meetings when the DFO determines adjournment to be in the public interest and chair meetings when directed to do so by the Secretary.

9. Estimated Number and Frequency of Meetings. The AMWG is expected to meet approximately twice a year, and at such other times as designated by the DFO.

10. Duration. Continuing.

11. Termination. The AMWG will terminate 2 years from the date the charter is filed, unless prior to that date, it is renewed in accordance with the provisions of section 14 of the FACA. The AMWG will not meet or take any action without a valid current charter.

12. Membership and Designation. Members and alternate members of the AMWG appointed by the Secretary will be comprised of, but not limited to, the following:

a. Secretary's Designee, who will serve as Chairperson for the AMWG.

b. One representative each from the following entities:

- (1) The Secretary of Energy (Western Area Power Administration)
- (2) Arizona Game and Fish Department
- (3) Hopi Tribe
- (4) Hualapai Tribe
- (5) Navajo Nation
- (6) San Juan Southern Paiute Tribe
- (7) Southern Paiute Consortium
- (8) Pueblo of Zuni

c. One representative each from the Governors from the seven basin States:

- (1) Arizona
- (2) California
- (3) Colorado
- (4) Nevada
- (5) New Mexico
- (6) Utah
- (7) Wyoming

d. Representatives each from the general public as follows:

- (1) Two from environmental organizations
- (2) Two from the recreation industry
- (3) Two from contractors who purchase Federal power from Glen Canyon Powerplant

e. One representative from each of the following DOI agencies as ex-officio non-voting members:

- (1) Bureau of Reclamation

- (2) Bureau of Indian Affairs
- (3) U.S. Fish and Wildlife Service
- (4) National Park Service

Members will be appointed to the AMWG by the Secretary, with input and recommendations from the above-referenced agencies, States, tribes, contractors for Federal power from Glen Canyon Dam, environmental organizations, and other stakeholders. Each member may also recommend an alternate member for appointment by the Secretary. Members and alternates of the AMWG will be appointed for a 3-year term

Members of the AMWG serve without compensation, except that the DFO, in his or her sole discretion, may choose to allow compensation for the Technical Work Group subcommittee chairperson according to applicable authorities. While away from their homes or regular places of business, members engaged in AMWG or subcommittee business approved by the DFO may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in Government service under section 5703 of title 5 of the United States Code.

A vacancy on the AMWG will be filled in the same manner in which the original appointment was made.

13. Ethics Responsibility.

- a. **Members Who Are Federal Employees.** Federal members who are appointed to the AMWG are appointed in their official capacity as Federal employees. This means that when these Federal employees act in their capacity as an AMWG member, they will be subject to the ethics statutes and regulations that apply to them as Federal employees, including the avoidance of conflict of interest.
- b. **Members Who Are Not Federal Employees.** AMWG or subcommittee members who are not Federal employees shall not participate in any AMWG or subcommittee deliberations or votes relating to a specific party matter before the Department or its bureaus and offices including a lease, license, permit, contract, grant, claim, agreement, or litigation in which the member or the entity the member represents has a direct financial interest.

14. Subcommittees. Subject to the DFO's approval, subcommittees may be formed for the purpose of compiling information or conducting research. However, such subcommittees must act only under the direction of the DFO and must report their recommendations to the full AMWG for consideration. Subcommittees must not provide advice or work products directly to the Agency. Subcommittees will meet as necessary to accomplish their assignments, subject to the approval of the DFO and the availability of resources.

15. Recordkeeping. The records of the AMWG, and formally and informally established subcommittees of the AMWG, shall be handled in accordance with General Records Schedule 6.2 or other approved Agency records disposition schedules. These records shall be available for inspection and copying, subject to the Freedom of Information Act, 5 U.S.C. 552.

C. 552.



Secretary of the Interior

9/19/19

Date Signed

SEP 19 2019

Date Filed

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February 9, 2011

GLEN CANYON DAM
ADAPTIVE MANAGEMENT WORK GROUP
OPERATING PROCEDURES

FOREWARD

The Grand Canyon Protection Act (Act) of October 30, 1992, (Public Law 102-575) directs the Secretary of the Interior (Secretary) to "establish and implement long-term monitoring programs and activities that will ensure that Glen Canyon Dam is operated in a manner consistent with that of section 1802" of the Act. "The monitoring programs and activities shall be established and implemented in consultation with the Secretary of Energy; the Governors of the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming; Indian tribes; and the general public, including representatives of academic and scientific communities, environmental organizations, the recreation industry, and contractors for the purchase of Federal power produced at Glen Canyon Dam." In order to comply with the consultation requirement of the Act, the Glen Canyon Dam EIS recommended formation of a Federal Advisory Committee. To fulfill this recommendation, the Glen Canyon Dam Adaptive Management Work Group (AMWG) was established. The AMWG Charter imposes the following criteria: (1) the AMWG shall operate under the Federal Advisory Committee Act (Public Law 92-463); (2) the Chairperson shall be designated by the Secretary; (3) the Secretary's Designee, shall also serve as the Designated Federal Official under the Federal Advisory Committee Act; (4) the Bureau of Reclamation will provide the necessary support in talking accurate minutes of each meeting; and (5) the AMWG shall continue in operation until terminated or renewed by the Secretary of the Interior under the Federal Advisory Committee Act.

OPERATION

1. Meetings. The AMWG is expected to meet semiannually. The Secretary's Designee may call additional meetings as deemed appropriate. A minimum of one meeting will be held annually. All meetings shall be announced by notice in the Federal Register and by news release to local newspapers.

Thirteen members must be present (either in person or on the telephone) at any meeting of the AMWG to constitute a quorum.

Robert's Rules of Order will be generally followed, except some flexibility will be allowed as needs dictate.

The Bureau of Reclamation is responsible for arranging meetings and for other duties associated with operation of the AMWG. They will arrange for meeting location, provide staff for the Designee, prepare minutes and Federal Register Notices, and other operational requirements of the AMWG.

Meetings of the AMWG will generally be held in Phoenix, Arizona, to allow for better travel accessibility for the members as well as provide greater opportunity for the public to attend. However, the Secretary's Designee may decide upon a different location as he/she deems appropriate.

The AMWG may make recommendations to the Secretary of the Interior in response to future legislation or appropriations that may affect or impact the Glen Canyon Dam Adaptive Management Program. This may be accomplished when an AMWG member requests to the Chair, an issue to be addressed either at a regular meeting of the AMWG, at a special meeting or during a conference call. AMWG members will discuss the issue and if appropriate, make recommendations on the issue to the Secretary of the Interior in a timely manner. When any other potentially controversial topics are identified by any AMWG member, they should notify the Chair so that this procedure can be implemented.

2. Chairperson. The Chairperson will be the Secretary's Designee, who will preside over the meetings of the AMWG. In the absence of the Chairperson, a senior level Interior representative will act as Chairperson for the AMWG. The Chairperson or designated alternate must be present before a meeting of the AMWG may convene. The Chairperson or his/her alternate is authorized to adjourn an AMWG meeting at any time.

The Secretary's Designee will also be responsible for sending a formal summary report after each Advisory Committee meeting directly to the Secretary of the Interior with copies of subject summary report to be provided to all AMWG members.

3. Members. Membership shall follow the guidelines in the AMWG Charter. Members of the AMWG will be designated by the Secretary of the Interior. They shall serve for a term of four years. Members may be re-designated to serve for more than one term.

4. Alternate Committee Members. Each AMWG member may designate an alternate to serve for the same term as the member. Alternates must be identified to the Chairperson in writing. Alternates must meet the same qualifications as the member. Alternates will have authority to participate in AMWG business, including quorum and voting privileges. A list of members and alternates shall be maintained and made available to AMWG members.

5. Agenda. At least 30 days prior to any meeting of the AMWG, a draft of the proposed agenda and related information will be sent to the group members. Members shall review the agenda and return comments and proposed agenda items to the Designee within two weeks of the agenda mailing date. The final agenda will be sent to the members 15 days prior to the meeting. The Secretary's Designee shall approve the agendas.

6. Voting. The maker of a motion must clearly and concisely state and explain his or her motion. Motions may be made verbally or submitted in writing in advance of the meeting. Notice of motions to be made by any member of the AMWG should be announced in the Federal Register and presented on the agenda. Any motions proposed by any member in meetings must be related to an agenda topic and will be considered only if a simple majority of members present agree to hear it. After a motion there should be presentations by staff followed by a discussion and a call for questions. The public will be given opportunity to comment during the question period as allowed by the Chairperson. Any member of the public, who has asked to address the AMWG, shall have a minimum of two minutes to comment. The Chairperson can limit the total time allowed to the public for comments. Comments shall address the motion and not be repetitive to presentations, group discussions or other comments previously presented. The motion must be fully documented for the minutes and restated clearly by the Chairperson before a vote is taken.

The group should attempt to seek consensus but, in the event that consensus is not possible, a vote should be taken. Voting shall be by verbal indication or by raised hand. Approval of a motion requires a 60 percent majority of members present and voting. The views of any dissenting member or minority group shall be briefly incorporated into the information transmitted to the Secretary along with the majority recommendation. In addition, at his/her discretion, the Secretary's Designee may ask any individual at the meeting for the rationale related to their vote. Voting shall occur only with the formal meetings of the group.

7. Minutes. Detailed minutes of each meeting will be kept. The minutes will contain a record of persons present and a description of pertinent matters discussed, conclusions reached, and actions taken on motions. Minutes shall be limited to approximately 5-15 pages. The corrections and adoption of the minutes will be by vote of the AMWG at the next subsequent meeting. The Secretary's Designee shall approve all minutes. The Bureau of Reclamation is responsible for recording and disseminating minutes to AMWG members, generally within two weeks of the subject meeting, but in no event longer than 30 days.

9. Public Involvement. No later than 15 days prior to each meeting of the AMWG, a notice will be published in the Federal Register. Meetings will be open to the public and advertised in local newspapers. Interested persons may appear in person, or file written statements to the AMWG. Public comments can be on any issue related to operation of the Glen Canyon Dam. A specific time for public comment will be identified in the agenda. Advance approval for oral participation may be prescribed and speaking time may be limited. Minutes of the AMWG meetings and copies of reports submitted to the AMWG will be maintained for public review at the Bureau of Reclamation's Upper Colorado Regional Office in Salt Lake City, Utah, and at the Library of Congress in Washington, D.C. They will also be posted to the Bureau of Reclamation web site www.uc.usbr.gov/amp).

10. Payment of Travel. While engaged in the performance of official business at AMWG and AMWG sub-group meetings (regular, ad hoc, and Protocol Evaluation Panel meetings) away from home or their regular places of business, all AMWG members or AMWG sub-group members shall, upon request, be reimbursed for travel expenses in accordance with current Federal Travel Regulations. Alternates representing the official committee member may also receive compensation for travel expenses.

11. Open/Closed Meetings. If any member proposes discussion of a sensitive issue felt to require a closed session, he or she should so state in a proposal submitted to AMWG members in sufficient time to include it in the agenda published in the Federal Register Notice announcing the next meeting. A closed executive session may be held during a regular meeting but should be used rarely. Any sensitive cultural issues will require consultation with Native Americans prior to meeting.

Telephone conference meetings must have a notice in the Federal Register 15 days prior to the call. There must be adequate opportunity for the general public to listen to the conference call.

The AMWG may conduct business outside of formal meetings through telephone polls conducted by the Chairperson or his/her designee. In emergency situations, telephone polls can be requested by the AMWG member to act on clearly defined written motions for AMWG approval. Following approval by the Chairperson, a telephone poll will be conducted within

seven working days. During a telephone poll, all members will be contacted and requested to vote. Approval of a motion requires 60 percent majority of all members voting. The Chairperson is responsible for documenting in writing how each member voted and distributing the record to all AMWG members.

12. Reports and Record Keeping. The Annual Report (AR) required by the Grand Canyon Protection Act shall be reviewed by the AMWG. The State of the Natural and Cultural Resources in the Colorado River Ecosystem report developed by the Grand Canyon Monitoring and Research Center will be attached to the AR and shall contain information on the condition of the resources impacted by the operation of Glen Canyon Dam. The AR shall be concise, containing critical resource issues and recommendations to the Secretary on future dam operations.

Bureau of Reclamation staff will supply GSA the required information to complete the summary report for Federal Advisory Committees.

13. Committee Expenses and Cost Accounting. An accounting of the expenses for operation of the AMWG shall be maintained by Reclamation. Expenses and other information will be submitted to GSA as required by FACA. Committee expenses are limited to approximately \$500,000 annually.

SUB-GROUPS

1. Formation. The AMWG may form sub-groups in order to facilitate the mission of the AMWG as identified in the Act and the AMWG Charter. Sub-groups will be formed for completion of specific tasks or for specified periods of time. Sub-group members will be named by the members of the AMWG for their own organization, or by the Secretary's Designee. Effort shall be made to keep sub-groups small. Sub-groups will be formed or dissolved by a vote of the AMWG.

2. Requirements. Sub-groups may choose their chairperson from among the AMWG named sub-group members. The chairperson of any sub-group may convene group meetings at his or her discretion. Sub-groups may develop their own operating procedures. One standing sub-group of the AMWG will be Glen Canyon Dam Technical Work Group (TWG). The TWG membership shall consist of one representative from each organization represented in the AMWG, with the exception that two members from the National Park Service representing the Grand Canyon National Park and the Glen Canyon Recreational Area, and one representative from the US Geological Survey. All sub-groups will elect their own officers. Names of all sub-group members will be announced to the AMWG at regular meetings and will be attached to the minutes. Sub-group members may designate alternates.

3. Charge. Sub-groups will receive their charges from the AMWG. Sub-groups will work only on issues assigned them by the AMWG. They will not be empowered to follow other issues on their own. They are encouraged to submit issues to the AMWG they feel worthy of consideration and discussion, but the AMWG must approve work on all new issues. The AMWG may require the sub-groups to develop plans and direct them to come to a consensus or majority opinion at their discretion. Sub-groups shall determine their own operating procedures, which must be reduced to writing and included with the AMWG and sub-group records.

4. Reporting. Sub-groups will report at least annually to the AMWG at the request of the Chairperson. Sub-groups shall report only to the AMWG. They shall provide information as necessary for preparing annual resource reports and other reports as required for the AMWG.

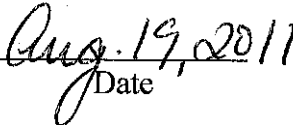
5. Ad Hoc Groups. Ad hoc groups may be created by the Secretary's Designee or as a subcomponent of a sub-group. These groups may meet to discuss assignments from the AMWG or sub-group. Ad hoc meetings will not require Federal Register notices. Minutes are recommended but not required. Ad hoc groups shall report to the AMWG or the main body of the sub-group, depending upon which gives the assignment.

Adopted by vote of the AMWG on February 9, 2011, in Phoenix, Arizona.

Approved: _____

Chairperson

 _____

 _____

Date

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Draft Agenda

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**Glen Canyon Dam Adaptive Management Program
Adaptive Management Work Group Meeting, February 10-11, 2021**

Wednesday, February 10, 2021

Day 1 Webinar Information:

<https://bor.webex.com/bor/j.php?MTID=m6513447f6eb67d4cb453d7da63567e84>

Telephone: 415-527-5035 Passcode: 199 831 1809

DRAFT AGENDA

START TIME ¹ (Duration)	Wednesday, February 10, 2021 Topic and Presenter and Purpose ²
8:30 PST/ 9:30 MST (:45)	Welcome and Administrative: TBD, Secretary's Designee to the Adaptive Management Work Group <ul style="list-style-type: none"> ▪ Introductions and Determination of Quorum (13 members) <ul style="list-style-type: none"> ○ Facilitator: Mike Harty and Kearns & West team ▪ Approval of August 2020 Meeting Minutes ▪ Approval of November 2020 Meeting Minutes ▪ Administrative Updates <ul style="list-style-type: none"> ○ AMWG Membership Status ○ FY2021 Program Funding Status ○ Action Item Tracking Report
9:15 PST/ 10:15 MST (:20)	FY 2020 Accomplishments and FY 2021 Outlook: Lee Traynham, Adaptive Management Group Chief, Bureau of Reclamation <ul style="list-style-type: none"> ▪ Presentation (15 minutes) ▪ Q&A and discussion (5 minutes) <p><u>Additional Information:</u> 1) 2020 AMWG Report and Recommendations, 2) AMWG Charter <u>Purpose:</u> To provide information regarding GCDAMP accomplishments in FY 2020 and to inform planning and priorities for FY 2021.</p>
9:35 PST/ 10:35 MST (:10)	BREAK
9:45 PST/ 10:45 MST (:45)	2021 GCDAMP Annual Reporting Meeting Update – Part 1: Mark Wimer, Acting Chief, Grand Canyon Monitoring and Research Center <ul style="list-style-type: none"> ▪ Presentation (30 minutes) ▪ Q&A and discussion (15 minutes) <p><u>Purpose:</u> To provide information regarding project work completed in FY20 and to inform work to be completed under the 2021-2023 triennial budget and work plan.</p>

START TIME ¹ (Duration)	Wednesday, February 10, 2021 Topic and Presenter and Purpose ²
10:30 PST/ 11:30 MST (:30)	Lower Colorado River Multi-Species Conservation Program-Overview: John Swett, Program Manager, Bureau of Reclamation <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) <p><u>Additional Information:</u> MSCP Website <u>Purpose:</u> To share information about the purpose, achievements, current workplan, and future of a complementary conservation program in the Colorado River Basin.</p>
11:00 PST/ 12:00 MST (1:30)	LUNCH
12:30 PST/ 1:30 MST (:30)	Tribal Liaison Report: TBD <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) <p><u>Purpose:</u> To report on the Tribal Liaisons' activities and meetings as well as Tribal concerns, challenges, and accomplishments.</p>
1:00 PST/ 2:00 MST (:45)	Basin Hydrology and Operations: Heather Patno, Hydraulic Engineer, Bureau of Reclamation <ul style="list-style-type: none"> ▪ Presentation (30 minutes) ▪ Q&A and discussion (15 minutes) <p><u>Additional Information:</u> 1) 24-Month Study. 2) Current GCD operations <u>Purpose:</u> To increase understanding of water supply, forecasted hydrologic conditions, and projected reservoir conditions and operations for the current and upcoming water years</p>
1:45 PST/ 2:45 MST (:15)	BREAK
2:00 PST/ 3:00 MST (:30)	Hydropower Resource - Updates and Emerging Issues: Tim Vigil, Colorado River Storage Project Manager, Western Area Power Administration <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) <p><u>Purpose:</u> To provide information and updates regarding WAPA's new energy market, the emergency exception outlook for FY21, and other emerging issues.</p>

START TIME ¹ (Duration)	Wednesday, February 10, 2021 Topic and Presenter and Purpose ²
2:30 PST/ 3:30 MST (:45)	2021 GCDAMP Annual Reporting Meeting Update – Part 2: Mark Wimer, Acting Chief, Grand Canyon Monitoring and Research Center <ul style="list-style-type: none"> ▪ Presentation (30 minutes) ▪ Q&A and discussion (15 minutes) <p><u>Additional Information:</u> GCMRC 2020 Annual Report <u>Purpose:</u> To provide information regarding project work completed in FY20 and to inform work to be completed under the 2021-2023 triennial budget and work plan.</p>
3:15 PST/ 4:15 MST (:15)	Public Comment
3:30 PST/ 4:30 MST	ADJOURN FOR THE DAY <ul style="list-style-type: none"> • Please fill out evaluation form if you will not return tomorrow.

¹ Every effort will be made to adhere to the schedule and agenda, but on occasion, for unforeseen reasons, some modifications may occur.

² Action may be by consensus or a vote; and either may be a recommendation to the Secretary of the Interior or feedback to presenter(s) or to subordinate groups.

Glen Canyon Dam Adaptive Management Program Adaptive Management Work Group Meeting, February 10-11, 2021

Thursday, February 11, 2021

Day 2 Webinar Information:

<https://bor.webex.com/bor/j.php?MTID=md00e5758d11f9cd0ad3e39d4a5f6709d>

Telephone: 415-527-5035 Passcode: 199 461 4466

DRAFT AGENDA

START TIME ¹ (Duration)	Thursday, February 11, 2021 Topic, Presenter, and Purpose ²
8:30 PST/ 9:30 MST (:15)	Welcome and Administrative: TBD, Secretary's Designee to the Adaptive Management Work Group <ul style="list-style-type: none"> ▪ Introductions and Determination of Quorum (13 members)
8:45 PST/ 9:45 MST (:45)	Federal Agency Updates (2-3 minutes each): <ul style="list-style-type: none"> ▪ GCDAMP Program Funding short-term and long-term (BOR, WAPA) ▪ ESA Update: Humpback chub, Razorback sucker, K. ambersnail (FWS) ▪ Non-native Aquatic Species Management Plan (NPS) ▪ LTEMP Litigation (DOI Solicitors Office) ▪ Additional Items <p><u>Additional Information:</u> 1) 2021 Consolidated Appropriations Act, Division D, Title III, Sec 306 2) PR: GCD Summer Ops 3) FRN Humpback chub 4) FRN Kanab ambersnail 5) NPS Expanded Management Plan, 6) Brown Trout Incentivized Harvest</p> <p><u>Purpose:</u> To share updates regarding current activities on the Colorado River that are pertinent to the GCDAMP.</p>
9:30 PST/ 10:30 MST (:45)	Stakeholder Updates (2-3 minutes each): <ul style="list-style-type: none"> ▪ States: AZDWR, AZGFD, CA, CO, NM, NV, UT, WY ▪ Tribes: Hopi, Hualapai, Navajo Nation, Pueblo of Zuni, Southern Paiute ▪ NGOs: Environmental (x2), Federal Power Purchasers (x2), Recreation (x2) <p><u>Purpose:</u> To share updates regarding current stakeholder activities on the Colorado River that are pertinent to the GCDAMP.</p>
10:15 PST/ 11:15 MST (:15)	BREAK

START TIME ¹ (Duration)	Thursday, February 11, 2021 Topic, Presenter, and Purpose ²
10:30 PST/ 11:30 MST (:45)	2021 GCDAMP Annual Reporting Meeting Update – Part 3: Mark Wimer, Acting Chief, Grand Canyon Monitoring and Research Center <ul style="list-style-type: none"> ▪ Presentation (30 minutes) ▪ Q&A and discussion (15 minutes) <p><u>Additional Information:</u> GCMRC 2020 Annual Report <u>Purpose:</u> To provide information regarding project work completed in FY20 and to inform work to be completed under the 2021-2023 triennial budget and work plan.</p>
11:15 PST/ 12:15 MST (1:30)	LUNCH
12:45 PST/ 1:45 MST (:30)	Technical Work Group Chair Report: Seth Shanahan, Technical Work Group Chair <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A, discussion (10 minutes) <p><u>Purpose:</u> To update AMWG members on the TWG meetings held October 2020 and January 2021.</p>
1:15 PST/ 2:15 MST (:30)	Stakeholder's Perspective—American Rivers: Matt Rice, Colorado River Basin Program Director, American Rivers <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) <p><u>Purpose:</u> Provide an introduction to American Rivers, outlining the organization's values, priorities, and major activities related to the Colorado River and the Glen Canyon Dam Adaptive Management Program.</p>
1:45 PST/ 2:45 MST (:15)	BREAK
2:00 PST/ 3:00 MST (:30)	Review of the 2007 Interim Guidelines (7.D. Review): Carly Jerla, Civil Engineer and Malcolm Wilson, Water Resources and Compliance Group Chief, Bureau of Reclamation <ul style="list-style-type: none"> ▪ Presentation (20 minutes) ▪ Q&A and discussion (10 minutes) <p><u>Additional information:</u> 7D Review website <u>Purpose:</u> Provide a basic overview of the process for the 2007 Interim Guidelines Review and summarize the findings of the Review Report.</p>

START TIME ¹ (Duration)	Thursday, February 11, 2021 Topic, Presenter, and Purpose ²
2:30 PST/ 3:30 MST (:45)	Potential Water Year 2021 Experiments: Lee Traynham, Bureau of Reclamation and Mark Wimer / Ted Kennedy, Grand Canyon Monitoring and Research Center <ul style="list-style-type: none"> ▪ Presentation (30 minutes) ▪ Q&A and discussion (15 minutes) <p><u>Purpose:</u> To update AMWG members on the process and possible LTEMP experiments that may be conducted in 2021.</p>
3:15 PST/ 4:15 MST (:10)	Public Comment
3:25 PST/ 4:25 MST (:05)	WRAP-UP: TBD, Secretary's Designee <ul style="list-style-type: none"> ▪ Next AMWG meeting dates: <ul style="list-style-type: none"> ○ May 19, 2021 (webinar) ○ August 18-19, 2021 ○ January 11-12, 2022 (Annual Reporting Meeting)
3:30 PST/ 4:30 MST	ADJOURN <ul style="list-style-type: none"> • Please fill out the meeting evaluation sheet at your place.

¹ Every effort will be made to adhere to the schedule and agenda, but on occasion, for unforeseen reasons, some modifications may occur.

² Action may be by consensus or a vote; and either may be a recommendation to the Secretary of the Interior or feedback to presenter(s) or to subordinate groups.

Draft Minutes & Action Items

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Glen Canyon Dam Adaptive Management Work Group Meeting August 19-20, 2020

Wednesday, August 19, 2020

Start Time: 9:30 am Mountain Daylight Time (MDT)

Conducting: Dr. Timothy “Tim” Petty, Assistant Secretary for Water and Science, Department of the Interior (DOI).

Recorder: Carliane Johnson, SeaJay Environmental, LLC.

Facilitator: Marlon Duke, Public Affairs Officer, Bureau of Reclamation, Upper Colorado Basin Region.

Welcome and Administrative

Presenters & Affiliation: Dr. Timothy “Tim” Petty, Assistant Secretary for Water and Science, DOI.

Introductions and Determination of Quorum (13 members)

Dr. Petty welcomed all new members and those who have been with the program a long time. He has been part of Administration since January 2018 and highlighted the following people on the call today:

- **Aubrey Bettencourt, Deputy Assistant Secretary for Water and Science, DOI.** This is her first Adaptive Management Work Group (AMWG) meeting. She has been with the U.S. Department of Agriculture for about a year, and prior to that worked on California water policy primarily associated with agriculture, but also Endangered Species Act (ESA) compliance, mitigation, water quality, and technology infrastructure.
- **Wayne Pullan, Acting Regional Director, Bureau of Reclamation (Reclamation), Upper Colorado Basin Regional Office.** He is acting in Brent Esplin’s former position.
- **Daniel Picard, Reclamation, Deputy Regional Director, Upper Colorado Basin Regional Office and Acting Designated Federal Office (DFO).** He is now serving as the Acting DFO.
- **Lee Traynham, Reclamation, Program Manager, Glen Canyon Dam Adaptive Management Program.** She has been with GCDAMP for just over a year and with Reclamation for seven years in a variety of roles.

A quorum was reached with 23 stakeholders represented by 30 AMWG members or their alternates.

Approval of February 12-13, 2020 Meeting Minutes

[Larry Stevens, Grand Canyon Wildlands Council (GCWC)] On page 21 of the February minutes, it was stated he was in favor of the pump storage facilities. That is a misinterpretation and needs to be corrected as well as one other correction sent by email to Lee. **[Steve Wolff, State of Wyoming]** Moved to approve the February minutes. **[Chris Harris, Colorado River Board of California (CRBC)]** Seconded. The minutes from the February 12-13, 2020 meeting, as distributed on July 28, 2020, were passed by consensus.

Approval of May 20, 2020 Meeting Minutes

No comments; no edits. **[Sara Price, Colorado River Commission of Nevada]** Moved to approve the May minutes. **[Vineetha Kartha, Arizona Department of Water Resources (ADWR)]** Seconded. The minutes from the May 20, 2020 meeting, as distributed on July 28, 2020, were passed by consensus.

Progress on Nominations and Reappointments [\[DOWNLOAD\]](#)

[Lee Traynham, Reclamation] As of Friday, August 14, 17 outstanding nominees had been appointed; four nominations are in process. Thanks to everyone for getting packages submitted during a very challenging time, and to Tara and to Dr. Petty's Chief of Staff, Kerry Rae, for assistance. All members are asked to take a meeting evaluation survey. Planning to provide an "AMWG 101" overview for some members. Would also like feedback on new members' experience with the Federal Advisory Committee (FAC). Every stakeholder, except for one, has a member or alternate in place on the AMWG.

Funding Status

Currently tracking the Energy and Water (E&W) Appropriations bill For Fiscal Year (FY) 2021 funding. The Glen Canyon Dam Adaptive Management Program (GCDAMP) is typically funded through hydropower revenues. ~~Due to~~ [Since](#) the 2019 Office of Management and Budget (OMB) Directive, ~~there must be direction from~~ Congress [has provided direction to regarding the](#) transfer [of](#) hydropower revenues to Reclamation from the Western Area Power Administration (WAPA). This funding supports the GCDAMP and several other programs associated with Colorado River storage facilities. The draft E&W bill in the House (now in House Resolution [H.R.] 7617) would allow for the full funding transfer to occur; however, we may end up operating under a Continuing Resolution ~~until the funding has been transferred.~~

Action Item Tracking Report [\[DOWNLOAD\]](#)

One item on the tracking report is related to the 20-year outlook of the Long-Term Experimental and Management Plan (LTEMP), which will be addressed through updates to guidance documents and the development of monitoring metrics. These are high priority items for Reclamation going forward.

General Awareness

Reclamation has had two new hires (Kerri Pedersen and Clarence Fullard). There will also be two vacancy announcements soon for the archeologist position and for tribal liaison. Hope to advertise and fill those new positions in early 2021. The facilitator contract is close to being awarded, and the science advisor contract is being drafted now and should be awarded in FY21.

During this meeting, we will be working on the work plan and budget to be submitted to DOI for the Secretary's approval. Later in FY21, we will focus on budget prioritization in an effort to mitigate for long-term funding uncertainty.

As a FAC, the charter needs to be renewed every two years; the AMWG Charter is due in September 2021. We will start working on that soon.

Memoriam: Charley Bullets, Kaibab Band of Paiute Indians and Southern Paiute Consortium

[Tim Petty, DOI and AMWG Chair] We recently experienced a great loss with our long-term AMWG member and representative of the Southern Paiute Consortium, Charley Bullets, who passed away suddenly in June 2020. It was a real privilege and honor to have worked with Charley these past three years. He was so enthusiastic and passionate about education, the Colorado River, and family. Many colleagues in Interior have sent condolences. He will be greatly missed.

Words of Remembrance Followed by a Moment of Silence

[Arden Kucate, Pueblo of Zuni] Charley was a special friend and today would have been his birthday. He came from the Kaibab Band of Paiute Indians. He was a great traditionalist; that he inherited through his grandfather and grandmother. He paved the way for the younger generation to understand traditional cultural values. Charley loved to instill his knowledge to others. His Indian name was Tiger. He wanted everyone to understand their connection to the river. We wish him well to the spirit world.

Additional Remarks

[Peter Bungart, Hualapai Tribe] Charley was known for his laughter and good humor. He was passionate about standing up for his people. When we lose someone with this strong sense of knowledge there is a tendency to feel an empty place. We should try to channel that spirit and the guidance they would have provided. Charley was a great voice in the program.

[John Jordan, Fly Fishers International (FFI)/Trout Unlimited] Ted Melis sent a lengthy recollection of his time with Charley, which was read to the group.

[Jakob Maase, Hopi Tribe] Charley always had a contagious spirit and laughter. He was also a colleague and friend who was very outspoken and direct. He will be missed, but as the Hopi say, he is well.

[Larry Stevens, GCWC] About 30 years ago when Larry and Charley first met, it was a rough start, but that edge softened as they spent time together. The high point was during the last river trip last year when Charley agreed to join the chorus of the humpback chub song.

COVID-19 Impacts to FY20 Workplan: Joel Sankey, U.S. Geological Survey (USGS), Grand Canyon Monitoring & Research Center (GCMRC)

Presentation ([DOWNLOAD](#))

[Joel Sankey, GCMRC] is a research scientist at GCMRC and has been acting as chief while Scott VanderKooi is completing a detail elsewhere. The presentation includes a timeline of COVID-19 impacts. GCMRC staff continue to conduct maximum telework with the exception of some laboratory work, field, and river opportunities. Of the trips for this year, 11 were cancelled and seven were postponed of which four of those have since launched and been completed while the rest were postponed to 2021.

Q&A and discussion

[Kelly Burke, GCWC] What is working and have there been any infections from the trips? **[Joel Sankey, GCMRC]** GCMRC has done a lot of work to keep people healthy. It is important that people show up healthy and COVID-free. So far, everything has gone well with no positive cases.

[Arden Kucate, Pueblo of Zuni] had recommended a while back to let Grand Canyon rejuvenate and see how the system reacts without any interference. **[Joel Sankey, GCMRC]** appreciates that comment.

FY2021-2023 Triennial Budget and Work Plan—Overview: Seth Shanahan, Technical Work Group (TWG) Chair; Craig Ellsworth, Budget Ad Hoc Group (BAHG) Chair; Lee Traynham, Reclamation; and Scott VanderKooi, GCMRC.

Presentations ([TWG Chair Presentation](#)) ([Reclamation Presentation](#)) ([GCMRC Presentation](#))

[Seth Shanahan, Southern Nevada Water Authority (SWNA) and TWG Chair] The first presentation summarizes the results of a long, deliberative process that the TWG and ad hoc groups went through to develop the final draft recommendation for the AMWG to consider. Many milestones were met. The action today is to provide input into the budget and recommend it to the Secretary for approval. Thanks

to many people who participated in the process that started back in October 2019. Thanks to Craig Ellsworth who led nine BAHG calls, and to the science advisors who were critical to the process. Additional changes were made after TWG's approval that were first seen July 29. These will be discussed today.

[Craig Ellsworth, WAPA and BAHG Chair] Thanks to the TWG members. This product is a reflection of long hours spent with GCMRC and Reclamation to work out all concerns. All products with respect to the BAHG process have been stored on the Wiki page.

[Lee Traynham, Reclamation] It was a great team effort and the leadership of Seth and Craig is appreciated. The second presentation shows an overview of the GCDAMP triennial budget, which is focused on implementing the 2016 LTEMP Record of Decision (ROD), addressing priorities outlined in the DOI guidance memo, and meeting compliance obligations. Reclamation's portion of the budget (20%) and workplan is focused on administering the AMWG and TWG; program management (e.g. contracting, permitting, facilitation, and other support services) and management actions; and supporting cultural and tribal resources. Highlights were shown of the budget changes made in response to comments received from stakeholders.

[Scott VanderKooi, GCMRC] Thanks to Seth, Craig, and Lee, and to everyone who contributed. It was a heavy lift. The third presentation highlights the GCMRC work plan, which is focused on LTEMP implementation and monitoring. The goal is to make sure conditions and resources can be monitored whether under an experiment or normal operations. Latest update on the Flagstaff new building is that the city was to approve the lease, but this has been delayed until maybe September. It will then take probably 18 months (around February 2022) before the move would occur.

Clarifying questions

[Steve Wolff, State of Wyoming] Will other non-federal partners have input into the prioritizations in 2021 that will be done by DOI? **[Lee Traynham, Reclamation]** Yes. DOI agencies would take a first cut at the draft particularly related to compliance requirements, then anticipate getting feedback from AMWG.

[David Brown, Grand Canyon River Guides (GCRG)] is interested in more specificity about what portion of B.2 was not funded and also B.5 that was not funded. What was the thinking? How the proposed changes in dam operations will affect High Flow Experiments (HFEs) and how release volumes affect sand storage seem like important questions. He is disappointed. **[Scott VanderKooi, GCMRC]** The original proposal for B.2 was to do channel mapping in two of the three years. This was reduced to one. B.5 was to update modeling, which was a tough one. Often there is a trade-off. This is important work, but difficult decisions had to be made, and more funding is needed. A number of things mentioned are covered by other elements, such as elements 1 and 2. Your comments are beneficial because if there is flexibility in the budget, there might be options later.

[Larry Stevens, GCWC] also agrees with the importance of those projects and hopes funding moves forward.

[Chris Cantrell, Arizona Game and Fish Department (AGFD)] There had been questions about dissolved oxygen issues as the LTEMP was being finished. There had also been a scare in Glen Canyon this past year with dissolved oxygen. It was thought that all had agreed some evaluations would be done of the dam to mitigate that. This is a big concern and the only option for AGFD to mitigate it is through stocking. **[Scott VanderKooi, GCMRC]** Know this is of concern and we are paying attention to it. GCMRC has oxygen sensors below the dam and at Lees Ferry. Believe there will be presentations about this on tomorrow's agenda. It is looking better than last year. The actions to take are more on the Reclamation

side. **[Lee Traynham, Reclamation]** This has definitely been a topic of conversation. Reclamation has an element for dissolved oxygen monitoring and risk assessment. We would like to understand if there is sufficient monitoring in place and understand the actual risks to determine the best mitigation strategies. It would be hard to mitigate this with dam operations because of the constraints, but there are alternatives that could be considered. This is also being discussed with Reclamation's Technical Service Center.

[Chris Cantrell, AZGFD] Is there a need for AMWG language for use of Native Fish Conservation Contingency funds? **[Lee Traynham, Reclamation]** Those funds are available and there is language that it can be used for emergencies. If an emergency is brewing, those conversations could start as soon as necessary.

[Leslie James, Colorado River Energy Distributors Association (CREDA)] Is it correct that Project B.2 is monitoring and Project B.5 is modeling? **[Scott VanderKooi, GCMRC]** Yes, that is correct.

[David Brown, GCRG] Is there a sense that if the model in Project B.5 were developed, it would help resolve some uncertainty regarding sediment? **[Paul Grams, GCMRC]** Other than improving and rebuilding the models, the biggest new thing would be to add fine sediment (silt and clay modeling), which the current models do not have. Other things to do would be incremental improvements and better calibrations. There has been support from other USGS offices in modeling streamflow in Grand Canyon. That may get us started, but not sure how far we would get. **[Lucas Bair, GCMRC]** Project J.1 is to develop predictive models for sandbars. This project would attempt to address some of David's and Larry's questions; specifically, sand input and hydrology scenarios in the long run. **[Paul Grams, GCMRC]** B.5 is rebuilding from the ground up those models that are currently being used, which must be done at some point. **[David Brown, GCRG]** There has been discussion about what would make a difference. If this model were produced, could it better inform that question? **[Paul Grams, GCMRC]** The kind of model we proposed was applied to the Lees Ferry reach, which was a test using a newer model. That is an example of what we propose for the rest of the canyon.

[Vineetha Kartha, ADWR] Project O is being funded by the C.5 Experimental Fund. Is it prudent to set aside C.5 funds to Project O given that it is not an LTEMP experiment? **[Lee Traynham, Reclamation]** The purpose for C.5 is to support LTEMP experiments and to address critical knowledge gaps. That is the priority. In past years, we have not needed all those funds. These went into the contingency fund, which is in good shape. There is interest in considering those funds for other purposes. One challenge about using that fund is uncertainty and timing. We want to be sure that we have sufficient funding to support LTEMP experiments if conditions allow. By spring, if Project O and the associated hydrograph were to be on the table, it would be tough to consider all the other things that might be competing for resources for the remainder of the year. We will need to make a judgement call at that time. **[Scott VanderKooi, GCMRC]** There are a number of things that are put forward out of the experimental fund that are condition-dependent and a decision has to be made by Reclamation whether to move forward. Project O is similar. It is not all-or-nothing. It is a little different than how other projects are done in the program. There will be difficult decisions to make depending on what happens this fall.

[Leslie James, CREDA] The GCPA does permit funding from other sources, so if folks have ideas for "outside" sources, here is a good opportunity to bolster funding.

[Kelly Burke, GCWC] We are actually in a position to be reasonably confident about what is likely to happen this fall. Because of timing with Project O, we might be able to evaluate that risk already before we move forward. **[Scott VanderKooi, GCMRC]** Agree, it seems unlikely to get inputs from the Paria, but things could turn around by the deadline. We have a number of decision points that will be part of the discussion.

[Larry Stevens, GCWC] Some stakeholders might think that Project O is not a critical need, but he disagrees with this. The longer-term perspective from springtime high flows are critical to gain knowledge about how the system responds. He encourages the group to think of the long game. **[David Brown, GCRG]** seconds Larry's comments about coming back to the big picture of the program in which learning seems to be a critical function. The opportunity to have a disturbance in the spring has been limited. Apron repairs have never been as low as 4,000 cubic feet per second (CFS) and the opportunity to ramp up quickly would answer some questions. It is not an HFE and circumstances are different, but it took nothing for an emergency response to ramp up the water in response to recent energy needs.

[Vineetha Kartha, ADWR] Agree with those above; not questioning the project itself, but clarity of the dollar amount and the process. Project C.5 does provide some leeway to help in the new studies.

[Steve Wolff, State of Wyoming] There is wide-spread support for a spring disturbance event; the question is how it gets funded. It should be part of the regular GCMRC program, it is a high priority.

[Peter Bungart, Hualapai Tribe] Given the flow regime for the apron repair, this is an essential situation to learn about the effects.

[Leslie James, CREDA] One clarification for David, the emergency operations that occurred this past week were addressed in the ROD. It may have appeared that they "just happened," but not really. Reclamation or WAPA could add details, if necessary.

FY2021-2023 Triennial Budget and Work Plan (TWP)—Discussion and Recommendation:

Discuss and determine consensus (or vote, if necessary) on each of the proposed changes to the budget

[Tim Petty, DOI and AMWG Chair] The end of this session will conclude with the third motion. We want to get to consensus. The dialogue is incredibly important. There are projects we all agree with; some we need to fine tune.

[Lee Traynham, Reclamation] We want to make sure we are capturing all elements of the discussion. We want to understand where the concerns are and what needs to be revised. The draft motion was proposed as follows: *AMWG recommends to the Secretary of the Interior the Glen Canyon Dam Adaptive Management Program Triennial Budget and Work Plan – Fiscal Years 2021-2023 (July 29, 2020 draft), subject to the following:....* This is where we want to start today.

[Leslie James, CREDA] The proposed deletion of a paragraph in Project N (page 312) as it is not relevant to the project is a joint suggestion from WAPA and CREDA.

[Lee Traynham, Reclamation] Is there any further discussion on this proposal for Project N?

[Scott VanderKooi, GCMRC] As Leslie said, WAPA and CREDA reached out to GCMRC. We have no issues with removing that language from the narrative of that project.

[Chris Cantrell, AZGFD] would like to see language to allow 20%, or not to exceed \$340,000, from the contingency fund for the National Park Service (NPS) to use in the Brown Trout Incentivized Harvest project. **[Steve Wolff, State of Wyoming]** Is that per year or for the three-year period? What are those estimated costs? **[Chris Cantrell, AZGFD]** The Year 1 funding has been limited. Reclamation is also going to provide some funding, but unfortunately, the rate is about \$25 per fish, which is not adequate to convince people to drive up there. It is estimated it would cost \$300,000 for mechanical removal. Anticipate this would be less if we saw the continued increase in brown trout. None of the funding has

to be spent unless the fish are removed. This would allow the program to be fully funded so it is not just a process we go through.

[John Jordan, FFI/Trout Unlimited] Would like to have the full name of the contingency fund added in there.

[Lee Traynham, Reclamation] Language added that this refers to Reclamation's Project Element C.6 Native Fish Conservation Contingency Fund.

[Ken Hyde, NPS] NPS has \$160,000 in funding that will start this fall and fund through FY2021. Added to that is \$100,000 over the next 2 years in Reclamation funding. We also have three additional years of funding starting in FY2022 of \$100,000 per year. We could look at bringing forth a proposal from partners to go to \$50 to \$66 per fish and then come back to this group reporting on successes, number of anglers, and then a follow-up discussion on either maintaining the rate or put the money toward removing more fish at an adjusted rate. This might augment the project. We also have GCMRC and Arizona State University staff helping with the social science and looking at different reward levels especially as we get into the hotter parts of the summer when anglers would be less likely to go fishing.

[Lee Traynham, Reclamation] It sounds as if the program funding is going well and this conversation on alternative funding sources might be more important after the first year of implementation. **[Ken Hyde]** Maybe add a bit more discussion about the funding payments.

[Lee Traynham, Reclamation] The NPS work is being conducted under their Expanded Non-Native Aquatic Species Management Plan, which is a separate effort from LTEMP. A previous discussion within the BAHG was whether the incentivized harvest project could be funded by the GCDAMP or not. There is interest in this project and it has a bearing on what we do, but without a more direct tie to mitigating dam operations, the LTEMP ROD, or a more imminent threat from brown trout on humpback chub, there was not consensus to put GCDAMP funds towards the Brown Trout Incentivized Harvest at that time.

[Seth Shanahan and Craig Ellsworth] Both agree with this summary.

[Chris Cantrell, AZGFD] Would add information about new surveys from Lees Ferry where 15-20% of the population is brown trout; another year of continuous increases. It is a win-win because if we are not removing brown trout, then that money is not being spent.

[John Jordan, FFI/Trout Unlimited] We were not part of that BAHG conversation. The reason for the contingency fund was for a catastrophic event. That fund has grown on the basis of unexpended experimental funds. Now it is at \$1.7 million. There haven't been any events that would have justified the expenditures. Don't preclude the incentivized harvest program, which is there to mitigate the potential of the threat. The way to keep that fund in place is to spend from it. The program benefits the humpback chub. The amount spent for mechanical removal would be greater than for the incentivized harvest.

[John Hamill, FFI/Trout Unlimited] There is a social aspect of this. Mechanical removal is of concern to tribal and fishing communities. Trying to do this program on a shoestring is not the way to get it off the ground. There is general consensus that \$25 per fish is not a strong incentive. It costs several hundred dollars per day to get a trip on the water. It is expensive to fish Lees Ferry and catch rates of brown trout there are small.

[John Jordan, FFI/Trout Unlimited] What is the timeframe of when there is a serious problem to consider? When the warning flag first came up that brown trout were out of control, the NPS was ready to go quickly with emergency mechanical removal. This is a preemptive program that would take a year

or more to get through this process if a threat came up. There is not more of a nexus to native fishes than there is with this proposal.

[Jeff Humphrey, USFWS] Are we incentivizing fishing or getting anglers to not release brown trout? The benchmark we are hearing from this conversation is the cost for anglers to get up there. Is the concern whether we are creating an industry when one already exists or are we trying to get anglers to put in a bit more effort when they do land a brown trout that is acceptable to the Tribes? What is an appropriate amount as opposed to “we’re just providing \$66 per fish”?

[John Hamill, FFI/Trout Unlimited] Think it is a little bit of both. We are going to try to attract a new breed of anglers. Fly fishing is not the most appropriate technique for brown trout and they have a culture of catch-and-release. There might be a new group who would specifically harvest all fish that are caught.

[Chris Cantrell, AZGFD] Initial goal of removal was around 2,400 to 2,500 individuals. At \$66 per fish, this would be maybe \$400,000 annually. He recommends reading the [brown trout report](#). That is a good place to start regarding concerns and different efficacies on how to manage that population.

[Jeff Humphrey, USFWS] Why hasn’t this been addressed in the TWP previously?

[Lee Traynham, Reclamation] Where the TWG and BAHG landed, in order to justify use of GCDAMP funding, there is a requirement to tie a proposal directly to mitigating for dam operations or to compliance obligations such as with the ESA. The consensus of the groups was that there was not that connection to consider this project for GCDAMP funding.

[Kirk Young, USFWS] If mechanical removal is needed in the Little Colorado River, it would be around \$2 million. He supports a solution to brown trout, but there is still an uncertain budget. Incentivized harvest is an experiment (not a treatment) to see if it is successful. There needs to be the option to take action, if it is needed. He recommends allowing the fund to accumulate and not deplete it.

[Lee Traynham, Reclamation] Would like to see language that commits the group to revisit this topic in FY21 and consider a recommendation that addresses the concerns heard today, if appropriate.

[Chris Cantrell, AZGFD] Twenty percent is a middle ground that gives flexibility to the NPS.

[Steve Wolff, State of Wyoming] Is it worthwhile to say, “All other available funds will be spent first, and the Native Fish Contingency Fund will be used as a backstop”?

[Lee Traynham, Reclamation] Drafted language: “Only following expenditure of other available funding, up to 20% or not to exceed \$340,000 from Reclamation’s Project Element C.6 Native Fish Conservation Contingency Fund will be considered available for NPS to use on the Incentivized Brown Trout Removal Project.”

[Brian Sadler, WAPA] We need to address what projects would be part of the GCDAMP authority.

[Rodney Smith, DOI Office of the Solicitor] We will need to connect the dots between the desired use and whether it fits within existing authority. This is typically done during the budget process. It is difficult to do this assessment on the fly.

[Chris Cantrell, AZGFD] The brown trout white paper conclusion statement says that the most plausible hypotheses are dam operations and fall HFEs. These are absolutely connections that cannot be ignored.

[Leslie James, CREDA] If there is a clear nexus from fall HFEs, then why continue to consider them? She has concerns about the authority as well for this type of work and regrets not having these conversations during the BAHG calls this summer. Nervous to craft this language on the fly.

[Shane Capron, WAPA] This discussion has come up at various times. The question is whether it crosses the fine line of funding the fishery, which been determined to be outside of GCDAMP funds. The question for Rod and others is whether to fund the fishery with power revenues. WAPA has been supportive of incentivized harvest, but would like to find ways to fund it without power revenues.

[Jan Balsom, NPS-Grand Canyon National Park (GRCA)] Whether fall HFEs are the culprit is still at the hypothesis stage. Chris Cantrell and others have spoken as to why we would like to take care of this before it becomes a problem. The incentivized harvest program does this and it is culturally sensitive. It is an important piece of the adaptive management process to address an emerging threat that is effective and integrates all stakeholders.

[Tim Petty, DOI and AMWG Chair] Bigger concern about [the Brown Trout Incentivized Harvest proposal] is whether to take it back to the TWG to work out the details. Also need this conversation on Project O. Need confidence to bring it to the Secretary.

[Steve Wolff, State of Wyoming] An email was sent out about proposed language for Project O. The water and power group (States and power representatives) has been discussing how to move this forward. Would not like to defer this any further. The proposal is for a one-year spring disturbance flow. There is wide support, but the concern is how the monitoring effort gets funded. This language would support a portion of the proposal as a one-year effort under the experimental fund.

[Leslie James, CREDA] All involved in the FLAHG discussion saw CREDA's comments on the Resources and Analysis paper. Part of this issue is the process. CREDA has been very supportive of the FLAHG work and the concept of within-powerplant-capacity disturbances. CREDA is not opposed, but just wants to be sure that the focus of this spring disturbance is clear, we have the resources to monitor the effects on the hypotheses that are most appropriate, and we are doing it within the constraints of the available funding. It is both process and substance. Have not heard anyone opposed to a spring disturbance.

[Larry Stevens, GCWC] Ted Kennedy developed a plan so we can learn from Project O within the timeframe of the TWP. Grand Canyon Wildlands Council fully endorses this. Only concern is there might not be enough attention to the timing related to the food base and whether we can synthesize enough information to clarify thinking of springtime HFEs for future planning. Perhaps pay more attention to the larger vision of the event.

[Joel Sankey, GCMRC] Project O was a recommendation that came out of the June TWG meeting and wrote the proposal in record time. It did not go through the usual round of revisions and reviews. It has been challenging because it is a hypothetical project with a hypothetical flow and it has happened in parallel with the FLAHG's process to review predicted effects, which has not been concluded. Anything decided today has to be something GCMRC can do that does not hold up the rest of the TWP.

[Steve Wolff, State of Wyoming] Think GCMRC did a great job putting Project O together in such a short time. His concerns only relate to how the project is being funded -- not how it was written.

[David Brown, GCRG] appreciates the support that the spring disturbance flow and concept has and concerns about the process. The concern about where funding comes from makes sense. The compromise resolution from Steve is a step in the right direction.

[Jan Balsom, NPS-GRCA] acknowledges the FLAHG work and amazing how quickly Project O came together. There is the need for the FLAHG to continue looking at experimental flows, and a need to develop a project design for a hypothetical flow that has not been approved. Having seen the river at 2,500 CFS, there is a process that we need to go through to figure out where this fits in the budget. More conversation is needed about nailing down a science plan for a hypothetical flow that we do not

know when it will occur. There are also things in the last version of the plan that still need to be addressed.

[Scott VanderKooi, GCMRC] GCMRC had tried to address the initial charge from the FLAHG by having elements in projects to address that, which was found to be unacceptable. Joel Sankey and Ted Kennedy tried again but want to be careful about rushing this. There is good work here and some needed revisions. Everyone is invested in this and wants to see a solution to reach consensus.

[Lee Traynham, Reclamation] Have three amendments to the proposed motion. Seems we have consensus on Project N. For the brown trout language may need to clarify language and to resolve question on funding authority. Several edits received on Project O to work through tonight with better language for the morning's discussions.

[Steve Wolff, State of Wyoming] If there was a spring disturbance flow in FY21, would GCMRC know enough to write a full-scale project for the following years? Or is a full, three-year project needed?

[Joel Sankey, GCMRC] GCMRC wrote Project O not knowing when this flow might occur. For the purpose of writing a work plan, Year 1 is 2021, which assumes this flow might occur next spring. Year 1 was proposed to be data collection for every possible resource that the FLAHG was considering. Year 2 would be to analyze and interpret the data, then report the learnings to the stakeholders. Year 3 (to get at Steve's question) would be to apply what was learned to future scenarios. That gets at some of GCMRC's concerns regarding limiting the monitoring to a few resources during the spring flow, which would address the unresolved FLAHG process of evaluating predicated effects. If Project O gets pared down to only the first year, then GCMRC would only collect data and not apply the learnings.

[Kelly Burke, GCWC] It would be useful to go back through the framework that got us here with the emphasis on a spring high flow. There are steps along the way that have led us to now. Those parameters make it important for us to consider what happens if we focus more on process rather than the substance of what we want to achieve. The most beneficial hydrograph looks to be the apron repairs, which would give us the biggest range. If we can proceed with the project as Joel described, that would set us up better for the next TWP. Worse-case scenario would be not having this learning for another six years.

[Scott VanderKooi, GCMRC] GCMRC has a lot of concerns and is worried about rushing this forward. One observation about the second bullet is that it was originally proposed in the third TWP draft. The constraints add real challenges such as saying GCMRC can't add an additional researcher. This is basically an unfunded mandate to do research without additional staff. GCMRC proposes pulling Project O from the work plan and having additional discussions with the TWG and others to make sure we have a fully workable proposal that has consensus.

[Steve Wolff, State of Wyoming] Appreciates those comments. Did not want to push any unfunded work on GCMRC. Biggest concern is about where the funding is coming from. Could fully support deferring this.

[Leslie James, CREDA] Agrees with this.

[David Brown, GCRG] Would Scott be comfortable with the Project O that was originally proposed? Is parsing it out the problem? **[Scott VanderKooi, GCMRC]** It is more of a concern being presumptive about the effects. Still working through the predictive effects document and what the final flow might look like. It seems premature to be picking and choosing what to include or not. The proposed project was to meet with the spirit of the recommendation of an interdisciplinary idea that met the FLAHG charge in which maybe not everything would be needed and things would be pulled out. It seems premature to do that now.

[Joel Sankey, GCMRC] Agrees with this. The concern is focusing only on these three elements when the FLAHG has not resolved the predicted effects. This is why an interdisciplinary project was proposed. The \$150,000 proposed for Year 1 is not enough to cover those three elements plus the additional researcher to assist in the data interpretation and analysis.

[Larry Stevens, GCWC] We trust USGS on the science so putting constraints on a potentially invaluable project before we understand the issues seems short-sighted. Why not support the project as is?

[Lee Traynham, Reclamation] It would be a disservice to the group to approve a recommendation that our science partners can't implement. There is comfort in sending this back to the TWG, which may clear up the direction that needs to be taken. There is alternative language for that approach, which can be reviewed tonight.

[Seth Shanahan, SWNA and TWG Chair] As a reminder, the TWG had approved this – but for asking GCMRC to find a way to incorporate the project and to find the budget. GCMRC staff are commended in this effort. It is a reasonable request to have the TWG and BAHG think through the specifics in the same fashion as every other budget item. The TWG has the time and space to do that because its next meeting is in October.

[John Hamill, FFI/Trout Unlimited] Concerned that it is August now and this would be a major event that would occur in March. GCMRC needs time to gear up for that. Could we consider an approach to submit comments to Reclamation and GCMRC over the next couple of weeks so that those agencies can consider them and submit an alternative proposal for consideration by the TWG with a recommendation to the AMWG?

[Seth Shanahan, SWNA and TWG Chair] BAHG could also provide input on this. Some of this is also for the FLAHG to review for a hydrograph recommendation and monitoring, which has not occurred yet.

[Jan Balsom, NPS-GRCA] Understood there would be flexibility if a flow were scheduled, it would not have to happen in March 2021. It could happen in spring 2022. **[Lee Traynham, Reclamation]** Reclamation has that flexibility. Facilities staff have confirmed this.

[Larry Stevens, GCWC] To clarify, if it does not occur in 2021, the learning could not take place within this work plan. It would be optimal to have it this spring to wrap up the learning process in this timeframe. As Joel explained, this is mostly a data process. It takes a lot of time to integrate this information. Then the third year of the TWP, information would be available for the process of planning for the next TWP.

[Leslie James, CREDA] We have been in that same situation with the bug flows. Not sure this is a deal killer.

[Lee Traynham, Reclamation] We will put together language to move this back to the TWG for consideration. This would mean deferring Project O until sometime in the near future, still within the current work plan, to continue these discussions for a project that would potentially occur next spring.

[John Jordan, FFI/Trout Unlimited] There are favorable things to see in the suggested motion from the power and water group. A concern about sending this back is that it will only work if there is a tight timeframe. This is not the initiation of a new process. Any *ad hoc* group [recommendations need] to be consolidated in the TWG. Want to make sure there is no slow walking this. Comfortable with the proposed amendments at this time. **[Vineetha Kartha, ADWR]** Can we develop a timeframe that is attached to the deferment? **[Lee Traynham, Reclamation]** The language includes a suggestion about the timeframe and comment submittals in order to expedite the process. These suggestions will help.

[John Jordan, FFI/Trout Unlimited] If approved by AMWG in February, could GCMRC move on the project by March? **[Scott VanderKooi, GCMRC]** If GCMRC has direction, GCMRC can stage itself to implement it. The hope is that GCMRC would have a sense of what might be needed and would be able to start those preparations.

[John Jordan, FFI/Trout Unlimited] Would it be possible to call an AMWG meeting with a one-item issue? **[Lee Traynham, Reclamation]** Yes, that can be done. Would just need to comply with Federal Advisory Committee Act (FACA) requirements.

[Peter Bungart, Hualapai Tribe] Would also recommend convening an *ad hoc* AMWG meeting on this one issue.

[Lee Traynham, Reclamation] Tomorrow's agenda may have 30-45 minutes to reach a recommendation. It seems there is good comfort with the Project N amendment. There is another proposal from Chris Cantrell that needs to be reviewed by DOI and others interested in getting together offline. We will revise the third amendment to defer Project O and will ask the TWG to consider the proposal and return with a recommendation. We will expedite the process to review and incorporate AMWG member comments.

Tribal Liaison Report: Theresa Pasqual, Tribal Liaison for the GCDAMP

Presentation (no visual provided)

[Theresa Pasqual, Joint Tribal Liaison] The role of the Tribal Liaison is an integral part of GCDAMP. Since COVID-19, each of us has become keenly aware how we have been affected including how we conduct business and the impact on tribal communities regarding how we communicate during these times of closures and other restrictions. This support really took priority especially as tribes have been disproportionately affected. Tribes have lost a number of their knowledge keepers during this pandemic. This has left the tribes struggling as to how to maintain our cultural health and well-being for the younger generation. Everyone is commended for stepping outside of the box to communicate with each other especially for Tribal colleagues who had difficulties accessing their offices. Appreciate the effort to get everyone fully involved in the TWP process. Tribal colleagues have been able to remain involved despite all the hurdles. The TWP is not perfect; however, much work was done to get projects submitted by tribes to ensure their perspectives were included. There is still much work that needs to be done to incorporate this multi-layered view and this remains a challenge for future work plans. There continues to be an expressed frustration that the scientific approach that has been used excludes Tribal Knowledge. This is a challenge to the program as a whole to make room for that information. Regarding the loss of Charley, Theresa has reached out to Chairwoman Ona Segundo to get guidance on who they will nominate for the Southern Paiute representation. Thanks to all who contributed in Charley's memory.

Basin Hydrology and Operations: Heather Patno, Hydraulic Engineer, Reclamation

Presentation ([DOWNLOAD](#))

[Heather Patno, Reclamation] This year has been very dry in the Upper Colorado with more precipitation in the lower part of the basin. Last year's snowpack was above average, which caused high base flows; however, it was a very dry fall and that carried over into this year. Conditions dried out in April, which is what caused the precipitous drop in forecasted runoff with nothing coming into the system. Forecasts are based on predictions of average precipitation and temperature into the future. The precipitation was significantly below average and the temperatures were above average. Between April and July, this was the 11th driest on record for unregulated flows into Lake Powell. Although it was

a dry year, we held onto that snowpack until the peak occurred at a normal time before coming down. Upper basin storage is under normal conditions and will be decreasing through the winter into next spring when we see 2021 runoff. The Green River had the most precipitation this year with Fontenelle and Flaming Gorge reservoirs at close to average in unregulated inflows. For Water Year 2021, the August most probable forecast of unregulated inflow is 80% of the average. The August 24-month study for Upper Colorado Basin sets the operational tier for 2021. The April 24-month study is used to see if there needs to be an adjustment to Balancing when operating under the Upper Elevation Balancing Tier. Taking that WY2021 forecast, with 80% of average runoff, we are in the Upper Elevation Balancing Tier in WY2021 and projecting an April adjustment to Balancing under the most probably scenario. It is important to note that the maximum probable water release would be similar to 2020 conditions with Mead elevation ending the water year above 1,075 ft and the annual release volume remaining at 8.23 maf. We are also not showing the potential for an adjustment to Equalization at this time. All of the proposed 2021 release schedules are compliant with the LTEMP ROD and the Interim Guidelines. A table of Glen Canyon Dam's maintenance schedule was also provided. There have been delays due to COVID-19 concerns about getting contractors into Glen Canyon and that has shifted the transformer replacement schedule.

Reclamation implemented the Emergency Exception Criteria at GCD in August at the request of WAPA and to assist California ISO emergency energy needs. The forecasted, continued, high temperatures should not require Emergency Exception Criteria; however, there is the potential to move water in September, if it should be needed. If that happens, it would likely be only 3,000 to 4,000 acre feet. Right now, the temperature around the penstock is normal for this time of year. The reservoir has thermally stratified with not a lot of mixing occurring. The pandemic has not allowed the normal surveys to occur so there is no updated dissolved oxygen information available except for directly below the dam from GCRMC and at key points within the reservoir. Dissolved oxygen is higher than last year. The conditions this year are not the same as in 2019 with low elevations and a 50-foot increase in elevation from spring runoff, so low dissolved oxygen is not of concern. If anything changes, Reclamation will communicate that with the group.

Q&A and discussion

[Steve Wolff, State of Wyoming] requests this presentation be emailed to members.

[Tim Petty, DOI and AMWG Chair] Those who are new and have not participated in the hydrology presentation, don't feel too overwhelmed by it. There is a lot of information in those slides once you become familiar with them.

Public Comments

None heard.

Closing Comments

[Lee Traynham, Reclamation] Today's discussion was really productive and appreciated. Action items:

1. Circulate the verbiage discussed today for a potential budget motion to consider tomorrow; and
2. Move around a few things on the agenda for Day 2.

First Day Meeting Adjourned at 5:00 pm MDT

Thursday, August 20, 2020

Start Time: 9:30 am MDT

Welcome and Administrative: Tim Petty, Assistant Secretary for Water and Science, Department of the Interior and Secretary's Designee

Introductions and Determination of Quorum (13 members)

[Tim Petty, DOI and AMWG Chair] Greatly appreciate all the effort yesterday and getting ready for Day 2. One thing to emphasize is to stay on the agenda timeframes because our goal is that much of this has been worked through by the TWG and BAHG.

[Lee Traynham, Reclamation] A quorum of 31 members or alternates are present representing 22 stakeholder groups.

[Tim Petty, DOI and AMWG Chair] The agenda was changed by moving federal agency updates in order to continue the discussion about the TWP. If we can't get to an agreement quickly, then will ask that Lee and Rod move us back to meeting in a subgroup to work through the wording.

FY2021-2023 TWP — Discussion and Recommendation (continued):

Discuss and determine consensus (or vote, if necessary) on each of the proposed changes to the budget

[Lee Traynham, Reclamation] A draft motion was presented with the following three items:

- Remove certain verbiage from GCMRC Project N.
- NPS does not have the need for additional federal funding right now for the Incentivized Brown Trout Removal Project; Ken Hyde (NPS) does have funding to implement it this year. NPS will come back to AMWG and TWG to report on status of the incentivized harvest program and figure out if there is need for additional funding, including looking at the Native Fish Conservation Contingency Fund as a possible source. As a result, consideration of this project using Native Fish Conservation Contingency Funds will be deferred, but may be revisited during the normal budget review process next year. [Chris Cantrell and Ken Hyde concur].
- Changes to Project O have been made that would defer it until the TWG can take another look to address comments from multiple members. The language also establishes a timeline.

[Larry Stevens, GCWC] That language seems to capture it. The reason for the compressed dates is to make sure the process can be fully vetted and implemented in time for a spring 2021 test flow. We want to make sure this information gets incorporated into the learnings of the TWP.

[Scott VanderKooi, GCMRC] For the October 7 date, GCMRC typically tries to get material to the TWG two weeks in advance of a meeting to make sure they have adequate time to review. It would be fine to move this earlier. All the other dates work.

[Seth Shanahan, SWNA and TWG Chair] Not opposed to pushing the TWG meeting back and making additional time available. The FLAHG conversations have been very helpful, but there are some technical discussions that have not been completed. We need to think through what is proposed and make sure that the FLAHG approves the approach. The ideal situation is that the FLAHG has enough time to make a recommendation, as well, on the hydrograph to meet the objective.

[Peggy Roefer, Colorado River Commission of Nevada (CRCN) and FLAHG Chair] is good with these dates. The FLAHG just needs to get the effects document and the hydrograph done. When does the AMWG have to approve this? **[Lee Traynham, Reclamation]** There needs be consensus from the AMWG

to move forward. As soon as the hydrograph is proposed and approved, then Reclamation and GCMRC can move forward with planning and preparation. The process for implementation begins in January of each year with the annual reporting meeting.

[Scott VanderKooi, GCMRC] November is a much better date for GCMRC to mobilize in time for March. If there is approval from AMWG, then GCMRC can at least start preparing before final approval by DOI.

[Joel Sankey, GCMRC] It is important that the FLAHG works through this effects document. GCMRC can probably get comments back on that document by mid-September at the latest.

[Peggy Roefer, CRCN and FLAHG Chair] It is hoped that the next time going to the FLAHG, the effects document is approved so it can be distributed with the hydrograph. Don't know how many meetings that will take.

[Seth Shanahan, SWNA and TWG Chair] AMWG needs to understand the importance of these documents together. The FLAHG was having conversations about the hydrograph itself and then identifying the benefits (i.e., the predicted effects). Now the stage is set for the monitoring and science. Some of this might have been out of sequence with what was proposed in Project O. It is helpful for the FLAHG to revisit these effects.

[Lee Traynham, Reclamation] is not hearing any opposition other than a comment to move the October 7 date. Do we bump the date up or move the TWG meeting out? **[Scott VanderKooi, GCMRC]** Either works for GCMRC. **[Joel Sankey, GCMRC]** If it is possible to move the TWG back that would allow the FLAHG process to move in parallel. **[John Jordan, FFI/Trout Unlimited]** There is more flexibility now in moving dates while we are remote, if Seth would be amenable to moving the TWG meeting. **[Lee Traynham, Reclamation]** Suggests removing the specific date and referring to it as the "October 2020 TWG meeting." First paragraph has a new section related to the apron repairs and the planning of a springtime HFE.

[Rod Smith, DOI Office of the Solicitor] recommends inserting planning language to be consistent with authorities.

[Scott VanderKooi, GCMRC] Element O.1 is about monitoring and is not related to flow itself.

[Vineetha Kartha, ADWR] had requested adding language related to the Experimental Management Fund and clarification about when it is approved.

[Jan Balsom, NPS-GRCA] Do we want to be more flexible than locked into a springtime 2021 flow? **[John Jordan, FFI/Trout Unlimited]** If that occurs, we should deal with it then. We should not equivocate if there is a willingness to do this in spring 2021. **[Kelly Burke, GCWC]** Agrees with John and there are avenues to deal with that in future. **[Vineetha Kartha, ADWR]** understands Jan's questions and suggests language that the flow be in tandem with the apron repairs. **[Jan Balsom, NPS-GRCA]** That is it exactly. **[Vineetha Kartha, ADWR]** Suggests language that is acceptable. **[Kelly Burke, GCWC]** We have a process for the final approval of the flow.

Motion:

AMWG recommends to the Secretary of the Interior the Glen Canyon Dam Adaptive Management Program Triennial Budget and Work Plan—Fiscal Years 2021-2023 (July 29, 2020 draft), subject to the following:

- Removal from GCMRC Project N the following verbiage:

Past research into changes in regional energy costs attributed to alteration of GCD operations have shown that no changes occur in hourly prices (U.S. Department of Interior, 2016b). Specifically, hourly energy prices at the regional hub important to GCD (Palo Verde) remain approximately the same with variation in production of energy at GCD. In addition, the analysis of experiments is a short-run analysis, assuming that demand for energy is inelastic (demand does not change with small changes in prices) and surplus power capacity exists. Therefore, changes in \$/MW and \$/MWh are accurate representations of the changes in consumer and producer surplus when evaluating minor, short-run changes in GCD operations. However, long-run changes in the energy sector may lead to a different economic outcome and a more complete modeling approach would be required. The evaluation of GCD operation and long-run changes in the electricity sector such as the integration of renewable energy, repurposing of federal hydropower resources, or power system capacity expansion would require a significant increase in research scope.

- Consideration of GCMRC Project O is deferred, but will be included in the 2021-2023 Triennial Budget and Work Plan as a proposal to be considered for the Reclamation C.5 Experimental Management Fund, pending revisions to be made by GCMRC and the Bureau of Reclamation and review by the Technical Work Group. After consideration and if recommended by AMWG, a springtime disturbance flow will be planned to occur in coordination with Glen Canyon Dam apron repairs, to ensure sufficient time to integrate the information and learning about the importance of springtime high flows into the 2021-2023 TWP, subject to an evaluation of the resource conditions described in the LTEMP ROD.

AMWG acknowledges and appreciates the effort to develop Project O in response to elements of the TWG Recommendation for the 2021-2023 Triennial Budget and Work Plan, consistent with guidance from the Secretary's Designee (memo issued August 14, 2019), and in support of the Flow Ad Hoc Group charge. GCMRC is commended for their effort.

AMWG members will submit written comments to GCMRC and Reclamation on Project O no later than Friday, September 4, 2020. GCMRC and Reclamation will make revisions based on comments received and will submit the revised Project O plan for TWG consideration by Wednesday, October 7, 2020, for discussion at the October 2020 TWG meeting. AMWG directs the TWG to review the revised Project O and to forward a revised Project O recommendation for AMWG consideration no later than Friday, October 30, 2020. The AMWG will act on the TWG recommendation no later than Friday, November 20, 2020.

[John Jordan, FFI/Trout Unlimited] moves the motion. **[Larry Stevens, GCWC]** Seconded. Unanimous consent on the motion.

[Lee Traynham, Reclamation] will make sure the motion gets posted to the website and will get the TWP in front of the Secretary as soon as possible. Thanks to everyone for the huge effort and participation.

Federal Agency Updates:

GCDAMP Program Funding short-term and long-term (Reclamation, WAPA)

- **[Kathy Callister, Reclamation]** On the long-term update, Reclamation continues to work with partners of the GCDAMP program and two recovery programs on FY23 and beyond. Work groups are meeting regularly with the Upper Colorado River and San Juan River Recovery Implementation Programs and making progress, but it is slower than expected due to COVID-19. **[Lee Traynham, Reclamation]** Short-term updates were discussed yesterday about language in the draft House-approved E&W Appropriations bill that would allow for hydropower revenues to be moved from WAPA to Reclamation to support this program. We will keep tracking that.
- **[Brian Sadler, WAPA]** As of August 17, there was \$138 million in the revolving fund, which is quite a bit less than the end-of year target of \$175 million. The projected end-of-year balance at end of September is \$133 million. This includes the expectation of transferring \$21.4 million back to the general fund of the Treasury and the \$21.4 million that was transferred to the program earlier this year.

Glen Canyon Dam Emergency Exception Criteria (WAPA): [Tim Vigil, WAPA] Starting last Friday, requests were coming in from the California Independent System Operator (CAISO) to provide emergency assistance, which was provided over four days. There are very stringent requirements when this occurs to make sure they have exhausted all other resources. A total of 1,872 megawatts (MW) of emergency assistance was provided and 565 MW to ramp down the units.

ESA Update: Humpback chub, Razorback sucker, Kanab ambersnail status (USFWS) [Jeff Humphrey, USFWS] Three listing actions are underway. 1) A proposed downlisting of humpback chub has been published. Navajo Nation requested a consultation. The Upper Basin Program is the lead for the recovery and the development of the proposed downlisting. They have not heard back yet from Navajo Nation about the proposal and it is requested that someone loop back on that. 2) Razorback sucker is heading toward a potential downlisting. The species status assessment has been through public comment and peer review. From this, the Upper Basin will likely be developing a proposal for downlisting. 3) Kanab ambersnail has been proposed for delisting based on its taxonomic uncertainty. That rule has been moving forward to the Federal Register, but the schedule for that is not known. **[Richard Begay, Navajo Nation]** had reached out to the Hualapai Fish and Wildlife Department to connect with you [USFWS] about the humpback chub downlisting and will remind them about this.

Expanded Non-native Aquatic Species Management Plan (NPS): [Billy Schott, NPS] Visitations continue, but have changed with no bus or international travelers. There has been increased use of Glen Canyon at Lees Ferry by anglers and by small craft water recreation such as paddleboards and kayaks, which might be causing visitor conflicts with restrooms, campgrounds, and beach use. There was funding to look into this, but it was postponed to next year due to COVID-19. Quite a few fishing guides in the Marble Canyon area have shifted their business model to back hauling and paddle operations. The Lees Ferry campground is one of the last that remains closed. If it is still closed this fall, the NPS will use it for administrative purposes.

[Ken Hyde, NPS] NPS was on the river with AGFD and found some green sunfish reproducing. A complete pump down will be done of the slough. Sixty fish were collected and will be sent to the AGFD

lab to verify they do not have any diseases or parasites. Also plan to collect the majority that are left, keep them quarantined, then release them into the Arizona portion of Lake Powell, upstream of the dam. There is \$160,000 in NPS funds to cover the Incentivized Harvest Program, including rewards to anglers, tribal guided fishing trips, and a tournament or two. Have an agreement with Reclamation to receive \$100,000 to augment that program. Also heard that NPS has half of needed funding for FY22, 23 and 24 from NPS Natural Resource Funds. Anticipating the dead zone will be much worse this year.

[Jan Balsom, NPS-GRCA] NPS has tried to reduce the number of people on commercial trips on the river, reduced the number of launches, and separated out launches so no two companies are at the ramp at the same time to reduce congestion. Becoming more comfortable about visitors and staff in those areas.

[Rob Billerbeck, NPS] An invasive species river trip last week found a few aggregations at different places of what could be reproducing green sunfish, but still need to confirm identifications. Some were found in Kanab Creek, which could indicate a source farther up. Also found some downstream at Grand Canyon West at River Mile 243. More are being found in western Grand Canyon during juvenile chub monitoring trips.

LTEMP Litigation (DOI Solicitor)

[Rodney Smith, DOI Office of the Solicitor] Recall that the Save the Colorado, Living Rivers, and Center for Biological Diversity had challenged 2016 LTEMP on National Environmental Policy Act grounds due to climate change effects and GCD removal not being considered in detail. The case is still in the early phases and figuring out the scope of the Administrative Record, which was filed on June 2nd, consisting of about 8,000 documents. The Parties are reviewing that record. We will learn by August 28 if there are challenges to its scope. If it is good, then the case will go straight to briefing.

Additional Information: 1) [H.R. 7617 - 2021 E&W Funding](#) 2) [PR: GCD Summer Ops](#) 3) [Federal Register Notice \(FRN\) Humpback chub](#) 4) [FRN Kanab ambersnail](#) 5) [NPS Expanded Management Plan](#)

Stakeholder's Perspective—State of Arizona: Clint Chandler and Vineetha Kartha, Arizona Department of Water Resources

Presentation ([DOWNLOAD](#))

[Vineetha Kartha, ADWR] discussed Arizona's water management successes and challenges. A 2018 law now allows for recycling of water for potable use. Groundwater is a finite resource and sometimes its recharge is not possible. The 1980 Groundwater Management Code was implemented to address severe groundwater depletion. Both groundwater and Colorado River water are priority-based systems.

LTEMP Experiments Considered & Implemented for WY2020 and WY2021: Lee Traynham, Reclamation; Joel Sankey, GCMRC

Presentation ([DOWNLOAD](#))

[Lee Traynham, Reclamation] provided a summary of the LTEMP flow experiments possible for implementation in 2021. **[Joel Sankey, GCMRC]** The process for triggering a fall HFE includes monitoring inputs of sand to the Colorado River from the Paria River, estimating the amount of sand exported from Marble Canyon, and evaluating the difference between the two in order to ensure a positive or neutral sand mass balance. **[Jeremiah Drewel, Reclamation]** discussed the sand budget model results. There is

not sufficient sand to support an HFE. **[Joel Sankey, GCMRC]** The “bug flows” experiment is in its third year. Monitoring continues to occur despite the pandemic, although half of what it was previously. It is still too early to say anything about the results from this summer. In Project E, preliminary study findings suggest decreased turbidity during the weekends resulting in 25% higher primary production.

Q&A and discussion

[Larry Stevens, GCWC] As curator of the Museum of Northern Arizona, Larry said he is more than happy to receive non-riverine and terrestrial insects through a Memorandum of Understanding with GCMRC. He appreciates their attention to those collections.

[Kurt Dongoske, Pueblo of Zuni] An important and significant aspect of Trout Management Flows, in addition to the questions on design, we know that several stakeholders have concerns about the taking of life. Consultations are an important step that would precede any discussion of potential implementation.

Stakeholder Updates:

States: AZ (ADWR, AGFD), CA, CO, NM, NV, UT, WY

[Charlie Ferrantelli, State of Wyoming] No updates.

[Scott McGettigan, State of Utah] There will be a presentation later about the Lake Powell Pipeline. No other updates.

[Sara Price, CRCN] No updates.

[Paul Harms, State of New Mexico] The San Juan Recovery Program and the Upper Colorado River Endangered Fish Recovery Program have similar budget concerns related to those of the Glen Canyon Dam Adaptive Management Program. **[Arianne Singer, State of New Mexico]** New AMWG member who is an attorney who worked on adjudication of Indian Water Rights Settlements and most recently worked on implementation of the Navajo Gallup Water Supply pipeline project.

[John McClow, State of Colorado] Making progress of the Colorado Water Conservation Board on its Demand Management Feasibility Investigation. A work group was commissioned to analyze the issues and their report was recently published. The board is taking public input now. On September 2nd, the board will hold a working session to decide on next steps.

[Chris Harris, Colorado River Board of California] California is in a profound and historic heat wave with a lot of lightning strikes and fires. Very much appreciate that the Glen Canyon Dam hydropower was brought in to meet the state’s energy needs for the last few days. It was tough. California has also reached out to neighboring states and have 300 pumper engines coming from Texas, Arizona and Nevada to fight the fires, and still looking for more. Air quality is very bad throughout the state.

[Ryan Mann, AZGFD] Worked with USGS and NPS to get a trip in June to complete Lees Ferry monitoring where an increase in brown trout was seen – about 14% of the fish population – which is up from last year. Also have a final trip this fall is to do a Diamond down trip to assess fish communities in far western Grand Canyon.

[Vineetha Kartha, ADWR] There have been extremely high temperatures the last couple of months that are setting records. Before 2026, the Secretary of Interior is to develop guidelines for the long-term management of the Colorado River system. ADWR and the Central Arizona Project have reconvened the Drought Contingency Plan Steering Committee to develop an Arizona perspective. These meetings will be public and a schedule is on the website.

Tribes: Hopi, Hualapai, Navajo Nation, Pueblo of Zuni, Southern Paiute

[Jakob Maase, Hopi Tribe] Hopi are still in quarantine lockdown until August 31. The river trip had to be cancelled this year due to COVID-19, but Hopi is looking to use the unspent funds to archive and synthesize past trip reports. Next river trip is planned for the spring.

[Peter Bungart, Hualapai Tribe] The Hualapai Tribe had similar experience to Hopi with strict lockdowns. Keeping up with government-to-government consultation requests. Anticipate continued reopening over next month. Had to cancel river trip and looking at other options.

[Richard Begay, Navajo Nation] Navajo Nation was shut down from March 16 until August 17 and have just reopened although working on staggered schedules. Had not planned to do a trip this year, but to send staff on existing science trips, which were cancelled.

[Arden Kucate, Pueblo of Zuni] Pueblo of Zuni declared an emergency order over the community since March. Currently in Phase IV. It has been hard with everyone working from home and trips postponed. Hoping to return to work by end of August with new return-to-work policies such as testing. Holding steady and remain involved in any projects or proposals.

[Kevin Bullets, Southern Paiute Consortium] The 2020 river trip was cancelled. Looking for a new director and was asked to attend these AMWG meetings until a new director is in place.

NGOs: Environmental Organizations, Federal Power Purchasers, and Recreation

[Larry Stevens, GCWC] The Grand Canyon Wildlands Council is engaged in a riparian restoration project at Paria Beach. Also doing work on identifying benthic algae from the dam to Lees Ferry. Very active with a publication on springs and spring vent species in the Colorado River Basin and a global review of river ecosystems. Happy to provide those papers if anyone is interested.

[Kevin Dahl, National Parks Conservation Association (NPCA)] The NPCA and other environmental partners intervened with FERC on a proposal to build a pump hydro storage off the Little Colorado River.

[Sinjin Eberle, American Rivers] American Rivers expresses its appreciation to Lee and Tara for moving nominees forward. American Rivers has also intervened in all three proposals of pumped hydro storage off the Little Colorado River.

[David Brown, GCRG] GCRG also submitted letters regarding pumped storage projects. GCRG held a workshop for members, which scientists attended. Have an upcoming Boatman's Quarterly being released. The respite in the canyon seems to have resulted in a healthy vegetation encroachment, particularly camelthorn, arrowweed and willow, in the campground areas.

[John Jordan, FFI/Trout Unlimited] Trout Unlimited continues to coordinate with the NPS to implement the brown trout incentivized removal program.

[Leslie James, CREDA] CREDA serves over 4 million users and the economic issues due to COVID-19 (paying bills, keeping power on) have been a real challenge in the region. She shared a picture of the Salt fire near the Silver King transmission line. ~~Arizona Public Service issued a request because one of their lines was out due to smoke.~~ Arizona has been suffering from fires as well. Yesterday was the 11th day in Phoenix at 115 degrees Fahrenheit or higher.

[Kevin Garlick, Utah Municipal Power Agency] The electrical grid is stressed right now. It is during these times when the value of the Glen Canyon Dam and other systems are appreciated.

[David Brown, GCRG] Was the situation in California because a couple of big generators went offline?

[Leslie James, CREDA] For the general public, there is ~~not~~ a lot of detailed information on the CAISO website. **[Tim Vigil, WAPA]** Over the last five days, at least two generators have gone down. Wind drops off when sun goes down.

GCMRC Science Updates: Joel Sankey, GCMRC (introductions)

[Tim Petty, DOI and AMWG Chair] This session is to update new members on the latest results of ongoing research to support GCDAMP and work group. Please ask questions on anything that is not clear so everyone has a clear understanding of this work.

[Joel Sankey, GCMRC] Rather than provide a broad overview as has been done in the past, this time the presentations are going to focus on a couple of concise topics. Emily Palmquist just presented her work on arrowweed at the Ecological Society of America. Lucas Bair is an economist on bioeconomic models. Both are rising star scientists at GCMRC.

Presentations ([DOWNLOAD1](#); [DOWNLOAD2](#))

(1) Examining variability in arrowweed physiological traits and responses to flooding, Emily Palmquist, GCMRC: This study looked at physiological traits and responses to flooding. Plants were collected from different provenances (hotter or cooler areas) and their responses to flooding was assessed.

(2) Are there any more surprises? Bioeconomic models and adaptive management, Lucas Bair, GCMRC: Chub and trout management are examples of how these can be used in a predictive model. There was a lot of research and monitoring data available and also quite a bit of modeling in the LTEMP environmental impact statement (EIS). The model results give metrics as to when it is cost-effective to remove rainbow trout. For example, translocations of juvenile humpback chub can be modeled to show how effective and efficient management options might be. Very close to a having a publication available for trout management flows and when mechanical removal would be implemented. The triggers are sensitive, but it was found that they are primarily driven by management options.

Q&A and discussion

[Larry Stevens, GCWC] How is the initial root mass and age of root mass controlled because that can affect leaf size? **[Emily Palmquist, GCMRC]** All of the cuttings were planted at the same time and grew for the same amount of time. Also have initial height measurements before the experiment began.

[Seth Shanahan, SWNA and TWG Chair] Appreciates Lucas's efforts. This is a useful tool to evaluate tradeoffs.

Technical Work Group Chair Report: Seth Shanahan, TWG Chair; Peggy Roefer, FLAHG Chair; Ted Kennedy and Jeff Muehlbauer, GCMRC

Presentation ([DOWNLOAD](#))

[Seth Shanahan, SWNA and TWG Chair] reported on TWG activities such as southwestern willow flycatcher and Yuma Ridgway's rail monitoring, exploring the triggers of spring HFEs, understanding the importance of springtime high flows for insect emergence, tracking conditions from Adopt-A-Beach repeat photography, and assessing low dissolved oxygen events. FLAHG is a fantastic forum for not only specific issues that need to be addressed, but also as a model to follow anytime someone is considering an idea related to flow.

[Ted Kennedy, GCMRC] The development of a hydrograph that coincides with the apron repair is a unique opportunity when combined with a spring pulse flow of up to 25,000 CFS. Flows as low as 4,000 CFS have not been seen since the early 90s. Flows of 20,000 CFS or greater have only occurred 7% of the time since 1997. It is very exciting to test this hydrograph. Have not predicted any negative effects, but GCMRC is still doing some analysis that will be reported later.

Lake Powell Pipeline Draft Environmental Impact Statement: Rick Baxter, Program Manager & Heather Patno, Hydraulic Engineer, Bureau of Reclamation

Presentation ([DOWNLOAD](#))

[Rick Baxter, Reclamation] Background and alternatives were provided about the Lake Powell Pipeline (LPP) project. The Southern Alternative involves several sub-alternatives. Comments need to be submitted by September 8. **[Heather Patno, Reclamation]** Heather presented what was analyzed for the LPP using the Colorado River Simulation System model. Reclamation used the 2019 model and the January 2020 initial conditions. Looked at direct natural flows and climate change hydrology under different scenarios (see slides, which are also in the EIS). Four scenarios were run, two of which were sensitivity analyses. To ascertain the impacts, all of the demands that were not reasonably foreseeable were held at 2020 levels. Then, all the reasonable depletions in the Upper Colorado were identified and held constant at 2060 levels. The second sensitivity analysis looked at having the depletions increase over time to the full depletions provided to Reclamation from the Basin States.

Additional information: 1) [LPP DEIS website](#) 2) [Project Proponents' website](#)

Q&A and Discussion

[David Brown, GCRG] What is the slide telling us? It seems to show there won't be any impacts from the pipeline. **[Heather Patno, Reclamation]** The numbers speak for themselves. Hesitate to assign values to the graph because everyone's significance thresholds are different. In terms of elevation between Action and No Action, there is relatively little significance as compared against the uncertainty regularly seen in the 24-Month Study hydrology.

[Kevin Dahl, National Parks Conservation Association] What is "10% No Action" in the key? The No Action Alternative will not take water so don't understand the different percentiles given. **[Heather Patno, Reclamation]** That is the 10th percentile of hydrology for No Action across every run. Rather than looking at changes in policy, this is looking at implementation or no implementation. It is a comparative analysis looking at the relative differences in Lake Powell pool elevation under the different alternatives.

[Kelly Burke, GCWC] Struggling to find the 10% No Action line in the graph. Is it 10% of normal inflows? **[Heather Patno, Reclamation]** There isn't a large impact from the pipeline at the low elevations. The 10% No Action line is almost hidden behind the 10% Proposed Action line because it is hydrology that is driving the system rather than impacts from the LPP.

[Kurt Dongoske, Pueblo of Zuni] The very concept of this project is considered by Zuni to be an adverse effect to Traditional Cultural Property (TCP), the Colorado River. This information was transmitted to the federal government in 2011; yet, there has not been a meaningful conversation with the Zuni governor or tribal council about this issue. The BLM is the lead for 106 compliance. Zuni concerns are similar concerns that have been expressed to GCDAMP for over 20 years. Over the past 10 years, Zuni concerns have not been adequately addressed by the Federal government.

[David Brown, GCRG] How are you dealing with the new Council on Environmental Quality (CEQ) guidance? It might be relevant as to how you treat new guidance with respect to cumulative impact for this program, which would be ignored under the new guidance. **[Rick Baxter, Reclamation]** Trying to make sure we are compliant and we will be. That is a longer conversation, but happy to have that with you.

[Scott McGettigan, State of Utah] Typical traces that are done in Reclamation modeling looks at 10% of the flows that were below and 90% were above with 50% in the middle. Then the 10% No Action pipeline is compared for each subsequent percentile. **[Peter Bungart, Hualapai Tribe]** From Vineetha's earlier presentation, where there are similar robust population growths over the decades, Arizona actually reduced its water use with municipalities such as Phoenix, Las Vegas, and Tucson using about 120 gallons per person per day. Yet in the St. George area, water use is over 300 gallons per person per day. Why wasn't conservation looked at more seriously, especially considering the hundreds of cultural resource sites? **[Todd Adams, State of Utah]** Washington County has reduced its water use substantially and has a goal to reduce it even more. Be very careful about comparing per capita water use because St. George's water use includes secondary water, reuse, and other things. **[Rick Baxter, Reclamation]** Those are the kinds of things that we need to hear during the comment period.

[Kelly Burke, GCWC] Was there a conservation alternative analyzed in the EIS? Also want to acknowledge Kurt's comment. It is an important thing to be addressed. **[Rick Baxter, Reclamation]** There is a conservation alternative in the DEIS, but it was eliminated because it did not meet the purpose and need. Reclamation plans to take another look at that.

[Review of the 2007 Interim Guidelines \(7.D. Review\): Carly Jerla, Civil Engineer and Malcolm Wilson, Water Resources and Compliance Group Chief, Bureau of Reclamation Presentation \(DOWNLOAD\)](#)

[Malcolm Wilson, Reclamation] Reported on the Interim Guidelines process and the review schedule. Additional information: [7D Review website](#)

Public Comment

[Kurt Dongoske, Pueblo of Zuni] The scientific path to review the natural world excludes Native American wisdom. A meaningful land ethic can only be developed when Native American cosmology, knowledge, and rights are taken into account.

Action Items:

1. Members are asked to support the family of Charley Bullets with cards and letters. Please contact Theresa Pasqual (trepasqual@gmail.com) for correspondence instructions.
2. AMWG members are asked to submit written comments on Project O to GCMRC and Reclamation by Friday, September 4th.
3. AMWG and TWG members will receive an inquiry for meeting dates for Project O discussion as outlined in Motion #3 above, including a date for a potential special AMWG session.
4. One or more of the upcoming AMWG meetings will receive updates from NPS's Brown Trout Incentivized Harvest project, including but not limited to funding status and future funding needs.

Wrap-up:

[Tim Petty, DOI and AMWG Chair] Great job to Lee and Marlon. To the members and alternates, a lot was accomplished with a unanimous consent to bring the TWP to the Secretary. Appreciate the times and dates to work on Project O and to vote on it this fall. Very proud of the great work from everyone. Please complete the meeting evaluation surveys, which are taken very seriously and will help us to improve.

FY2021 AMWG and Annual Reporting Meeting Dates:

- January 20-21, 2021 (Annual Reporting Meeting)
- February 10-11, 2021
- May 19, 2021 (webinar)
- August 18-19, 2021

Second Day Meeting Adjourned at 4:00 pm MDT

Meeting Attendees

AMWG Members, Alternates, and Leadership

Todd Adams, State of Utah
Jan Balsom, NPS-GRCA
Cliff Barrett, UMPA (Alternate)
Richard Begay, Navajo Nation
Aubrey Bettencourt, DOI (Alternate Designee)
David Brown, GCRG
Peter Bungart, Hualapai Tribe
Kathleen Callister, Reclamation (Alternate)
Garry Cantley, Bureau of Indian Affairs (Alternate)
Chris Cantrell, AGFD
Charlie Ferrantelli, State of Wyoming (Alternate)
Kevin Garlick, UMPA
Michelle Garrison, State of Colorado (Alternate)
Ed Gerak, CREDA (Alternate)
John Hamill, FFI/Trout Unlimited (Alternate)
Paul Harms, State of New Mexico (Alternate)

Leslie James, CREDA
John Jordan, FFI/Trout Unlimited
Vineetha Kartha, ADWR (Alternate)
Arden Kucate, Pueblo of Zuni
Jakob Maase, Hopi Tribe
John McClow, State of Colorado
Jessica Neuwerth, CRBC
Timothy Petty, DOI and Secretary's Designee
Daniel Picard, AMWG DFO
Sara Price, CRCN
Matt Rice, American Rivers
Peggy Roefer, CRCN (Alternate)
Brian Sadler, WAPA (Alternate)
Billy Schott, NPS-GLCA (Alternate)
Arianne Singer, State of New Mexico
Larry Stevens, Grand Canyon Wildlands Council

Chris Harris, CRBC (Alternate)
Jeff Humphrey, USFWS

Steve Wolff, State of Wyoming
Kirk Young, USFWS (Alternate)

USGS/GCMRC Staff

Lucas Bair
Joshua Caster
Bridget Deemer
Kimberly Dibble
Laura Durning
Helen Fairley
Paul Grams
Thomas Gushue
Ted Kennedy
Keith Kohl
Anya Metcalfe

Michael Moran
Jeff Muehlbauer
Emily Palmquist
Mike Runge
Joel Sankey
David Topping
Scott VanderKooi
David Ward
Scott Wright
Charles Yackulic
Mike Yard

Reclamation Staff

Pam Adams
Ryan Alcorn
Tara Ashby
Rick Baxter
Kathleen Callister
Paul Davidson
Jeremiah Drewel
Marlon Duke
Clarence Fullard
Dave Isleman

Zachary Nelson
Heather Patno
Kerri Pedersen
Daniel Picard
Alex Pivarnik
Wayne Pullan
Lee Traynham
Chris Watt
Nicholas Williams
Malcolm Wilson

Interested Persons

Rob Billerbeck, NPS
David Braun, Sound Science
Kevin Bullets, Southern Paiute Consortium
Kelly Burke, Grand Canyon Wildlands Council
Shane Capron, WAPA
Kevin Dahl, National Parks Conservation Association
Martina Dawley, Hualapai Tribe
Kurt Dongoske, Pueblo of Zuni
Sinjin Eberle, American Rivers
Craig Ellsworth, WAPA
Sheri Farag, Arizona Salt River Project
Alicyn Gitlin, Sierra Club
Jessica Gwinn, USFWS
Ken Hyde, Glen Canyon National Recreation Area
Carliane Johnson, SeaJay Environmental

Scott McGettigan, State of Utah
Craig McGinnis, ADWR
Lisa Meyer, WAPA
Virginia O'Connell, ADWR
Emily Omana Smith, NPS-GRCA
Amy Ostdiek, State of Colorado
Theresa Pasqual, Joint Tribal Liaison
Bill Persons, FFI/Trout Unlimited
Noah Pleshet, Southern Paiute Consortium
Kerry Rae, DOI
David Rogowski, AGFD
Amy Schott, NPS
Gene Seagle, NPS
Seth Shanahan, TWG Chair and SNWA
Erik Skeie, State of Colorado

Edward Keable, NPS
Sara Larsen, Upper Colorado River Commission
Ryan Mann, AGFD
Kevin McAbee, USFWS
Adam McAnally, Arizona Salt River Project

Rod Smith, DOI
Jim Stroger, FFI/Trout Unlimited
Tim Vigil, WAPA
Brian Wooldridge, USFWS

Abbreviations

ADWR – Arizona Department of Water Resources
AMP – Adaptive Management Program
AMWG – Adaptive Management Work Group
AGFD – Arizona Game and Fish Department
BAHG – Budget Ad Hoc Group

CAISO – California Independent System Operator

CEQ – Council on Environmental Quality
CFS – cubic feet per second
CREDA – Colorado River Energy Distributors Association
CRCN – Colorado River Commission of Nevada
DFO – Designated Federal Officer
DOI – Department of the Interior
E&W – Energy and Water
EIS – Environmental Impact Statement
ESA – Endangered Species Act
FAC – Federal Advisory Committee
FACA – Federal Advisory Committee Act
FFI – Fly Fishers International
FLAHG – Flow Ad Hoc Group
FRN – Federal Register Notice
FY – Fiscal Year (October 1 – September 30)
GCD – Glen Canyon Dam
GCDAMP - Glen Canyon Dam Adaptive Management Program
GCMRC – Grand Canyon Monitoring & Research Center
GCWC—Grand Canyon Wildlands Council

GLCA – Glen Canyon National Recreation Area
GRCA – Grand Canyon National Park
HFE – High Flow Experiment
H.R. – House Resolution
JCM-West – Juvenile Chub Monitoring-West
LTEMP – Long-Term Experimental and Management Plan
LPP – Lake Powell Pipeline
MDT – Mountain Daylight Time
MW – megawatt
MWh – megawatt-hour
NEPA – National Environmental Policy Act
NPS – National Park Service
OMB – Office of Management and Budget
RIP – Recovery Implementation Program
Reclamation – Bureau of Reclamation
ROD – Record of Decision
Secretary – Secretary of the Interior
SNWA – Southern Nevada Water Authority
TCP – Traditional Cultural Property
TWG – GCDAMP Technical Work Group
TWP – Triennial Budget and Work Plan
UMPA - Utah Municipal Power Agency

USFWS – United States Fish & Wildlife Service
USGS – United States Geological Survey
WAPA – Western Area Power Administration

Glen Canyon Dam Adaptive Management Program Adaptive Management Work Group Meeting November 17, 2020

Tuesday, November 17, 2020

Start Time: 9:01 am Mountain Standard Time (MST)

Recorder: Carliane Johnson, SeaJay Environmental, LLC.

Welcome and Administrative: Dr. Timothy “Tim” Petty, Assistant Secretary for Water and Science, Department of the Interior (DOI) and Secretary’s Designee

- **Introductions and Determination of Quorum (13 members) [Tim Petty, DOI and Adaptive Management Work Group (AMWG) Chair]** A lot of topics were covered during the August AMWG meeting. Since then, there has been good participation on the Technical Work Group (TWG) and the other subgroups to allow us to meet again and consider this motion today. The following DOI leadership members were introduced: Aubrey Bettencourt, DOI Deputy Assistant Secretary; Jaci Gould, Bureau of Reclamation (Reclamation) Acting Regional Director, Upper Colorado Basin Regional Office; and Daniel Picard, Reclamation, Deputy Regional Director, Upper Colorado Basin Regional Office and Acting Designated Federal Officer.
- **[Lee Traynham, Reclamation]** A quorum was reached with 20 members.
- **Administrative Update [Tim Petty, DOI and AMWG Chair]** The administrative updates were distributed via email on October 28, 2020.

Technical Work Group (TWG) Chair Report: Seth Shanahan, TWG Chair

[PRESENTATION] **[Seth Shanahan, Southern Nevada Water Authority (SNWA) and TWG Chair]** This presentation timeline is intended to introduce the AMWG to the TWG’s process in order to fully understand the level of work that went into the technical evaluations and recommendations on Project O. A table was provided to show the Flow Ad Hoc Group’s (FLAHG) workflow with the TWG. The process was successful in achieving the desired outcomes and culminated in a set of recommendations to the AMWG that were adopted by consensus at the October 14-15, 2020 TWG meeting.

[PRESENTATION] **[Peggy Roefer, Colorado River Commission of Nevada and FLAHG Chair]** The FLAHG started meeting in September 2019 and had developed its charge by December 2019. In mid-September 2020, the FLAHG submitted a Spring Disturbance Flow hydrograph to the TWG for consideration. The presentation outlined those efforts. The proposed hydrograph is subject to further review and evaluation by the Planning and Implementation Team (“Technical Team”) and could be further revised.

[Vineetha Kartha, Arizona Department of Water Resources (ADWR)] This is a unique project because it is stakeholder-driven. Under the Long-Term Experimental and Management Plan (LTEMP), high flow experimental (HFE) releases are the principal types of flows that cause disturbance to the ecosystem. Research efforts on HFEs are primarily focused on whether they can build sandbars with most of

this research occurring during fall HFEs. The only spring HFE that had substantial data was in 2008. While spring HFEs may benefit natural processes, they may also cause a relative increase in the abundance of rainbow trout so the LTEMP instituted a moratorium (that has now passed) on spring HFEs. There are two sediment accounting periods for spring and fall HFEs. Discharge data has shown that spring HFEs may occur less frequently. In 2018, the Grand Canyon Monitoring & Research Center (GCMRC) was tasked with assessing the impact of high flows on high value resources. The FLAHG was stood up in 2019, as was shown in Peggy's presentation. The TWG accepted the hydrograph recommendation from the FLAHG on October 14. There was consensus for the TWG to recommend to the AMWG that the Secretary of the Interior consider a spring disturbance flow hydrograph, as shown in the motion. Peggy was also recognized for her work on the FLAHG.

Motions and Votes

1. Spring Disturbance Flow Hydrograph

[Lee Traynham, Reclamation] This draft motion is almost word-for-word the one from the TWG [\[TWG MOTION\]](#), except for "associated presentations to the AMWG on November 17, 2020." Motion was read into the record.

[Tim Petty, DOI and AMWG Chair] Everyone is reminded that while this is clearly within the LTEMP protocol, the Secretary of the Interior will make the final decision as to whether or not to implement the proposed spring disturbance flow, but not until the February/March 2021 timeframe. It was recognized that the proposed motion is based on the specific science outlined by Seth, Peggy, and Vineetha.

Discussion

[Larry Stevens, Grand Canyon Wildlands Council (GCWC)] Appreciates the clear description of the process of the TWG and the FLAHG. The GCWC has long regarded this as a very, very important experiment that will help guide future dam management. While the motion passed with consensus, it is not consensus without concern because the experimental design is not perfect. In the distant past, flow experiments were followed by constant flow periods. However, given that much of the work will take place in the Lees Ferry reach, there may be less concern about this, and it is a cost savings. It was also a good learning experiment for understanding appropriately timed high flows. **[Leslie James, Colorado River Energy Distributors Association (CREDA)]** Thanks to Seth, Peggy, and others involved in these discussions. The resource assessment document from GCMRC could be a template for future experiments. Dr. Petty's comments about this being consistent with the LTEMP protocol for a spring disturbance is noted. The wholesale market prices will probably double in the third quarter and it is good that the LTEMP protocol requires a look at this before anything is decided by the Secretary. **[Tim Petty, DOI and AMWG Chair]** One thing that came up in the TWG was the number of low flow actions proposed for 2021. We always want to take those concerns into consideration as we work to meet the resource goals of the LTEMP. **[Peter Bungart, Hualapai Tribe]** Some of these spring disturbance flows have the potential to enhance biodiversity and more closely reflect a natural regime. This is significant to the Hualapai people and it is believed that the other tribes would reflect the same sentiments.

Moved by: Peter Bungart, Hualapai Tribe

Seconded: John Jordan, Fly Fishers International (FFI)/Trout Unlimited (TU)

No Voting Members Present: Southern Paiute Consortium, Navajo Nation, Utah

Motion approved by consensus.

[Tim Petty, DOI and AMWG Chair] This [MOTION](#) will go to the Secretary of the Interior so that we would be prepared if conditions met the requirements to have a spring disturbance flow event. Great job by everyone on this.

2. Spring Disturbance Flow Monitoring Proposal (“Project O”)

[PRESENTATION] **[Scott VanderKooi, GCMRC]** Background and revisions on Project O were presented. The idea was to take advantage of the apron repair and develop a potential spring disturbance with low flows not seen since the early 1990s followed by a higher pulse, and to see what effect that might have on downstream resources of the Colorado River Ecosystem. GCMRC had included part of this in the Triennial Budget and Work Plan (TWP), but it became clear that GCMRC’s approach to add elements into existing projects was not sufficient. GCMRC was asked to develop a full project, which became “Project O,” in the draft TWP prior to the August AMWG meeting. A lot of discussion ensued about Project O and funding issues. In August, the AMWG deferred Project O for further consideration, feedback, and revisions by the TWG.

[Mike Moran, GCMRC] After the August AMWG meeting, it was recommended that Project O be revised based on stakeholder comments. GCMRC reviewed and revised Project O. Two documents were developed and provided to the TWG – one was the responses to comments and the other was the revised Project O. Three meetings were held for the Budget Ad Hoc Group (BAHG) to review the budget aspects of Project O. Two recommendations were made to: 1) prioritize Project O elements, and 2) identify appropriate sources of funding. Stakeholder comments and recommendations resulted in major changes to Project O. GCMRC made two additional changes following the review of Project O during the October TWG meeting. The latest version was sent to Reclamation on October 29.

Discussion

[Larry Stevens, GCWC] It is not only the experiment but the process itself that has been a learning experience. It would be helpful to have these presentations archived to remind us of these discussions if this is revisited in the future. **[Scott VanderKooi, GCMRC]** GCMRC plans to provide these presentations to post on Reclamation’s website. **[Craig Ellsworth, Western Area Power Authority (WAPA) and BAHG Chair]** The Wiki FLAHG page will be updated to show how the process unfolded and how the motions were passed.

[Craig Ellsworth, WAPA and BAHG Chair] The BAHG’s charge from the TWG was to 1) look at a [PRIORITIZATION](#) of the project elements, which has been incorporated into the revised Project O, and to 2) discuss appropriate funding sources. Many of the bullets in the proposed motion came from the BAHG. There was a lot of work in revising the document and that effort from everyone was appreciated.

[Vineetha Kartha, ADWR] As part of a lengthy discussion of the TWP budget, the AMWG had directed the TWG to review a revised Project O and to forward recommendations to the AMWG before October 30. The AMWG was then to consider and act on the TWG recommendation no later than November 20, 2020. Both deadlines were met. The revised Project O is now before the group for a vote.

[Tim Petty, DOI and AMWG Chair] The prioritized list that was developed is going to be extremely helpful for AMWG members to understand what should be accomplished first. The group is reminded of all the other projects that are part of the 2021-2023 TWP approved before Project O that are also moving forward. The GCMRC team is working with Reclamation to identify resources available for

Project O because the budget was already considered and committed to Projects A through N. We need to be sure there is a discussion about the finances and the amount of resources that will be available.

[Lee Traynham, Reclamation] The draft motion is almost identical to the motion that was passed by consensus from the TWG. The two changes were the inclusion of a reference to November 13, which was the date when the new draft was distributed by GCMRC, and the removal of a bullet containing specific year references so that the project now refers to Year 1 and Year 2. The document with the three prioritization tiers that had been recommended by the BAHG was displayed on the screen to the group. **[Leslie James, CREDA]** The reason for requesting this was to address the challenges of prioritization. There is always more work, more science, and more studies than there is money for. This was a way for the BAHG to prioritize limited resources. It was important to do that. When this motion is posted, maybe Craig could link to the various documents within the motion. That way, we have a compendium of all the associated documents that went along with this process. It is great for this program to get to this point. **[Craig Ellsworth, WAPA and BAHG Chair]** Completely agree. All this information will be on the Wiki, perhaps on the BAHG page. That is one of the reasons why the Wiki is being used is to be able to see how these things were done. See also the table at the bottom of the prioritization document that lists the BAHG's rank order with input from the different stakeholders of the different project elements. **[Lee Traynham, Reclamation]** This was Attachment A-4 that was distributed as part of the meeting materials to members and was submitted to the TWG on October 8. A lot of work went into that table to capture the complexity of interests in these project elements.

[Mike Moran, GCMRC] Should bullet 4 include language similar to bullet 5 about Elements O.1 and O.2 regarding funding to include "or other Reclamation considerations"? **[Lee Traynham, Reclamation]** Believe that language in bullet 5 was specifically related to science advisor funds in Element O.11 to leave room for that consideration. It is not believed that would apply to O.1 and O.2 **[Scott VanderKooi, GCMRC]** It seems it would allow for flexibility and options because right now, it looks constrained to only come from those funding sources. We want to look for as many sources as possible to leverage resources. **[Vineetha Kartha, ADWR]** Recalls that the distinction was on the words 'should' and 'could' and would agree with Scott to add "or other Reclamation considerations." **[John Jordan, FFI/TU]** Funding falls to GCMRC and Reclamation and he supports GCMRC to have as much flexibility as possible. **[Tim Petty, DOI and AMWG Chair]** If Reclamation has those capabilities and resources, then that language provides the flexibility to use them. To emphasize Leslie's point, there are many things we would love to do, and if we have the resources, we should consider them.

[Chris Cantrell, Arizona Game and Fish Department (AZGFD)] Notes that AZGFD is not abstaining from the vote and requests that be changed in the record.

[Leslie James, CREDA] Recalls that there was a distinction that recognized priority differences between elements O.1, O.2, and O.11 and that the main discussions had occurred around 'should' versus 'could.' Agrees with Vineetha on that. **[Tim Petty, DOI and AMWG Chair]** That highlights the purpose of the prioritized list, and helps to emphasize the need to continue discussions and consider whether resources are available to support project elements as the project progresses.

[Jan Balsom, National Park Service-Grand Canyon] Navajo Nation should be in a different category on the motion than "abstained".

[Tim Petty, DOI and AMWG Chair] A request to move the [\[MOTION\]](#) was made.

Moved by: John Jordan, FFI/Trout Unlimited

Seconded: Steve Wolff, State of Wyoming

Absent: Southern Paiute Consortium, Navajo Nation and Utah – no voting members present.

Approved by consensus at 10:36 am MST on November 17, 2020

[Lee Traynham, Reclamation] Everyone's input and participation in this process has been appreciated. The process was very effective because of great leadership from the group leads and participation of the AMWG and TWG members.

Public Comment

None.

Wrap-Up: Tim Petty, Secretary's Designee

FY 2021 TWG and AMWG meeting dates:

- January 20-22 (Annual Reporting Meeting & TWG)
- February 10-11 (AMWG)
- May 19 (AMWG)
- August 18-19 (AMWG)

Closing comments:

[Tim Petty, DOI and AMWG Chair] A lot was done this year. Thanks to Lee's and Scott's great teams. There was much accomplished this year despite COVID.

[Lee Traynham, Reclamation] The draft TWP is on route to the Secretary. The two recommendations from today's meeting will be expedited to leadership in Washington D.C. The holidays are a tough time to get reviews completed but confident there will be a fast turnaround. Members will be updated on that progress. We will then hit the ground running in January with the Annual Reporting meeting. Happy and safe holidays to everyone.

Meeting adjourned at 10:43 am MST.

Meeting Attendees

AMWG Members, Alternates, and Leadership

Jan Balsom, NPS-GRCA

Cliff Barrett, UMPA (Alternate)

Richard Begay, Navajo Nation

David Brown, GCRG

Peter Bungart, Hualapai Tribe

Kathleen Callister, Reclamation (Alternate)

Chris Cantrell, AZGFD

Charlie Ferrantelli, State of Wyoming (Alternate)

Kevin Garlick, UMPA

Michelle Garrison, State of Colorado (Alternate)

Vineetha Kartha, ADWR (Alternate)

Arden Kucate, Pueblo of Zuni

Charles "Chip" Lewis, Bureau of Indian Affairs

Jakob Maase, Hopi Tribe

John McClow, State of Colorado

Jessica Neuwerth, CRBC

Timothy Petty, DOI and Secretary's Designee

Daniel Picard, AMWG DFO

Matt Rice, American Rivers

Peggy Roefer, CRCN (Alternate)

John Hamill, FFI/Trout Unlimited (Alternate)
Paul Harms, State of New Mexico (Alternate)
Chris Harris, CRBC (Alternate)
Jeff Humphrey, USFWS
Leslie James, CREDA
John Jordan, FFI/Trout Unlimited

Brian Sadler, WAPA (Alternate)
Billy Schott, NPS-GLCA (Alternate)
Arianne Singer, State of New Mexico
Larry Stevens, Grand Canyon Wildlands Council
Steve Wolff, State of Wyoming

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David Lytle
Michael Moran

Jeff Muehlbauer
Emily Palmquist
Joel Sankey
Scott VanderKooi
David Ward

Reclamation Staff

Tara Ashby
Mike Bernardo
Clarence Fullard
Dave Isleman
Heather Patno
Kerri Pedersen

Alex Pivarnik
Wayne Pullan
Shana Tighi
Lee Traynham
Nicholas Williams

Interested Persons

Terra Alpaugh, Kerns West
Rob Billerbeck, NPS
Daniel Bullets, Southern Paiute Consortium
Kevin Bullets, Southern Paiute Consortium
Kelly Burke, Grand Canyon Wildlands Council
Carrie Cannon, Hualapai Tribe
Kevin Dahl, National Parks Conservation Association
Chrystal Dean, WAPA
Kurt Dongoske, Pueblo of Zuni
Sinjin Eberle, American Rivers
Craig Ellsworth, WAPA
Amy Haas, Upper Colorado River Commission
Brian Healy, NPS
Carliane Johnson, SeaJay Environmental
Theresa Johnson, ADWR

Sara Larsen, Upper Colorado River Commission
Ryan Mann, AZGFD
Scott McGettigan, State of Utah
Craig McGinnis, ADWR
Amy Ostdiek, State of Colorado
Bill Persons, FFI/Trout Unlimited
Kerry Rae, DOI
Shana Rapoport, Colorado River Board of California
David Rogowski, AZGFD
Seth Shanahan, TWG Chair and SNWA
Erik Skeie, State of Colorado
Rod Smith, DOI
Jim Stroger, FFI/Trout Unlimited
Melissa Trammell, NPS

Abbreviations

ADWR – Arizona Department of Water Resources
AMWG – Adaptive Management Work Group

AZDGF – Arizona Game and Fish Department
BAHG – Budget Ad Hoc Group
CRBC – Colorado River Board of California
CRCN – Colorado River Commission of Nevada
CREDA – Colorado River Energy Distributors Association

DFO – Designated Federal Officer
DOI – Department of the Interior

FFI – Fly Fishers International

FLAHG – Flow Ad Hoc Group

GCDAMP - Glen Canyon Dam Adaptive Management Program

GCMRC – Grand Canyon Monitoring & Research Center

GCRG – Grand Canyon River Guides

GLCA – Glen Canyon National Recreation Area

GRCA – Grand Canyon National Park

HFE – High Flow Experiment

LTEMP – Long-Term Experimental and Management Plan

MST – Mountain Standard Time

NPS – National Park Service

Reclamation – Bureau of Reclamation

Secretary – Secretary of the Interior

SNWA – Southern Nevada Water Authority

TMF – Trout Management Flows

TU - Trout Unlimited

TWG – GCDAMP Technical Work Group

TWP – Triennial Budget and Work Plan

UMPA - Utah Municipal Power Agency

USGS – United States Geological Survey

WAPA – Western Area Power Administration

Intentionally left blank

GLEN CANYON DAM ADAPTIVE MANAGEMENT WORK GROUP ACTION ITEM TRACKING REPORT

Note: Items marked “Closed” will be removed from the next iteration of the report.

ITEM No. / DATE	ACTION ITEM	ASSIGNED To / DUE DATE	STATUS
Item 2017.Sep.01	<p>At its next meeting, AMWG will consider a process for planning for the next 20 years of LTEMP.</p> <p><u>February 2018 update:</u> This will be addressed through the development of monitoring metrics and by the streamlining of GCDAMP guiding documents as described in the LTEMP ROD.</p> <p><u>August 2018 update:</u> DOI will be working on this over the next year with input from the AMWG with the target to complete the process by the end of 2019. This action item will remain open until the entire process is completed.</p> <p><u>March 2019 update:</u> Personnel transitions in the program office and the government shutdown have impacted progress on this item. A more detailed update will be provided at the May webinar. This action item will remain open until the entire process is completed.</p> <p><u>May 2019 Update:</u> Planning for the next 20 years of LTEMP is a high priority for Reclamation, and, now that the Adaptive Management Group Chief position has been filled, Reclamation intends to make substantive progress on this issue this fiscal year (by September 30, 2019).</p> <p><u>August 2019 Update:</u> This action item will move forward as directed and informed by the Guidance Memo issued by the Secretary’s Designee in August 2019.</p> <p><u>February 2020 Update:</u> Information and experience from the 2019-2020 Knowledge Assessment and from development of the 2021-2023 TWP will inform this action. Additional emphasis is on assembling critical elements including program staff (e.g. biologist, archeologist, tribal liaison), facilitator, and Science Advisor to support this effort.</p> <p><u>May 2020 Update:</u> The draft FY21-23 budget and workplan includes funding support to develop and track monitoring metrics and and to streamline guidance documents. Beginning Oct 20, Reclamation and GCMRC will initiate review of the LTEMP FEIS metrics. This work will be a focus for FY21, but will likely be ongoing through the FY21-23 TWP.</p> <p><u>August 2020 Update:</u> See above.</p> <p><u>November 2021 Update:</u> See above.</p>	Lee Traynham / ongoing	Open

Supplemental Materials

Potential GCDAMP & Other Meetings in 2021

Days	Dates	Meeting	Comments
JANUARY			
W-Th	Jan 6-7	CRAB meeting	
M	Jan 18	Martin Luther King Holiday	
W-Th	Jan 20-21	Annual Reporting Meeting – Phoenix, AZ	
Fri	Jan 22	TWG Meeting – Phoenix, AZ	
Tu-Th	Jan 26-28	CRTR meeting	
FEBRUARY			
M	Feb 14	President's Day Holiday	
Tu	Feb 9	DOI Federal Family Meeting - Phoenix, AZ	
W-Th	Feb 10-11	AMWG Meeting – Phoenix, AZ	
	Feb	Possible Salinity work group meeting	
MARCH			
Sun	Mar 14	Daylight Savings	
M-F	Mar 15-19	School Spring Recess in Flagstaff	
Th	Mar 18	Flaming Gorge WG	
APRIL			
W-Th	Apr 13-14	TWG Meeting – Phoenix, AZ	
	Apr	Possible Salinity work group meeting	
Th	Apr 15	Flaming Gorge WG	
Th	Apr 22	Fontenelle WG	
W	Apr 28	MSCP Steering Committee meeting	
MAY			
	May	MSCP work group	
W	May 19	AMWG Webinar	
M	May 31	Memorial Day Holiday	
JUNE			
	June	Possible 100 th Salinity Forum	
W-Th	Jun 16-17	TWG Meeting – Phoenix, AZ	
W	June 23	MSCP Steering Committee meeting	
JULY			
Sun	Jul 4	Independence Day Holiday	
AUGUST			
Th	Aug 12	Flaming Gorge WG	
Tu	Aug 17	DOI Federal Family Meeting – Flagstaff, AZ	
W-Th	Aug 18-19	AMWG Meeting	
Th	Aug 18	Fontenelle WG	
	Aug	Possible Salinity work group meeting	

Days	Dates	Meeting	Comments
M-F	Aug 23-27	Fall semester starts at NAU – Flagstaff, AZ	
		SEPTEMBER	
M	Sep 6	Labor Day Holiday	
		OCTOBER	
M	Oct 11	Columbus Day	
W-Th	Oct 13-14	TWG Meeting – Phoenix, AZ	
	Oct	Possible 101 st Salinity Forum	
W	Oct 27	MSCP Steering Committee meeting	
		NOVEMBER	
Th	Nov 11	Veteran's Day Holiday	
Th	Nov 25	Thanksgiving Holiday	
		DECEMBER	
Sa	Dec 25	Christmas Day Holiday	



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

AUG 14 2019

MEMORANDUM

To: Brent Esplin, Designated Federal Officer, Bureau of Reclamation
Regional Director, Upper Colorado Region
Kathleen Callister, Resources Management Division Manager, Bureau of Reclamation
Upper Colorado Region
Scott VanderKooi, Chief, Grand Canyon Monitoring and Research Center (GCMRC)
U.S. Geological Survey (USGS)

From: Timothy R. Petty, Ph.D.
Secretary's Designee
Assistant Secretary for Water and Science

Subject: Glen Canyon Dam Adaptive Management Program Guidance

The Colorado River faces many challenges in the coming years, especially with an ongoing drought now in its 19th year. As such, it is important that the Glen Canyon Dam Adaptive Management Program (GCDAMP) is managed in such a way as to ensure consistency with the Grand Canyon Protection Act (GCPA) and the priorities of the Secretary of the Interior, and in accordance with the Law of the Colorado River and the Glen Canyon Dam Long Term Experimental and Management Plan (LTEMP) Record of Decision (ROD) and Final Environmental Impact Statement (FEIS).

The GCDAMP plays a central role in ensuring compliance with multiple laws associated with the operation of Glen Canyon Dam. It provides a process for cooperative integration of dam operations, downstream resource protection and management, and monitoring and research. Under the GCPA, Reclamation and GCMRC conduct research and monitoring and consult with specific stakeholders on that research and monitoring. The Adaptive Management Working Group (AMWG), a Federal Advisory Committee, is the vehicle through which Reclamation accomplishes this consultation. The AMWG also makes recommendations to the Secretary per the LTEMP ROD.

LTEMP Implementation

The primary guiding documents for the GCDAMP will continue to be the LTEMP FEIS and ROD, which provide the framework for adaptively managing Glen Canyon Dam operations and management actions associated with downstream resources through 2037. This program guidance document will help ensure continuity and continued successes within the GCDAMP under the current administration and in the years to come. The priorities identified in the LTEMP ROD for the GCDAMP are as follows:

- Management and Experimental Actions
- Mitigation and Environmental Commitments
- Research and Monitoring

In addition, the Department of the Interior (Interior) has recently prioritized the responsible development and production of renewable energy on federal lands. To this end, I encourage the GCDAMP to work within the LTEMP framework to seek ways to improve the value of the hydropower resource. This work may include continued engagement with Project N of the GCDAMP Fiscal Years (FY) 2018-20 Triennial Workplan (TWP) and with interested AMWG stakeholders regarding the current science and policy regarding dam operations.

Updating Guidance Documents

I direct Reclamation, USGS, and other Interior agencies to work with the AMWG to update the GCDAMP guiding documents to reflect and be fully consistent with the priorities outlined in the LTEMP FEIS Section 1.4 and emphasized in Section 6.1(c) of the LTEMP ROD. These guiding documents include the GCDAMP strategic plan, vision, mission, and charter.

With the challenges faced in FY 2018 regarding funding for the GCDAMP and the need to ensure appropriations are requested through the federal budget process, Interior supports continuing with the three-year workplan and budget process. The current FY 2018-20 GCDAMP TWP and budget process demonstrated that it can improve program efficiency by reducing the time and effort spent on annually developing a workplan and budget. The GCDAMP should continue to review the TWP annually to ensure it meets the priorities and goals of the GCPA and GCDAMP.

The development of the TWP and budget for FY 2021-23 will commence in late FY 2019 and continue through FY 2020. Its development should include consultation with members of AMWG, who will recommend to the Secretary whether they support the planned projects and funding. Reclamation and GCMRC will take the lead in drafting the FY 2021-23 TWP. The TWP and budget should focus on compliance priorities including:

- Maintaining dam releases consistent with applicable laws;
- Activities associated with the Endangered Species Act;
- Actions necessary for compliance with the National Historic Preservation Act; and
- Research and monitoring as required by the Grand Canyon Protection Act.

Activities that concern annual release volumes from Glen Canyon Dam—including discussion of Drought Contingency Planning and new negotiations of the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead—will be underway in FY 2019 or in the coming years. The GCDAMP and AMWG guidance documents discussed here should consider any implications of these ongoing discussions.

The LTEMP Scientific Monitoring Plan will continue to provide a framework for the scientific support needed to complete the monitoring and experimentation specified in the LTEMP FEIS

and ROD. This plan will help ensure that long-term monitoring and research activities are aligned with the LTEMP FEIS and ROD and the GCDAMP decision making process. In accordance with the LTEMP ROD, the Science Plan will be reviewed every three years and may be updated as needed. The next review will occur in conjunction with the start of the next TWP development process in early FY 2020. Also, in accordance with the LTEMP ROD, specific details concerning the means to collect, analyze, and report information required to support development of recommendations by the AMWG and decision making by Interior will be included in the TWP.

It is also important that the GCDAMP develops and implements monitoring metrics for the resource goals and objectives defined in the LTEMP ROD. Interior directs the AMWG to develop recommendations for these monitoring metrics to assist Interior in their development. The recommended metrics should build on existing LTEMP conservation measures, environmental and recreational goals, and other easily identifiable goals. As the process continues, additional goals can be developed.

Future research proposed and undertaken by the GCDAMP should be tied directly to LTEMP resource goals and objectives and continue to be focused on providing the best available science such that decision making is science-based and continues to work towards ensuring benefits to as many resources downstream of the dam as possible. This should be done in a collaborative process involving AMWG and TWG members, the Science Advisors Program, and ad hoc groups as needed. Several areas to consider as identified by the GCDAMP partners include:

- Evaluation of the threat posed by invasive non-native species.
- Exploring vegetation management to benefit high value recreational beaches and protect vulnerable archaeological sites.
- Considering impacts to hydropower as part of the development of a LTEMP experiments and study plans.

Operating Criteria and Operational Flexibility

The LTEMP ROD provides guidance for hourly, daily, and monthly releases (see, for example, Table 3, p. B-4). In accordance with the LTEMP ROD Attachment B Section 1.2 (Page B-7), I encourage Reclamation to continue to utilize operational flexibility at Glen Canyon Dam in response to varying hydrological and other resource-related conditions. As warranted, Reclamation, in consultation with Western Area Power Administration (WAPA), should continue to make adjustments to hourly, daily, and monthly release volumes within the water year in response to operational, resource-related, and hydropower-related issues.

In response to stakeholder input at recent AMWG meetings, the feasibility of conducting Spring High Flow Experiments (HFE), along with modeling for improvements and efficiencies that benefit resources including natural, cultural, recreational, and hydropower should be explored. As a potential starting point, I encourage you to consider opportunities to conduct higher spring releases within power plant capacity, along with spring HFEs that may be triggered under the current LTEMP Protocol.

Conclusion

This guidance is not meant to be all encompassing or to preclude additional scientific investigations that can improve the resources downstream of Glen Canyon Dam that are consistent with the LTEMP. The GCDAMP should seek ways to continuously improve the program, including searching for efficiencies and improvements and listening to the States, Tribes, and other program stakeholders.

The GCDAMP and AMWG are vital to ensuring Interior's responsibilities under the GCPA and the LTEMP ROD, and I greatly appreciate Reclamation, USGS, other Interior bureaus, and our external partners' dedication to ensuring Glen Canyon Dam is operated in a manner that protects, mitigates impacts to, and improves downstream resources.

**Approximate Timelines for the Development and Implementation of the TWP (Table 1) and
Criteria for Review and Revisions (Section 2.7)**

**March 6, 2019
Passed by Consensus by the AMWG**

Table 1. Approximate timelines for the development and implementation of the TWP. Dates shown are estimated targets. Dates are shown which implement the 2021-23 TWP for reference.*

Month	Year-1 (2020) (development of TWP)	Year-2 (2021)
December (year prior)	GCMRC and Reclamation produces annual project reports document for GCDAMP review.	
January	Annual reporting meeting and information synthesis (2 days) followed by 1-day TWG meeting to review budget and provide initial guidance to GCMRC and Reclamation. TWG reviews progress in addressing Information Needs and research accomplishments.	Annual reporting meeting (1-2 days) followed by 1-day TWG meeting with a primary emphasis on reporting results/findings/scientific advances on previous work plan.
February	GCMRC meets with tribes and DOI agencies. GCMRC follow-up with BAHG on priorities and areas of emphasis on TWP. GCMRC meets with cooperators to develop projects. AMWG meeting to discuss initial priorities. DOI and Federal family input.	
March	GCMRC and Reclamation will develop an initial TWP based on DOI priorities and input from scientists, the TWG, and DOI/DOE family. Initial TWP presented to DOI and Secretary's Designee.	
April	GCMRC meets with tribes and DOI agencies. April TWG meeting to consider draft TWP, including anticipated funding sources. Unresolved issues or conflicting priorities will be resolved by DOI in consultation with the DOI Family. GCMRC begins development of second draft TWP.	BAHG and TWG considers potential changes to the Fiscal Year 2 TWP based on criteria in section 2.7.
May	GCMRC and Reclamation provide a second draft TWP to the BAHG, Science Advisors, DOI agencies, and tribes for their review and comment. GCMRC meets with tribes, BAHG, to get input on TWP. GCMRC develops third draft of TWP.	
June	GCMRC and Reclamation finish third draft for review. TWG meets to provide input on the draft GCMRC and Reclamation TWP and provide a recommendation to the AMWG.	TWG recommends Fiscal Year 2 (2022) budget of TWP to AMWG.
July	GCMRC and Reclamation provide a final draft TWP to the AMWG for their review.	
August	AMWG meets to provide input on the GCMRC and Reclamation draft TWP and provide a recommendation to the SOI.	AMWG recommends Fiscal Year 2 (2022) budget of TWP to SOI.
September	SOI reviews the budget and work plan recommendation from AMWG.	
October 1	Fiscal Year 1 begins under the TWP guidance.	Fiscal Year 2 begins under the TWP guidance.
November 1	Consumer Price Index becomes available.	
Late November	Science and management meeting with DOI and cooperators.	Science and management meeting with DOI and cooperators.
December	Budget is finalized. USGS produces GCMRC annual project reports document for prior year work.	GCMRC produces annual project reports document.

Table 1 (continued). Approximate timelines for the development and implementation of the TWP. Dates shown are estimated targets. Dates in parentheses are shown which implement the 2021-23 TWP cycle for reference.

Month	Year-3 (2022)	Year-4 (2023)
January	Annual reporting meeting and information synthesis (2 days) followed by 1-day TWG meeting to review initial results and findings of TWP. Potential TWP changes may be identified.	Process starts again under year 1.
February	BAHG/agencies/tribes meetings to consider mid-work plan adjustments to TWP, February through March.	
March		
April	Consider mid-work plan adjustments at TWG meeting. BAHG and TWG considers potential changes to the Fiscal Year 3 TWP based on criteria in section 2.7.	
May		
June	TWG considers and recommends mid-work plan adjustments to TWP and a recommendation for Fiscal Year 3 (2023) budget.	
July		
August	AMWG meets and considers mid-work plan adjustments to TWP recommended by TWG and recommends Fiscal Year 3 (2023) budget to the SOI.	
September		
October 1	Fiscal Year 3 begins under the TWP guidance.	
November 1	Consumer Price Index becomes available.	
Late November	Science and management meeting with DOI and cooperators. New TWP development meeting within DOI.	
December	USGS produces GCMRC annual project reports document for prior year work.	

* Table 1 calendar years have been updated to reflect development of the 2021-2023 Triennial Work Plan.

2.7 Criteria for Review and Revisions of the Budget and Work Plan

In order for the TWP process to be successful in reducing the administrative burden on the GCMRC, Reclamation, and the GCDAMP, it must have clear criteria for making changes to the budget and work plan. Revisions of the year two budget are intended to be limited to unexpected changes due to a scientific requirement or merit, or administrative needs. Year three changes may be more substantive according to the guidelines below. The individual steps of the process, including roughly when meetings should occur and their objectives, are provided in Table 1. The burden of an appropriate rationale for proposing a change falls upon the proposer to make a persuasive argument to the TWG and AMWG. The following criteria will be used by GCMRC, Reclamation, and TWG in making recommendations to AMWG on changes to the budget and work plan:

- **Scientific requirement or merit:** New information gained during the implementation of monitoring and research projects may result in a need to alter methods, scope, or timelines in the work plan or substantially alter or eliminate a project. This is a science need based on the experience of implementing an already approved project. This does not represent a shifting priority (e.g., policy change), but a scientific learning process which results in needed modifications to carry out the goals of the Program.
- **Administrative needs:** Administrative, policy, or programmatic changes may occur within the time-frame of an approved TWP. Examples might include the mitigation of an impact resulting from ESA, NHPA, or tribal consultation, a change in the “overhead” charges of a federal or state agency, a significant reduction of the balance of available funds, or a failure to secure permits.. As soon as an administrative event occurs that affects the TWP, GCMRC (or relevant agency – such as DOI) will notify the TWG.
- **New initiatives:** New initiatives may be brought up for discussion by members during BAHG or TWG budget discussions (see Table 1) for consideration by Reclamation and GCMRC. These new initiatives may need to be considered by the GCDAMP Program Manager prior to requesting either GCMRC or Reclamation to develop a proposal for mid-work plan consideration. If DOI determines it is beyond the scope of a mid-work plan change, then the initiative could be considered during the development of the next work plan. Given that the budget will likely be fully accounted for, direction on funding source within the current budget will be required for discussion with the GCDAMP Program Manager. Revisions must comply with the Budget Principles (see Section 2.1).

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TABLE 4 Implementation Criteria for Experimental Treatments of Alternative D

Experimental Treatment	Trigger ^a and Primary Objective	Replicates	Duration	Annual Implementation Considerations ^b	Long-Term Off-Ramp Conditions ^c	Action if Successful
<i>Sediment-Related Experiments^d</i>						
Spring HFE up to 45,000 cfs in Mar. or Apr.	Trigger: Sufficient Paria River sediment input in spring accounting period (Dec.–Jun.) to achieve a positive sand mass balance in Marble Canyon with implementation of an HFE Objective: Rebuild sandbars	Not conducted during first 2 years of LTEMP, otherwise implement in each year triggered, dependent on resource condition and response	≤96 hr	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs; sediment-triggered spring HFEs will not occur in the same water year as an extended-duration (>96 hr) fall HFE	Sediment-triggered spring HFEs are not effective in building sandbars; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow
Proactive spring HFE up to 45,000 cfs (Apr., May, or Jun.)	Trigger: High-volume year with planned equalization releases (≥10 maf) Objective: Protect sand supply from equalization releases	Not conducted during first 2 years of LTEMP, otherwise implement in each year triggered, dependent on resource condition and response	First test 24 hr; subsequent tests could be shorter, but not longer, depending on results of first tests	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs; will not be implemented in the same water year as a sediment-triggered spring HFE or extended-duration fall HFE	Proactive spring HFEs are not effective in building sandbars; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger ^a and Primary Objective	Replicates	Duration	Annual Implementation Considerations ^b	Long-Term Off-Ramp Conditions ^c	Action if Successful
<i>Sediment-Related Experiments (Cont.)</i>						
Fall HFE ≤96 hr up to 45,000 cfs in Oct. or Nov.	Trigger: Sufficient Paria River sediment input in fall accounting period (Jul.–Nov.) to achieve a positive sand mass balance in Marble Canyon with implementation of an HFE Objective: Rebuild sandbars	Implement in each year triggered, dependent on resource condition and response	≤96 hr	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs	This type of fall HFE is not effective in building sandbars; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow
Fall HFEs longer than 96-hr duration up to 45,000 cfs in Oct. or Nov.	Trigger: Sufficient Paria River sediment input in fall accounting period (Jul.–Nov.) to achieve a positive sand mass balance in Marble Canyon with implementation of an HFE longer than a 96-hr, up to 45,000-cfs flow Objective: Rebuild sandbars	Implement in each year triggered; limited to total of four tests in LTEMP period	Up to 250 hr depending on availability of sand duration of first test not to exceed 192 hr	Potential short-term unacceptable impacts on resources listed in Section 1.3; unacceptable cumulative effects of sequential HFEs	Extended-duration fall HFEs are not effective in building sandbars; resulting sandbars are no bigger than those created by shorter-duration HFEs; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger ^a and Primary Objective	Replicates	Duration	Annual Implementation Considerations ^b	Long-Term Off-Ramp Conditions ^c	Action if Successful
<i>Aquatic Resource-Related Experiments^e</i>						
Trout management flows	Trigger: Predicted high trout recruitment in the Glen Canyon reach Objective: Test efficacy of flow regime on trout numbers and survival of humpback chub	Implement as needed when triggered after consultation with Tribes; test may be conducted early in the 20-year period even if not triggered by high trout recruitment ^f	Implemented in as many as 4 months (May–Aug.)	Potential short-term unacceptable impacts on resources listed in Section 1.3	TMFs have little or no effect on trout recruitment after at least three tests; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment triggered by predicted high trout recruitment in Glen Canyon, taking into consideration Tribal concerns
Tier 1: Expanded translocation of humpback chub in the Little Colorado River	Trigger: Number of adult or subadult humpback chub in the Little Colorado River reach below Tier 1 triggers Objective: Increase number of adult and subadult humpback chub	Implement in each year triggered unless determined ineffective	As needed	Potential short-term unacceptable impacts on resources listed in Section 1.3	Expanded translocation has little or no effect on increasing the number of adult or subadult humpback chub; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow
Tier 1: Implement head-start program for larval humpback chub	Trigger: Number of adult or subadult humpback chub in the Little Colorado River reach below Tier 1 triggers Objective: Increase number of adult and subadult humpback chub	Implement in each year triggered unless determined ineffective	As needed	Potential short-term unacceptable impacts on resources listed in Section 1.3	Head-start program has little or no effect on increasing the number of adult or subadult humpback chub; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered and existing resource conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger ^a and Primary Objective	Replicates	Duration	Annual Implementation Considerations ^b	Long-Term Off-Ramp Conditions ^c	Action if Successful
<i>Aquatic Resource-Related Experiments (Cont.)</i>						
Tier 2: Mechanical removal of nonnative fish in Little Colorado River reach	Trigger: Tier 1 actions ineffective; humpback chub numbers in Little Colorado River below Tier 2 triggers Objective: Increase number of adult and subadult humpback chub	Implement in each year triggered unless determined ineffective after consultation with Tribes	Monthly removal trips (Feb.–Jul.) until “predator index” or adult humpback chub reach acceptable levels (see Appendix O)	Potential short-term unacceptable impacts on resources listed in Section 1.3	Mechanical removal has little or no effect on reducing predator index in the Little Colorado River reach; no population-level benefit on humpback chub; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment when triggered, taking into consideration Tribal concerns
Low summer flows (minimum daily mean 5,000 to 8,000 cfs) to target $\geq 14^{\circ}\text{C}$ at Little Colorado River confluence	Trigger: Initial experiment: in the second 10 years of the LTEMP period, when target temperature of $\geq 14^{\circ}\text{C}$ can be achieved only with low summer flow Objective: Increase humpback chub growth	Subsequent experimental use if: (1) initial test was successful, (2) humpback chub population concerns warrant their use, (3) water temperature appears to be limiting recruitment, and (4) target temperature of $\geq 14^{\circ}\text{C}$ could be achieved only with low summer flow	3 months (Jul.–Sep.)	Potential short-term unacceptable impacts on resources listed in Section 1.3	Low summer flows do not increase growth and recruitment of humpback chub; increase in warmwater nonnative species or trout at the Little Colorado River; long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed; or sufficient warming does not occur as predicted	Implement as adaptive treatment when conditions allow

TABLE 4 (Cont.)

Experimental Treatment	Trigger ^a and Primary Objective	Replicates	Duration	Annual Implementation Considerations ^b	Long-Term Off-Ramp Conditions ^c	Action if Successful
<i>Aquatic Resource-Related Experiments (Cont.)</i>						
Macroinvertebrate production flows	Trigger: None Objective: Improve food base productivity and abundance or diversity of mayflies, stoneflies, and caddisflies	Target two to three replicates	Up to 4 months (May–Aug.) ^g	Potential short-term unacceptable impacts on resources listed in Section 1.3; coordinate planning with other experiments to avoid confounding conditions or results	Steady weekend flows have little or no benefit on food base, trout fishery, or native fish; increase in warmwater nonnative species or trout at the Little Colorado River; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment in target months when conditions allow
<i>Riparian Vegetation Experiments</i>						
Non-flow vegetation treatments	Trigger: None Objective: Improve vegetation conditions at key sites	Not applicable	20 years if successful pilot phase	Potential short-term unacceptable impacts on resources listed in Section 1.3	Control and replanting techniques are not effective or practical; or long-term unacceptable adverse impacts on the resources listed in Section 1.3 are observed	Implement as adaptive treatment if invasive species can be reduced and native species increased

^a Triggers will be modified as needed during the 20-year LTEMP period in an adaptive manner through processes including ESA consultation and based on the best available science utilizing the experimental framework for each alternative.

^b Annual determination by the DOI. Any implementation will consider resource condition assessments and resource concerns using the annual processes described in Sections 1.3 and 1.4.

^c Suspension of experiment if the DOI determines effects cannot be mitigated.

^d Details of implementation of sediment experiments are presented in Section 2.1.

^e Details of implementation of aquatic resource experiments are presented in Section 2.2.

^f The decision to conduct TMFs in a given year will consider the resource conditions, as specified in Section 1.3, and will also involve considerations regarding the efficacy of the test based on those resource conditions.

^g The duration and other characteristics of experimental macroinvertebrate production flows could be adjusted based on the results of initial experiments.

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