

Index

Index

A

Adobe Ruin, 3-6, 3-8
 Ak-Chin Indian Community, 3-12, 3-90, 3-91,
 3-92, 3-94, 6-7
 Alamo Dam, 1-19, 3-24
 algae, 3-45, 3-51, 3-52, 4-155, 4-169
 All-American Canal (AAC), 1-12, 1-19, 3-9,
 3-10, 3-26, 3-27, 3-86, 3-104, 4-89, 4-197,
 4-200, 4-239, 4-242, 4-335, 5-9, 5-10, 5-11,
 5-12, 5-13
 American bittern, 3-77, 4-221, 4-223, 4-232,
 4-233
 American kestrel, 3-73, 3-78, 4-221, 4-223,
 4-226, 4-229, 4-232, 4-233
 American peregrine falcon, 3-70, 3-76, 4-201,
 4-210, 4-221, 4-223
 American white pelican, 3-77, 4-221, 4-223,
 4-226, 4-229, 4-232, 4-233
 Annual Operating Plan (AOP), ES-2, ES-5, 1-1,
 1-2,
 1-6, 1-13, 1-21, 1-22, 1-23, 1-25, 2-3, 2-6, 6-2
 Antelope Point, 3-111, 3-112, 4-33, 4-35, 4-283,
 4-284, 4-292
 Antelope Point Marina, 3-112
 Arizona Bell's vireo, 3-77
 Arizona Department of Water Resources
 (ADWR),
 3-40, 4-17, 4-97, 4-143, 6-6
 Arizona Public Service Company, 3-106
 Arizona Water Settlement Act (AWSA), 4-97,
 4-144, 4-274

B

bald eagle, 3-73, 4-201, 4-203, 4-210, 4-219,
 4-221, 4-223, 4-226, 4-229, 4-232, 4-233, 5-3
 beach/habitat-building flows (BHBF), 1-24,
 3-20, 3-50, 4-48
 belted kingfisher, 4-201, 4-204, 4-210, 4-221,
 4-223, 4-226, 4-229, 4-232, 4-233

Big Bend Water District, 3-13
 Bill Williams River, 1-11, 1-19, 3-7, 3-8, 3-24,
 3-51, 3-119, 3-120, 4-74, 4-187, 4-228
 Bill Williams River National Wildlife Refuge,
 3-120
 Black Canyon, 3-7, 3-23, 3-60
 black tern, 4-226, 4-229, 4-232, 4-233
 bluehead sucker, E-16, 3-68, 4-206, 4-207,
 4-213, 4-215, 4-216, 4-217, 4-220, 4-224,
 4-240
 boating, E-20, E-22, 1-8, 3-109, 3-110, 3-111,
 3-113, 3-114, 3-118, 3-120, 3-121, 3-122,
 3-123, 3-124, 3-125, 3-126, 4-279, 4-280,
 4-284, 4-286, 4-291, 4-292, 4-324, 4-327,
 5-13
 bonytail, E-15, E-17, 3-7, 4-186, 4-200, 4-202,
 4-204, 4-229, 4-230, 4-231, 4-233, 4-234,
 4-235, 4-239, 4-241, 5-9
 Boulder Basin, 3-13, 3-51, 3-52, 3-60, 3-83,
 3-84, 4-153, 4-169
 Boulder Beach, 3-115, 3-116, 3-118
 Boulder Canyon, 1-12, 1-14, 3-105, 3-106,
 4-269
 Boulder Canyon Project (BCP), 3-106
 Bridge Canyon, 3-112, 4-285
 Bullfrog Marina, 3-112

C

California black rail, 3-77, 4-221, 4-223, 4-226,
 4-229, 4-232, 4-233
 California Condor, 3-76
 California Department of Water Resources,
 4-10, 6-6
 Camp Verde Indian Reservation, 6-8
 Cataract Canyon, 3-6, 3-123
 Cathedral in the Desert, ES-13, 3-59, 4-181,
 4-182, 4-183
 Cattail Cove State Park, 3-120

Index

- Central Arizona Project (CAP), ES-3, 1-13, 1-19, 1-23, 2-6, 3-3, 3-8, 3-11, 3-12, 3-24, 3-34, 3-35, 3-39, 3-40, 3-41, 3-61, 3-90, 3-91, 3-92, 3-93, 3-94, 3-95, 3-96, 3-105, 3-106, 3-133, 3-134, 3-135, 4-19, 4-20, 4-97, 4-143, 4-144, 4-145, 4-146, 4-249, 4-251, 4-267, 4-269, 4-272, 4-274, 4-299, 4-302, 4-303, 4-307, 4-329
- Central Arizona Water Conservation District (CAWCD), 3-8, 3-11, 4-274, 4-302, 6-6
- Chemehuevi Indian Tribe, 3-89, 6-7
- Chemehuevi Reservation, 3-40, 3-89, 6-7
- Chemehuevi Valley, 3-24, 3-25, 3-85
- Cibola Gage, 3-6, 3-8, 3-9, 3-25, 3-26, 3-64, 3-121, 3-122, 4-80
- Cibola National Wildlife Refuge (NWR), 3-7, 3-8, 3-34, 3-121, 3-127, 4-234, 5-1
- Cibola Valley, 3-25, 3-39
- Cienega de Santa Clara, 4-18
- City of Page, 3-6, 3-17, 3-107, 4-251, 4-272, 4-273, 4-277
- Clark County, 1-26, 3-13, 3-56, 3-57, 3-58, 3-134, 3-137, 3-138, 4-335, 4-339, 5-8
- Clark County Water Reclamation District, 3-13, 5-8
- Clean Water Act (CWA), 3-46, 5-3
- Climate Change, ES-23, E-24, 4-9, 4-10, 4-11, 4-13, 4-14, 4-15
- Coachella Canal, 4-335
- Coachella Valley Water District (CVWD), 1-26, 3-9, 3-26, 3-36, 3-40, 3-41, 3-136, 4-17, 4-130, 4-131, 4-335, 6-7
- Coconino County, 3-57, 3-133, 3-135
- Cocopah Indian Reservation, 3-7, 3-88, 3-90, 4-249
- Colorado Department of Natural Resources, 6-7
- Colorado pikeminnow, ES-15, 3-66, 3-76, 4-200, 4-202, 4-204, 4-239
- Colorado River Aqueduct (CRA), 3-8, 3-14, 3-41
- Colorado River Basin Compact (Compact), 1-1, 1-12, 1-13, 1-14, 1-15, 1-21, 2-6, 3-17, 3-31, 3-46, 4-98
- Colorado River Basin Salinity Control Program (SCP), 3-104, 3-105, 4-153, 4-155, 4-156, 4-267
- Colorado River Board of California (CRBC), 6-7
- Colorado River Commission of Nevada, 6-7
- Colorado River cotton rat, ES-17, 4-222, 4-228, 4-230, 4-231, 4-232, 4-234, 4-235, 4-237, 4-241
- Colorado River Dam Fund (Dam Fund), 3-105, 3-106, 4-269
- Colorado River Energy Distributors Association (CREDA), 6-7
- Colorado River Indian Reservation (CRIR), 1-19, 3-8, 3-39, 3-40, 3-89, 3-95, 4-83, 4-85, 6-8
- Colorado River Indian Tribes (CRIT), 3-89, 3-95, 4-249, 4-266, 6-8
- Colorado River Storage Project Act (CRSPA), 1-12, 1-14, 1-21, 3-17, 3-32
- Colorado River Toad, 3-79
- Colorado River Water Conservation District (CRWCD), 6-7
- Colorado Water Conservation Board (CWCB), 6-7
- Cooperating Agency/Agencies, ES-1, ES-3, ES-7, 1-4, 1-5, 2-2, 2-15, 4-330, 5-1, 6-3, 6-4, 6-6
- Cottonwood Cove, 3-118

D

- Dangling Rope Marina, 3-111, 3-112, 3-123
- Davis Dam, ES-10, ES-14, ES-17, ES-21, 1-14, 1-19, 1-21, 1-27, 3-6, 3-7, 3-8, 3-23, 3-24, 3-25, 3-34, 3-57, 3-64, 3-66, 3-81, 3-84, 3-85, 3-103, 3-114, 3-118, 3-119, 3-120, 3-127, 3-129, 4-68, 4-74, 4-78, 4-79, 4-80, 4-87,

4-95, 4-185, 4-187, 4-189, 4-194, 4-195,
4-196, 4-199, 4-200, 4-226, 4-228, 4-229,
4-230, 4-231, 4-232, 4-233, 4-234, 4-238,
4-241, 4-245, 4-246, 4-291, 4-295, 4-297,
4-325, 4-331, 5-8
Desert Lake View Newspaper, 3-126
Diamond Creek, 3-52, 3-113, 3-125, 4-155,
4-158, 4-164, 4-165, 4-189, 4-205, 4-206,
4-207, 4-208, 4-213, 4-214, 4-215, 4-216,
4-217, 4-281, 4-286, 4-289
dissolved oxygen, 3-45, 3-52, 4-155, 4-166,
4-169, 4-283
Dome Gaging Station, 3-29
Drop 2 Storage Reservoir Project, ES-23, 4-333,
4-335, 4-336, 4-337, 4-338, 4-339, 4-340,
4-341, 4-342

E

Echo Bay, ES-20, 3-116, 3-118, 4-59, 4-279,
4-290, 4-292
Echo Beach, 3-115
El Dorado Canyon, 3-7, 3-23
elf owl, 4-226, 4-229, 4-232, 4-233
Endangered Species Act (ESA), 1-13, 1-26,
3-68, 3-74, 3-75, 3-79, 4-185, 5-1, 5-6, 6-3

F

ferry service, E-21, 3-129, 4-295, 4-296, 4-297,
4-331
fishing, 1-5, 1-8, 3-94, 3-96, 3-110, 3-112,
3-113, 3-114, 3-115, 3-118, 3-119, 3-120,
3-121, 3-122, 3-126, 3-127, 4-280, 5-10, 5-13
flannelmouth sucker, ES-15, ES-16, E-17, 3-65,
3-68, 3-72, 4-200, 4-204, 4-206, 4-207,
4-213, 4-215, 4-216, 4-217, 4-220, 4-224,
4-229, 4-230, 4-231, 4-239, 4-240, 4-241
Flood Control Operation, 1-21, 3-22

Fort Apache Reservation, 6-8
Fort McDowell Indian Community, 3-90
Fort McDowell Reservation, 3-92, 3-94
Fort McDowell Yavapai Nation, 3-12, 3-94, 6-8
Fort Mojave Indian Tribe, 3-89, 6-8
Fort Mojave Reservation, 3-39, 3-40, 3-43, 3-89
Fort Yuma Indian Reservation, 3-40, 3-89,
4-249, 6-8

G

Gila Gravity Main Canal, 1-19, 3-9, 3-26
Gila River, 1-10, 3-9, 3-10, 3-12, 3-26, 3-28,
3-29, 3-51, 3-52, 3-90, 3-91, 3-92, 3-95,
3-135, 4-18, 6-8
Gila River Indian Community, 3-12, 3-91, 3-95,
6-8
Gila River Reservation, 3-90, 3-92, 3-95
Gila woodpecker, 3-77, 4-226, 4-229, 4-232,
4-233
gilded flicker, 4-226, 4-229, 4-232, 4-233
Glen Canyon Dam, ES-1, ES-9, ES-10, ES-12,
ES-13, ES-14, ES-15, ES-20, ES-21, 1-4, 1-5,
1-11, 1-12, 1-14, 1-21, 1-23, 1-24, 2-7, 3-6,
3-7, 3-17, 3-18, 3-19, 3-20, 3-22, 3-46, 3-48,
3-49, 3-50, 3-51, 3-52, 3-57, 3-59, 3-60, 3-61,
3-62, 3-65, 3-66, 3-67, 3-68, 3-69, 3-70, 3-71,
3-72, 3-82, 3-101, 3-102, 3-109, 3-110,
3-112, 3-114, 3-125, 3-126, 3-129, 3-135,
4-23, 4-24, 4-39, 4-40, 4-41, 4-43, 4-44, 4-45,
4-46, 4-47, 4-48, 4-94, 4-95, 4-96, 4-153,
4-154, 4-155, 4-157, 4-158, 4-166, 4-167,
4-169, 4-170, 4-173, 4-177, 4-180, 4-181,
4-182, 4-185, 4-187, 4-188, 4-189, 4-192,
4-193, 4-195, 4-196, 4-199, 4-205, 4-206,
4-208, 4-210, 4-211, 4-212, 4-213, 4-214,
4-215, 4-216, 4-217, 4-218, 4-219, 4-220,
4-238, 4-239, 4-243, 4-244, 4-249, 4-251,
4-252, 4-281, 4-282, 4-283, 4-285, 4-286,
4-292, 4-293, 5-2, 5-10, 5-11, 5-13

Index

Glen Canyon Dam Adaptive Management Program (AMP), 1-24, 3-50, 3-61, 4-185, 4-282, 5-10
Glen Canyon National Recreation Area (GCNRA), 1-5, 1-13, 3-6, 3-7, 3-62, 3-67, 3-72, 3-82, 3-109, 3-110, 3-112, 3-123, 3-124, 3-126, 3-139, 5-10, 6-3
Glen Canyon Powerplant, ES-19, 3-99, 3-102, 3-107, 4-38, 4-251, 4-252, 4-253, 4-254, 4-255, 4-256, 4-266, 4-267, 4-270, 4-271, 4-272, 4-275, 4-278
Grand Canyon evening primrose, ES-16, 3-79, 4-205, 4-211, 4-220, 4-240
Grand Canyon National Park, 1-5, 1-13, 3-6, 3-7, 3-55, 3-57, 3-72, 3-82, 3-109, 3-112, 3-113, 3-114, 3-126, 5-2, 5-10, 6-3
Grand Wash Cliff, 3-114, 3-125, 4-290
great egret, 4-221, 4-223, 4-226, 4-229, 4-232, 4-233
Green River, 1-10, 3-15
Gypsum Canyon, 3-6, 4-182

H

Halls Crossing Marina, 3-112
Havasu Wilderness Area, 3-120
Havasupai Indian Tribe, 6-8
Headgate Rock Dam, 1-19, 3-8, 3-25, 3-39, 3-95, 3-104, 4-83, 4-249, 4-251
Headgate Rock Powerplant, 3-95, 3-99, 3-104, 4-249, 4-251, 4-252, 4-264, 4-265, 4-266, 4-274, 4-276, 4-277
Hemenway Harbor, 3-118
Hite Marina, 3-112, 3-123, 4-31
Hoover Dam, ES-1, ES-9, ES-10, ES-12, ES-14, ES-17, 1-4, 1-12, 1-16, 1-19, 1-21, 1-27, 2-14, 3-6, 3-7, 3-8, 3-20, 3-21, 3-22, 3-23, 3-29, 3-34, 3-46, 3-50, 3-51, 3-52, 3-57, 3-58, 3-60, 3-61, 3-64, 3-66, 3-72, 3-73, 3-83, 3-86, 3-101, 3-102, 3-106, 3-114, 3-118, 3-126, 3-127, 4-49, 4-68, 4-69, 4-71, 4-72, 4-73,

4-74, 4-80, 4-89, 4-95, 4-96, 4-140, 4-154, 4-156, 4-166, 4-169, 4-171, 4-177, 4-183, 4-185, 4-187, 4-194, 4-199, 4-226, 4-228, 4-238, 4-241, 4-244, 4-245, 4-269, 4-277, 4-283, 4-291, 4-325, 5-1, 5-7, 5-8
Hopi Tribe, 3-82, 6-8
Hualapai Indian Reservation, 3-7, 3-82, 3-97, 3-112, 3-113, 4-249, 4-250, 6-8
Hualapai Indian Tribe, 3-82, 3-96, 3-97, 3-113, 4-244, 4-247, 4-250, 6-5, 6-8
humpback chub, ES-16, 4-206, 4-208, 4-213, 4-215, 4-216, 4-217, 4-224, 4-240

I

Imperial County, 3-137, 3-142, 4-330, 4-341
Imperial Dam, ES-12, ES-14, ES-15, ES-17, ES-18, 1-19, 1-27, 3-6, 3-9, 3-10, 3-26, 3-27, 3-28, 3-39, 3-40, 3-46, 3-51, 3-64, 3-66, 3-81, 3-86, 3-89, 3-121, 3-122, 4-80, 4-83, 4-85, 4-87, 4-89, 4-153, 4-154, 4-156, 4-185, 4-196, 4-197, 4-200, 4-231, 4-232, 4-233, 4-234, 4-235, 4-239, 4-241, 4-242, 4-246, 4-291, 4-325, 5-8, 5-9
Imperial Irrigation District (IID), 1-26, 3-9, 3-26, 3-36, 3-40, 3-41, 3-104, 3-136, 4-17, 4-130, 4-131, 4-335, 5-9, 6-7
Imperial National Wildlife Refuge (Imperial NWR), 3-7, 3-9, 3-121, 3-122, 3-127, 5-1
Imperial Valley, 3-28, 3-40
Indian Trust Assets (ITA), ES-19, 1-8, 3-87, 3-88, 3-90, 3-93, 3-94, 3-95, 3-96, 3-97, 4-249, 4-330, 4-340, 5-12, 6-3
Intergovernmental Panel on Climate Change (IPCC), 4-9
Interim Surplus Criteria Final EIS, 3-75, 3-109
Interim Surplus Guidelines (ISG), ES-2, ES-5, ES-7, ES-8, E-11, 1-2, 1-4, 1-14, 1-22, 1-23, 1-25, 2-2, 2-3, 2-7, 2-8, 2-11, 2-13, 2-15, 2-17, 2-19, 2-20, 3-3, 3-22, 3-31, 3-34, 3-36, 3-75, 4-3, 4-22, 4-116, 4-117, 4-151

J

Jicarilla Apache Nation, 6-8

K

Kaibab Band of Paiute Indians, 3-82, 6-8
 Kaibab Indian Reservation, 6-8
 Kanab ambersnail, E-16, 3-79, 4-205, 4-211,
 4-220, 4-240
 Kane County, 4-331
 Kerr McGee Chemical Company, 3-53

L

La Paz County, 3-135, 3-136
 Laguna Dam, 3-9, 3-10, 3-26, 3-66
 Lake Havasu Ferry Service, 3-129, 4-295, 4-297
 Lake Havasu National Wildlife Refuge (Lake
 Havasu NWR), 1-16, 3-7, 3-8, 3-119, 3-120,
 4-74, 4-78, 5-1
 Lake Havasu State Park, 3-7, 3-119, 3-120
 Lake Mead delta, ES-13, 3-57, 3-63, 4-173,
 4-180
 Lake Mead National Recreation Area
 (LMNRA), 1-5, 3-7, 3-43, 3-58, 3-60, 3-72,
 3-109, 3-114, 3-115, 3-139, 3-140, 5-7, 6-3
 Lake Powell Ferry Service, 3-129, 4-295
 Las Vegas Bay, 3-115, 3-116, 3-118, 4-169, 5-8,
 5-11
 Las Vegas Bear Poppy, 3-79
 Las Vegas Boat Harbor, 3-118
 Las Vegas Indian Colony, 6-8
 Las Vegas Tribe of Paiute Indians, 6-8
 Las Vegas Valley Water District, 3-13, 3-43, 6-7
 Las Vegas Wash, 3-51, 3-52, 3-53, 4-153, 5-8
 Laughlin River Taxis, 3-129, 4-295, 4-297
 Little Colorado River, 1-11, 3-20, 3-50, 3-51,
 3-52, 3-53, 3-70, 3-96, 4-155, 4-158, 4-162,

4-163, 4-189, 4-207, 4-208, 4-213, 4-215,
 4-216, 4-217, 4-281, 4-286, 4-288

London Bridge, 3-120, 3-129

Long Range Operating Criteria (LROC), ES-5,
 1-1, 1-3, 1-13, 1-21, 1-22, 1-23, 2-3, 2-6, 3-
 19, 3-22, 3-34

long-eared owl, 4-221, 4-223, 4-226, 4-229,
 4-232, 4-233

Los Angeles County, 3-137, 3-142

Los Angeles Department of Water and Power,
 3-106

Lost City, 3-83

Lower Colorado River Multi-Species

Conservation Program (LCR MSCP), ES-5,
 1-24, 1-26, 1-27, 2-3, 3-6, 3-61, 3-63, 3-64,
 3-75, 3-109, 4-24, 4-78, 4-87, 4-185, 4-186,
 4-188, 4-227, 4-336, 4-339, 5-6, 5-8, 5-9,
 5-11, 5-12, 5-13

lowland leopard frog, 3-69, 4-230

M

Marble Canyon, 3-7, 3-20, 3-60

Maricopa County, 3-12, 3-94, 3-136

Martinez Lake, 3-9, 3-121, 3-122, 5-2

McCulloch Manufacturing Plant, 3-53

metals, 3-45, 4-155, 4-170, 4-171, 4-330

Metropolitan Water District of Southern

California (MWD), ES-3, 1-19, 1-26, 2-12,
 3-3, 3-8, 3-14, 3-24, 3-40, 3-41, 3-42, 3-61,
 3-103, 3-134, 3-136, 3-141, 4-10, 4-17, 4-97,
 4-143, 4-148, 4-272, 4-322, 4-323, 6-7

Minute 242, ES-12, 1-14, 3-38, 3-46, 4-156

Mittry Lake, 3-9, 3-10, 3-122

Mittry Lake Wildlife Area, 3-10, 3-122

Moapa Band of Paiute Indians, 6-8

Moapa River Indian Reservation, 6-8

Mohave County, 3-57, 3-58, 3-134

Morelos Diversion Dam, ES-15, ES-18, ES-23,
 3-9, 3-10, 3-27, 3-28, 3-29, 3-38, 3-51, 3-64,
 4-18, 4-89, 4-91, 4-92, 4-93, 4-188, 4-198,

Index

4-199, 4-200, 4-236, 4-237, 4-238, 4-239,
4-242, 4-337, 4-339
Muddy River, ES-23, 1-27, 3-60, 3-72, 3-75,
4-333, 4-334, 4-336, 4-337, 4-338, 4-339,
4-340, 4-341

N

Natural Flow, 1-10, 1-11, 3-15, 3-16, 3-31, 4-4,
4-6, 4-7, 4-9, 4-14, 4-17, 4-154
Navajo Generating Station (NGS), 3-106, 3-107,
4-272, 4-274, 4-277
Navajo Indian Reservation, 3-6, 3-7, 3-82, 3-96,
3-106, 3-112
Navajo Mountain, 3-59
Navajo Nation, 3-82, 3-96, 4-244, 4-249, 4-250,
6-5, 6-8
Navajo Sandstone, 3-59, 3-62, 4-173
New Mexico Interstate Stream Commission, 6-7
northern cardinal, 4-226, 4-229, 4-232, 4-233
northern harrier, 3-73, 4-221, 4-223, 4-226,
4-229, 4-232, 4-233
northern leopard frog, 3-67, 3-69
nutrients, 1-24, 3-45, 3-50, 3-51, 3-52, 4-155,
4-169

O

Occult little brown bat, 3-78
Office of the State Engineer, Wyoming, 6-7
Orange County, 3-137, 3-142
osprey, 3-73, 4-201, 4-203, 4-204, 4-210, 4-221,
4-223, 4-226, 4-229, 4-232, 4-233
Ouray Reservation, 6-8
Overton Beach, 3-60, 3-116, 3-117, 4-56
Overton Wildlife Management Area, 3-114

P

Painted Desert, 3-20
Paiute Indian Tribe, 3-82, 6-8

Palo Verde Diversion Dam, 1-14, 1-19, 3-8,
3-25, 3-66, 3-121, 4-83, 4-85, 4-87
Palo Verde Irrigation District (PVID), 1-19,
3-25, 3-26, 3-40, 3-41, 6-7
Palo Verde Valley, 3-25
Paria River, 3-20, 3-50, 3-51, 3-68, 3-69
Parker Dam, ES-10, ES-12, ES-14, ES-17, 1-1
4, 1-19, 1-21, 1-27, 3-6, 3-8, 3-24, 3-25, 3-26,
3-28, 3-46, 3-51, 3-64, 3-66, 3-84, 3-85, 3-86,
3-103, 3-104, 3-119, 3-120, 3-121, 3-127,
3-135, 4-74, 4-78, 4-80, 4-82, 4-83, 4-87,
4-88, 4-95, 4-154, 4-156, 4-185, 4-187,
4-189, 4-195, 4-196, 4-197, 4-199, 4-200,
4-226, 4-231, 4-232, 4-233, 4-234, 4-235,
4-236, 4-237, 4-238, 4-239, 4-241, 4-246,
4-247, 4-291, 4-325, 4-335, 4-336, 5-8
Parker Strip Recreation Area, 3-121
Parker Valley Natural Resources Conservation
District, 6-7
Pearce Bay, ES-20, 3-113, 3-116, 3-125, 4-53,
4-290, 4-292
Pearce Ferry, 3-60, 3-113, 3-116, 3-125, 4-54,
4-279, 4-290
perchlorate, 3-45, 3-53, 4-155, 4-170, 4-171,
4-330
Phantom Ranch, 3-113
Picacho State Recreation Area, 3-7, 3-121
Pilot Knob Powerplant, 3-10
Pima County, 3-66
Pinal County, 3-91
Pueblo Grande de Nevada, 3-83
Pueblo of Acoma, 6-8
Pueblo of Cochiti, 6-8
Pueblo of Jemez, 6-8
Pueblo of Laguna, 6-8
Pueblo of Nambe, 6-8
Pueblo of Pojoaque, 6-8
Pueblo of San Felipe, 6-8
Pueblo of San Juan, 6-8
Pueblo of Sandia, 6-8
Pueblo of Santa Ana, 6-8

Pueblo of Santa Clara, 6-8
 Pueblo of Tesuque, 6-8
 Pueblo of Zia, 6-8
 Pueblo of Zuni, 3-82
 Pyramid Canyon, 3-7, 3-23

Q

Quartermaster Area, 3-113, 3-114

R

Rainbow Bridge, 3-59, 3-111, 3-112, 4-29,
 4-285, 4-292, 4-330
 Rainbow Bridge National Monument, 3-59,
 3-111, 3-112, 4-285, 4-292
 razorback sucker, ES-15, ES-17, 3-7, 3-72,
 4-186, 4-188, 4-200, 4-202, 4-224, 4-225,
 4-227, 4-229, 4-230, 4-231, 4-233, 4-234,
 4-239, 4-241, 4-250, 4-291, 5-9
 relict leopard frog, 3-72, 4-230
 Riverside County, 3-137
 RiverWare™, 4-4
 Rocky Mountain National Park, 1-9

S

salinity, ES-12, 1-13, 3-45, 3-46, 3-104, 3-106,
 4-153, 4-154, 4-155, 4-156, 4-170, 4-269,
 4-280, 4-283, 4-330
 Salt River Pima-Maricopa Indian Community,
 3-12, 3-90, 3-93, 4-20, 6-8
 Salt River Project (SRP), 3-93, 3-94, 3-106,
 4-272
 Salt River Reservation, 3-92, 3-93, 3-94, 6-8
 Salt Song Trail, 3-83
 San Bernardino County, 3-135, 3-137, 3-142
 San Carlos Apache Tribe, 3-12, 3-91, 3-92,
 3-94, 6-8
 San Carlos Reservation, 3-92, 3-94, 6-8
 San Diego County, 1-26, 3-136, 3-137, 6-7

San Diego County Water Authority (SDCWA),
 1-26, 3-136, 6-7
 San Juan County, 3-142, 3-143, 4-329, 4-330, 4-
 331
 San Juan River, 1-10, 3-6, 3-15, 4-200, 4-202,
 4-203, 4-204
 San Juan Southern Paiute Tribe of Arizona, 6-8
 San Xavier District, 3-12, 3-92, 3-93
 Schuk Toak District, 3-12, 3-92, 3-93
 Secretarial Implementation Agreement (SIA),
 3-75, 4-17
 sediment, ES-13, ES-16, 1-8, 3-9, 3-20, 3-26,
 3-45, 3-50, 3-51, 3-59, 3-60, 3-63, 3-84,
 3-125, 4-54, 4-155, 4-166, 4-167, 4-169,
 4-171, 4-173, 4-176, 4-181, 4-182, 4-184,
 4-190, 4-192, 4-199, 4-204, 4-205, 4-212,
 4-215, 4-217, 4-220, 4-221, 4-223, 4-230,
 4-240, 4-249, 4-290, 4-330, 4-338
 sediment deltas, ES-13, 1-8, 3-50, 3-59, 3-60,
 4-166, 4-169, 4-181, 4-182, 4-184, 4-190,
 4-221, 4-223, 4-330
 selenium, 3-52
 Senator Wash Dam, 3-9
 Separation Canyon, 3-6, 3-66, 4-205, 4-227,
 4-244
 Shivwits Plateau, 3-114
 Siphon Drop Powerplant, 3-27, 4-89, 4-197,
 4-200
 small-footed myotis, 4-222, 4-228
 snowy egret, 3-67, 4-210, 4-221, 4-223, 4-226,
 4-229, 4-232, 4-233
 Sonoran yellow warbler, 3-77, 4-226, 4-229,
 4-232, 4-233
 South Cove, 3-116, 3-125, 4-53, 4-56
 Southern Nevada Water Authority (SNWA),
 ES-3, ES-9, ES-23, 1-19, 2-4, 2-6, 2-12, 2-14,
 3-3, 3-13, 3-36, 3-42, 3-43, 3-61, 3-107,
 3-134, 3-138, 4-10, 4-17, 4-59, 4-60, 4-69,
 4-80, 4-97, 4-99, 4-103, 4-143, 4-148, 4-149,
 4-151, 4-171, 4-251, 4-272, 4-273, 4-274,
 4-323, 4-333, 4-334, 4-335, 4-336, 4-337,

Index

4-338, 4-339, 4-340, 4-341, 5-7, 5-8, 5-11,
5-12, 5-13, 6-7
Southern Ute Indian Tribe, 6-8
Southern Ute Reservation, 6-8
southwestern willow flycatcher, ES-16, 3-120,
4-210, 4-219, 4-221, 4-223, 4-226, 4-229,
4-232, 4-233, 4-240, 4-339
sport fishing, 3-109, 3-121, 3-122, 3-126, 4-279,
4-280, 4-285, 4-286, 4-291
sticky buckwheat, ES-16, 4-240
summer tanager, 4-226, 4-229, 4-232, 4-233
Systems Conveyance and Operations Program
(SCOP), 4-52, 4-60, 4-153, 4-155, 4-166,
4-169, 4-170, 4-171, 4-188, 5-8, 5-11, 5-12,
5-13

T

temperature, ES-12, 1-24, 3-45, 3-48, 3-52,
3-126, 3-127, 4-7, 4-13, 4-154, 4-155, 4-157,
4-158, 4-161, 4-162, 4-163, 4-164, 4-165,
4-166, 4-170, 4-187, 4-188, 4-189, 4-193,
4-206, 4-207, 4-208, 4-209, 4-213, 4-214,
4-215, 4-216, 4-217, 4-218, 4-281, 4-282,
4-283, 4-284, 4-285, 4-286, 4-287, 4-288,
4-289, 4-291, 4-330, 5-11, 5-12, 5-13
Temple Bar, 3-115, 3-116, 3-117, 3-125, 4-57
Tohono O’odham Nation, 3-12, 3-92, 3-93
Tonto Apache Tribe, 3-12, 6-8
Topock Gorge, 3-120
Topock Marsh, 3-8, 3-120
tour boats, 3-123, 3-129, 4-295

U

United States - Mexico Water Treaty of 1944
(1944 Treaty), ES-23, 1-3, 1-5, 1-11, 1-12,
1-16, 1-18, 1-21, 1-23, 1-27, 2-5, 2-7, 2-9,
2-16, 2-18, 3-10, 3-22, 3-27, 3-37, 3-38, 3-46,
4-18, 4-19, 4-20, 4-21, 4-89, 4-138, 4-140,
4-150, 4-156, 4-337, 5-5, 6-4, 6-6

United States Army Corps of Engineers
(USACE), 1-19, 1-21, 3-22, 3-24, 3-64, 3-82,
4-89, 5-3
United States Bureau Land Management (BLM),
1-26, 3-10, 3-34, 3-64, 3-76, 3-78, 3-79,
4-335, 4-338, 4-339, 4-340, 4-341, 4-342, 5-7
United States Bureau of Indian Affairs (BIA),
ES-1, 1-5, 1-26, 3-87, 3-95, 3-99, 3-104,
4-266, 6-3, 6-4
United States Department of State, 6-6
United States Department of the Interior, ES-1,
1-1, 5-1
United States Environmental Protection Agency
(USEPA), 3-45, 3-46, 3-51, 3-52, 3-53, 3-55,
3-56, 3-57, 6-6
United States Fish and Wildlife Service (FWS),
ES-1, 1-5, 1-26, 1-27, 3-7, 3-8, 3-64, 3-72,
3-73, 3-74, 3-75, 3-120, 3-121, 3-127, 4-212,
4-247, 5-1, 5-8, 5-9, 6-3
United States National Park Service (NPS),
ES-1, ES-3, ES-7, ES-20, 1-5, 1-26, 2-2,
2-15, 3-6, 3-7, 3-65, 3-67, 3-82, 3-109, 3-110,
3-111, 3-112, 3-113, 3-115, 3-116, 3-123,
3-124, 3-125, 3-126, 3-139, 3-140, 4-173,
4-243, 4-244, 4-247, 4-279, 4-280, 4-284,
4-285, 4-290, 4-292, 5-2, 5-7, 5-8, 6-3, 6-4
United States Section of the International
Boundary and Water Commission
(USIBWC), ES-1, 1-5, 5-6, 6-4, 6-6
Upper Colorado River Basin Fund (Basin Fund),
3-104, 3-105, 3-106, 4-266, 4-267, 4-269
Upper Colorado River Commission
(Commission), 1-6, 3-31, 3-32, 3-42, 4-17,
4-270, 5-3, 6-4, 6-5, 6-6, 6-7, 6-9
Utah Division of Water Resources, 6-7
Ute Indian Tribe of the Uintah, 6-8

V

Ventura County, 3-134, 3-141
 vermilion flycatcher, 4-226, 4-229, 4-232,
 4-233
 Virgin River, ES-23, 1-11, 1-27, 3-52, 3-60,
 3-63, 3-75, 3-84, 3-114, 4-333, 4-334, 4-336,
 4-337, 4-338, 4-339, 4-340, 4-341

W

Wahweap Bay, 3-65, 3-123
 Wahweap Marina, 3-112, 3-123, 4-30, 4-279
 waterfowl, 1-8, 3-67, 3-70, 3-71, 3-73, 3-74,
 3-114, 3-127, 4-193, 4-201, 4-210, 5-1, 5-14
 Wellton-Mohawk Irrigation and Drainage
 District, 3-93
 Western Area Power Administration (Western),
 ES-1, ES-3, ES-7, 1-5, 1-21, 1-26, 2-2, 2-15,
 3-61, 3-69, 3-77, 3-78, 3-79, 3-95, 3-99,
 3-100, 3-101, 3-102, 3-103, 3-104, 3-105,
 3-135, 4-13, 4-192, 4-226, 4-228, 4-229,
 4-232, 4-233, 4-251, 4-252, 4-254, 4-255,
 4-266, 4-267, 4-269, 4-270, 4-271, 4-272, 6-
 3, 6-4, 6-6
 Western Electricity Coordinating Council
 (WECC), 3-100, 3-101, 3-102
 western least bittern, 4-221, 4-223
 western yellow-billed cuckoo, 4-226, 4-229,
 4-232, 4-233

White Mountain Apache Tribe, 6-8
 white-faced ibis, 4-221
 whitewater boating, ES-20, 3-109, 3-113, 3-126,
 4-279, 4-280, 4-285, 4-292
 Willow Beach National Fish Hatchery, 3-7

Y

Yavapai Reservation, 3-95, 6-8
 Yavapai-Apache Nation, 3-12, 6-8
 Yavapai-Prescott Tribe, 3-12, 3-95, 6-8
 yellow-breasted chat, 3-70, 4-226, 4-229, 4-232,
 4-233
 Yuma clapper rail, 3-77, 3-120, 4-221, 4-223,
 4-226, 4-229, 4-232, 4-233
 Yuma County, 3-134, 3-135, 3-142, 4-237
 Yuma Desalting Plant, 4-18
 Yuma Hispid Cotton Rat, 3-78
 Yuma Main Canal, 1-19, 3-10
 Yuma Mesa, 3-9, 3-26, 3-91
 Yuma myotis, 3-78, 4-202, 4-209, 4-222, 4-228
 Yuma Project, 1-14, 1-19, 3-9, 3-26, 3-39, 3-41,
 3-89

Z

Zuni Reservation, 6-8
 Zuni Tribe, 6-8

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Acronyms

Acronyms

1944 Treaty	The February 3, 1944 Treaty between the United States and Mexico Relating to the Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande	BA	Biological Assessment
602(a) storage	Section 602(a) of the Colorado River Basin Project Act of 1968	Basin Fund	Upper Colorado River Basin Fund
I-8	Interstate Highway 8 (Interstate 8)	Basin States	Colorado River Basin States
°C	degrees Celsius	BBAMP	Boulder Basin Adaptive Management Plan
°F	degrees Fahrenheit	BCP	Boulder Canyon Project
µg/L	microgram per liter	BCPA	Boulder Canyon Project Act of 1928
µg/m³	microgram per cubic meter of air	BHBF	beach/habitat-building flow
§	Section	BIA	Bureau of Indian Affairs
§§	Sections	BLM	Bureau of Land Management
AAC	All-American Canal	BMI	Basic Management, Inc.
AAQS	Ambient Air Quality Standards	BO	Biological Opinion
af	acre-feet	CADSWES	Center for Advanced Decision Support for Water and Environmental Systems
afy	acre-feet per year	CA PLAN	California's Colorado River Water Use Plan
ACHP	Advisory Council on Historic Preservation	CalEPA	California Environmental Protection Agency
ADWR	Arizona Department of Water Resources	CAP	Central Arizona Project
AGC	Automatic Generation Control	CAWCD	Central Arizona Water Conservation District
AMO	Atlantic Multidecadal Oscillation	CEQ	Council on Environmental Quality
AMP	Adaptive Management Program	C.F.R.	Code of Federal Regulations
AMWG	Adaptive Management Work Group	cfs	cubic feet per second
AOP	Annual Operating Plan for Colorado River Reservoirs	Commission	Upper Colorado River Commission
APE	area of potential effect	Compact	Colorado River Compact of 1922
ARPA	Archaeological Resources Protection Act	Consolidated Decree	Entered by the United States Supreme Court on March 27, 2006 in the case of <i>Arizona v. California</i> , 547 U.S. 150 (2006)
AWBA	Arizona Water Banking Authority	Cr(VI)	hexavalent chromium
AWSA	Arizona Water Settlement Act		

Acronyms

CRBPA	Colorado River Basin Project Act of 1968	ESA	Endangered Species Act of 1973, as amended
CRIR	Colorado River Indian Reservation	Exec. Order	Executive Order
CRIT	Colorado River Indian Tribes of the Colorado River Indian Reservation, Arizona and California	Fed. Reg.	Federal Register
CRSP	Colorado River Storage Project	feet msl	feet above mean sea level
CRSPA	Colorado River Storage Project Act of 1956	Final EIS	Final Environmental Impact Statement
CRSS	Colorado River Simulation System	FONSI	Finding of No Significant Impact
CVWD	Coachella Valley Water District	Forum	Colorado River Basin Salinity Control Forum
CWA	Clean Water Act of 1972, as amended	FWS	United States Fish and Wildlife Service
CWC	Clean Water Coalition	GCDAMP	Glen Canyon Dam Adoptive Management Program
Dam Fund	Colorado River Dam Fund	GCM	General Circulation Model
DBP	disinfection by-product	GCNRA	Glen Canyon National Recreation Area
Decree	The 1964 United States Supreme Court Decree in the case of <i>Arizona v. California</i>	GEMSS	Generalized Environmental Modeling System for Surfacewater
Department	Department of the Interior	GWh	gigawatt-hour
Development Fund	Lower Colorado River Basin Development Fund	HRR	Hualapai River Runners
Draft EIS	Draft Environmental Impact Statement	HVID	Harquahala Valley Irrigation District
DTSC	California Environmental Protection Agency Department of Toxic Substances Control	IBWC	International Boundary and Water Commission
EA	Environmental Assessment	ICS	Intentionally Created Surplus
EIR	Environmental Impact Report	ICUA	Intentionally Created Unused Apportionment
EIS	Environmental Impact Statement	IID	Imperial Irrigation District
ENSO	El Nino Southern Oscillation	Indian	American Indian
EOM	end-of-month	IPCC	Intergovernmental Panel on Climate Change
EOCY	end-of-calendar year	IPS-3	Intake Pumping Station No. 3
		ISG	Interim Surplus Guidelines

Acronyms

ISM	Indexed Sequential Method	msl	mean sea level
ITA	Indian Trust Asset	MW	megawatt
kaf	thousand acre-feet	MWD	Metropolitan Water District of Southern California
kafy	thousand acre-feet per year	MWh	megawatt-hour
kW	kilowatt	NAAQS	National Ambient Air Quality Standards
kWh	kilowatt-hour	NAGPRA	Native American Graves Protection and Repatriation Act of 1990
LC	Lower Colorado (Reclamation's Lower Colorado Region)	NASS	National Agricultural Statistics Service
LCR MSCP	Lower Colorado River Multi-Species Conservation Program	NAU	Northern Arizona University
LDS Church	Church of Jesus Christ of Latter-Day Saints	NDEP	Nevada Division of Environmental Protection
LMNRA	Lake Mead National Recreation Area	NDOW	Nevada Department of Wildlife
Lower Basin	Colorado River Lower Basin – Arizona, California, Nevada, New Mexico, and Utah, within and from which waters drain naturally into the Colorado River Basin below Lee Ferry Compact Point, Arizona	NEPA	National Environmental Policy Act of 1969, as amended
Lower Division states	Colorado River Lower Division states - Arizona, California, and Nevada	NERC	North American Electric Reliability Council
LROC	Long-Range Operating Criteria (Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968)	NGO	non-governmental organization
M&I	municipal and industrial	NGS	Navajo Generating Station
maf	million acre-feet	NHPA	National Historic Preservation Act of 1966, as amended
mafy	million acre-feet per year	NIB	Northerly International Boundary
MCL	Maximum Contaminant Level	NNAD	Navajo Nation Archaeological Department
Mexico	United Mexican States	NOA	Notice of Availability
mg/L	milligram per liter	NOAA	National Oceanic & Atmospheric Administration
MLFF	Modified Low Fluctuating Flows	NOI	Notice of Intent
		NPS	National Park Service
		NRA	National Recreation Area
		NRC	National Research Council

Acronyms

NRHP	National Register of Historic Places	SCP	Colorado River Basin Salinity Control Program
NRI	Nationwide Rivers Inventory	SDCWA	San Diego County Water Authority
NWPCC	Northwest Power and Conservation Council	Secretary	Secretary of the Department of the Interior
NWR	National Wildlife Refuge	SHPO	State Historic Preservation Officer
O&M	operation and maintenance	SIA	Secretarial Implementation Agreement
P-DP	Parker-Davis Project	SIB	Southerly International Boundary
PDO	Pacific Decadal Oscillation	SIRA	Storage and Interstate Release Agreement
PG&E	Pacific Gas and Electric	SLCA/IP	Salt Lake City Area Integrated Projects
PM	particulate matter	SNWA	Southern Nevada Water Authority
PM2.5	particulate matter (dust particles) less than 2.5 micrometers in diameter	SRA	State Recreation Area
PM10	particulate matter (dust particles) of ten micrometers or less in diameter	SRP	Salt River Project
ppb	parts per billion	TCP	Traditional Cultural Property
ppm	parts per million	TDS	total dissolved solids
PPR	Present Perfected Rights	THPO	Tribal Historic Preservation Officer
PSD	Prevention of Significant Deterioration	TMDL	Total Maximum Daily Load
pt.	part	Upper Basin	Colorado River Upper Basin – Arizona, Colorado, New Mexico, Utah, and Wyoming, within and from which waters drain naturally into the Colorado River Basin above Lee Ferry Compact Point, Arizona
PUP	Priority Use Projects	Upper Division states	Colorado River Upper Division states - Colorado, New Mexico, Utah, and Wyoming
PV 2008 \$	Present Value in 2008 dollars	USACE	United States Army Corps of Engineers
PVID	Palo Verde Irrigation District	U.S.C.	United States Code
QSA	Quantification Settlement Agreement	USDA	United States Department of Agriculture
Reclamation	Bureau of Reclamation	USEPA	United States Environmental Protection Agency
RM	river mile	USGS	United States Geological Survey
ROD	Record of Decision		
SCOP FEIS	Systems Conveyance and Operations Program Final Environmental Impact Statement		

Acronyms

USIBWC	United States Section of the International Boundary and Water Commission	Western	Western Area Power Administration
USU	Utah State University	Workgroup	Arizona Department of Water Resources Director's Shortage Sharing Workgroup
Water Control Manual	Water Control Manual for Flood Control, Hoover Dam and Lake Mead, Colorado River, Nevada and Arizona, dated December 1982, published by the United States Army Corps of Engineers	ZCRE	Zuni Cultural Resource Enterprise
WECC	Western Electricity Coordinating Council		

Acronyms

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Glossary

Glossary

A

acre-foot (af)	Volume of water (43,560 cubic feet) that would cover one acre to a depth of one foot.
adaptive management	A method for examining alternative strategies for meeting measurable biological goals and objectives, and then if necessary, adjusting future conservation management actions according to what is learned.
affected environment	Existing biological, physical, social, and economic conditions of an area that are subject to change, both directly and indirectly, as the result of a proposed human action.
algae	Simple plants containing chlorophyll; most live submerged in water.
allocation, allotment	Refers to a distribution of water through which specific persons or legal entities are assigned individual rights to consume pro-rata shares of a specific quantity of water under legal entitlements. For example, a specific quantity of Colorado River water is distributed for use within each Lower Division state through an apportionment. Water available for consumptive use in that state is further distributed among water users in that state through the allocation. An allocation does not establish an entitlement; the entitlement is normally established by a written contract with the United States government. <i>See also</i> Lower Division states.
alluvium	Sedimentary material transported and deposited by the action of flowing water.
ambient	Surrounding natural conditions (or environment) in a given place and time.
amphibian	Vertebrate animal that has a life stage in water and a life stage on land (e.g., salamanders, frogs, toads).
annual flow-weighted average concentration	A weighted average of monthly total dissolved solids (TDS) concentrations for a year, where the weight for each month is based on the relative flow for each month.
Annual Operating Plan for Colorado River Reservoirs (AOP)	The AOP describes how Reclamation will manage Colorado River resources over a 12-month period, consistent with the Long-Range Operating Criteria and the <i>Arizona v. California</i> 1964 Supreme Court Decree. The AOP is prepared annually by Reclamation in cooperation with the Basin States, appropriate federal agencies, Indian tribes, state and local agencies, and the general public, including governmental interests as required by federal law. As part of the AOP process, the Secretary of the Department of the Interior (Secretary) makes annual determinations regarding the availability of Colorado River water for deliveries to the Lower Division states of the Colorado River Basin. <i>See also</i> Lower Division states.
apportionment	Refers to the distribution of water available to each Lower Division state in Normal, Surplus or Shortage condition years, as set forth, respectively, in Articles II(B)(1), II(B)(2), and II(B)(3) of the 1964 Supreme Court Decree in the case of <i>Arizona v. California</i> .
appropriative rights	The right to divert a specified quantity of water at a specified point of diversion for reasonable and beneficial uses at a specified place of use for a specified manner of use. Appropriative rights are generally “first-in-time, first-in-right”; that is, one appropriative right has priority over appropriative rights established later.

Glossary

B

backwater	A relatively small, generally shallow area of a river with little or no current.
banked groundwater	Water that has been stored temporarily in a groundwater aquifer. Banked groundwater can be recovered for use at a later time.
base load	Minimum load in a power system over a given period of time.
Basin States	In accordance with the Colorado River Compact of 1922, the Colorado River Basin is comprised of those parts of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, within and from which waters drain naturally into the Colorado River. These seven states are referred to as the Basin States. <i>See also</i> Colorado River Compact of 1922.
Biological Assessment (BA)	To facilitate compliance with Section 7(a)(2) of the Endangered Species Act (ESA), federal agencies must prepare a BA pursuant to Section 7(c)(1) of ESA that identifies the likely effects of the proposed federal action on threatened and endangered species. <i>See also</i> Endangered Species Act.
Biological Opinion (BO)	Document stating the United States Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service opinion as to whether a federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat.
bypass flows	Saline agricultural return flows from the Wellton-Mohawk Irrigation and Drainage District that are routed to the Cienega de Santa Clara in Mexico in order to ensure compliance with the salinity provisions of Minute 242 of the 1944 Treaty.

C

candidate species	Plant or animal species not yet officially listed as threatened or endangered under the ESA, but which is undergoing status review by the United States Fish and Wildlife Service.
catch	At a recreational fishery, refers to the number of fish captured, whether they are kept or released.
channel (watercourse)	An open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of water. River, creek, run, branch, and tributary are some of the terms used to describe natural channels. Natural channels may be single or braided. Canal and floodway are some of the terms used to describe artificial channels.
<i>Cladophora</i>	Filamentous green alga important to the food chain in the Colorado River downstream of Glen Canyon Dam.
Colorado River Basin	All of the drainage area of the Colorado River system and all other territory within the United States to which the waters of the Colorado River system shall be beneficially applied.
Colorado River Basin Project Act of 1968 (CRBPA)	This Act authorized construction of a number of water development projects, including the Central Arizona Project (CAP), and required the Secretary to develop the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs, or Long-Range Operating Criteria (LROC).
Colorado River Basin Salinity Control Forum	The organization dedicated to controlling Colorado River salinity, consists of representatives of the seven Basin States.

Colorado River Compact of 1922	The agreement concerning the apportionment of the use of the waters of the Colorado River Basin, dated November 24, 1922, executed by Commissioners for the States of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, approved by Herbert Hoover, representative of the United States, and proclaimed effective by the President of the United States, June 25, 1929.
Colorado River Simulation System (CRSS)	An operational model of the Colorado River Basin based on a monthly time step.
Colorado River system	The portion of the Colorado River and its tributaries within the United States as defined in the Colorado River Compact of 1922.
Compact	The Colorado River Compact of 1922.
Compact Point	Lee Ferry, Arizona, the reference point designated by the Colorado River Compact of 1922 as dividing the Colorado River Basin into two sub-basins, the Upper Basin and the Lower Basin. <i>See also</i> Lee Ferry Compact Point.
Consolidated Decree	Entered by the United States Supreme Court on March 27, 2006 in the case of <i>Arizona v. California</i> , 547 U.S. 150 (2006). In 1963 the Supreme Court reached a Decision in the case of <i>Arizona v. California</i> . The 1964 Supreme Court Decree in the case of <i>Arizona v. California</i> implemented the 1963 Decision. This 1964 Supreme Court Decree was supplemented over time after its adoption and the Supreme Court entered a Consolidated Decree in 2006 which incorporates all applicable provisions of the earlier-issued Decisions and Decrees.
consumptive use	For purposes of this Environmental Impact Statement (EIS), diversions of water from mainstream Colorado River, including water withdrawn from the mainstream through underground pumping, minus any measured and unmeasured return flows.
Contractors	Those who hold entitlements to Colorado River water are referred to as Contractors. Contractors consist of the federal government, states, Indian tribes, and various public and private entities that are recognized under the Consolidated Decree, hold a Section 5 Contract with the Secretary, or have a Secretarial Reservation of water. <i>See also</i> Consolidated Decree.
conveyance loss	Water that is lost in transit from a pipe, canal, conduit, or ditch by leakage or evaporation. If the water is lost due to leakage, it may be considered return flow if it percolates to an aquifer and is available for reuse. If the water evaporates, it is considered consumptive use.
Cooperating Agency	With respect to the National Environmental Policy Act of 1969, as amended, (NEPA) process, an agency that has jurisdiction by law or special expertise concerning an aspect of a proposed federal action, and that is requested by the lead agency to participate in the preparation of an Environmental Impact Statement.
coordinated operation	As applied to hydroelectric power resources, the operation of a group of hydroelectric powerplants to obtain optimal power benefits with due consideration for all other uses. Generally, the operation of two or more interconnected electrical systems to achieve greater reliability and economy.
covered species	Those species addressed in the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) for which conservation measures would be implemented and for which authorization for “take” is being requested under Section 10 of the ESA. <i>See also</i> take.
criteria	Standards used for making a determination.
critical habitat	Specific areas with physical or biological features essential to the conservation of a listed species and which may require special management considerations or protection. These areas have been legally designated via <i>Federal Register</i> notices.

Glossary

cubic foot per second (cfs) A measure of water flow equal to one cubic foot of water passing a point on the stream in one second of time.

cultural resource Building, site, district, structure, or object significant in history, architecture, archeology, culture, or science.

D

dead pool Reservoir elevation corresponding to dead storage.

dead storage Reservoir space from which stored water cannot be evacuated by gravity.

delta Sediment deposit formed at the mouth of the Colorado River and other rivers where they enter Lake Powell, Lake Mead or the Gulf of California.

depletion Loss of water from a stream, river, or basin resulting from consumptive use.

deposition Settlement of material out of the water column and on to the streambed. Occurs when the energy of flowing water is unable to support the load of suspended sediment.

discharge (flow) Volume of water that passes a given point within a given period of time; expressed in this EIS in cubic feet per second. *See also* cubic foot per second.

dissolved oxygen (DO) Amount of free oxygen found in water; perhaps the most commonly employed measurement of water quality. Low DO levels adversely affect fish and other aquatic life. The ideal dissolved oxygen for fish life is between 7 milligrams per liter (mg/L) and 9 mg/L; most fish cannot survive when DO falls below 3 mg/L.

diversion(s) Colorado River water withdrawn from the mainstream, including water diverted from reservoirs or drawn from the mainstream by underground pumping.

domestic use Refers to the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but excludes the generation of electrical power.

draw down Lowering of a reservoir's elevation; process of depleting reservoir or groundwater storage.

E

ecosystems Complex system composed of a community of fauna and flora and that system's chemical and physical environments.

electric power system Physically connected electric generating, transmission, and distribution facilities operated as a unit under one control.

electrical demand Energy requirement placed upon a utility's generation at a given instant or averaged over any designated period of time.

endangered species A species or subspecies whose survival is in danger of extinction throughout all or a significant portion of its range.

Endangered Species Act (ESA) The Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531-1544), as amended, under Section 9, provides for the prohibition of "take" of any fish or wildlife species listed as threatened or endangered under the ESA unless specifically authorized by regulation. *See also* take.

energy Electric capacity generated and/or delivered over time.

entitlement Refers to an authorization to beneficially consume Colorado River water pursuant to a decreed right; a contract with the United States through the Secretary; or a Secretarial Reservation of water.

epilimnion Thermal layering of water in lakes and streams. *See also* stratification.

F

firm energy or power Non-interruptible energy or power guaranteed by the supplier to be available at all times except for reasons of uncontrollable forces or "continuity of service" contract provisions.

flood An overflow or inundation that comes from a river or other body of water, and causes or threatens damage. Any relatively high streamflow overtopping the natural or artificial banks in any reach of a river or stream. A relatively high flow as measured by either gage height or discharge quantity.

flood control pool Reservoir volume above the active conservation and joint-use pool that is reserved for flood runoff and then evacuated as soon as possible to keep that space in readiness for the next flood.

flood control release The release of water from Lake Mead and the operation of Hoover Dam for flood control purposes pursuant to the reservoir operating criteria specified in the February 8, 1984 Field Working Agreement between the United States Army Corps of Engineers (USACE) and the Bureau of Reclamation (Reclamation), and the USACE regulations contained in 33 C.F.R. pt 208.11.

flow Volume of water passing a given point per unit of time expressed in cubic foot per second. *See also* cubic foot per second.

forage fish Generally, small fish that reproduce prolifically and are consumed by predators.

fore bay Impoundment immediately above a dam or hydroelectric plant intake structure. The term is applicable to all types of hydroelectric developments (storage, run-of-river, and pumped-storage).

fry Life stage of fish between the egg and fingerling stages.

full pool Volume of water in a reservoir at maximum design elevation.

G

gaging station Specific location on a stream where systematic observations of hydrologic data are obtained through mechanical or electrical means.

gigawatt-hour (GWh) One billion watt-hours of electrical energy.

H

headwater The source and upper part of a stream.

hydroelectric power Electrical capacity produced by falling water.

hypolimnetic zone The deep portion of a lake or reservoir volume generally classified as below the level of the thermocline.

hypolimnion Thermal layering of water in lakes and streams. *Also see* stratification.

Glossary

I

Important Farmland	As defined by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (formerly the Soil Conservation Service), Important Farmlands include Prime Farmland, Unique Farmland, Farmland of Statewide Importance, and Farmland of Local Importance. The categorization of farmland is based upon a soil classification system which accounts for the physical and chemical characteristics of the land and the suitability of the land for producing crops. Important Farmlands are afforded special protection due to their importance to agricultural production.
impoundment	Body of water created by a dam.
incidental take	Incidental take is defined under the ESA as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity” (50 C.F.R. pt. 17.22 and 17.32). <i>See also</i> take.
Indian Trust Assets (ITAs)	Indian Trust Assets are ‘legal interests’ in ‘assets’ held in ‘trust’ by the federal government for federally recognized Indian tribes or individual Indians.
inflow	Water flowing into a lake or reservoir from a river and/or its tributaries; or water entering a river from tributaries.
<i>in situ</i>	In archaeology, and as used in this EIS, <i>in situ</i> refers to an artifact that has not been moved from its original place of deposit.
Interim Surplus Criteria (ISC)	<i>See</i> "Interim Surplus Guidelines".
irrigated area	The gross farm area upon which water is artificially applied for the production of crops, with no reduction for access roads, canals, or farm buildings.
irrigation	The controlled application of water to arable lands to supply water requirements not satisfied by rainfall.

J-K

juvenile	Young fish older than one year but not having reached reproductive age.
kilowatt-hour (kWh)	One thousand watt-hours of electrical energy.

L

land cover type	A classification system to describe vegetation and other habitat types (e.g., cottonwood willow, honey mesquite type III, marsh).
Las Vegas Valley	The topographic basin containing the City of Las Vegas, the City of North Las Vegas, the City of Henderson, and certain unincorporated townships of Clark County.
Las Vegas Wash	The natural drainage channel for the entire Las Vegas Valley. It is dominated by wastewater flows from the City of Las Vegas, Clark County Sanitation District, and City of Henderson wastewater treatment plants. It terminates in the Las Vegas Bay of Lake Mead.

Law of the River	As applied to the Colorado River, the Secretary is vested with the responsibility to manage the mainstream waters of the Lower Basin pursuant to applicable federal law. This responsibility is carried out consistent with a body of documents referred to as the Law of the River. This collective set of documents comprising numerous operating criteria, regulations, and administrative decisions included in federal and state statutes, interstate compacts, court decisions and decrees, an international treaty, and contracts with the Secretary, apportions the Colorado River waters and regulates the use and management of the Colorado River among the seven Basin States and Mexico.
lead agency	A lead agency is an agency initiating and overseeing the preparation of an EIS. For this EIS, Reclamation is the lead agency for compliance with NEPA.
Lee Ferry Compact Point	The Colorado River Compact of 1922 divided the Colorado River Basin into two sub-basins: the Upper Basin, and the Lower Basin. The Lee Ferry Compact Point, identified as the reference point which marks this division between the Upper Basin and the Lower Basin, is located in the mainstream Colorado River in Arizona, one mile below the confluence of the Colorado River with the Paria River.
Lees Ferry Gaging Station	The site of the United States Geological Survey (USGS) stream gage (Lees Ferry Gaging Station) located in Arizona, on the Colorado River upstream of its confluence with the Paria River, downstream of Glen Canyon Dam. Also, the location of Colorado River ferry crossings (1873 to 1928).
limnology	Scientific study of physical characteristics and biology of lakes, ponds, and streams.
load	Amount of electrical power or energy delivered or required at a given point.
Lower Basin (states)	The Colorado River Compact of 1922 divided the Colorado River system into two sub-basins: the Upper Basin, and the Lower Basin, and defined the Lower Basin as including those parts of the states of Arizona, California, Nevada, New Mexico, and Utah, within and from which waters drain naturally into the Colorado River below the Lee Ferry Compact Point in Arizona. <i>See also</i> Lee Ferry Compact Point.
Lower Division (states)	The Colorado River Compact of 1922 divided the seven Colorado River Basin states into two groups: Upper Division states, and Lower Division states. The Lower Division states are Arizona, Nevada, and California. <i>See also</i> Basin States.

M

magnitude	A number characteristic of a quantity and forming a basis for comparison with similar quantities such as flows.
mean monthly flow	Average flow for the month, usually expressed in cubic feet per second.
mean sea level (msl)	The average height of the surface of the oceans and seas measured throughout all stages of the tidal cycle, determined from hourly readings of tidal height and computed over a long (usually 19-year) period. It is used as a datum plane, i.e., serves as the reference surface, from which elevations and depths are measured.
median	Middle value in a distribution, above and below which lie an equal number of values.
megawatt (MW)	One million watts of electrical power (capacity).
megawatt-hour (MWh)	One million watt-hours of electrical energy.
metalimnion	Thermal layering of water in lakes and streams. <i>See also</i> stratification.
milligram per liter (mg/L)	Equivalent to one part per million.

Glossary

N

National Environmental Policy Act of 1969, as amended (NEPA)	Law requiring federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, federal agencies prepare a detailed statement known as an Environmental Impact Statement, or EIS.
National Register of Historic Places (NRHP)	The nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.
natural flow	The flow of any stream undepleted by human activities.
non-system water	Waters originating from outside the Colorado River system.
Normal Condition	When the Secretary has determined that there is available for annual release 7.5 maf to satisfy consumptive use in the Lower Division states pursuant to Article II(B)(1) of the Consolidated Decree.

O

oligotrophic	A body of water characterized by low dissolved plant nutrient and organic matter, and rich in oxygen at all depths.
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P-Q

peak flow	Maximum instantaneous flow in a specified period of time.
peak load	Maximum electrical demand in a stated period of time.
penstock	Conduit pipe used to convey water under pressure to the turbines of a hydroelectric plant.
percentile	A statistical term. A descriptive measure that splits ranked data into 100 parts, or hundredths. For example, the 10 th percentile is the value that splits the data in such a way that ten percent of the values are less than or equal to the 10 th percentile.
Piscivorous	Habitually feeding on fish.
PM ₁₀ (PM10)	Particulate matter (PM) (dust particles) standard that includes particles with a diameter of ten micrometers or less.
power	Electrical capacity generated, transferred or used.
Present Perfected Right (PPR)	Many Colorado River water rights originated as 'perfected rights' specified in the 1964 United States Supreme Court Decree in the case of <i>Arizona v. California</i> . 'Present perfected rights' (PPRs) are the highest priority Colorado River water rights that the 1964 Decree defines as those perfected rights existing on June 25, 1929 (the effective date of the Boulder Canyon Project Act of 1928).
priority	A ranking with respect to diversion of water relative to other water users.

probability	In this EIS, the relative frequency with which a range of modeled values occurs. For example, the probability of Lake Mead elevation exceeding 1,180 feet msl in June 2005 is equal to the number of modeled elevations greater than 1,180 feet msl in June 2005, divided by the total number of modeled elevations in June 2005.
public involvement	Process of obtaining citizen input into each stage of development of planning documents. Required as a major input into any EIS.

R

ramp rate	The rate of change in instantaneous output from a powerplant. The ramp rate is established to prevent undesirable effects due to rapid changes in loading or, in the case of hydroelectric plants, discharge.
rated head	Water depth for which a hydroelectric generator and turbines were designed.
reach	A specified segment of a river, stream, channel, or other water conveyance facility.
recruitment	Survival of young plants and animals from birth to a life stage less vulnerable to environmental change.
reregulating reservoir	A reservoir for reducing diurnal fluctuations resulting from the operation of an upstream reservoir for power production.
resampling	The digital process of changing the sample rate or dimensions of sampled data (e.g., digital imagery or audio) by temporarily or areally analyzing and sampling the original data.
reserved water	In the case of Indian reservations, rights based on the doctrine of Indian reserved rights, and in the case of federal establishments other than Indian reservations, a federal reservation of water for use on property under federal jurisdiction.
reservoir	A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.
return flow	Portion of water previously diverted from a river or stream and subsequently returned to that river or stream, and is available for consumptive use by others.
return flow credit	In the accounting of consumptive use in the Lower Basin, Colorado River water that is returned to the river and is available for consumptive use by others in the year in which it was diverted is credited against a water user's total diversions.
riffle	A stretch of choppy water caused by an underlying rock shoal or sandbar.
riparian	Of, on, or pertaining to the bank of a river, pond, or lake.
river mile (RM)	River miles are numbered along the Colorado River from south to north starting with RM 0.0 at the Southerly International Border (SIB) with Mexico. Dam locations are noted at their respective river miles.
river stage	Water surface elevation of a river above a datum.
RiverWare™	A commercial river system simulation computer program that was configured to simulate operation of the Colorado River for this EIS.
runoff	That part of the precipitation that appears in surface streams. It is the same as streamflow unaffected by artificial diversions, storage, or other works of man in or on the stream channels.

Glossary

S

salinity	A term used to refer to the dissolved minerals in water, also referred to as total dissolved solids (TDS). <i>See also</i> total dissolved solids.
Secretary	The Secretary of the Department of the Interior, and duly appointed successors, representatives and others with properly delegated authority.
Section 10(a)(1)(B) permit	Section 10(a)(1)(B) of the ESA authorizes the FWS to issue non-federal entities a permit for the incidental take of endangered and threatened wildlife species. This permit allows the non-federal entity to proceed with an activity that is legal in all other respects, but that results in the “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” <i>See also</i> take.
sediment	Unconsolidated solid material that comes from weathering of rock and is carried by, suspended in, or deposited by water or wind.
sediment load	Mass of sediment passing through a stream.
seepage	Relatively slow movement of water through a medium, such as sand.
Shortage Condition	When the Secretary has determined that there is available for annual release less than 7.5 maf to satisfy consumptive use in the Lower Division states pursuant to Article II(B)(3) of the Consolidated Decree.
spawn	To lay eggs, especially fish.
spills	Water releases from a dam in excess of powerplant capacity.
spillway	Overflow facility at a dam, usually consisting of a sill at the full-reservoir elevation.
spinning reserves	Available capacity of generating facilities synchronized to the interconnected electric system so that it can be called upon for immediate use in response to system problems or sudden load changes.
stage	Reservoir elevation.
Standards	A means established by authority as a rule for the measure of quality, such as cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.
storage	Water artificially impounded in surface or underground reservoirs, for future use. Water naturally detained in a drainage basin, such as groundwater, channel storage, and depression storage. The term "drainage basin storage" or simply "basin storage" is sometimes used to refer collectively to the amount of water in natural storage in a drainage basin. <i>See also</i> conservation storage and dead storage.
stratification	Thermal layering of water in lakes and streams. Lakes usually have three zones of varying temperature: (1) <i>epilimnion</i> – top layer with essentially uniform warmer temperature; (2) <i>metalimnion</i> – middle layer of rapid temperature decrease with depth; and (3) <i>hypolimnion</i> – bottom layer with essentially uniform colder temperatures.
streamflow	The discharge that occurs in a natural channel. Although the term discharge can be applied to the flow of a canal, the word streamflow uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than runoff, as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.
system storage	The total volume of water available in the Colorado River Basin at a specific point in time.

system water	Waters originating from the Colorado River system.
Surplus Condition	When the Secretary has determined that there is available for annual release more than 7.5 maf to satisfy consumptive use in the Lower Division states pursuant to Article II(B)(2) of the Consolidated Decree.

T

tail water	Water immediately downstream of the outlet from a dam or hydroelectric powerplant.
take	As defined by the ESA, “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 U.S.C. §§ 1531[18]).
thermocline	The zone of maximum change in temperature in a water body, separating upper (epilimnetic) from lower (hypolimnetic) zones.
threatened species	A species or subspecies that is likely to become endangered in the foreseeable future.
total dissolved solid (TDS)	A measure of the inorganic or mineral content of water, commonly expressed in milligrams per liter. <i>See also</i> salinity.
traditional cultural property	A site or resource that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community. <i>See also</i> National Register of Historic Places.
tributary	River or stream flowing into a larger river or stream.
Turbidity	Cloudiness of water, measured by how deeply light can penetrate into the water column from the surface.

U-V

Upper Basin (states)	The Colorado River Compact of 1922 divided the Colorado River system into two sub-basins: the Upper Basin, and the Lower Basin, and defined the Upper Basin as including those parts of the states of Arizona, Colorado, New Mexico, Utah, and Wyoming, within and from which waters drain naturally into the Colorado River above the Lee Ferry Compact Point in Arizona. <i>See also</i> Lee Ferry Compact Point.
Upper Colorado River Commission	Commission established by the Upper Colorado River Basin Compact of appointed members from the Upper Division states whose purpose is to secure the storage of water for beneficial consumptive use in the Upper Basin.
Upper Division (states)	The Colorado River Compact of 1922 divided the seven Colorado River Basin states into two groups: Upper Division states, and Lower Division states. The Upper Division states are Colorado, New Mexico, Utah, and Wyoming. <i>See also</i> Basin States.

Glossary

W-X

water year

That period of twelve months ending September 30 of each year.

Waters of the United States

In accordance with the Clean Water Act, Waters of the United States include: (1) all waters which may be susceptible to use in interstate or foreign commerce; (2) all interstate waters including interstate wetlands; (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters; (4) all impoundments of waters otherwise defined as waters of the United States; (5) tributaries of waters identified in this EIS; (6) the territorial seas; and (7) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in this EIS.

watershed

The drainage area upstream of a specified point on a stream.

Y-Z

List of Preparers

List of Preparers

This Final Environmental Impact Statement was prepared by the Bureau of Reclamation, Upper and Lower Colorado Regions. This List of Preparers presents the persons who developed significant background material and various sections, or participated to a significant degree in the preparation of this Final Environmental Impact Statement.

Alan G.K. Solbert
1950-2006

Alan Solbert of Jones & Stokes, a dear friend and colleague, contributed substantially to the completion of this document. The project team as well as many others will miss Alan's leadership, enthusiasm, and friendship. This effort is dedicated to his memory.

List of Preparers

BUREAU OF RECLAMATION, LOWER COLORADO REGION

Name	Education	Qualifications	Experience	Project Role
Belew, Stephen	B.S., Civil Engineering	GIS	10	GIS
Blasius, Becky	B.S., Physiology M.S., Entomology	Aquatic ecology	9	Water Quality
Callejo, Russell	M.S., Civil Engineering	Hydrologic modeling and data analysis	5	Hydrologic Resources/Modeling Team
Cunningham, Amber	Economics degree from UNLV	Economics and Colorado River contracts	3	Water Supply/Modeling Team
Dwyer, Colleen	B.S., Engineering	Writing/Editing	23	Public Outreach
Ellis, Bruce	B.A., Anthropology	NEPA/ESA compliance	30	Quality Control and Quality Assurance
Fulp, Terry	Ph.D., Mathematical and Computer Sciences	Hydrology and water operations	20	Project Manager
Gould, Glen	M.S., Fisheries Management	Ecology of Lower Colorado River	26	Biology
Hvinden, Steve	M.S., B.S., Agricultural Economics	Water entitlements and priorities, water contracts, Indian trust assets	27	Hydrologic Resources/Modeling Team
Jamrog, John	B.S. Forestry	Natural resources management	30	Agriculture
Jerla, Carly	B.S., Civil Engineering, B.S., Engineering Public Policy M.S., Civil Engineering	Water resources engineering - hydrologic modeling	5	Hydrologic Resources/Modeling Team
Kleinman, Alan	B.S., M.S., Ph.D., Economics	Agricultural economics	35	Hydrologic Resources/Modeling Team
Martin, Bill	B.S., Natural Resources, and Business Administration	Outdoor recreation management	10	Recreation
Maus, Shorty	A.S. Leisure Studies	Grabblin', nocturnal foraging	0.01	Post-production
Saint, Debby	B.A., Geography	Environmental specialist, social factors analyst, Lower Colorado Region Native American Affairs Program Manager	33	Indian Trust Assets

BUREAU OF RECLAMATION, LOWER COLORADO REGION

Name	Education	Qualifications	Experience	Project Role
Selig, Margot	M.S., Agricultural Economics	Land use, shortage allocation model, entitlements	14	Sociological
Simms, Ron	B.A., Anthropology M.S., Geology	Land use, settlements, shortage allocation model	21	GIS
Smith, Ron	B.S., Electrical Engineering	Power generation	23	Electric Power Generation
Watt, Dennis	B.S., Geology	Groundwater	32	Groundwater
Yoder, Nan	B.A., Economics	Project management	10	Project Coordinator, Quality Control and Assurance
Denver Technical Service Center:				
Harpman, David	M.S., Agricultural Economics Ph.D., Natural Resource Economics	Water resource economics, the economics of hydropower, nonmarket valuation and the valuation of instream flow	17	Electric Power Generation
Lichtkoppler, Rich	B.S., Business Administration M.S., Park and Recreation Administration Ph.D., Resource Economics	Natural resource economics, recreation economics, Economic damage assessment, national park planning, environmental justice	22	Sociological

BUREAU OF RECLAMATION, UPPER COLORADO REGION

Name	Education	Qualifications	Experience	Project Role
Barnett, Karen	B.S., Biology	Biology	15	Biology
Berry, Mike	Ph.D., Anthropology M.A., Anthropology B.A., History	Archaeology	30	Cultural Resources
Blair, Jane	B.S., Civil Engineering M.S., Civil Engineering	Hydropower	25	Agency Review
Clayton, Rick	B.S., Economics B.S., Civil Engineering	Hydrology	9	Hydrologic Resources/Modeling Team
Coulam, Nancy	B.A., M.A., Ph.D., Anthropology	Environmental compliance	20	Quality Control and Quality Assurance

List of Preparers

BUREAU OF RECLAMATION, UPPER COLORADO REGION

Name	Education	Qualifications	Experience	Project Role
Cutler, Amy	B.S., Civil Engineering M.E., Environmental Civil Engineering	Water quality	8	Water Quality/Modeling
Cutler, Chris	B.S., Civil Engineering M.E., Environmental Civil Engineering	Hydrology	5	Hydrologic Resources/Modeling Team
Gilmore, Andrew	M.S., Civil Engineering	Hydrology	7	Hydrologic Resources/Modeling Team
Kelleher, Jayne		Technical writing	28	Project Coordinator
Liljegren, Fred	B.S., Landscape Architecture	Landscape architecture	32	Recreation
Loring, Mike	M.S., Resource Economics	Economics	21	Socioeconomics, Hydropower
Parry, Brian	J.D.	Water rights and Indian Trust Assets	30	Indian Trust Assets
Miller, Jerry	B.S., Geology/Chemistry	Water quality/modeling	30	Water Quality
Peterson, Randall	B.S., Civil Engineering	Environmental compliance	30	Project Manager
Prairie, Jim	Ph.D., Civil Engineering	Water quality/modeling	6	Hydrologic Resources/Modeling Team
Ryan, Tom	B.A., Psychology B.S., Civil Engineering	Hydrology	18	Hydrologic Resources/Modeling Team

COOPERATING AGENCY REPRESENTATIVES

Name	Education	Qualifications	Experience	Project Role
National Park Service:				
Henderson, Norman	B.S., Biology M.S., Ecology	Park management/recreation	25	Recreation
Western Area Power Administration:				
Loftin, Sam	A.S., Casper College B.S.E.E., (Electrical Engineering)	CRSP hydro resources, forecasting power purchases	27	Electric Power Generation
Palmer, Clayton	M.A., Economics	Natural resource economics, hydroelectric power economics	22	Electric Power Generation
Young, Brian	B.S., Engineering	Hydropower generation & marketing	22	Electric Power Generation

BROWN AND CALDWELL

Name	Education	Specialty Area	Experience	Project Role
Beavers, Kathleen		Project management and administrative coordination	5	Administrative coordinator
Biggs, John	B.S.E., Civil Engineering M.S.E., Civil Engineering	Odor/Air emissions monitoring & control, buried infrastructure assessment, water/wastewater treatment.	4	Hydrological Resources, Quality Control and Quality Assurance
Dow, Sarahann	B.S., Biology M.S., Ph.D., Environmental Engineering	Water chemistry, microbial assessments, and advanced treatment technologies	7	Resource Lead – Water Quality
Duren, Sabre	B.A., Environmental Studies M.S., Environmental Engineering	Watershed water quality and hydrology assessments	5	Visual, Hydrological
Ennis, Renee		Word processing management, document preparation, database maintenance	15	Word Processor Lead
Gain, Jenny	B.S., Civil and Environmental Engineering M.S., Environmental Engineering	Watershed management, water quality monitoring, water supply and conservation, ecosystem restoration	4	Recreation
Herencia, Chris	B.S., Civil Engineering Facilities Management	Storm water management, hydraulic applications, and storm water characterization and monitoring	19	Hydrology

List of Preparers

BROWN AND CALDWELL

Name	Education	Specialty Area	Experience	Project Role
Kadaster, Omer	B.S., Civil Engineering M.S., Civil Engineering Registered Professional Civil and Geotechnical Engineer in California	Civil and Environmental Engineering; CERCLA process and compliance	41	Technical Review/Editing
Kremer, Robert	B.S., Business Administration M.A., Environmental Geography Ph. D., Forestry	Ecological assessment/arid land ecology	20	Co-lead, vegetation resources.
Lindburg, Matt	B.S., Agricultural Engineering M.S., Agricultural and Biological Systems Engineering	Project management and water resources planning and engineering for irrigation and hydrogenation facilities	12	Agricultural
Lindenmayer, Laura	B.S., Water Resource Management M.S., Hydrology	Hydrology	1	Hydrologic Resources, Quality Control and Quality Assurance
Marshall, Laura	B.S., Civil Engineering M.S., Environmental Engineering	Ecosystem restoration planning and analysis, surface water and groundwater quality, environmental services	5	Recreation
Martin, Eric	B.S., Natural Resources	Environmental permitting, groundwater investigations, groundwater and soil remediation, and data management	7	Project Coordinator, Quality Control and Quality Assurance
Moshier, Emily	B.S., Environmental Engineering M.S., Environmental Engineering	Water quality assessments and models, environmental services	4	Water Quality
Meyer, Dave	B.S., Range Forest Management MEPM Environmental Policy and Management	Multi-media compliance and permitting, environmental impact evaluations, sustainable management systems	27	Resource Lead – Electrical Power Resources
Miller, David	M.A., English Literature M.S., Irrigation Engineering Ph.D., Agricultural Engineering	Agricultural water management, water resources planning, agricultural water quality	26	Resource Lead - Agricultural
Nienberg, Mike	B.S., Biology MPH., Environmental Health Management DrPH., Environmental Management and Planning	NEPA/CEQA compliance, environmental impact assessment, public health	28	Quality Control and Quality Assurance

BROWN AND CALDWELL

Name	Education	Specialty Area	Experience	Project Role
Plude, Bryan	B.A., Biology M.A., Management and Business M.S., Civil Engineering	Restoration and conservation of ecosystems as well as design, planning, and restoration of wetlands	28	Resource Lead - Visual; Recreation
Reichard, Chris	B.S., Natural Resources	Wetland, riparian and threatened/endangered species assessments, environmental permitting, and ecological mitigation design and planning	8	Resource Lead - Biology
Schmucker, Betty	B.A., Anthropology M.A., Anthropology	Community coordination for environmental remediation, environmental impact assessments, and cultural resources	22	Resource Lead - Cultural Resources and Archeology
Yee, Wellington	B.S., Microbiology Registered Environmental Health Specialist in California Registered Environmental Assessor in California	Environmental regulatory compliance	20	Resource Lead – Air Quality
Yoshida, Kathleen		Word processor, document preparation (format, spelling, QA/QC; data entry)	10	Word Processing
Zubia, Ruben	B.S., Civil Engineering M.B.A. Registered Professional Civil Engineer in California	Project management, water resource planning, NEPA compliance, agency coordination	20	Project Manager, Resource Lead - Hydrology, Water Deliveries

JONES AND STOKES

Name	Education	Qualifications	Experience	Project Role
Elliott, Chris	B.S., Landscape Architecture	Licensed Landscape Architect (CA 4247), restoration ecology, open space and recreational planning, landscape architecture	13	Resource Lead - Recreation
Engels, Tom	B.A., English; Ph.D., Biological Sciences	NEPA compliance, regulatory compliance, water resource planning	11	Recreation
Glines, Harlan	B.A., Environmental Studies	NEPA compliance, regulatory compliance, water resource planning	21	Assistant Project Manager
Hick, Carol-Anne	B.S., Environmental and Resource Sciences	MS Office systems, document production	4	Document Production

List of Preparers

JONES AND STOKES

Name	Education	Qualifications	Experience	Project Role
Lingappaiah, Colleen	B.A., Biology with emphasis in Chemistry	NEPA compliance, regulatory compliance, water resource planning	14	Document Production, Project Coordinator
Maniscalco, Donna	B.S., Wildlife Fish & Conservation Biology	Fisheries biology	6	Biology
McConnaha, Willis	B.A., Geology M.S., Fisheries Ph.D., Environmental Science and Resources	Fisheries biology, aquatic ecology, urban and regional planning	28	Biology
McGowan, Dana	B.A., Anthropology Minor in Geology M.A., Anthropology	Historical archaeology, prehistoric archaeology	25	Resource Lead—Indian Trust Assets; Cultural Resources
Norgaard, Ingrid	B.A., Political Science	Public outreach/ education, public involvement/ facilitation, community affairs	8	Resource Lead—Environmental Justice
Oakes, Harry	B.S., Wildlife and Fisheries Biology Minor, Forestry	Restoration ecology, riparian ecology, vegetation management	12	Biology
Rimpo, Tim	B.A., Economics M.S., Economics	Natural resource economics, NEPA/SEPA/CEQA compliance	17	Resource Lead—Transportation
Rogers, Jennifer	B.A., Journalism	Public outreach/education	1	Population and Housing
Roy, Gregg	B.S., Political Economy of Natural Resources	NEPA compliance documents and socioeconomic studies	16	Resource Lead—Socioeconomics; Project Team
Solbert, Alan	B.S., Biology and Zoology M.S., Wildlife Sciences and Ecology	Project management, NEPA compliance, environmental impact analysis, flood protection and water resource planning, habitat restoration planning, local government and interagency coordination, land use planning, interagency facilitation, mitigation planning	23	Assistant Project Manager
Stock, Jennifer	B.S., Landscape Architecture	Licensed Landscape Architect open space and recreational planning, Computer Aided Design & Drafting	8	Recreation
Unhold, Claudia	B.A., Geography M.S., City and Regional Planning	Urban and regional planning, public involvement/facilitation, environmental data analysis	20	Resource Lead—Population and Housing, Land Use

JONES AND STOKES

Name	Education	Qualifications	Experience	Project Role
Williams, Karen	B.A., Anthropology	Prehistoric archaeology, public involvement/ facilitation	19	Population and Housing; Land Use

SAIC

Name	Education	Specialty Area	Experience	Project Role
Rawlings, Pete	B.S., Wildlife Management	Wildlife biology and management, conservation planning, and endangered species compliance	26	Biology
Springer, Lisbeth	B.A., Sociology Master of City and Regional Planning Certified Planner: American Institute of Certified Planners (AICP) Certificate in Negotiation and Mediation	Certified Planner: American Institute of Certified Planners (AICP) Certificate in Negotiation and Mediation	25	Biology
Thompson, Rosemary	B.A., Zoology Ph.D., Marine Biology	Threatened, Endangered, and Special Status fish	32	Biology

List of Preparers

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Distribution List

Draft EIS Distribution List

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John Biggs, Brown and Caldwell

Steve Cole, Arizona Daily Sun

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Sabre Duren, Brown and Caldwell

Lisa Fardal, Montgomery, Watson, & Harza

Warren Felger, Felger & Associates

Harlan Glines, Jones and Stokes

Maddie Gugino, Kummer Kaempfer Bonner Renshaw & Ferrario

Ben Harding, Hydrosphere

Thomas Havens, American Water Resources Incorporated

Robert Hawkins, Law Offices of Robert C. Hawkins

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Anika Leerssen, Rossman & Moore LLP

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Tony Mardam, CH2M Hill

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David Miller, Brown and Caldwell

Jerome C. Muys, Muys & Associates, PC

Michael Nienberg, Brown and Caldwell

Ingrid Norgaard, Jones and Stokes

Bryan Plude, Brown and Caldwell

Pete (Marcus) Rawlings, SAIC

Chris Reichard, Brown and Caldwell

Brad Ross, Resolution Copper Company

Greg Roy, Jones & Stokes

Erik Ryberg, Attorney At Law

Betty Schmucker, Brown & Caldwell

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Jack Stonehocker, CRC Industrial Customers

Mechele Van Quathem, Ryley, Carlock & Applewhite

Wellington Yee, Brown & Caldwell

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Amy Brunvand, University of Utah

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Decision Support for Water and
Environmental System
John Sullivan, Professor of Political Studies,
Pitzer College

Federal Agencies

Allen Anspach, BIA
Steve Augustin, Reclamation
Mary Brandt, U.S. International Boundary
and Water Commission (US IBWC)
Darryl Beckmann, Reclamation
Levi Brekke, Reclamation
Christopher Cutler, Reclamation
Richard Clayton, Reclamation
Nancy Coulam, Reclamation
Russell Callejo, Reclamation
Randy Chandler, Reclamation
Gary Davis, Reclamation
William Dickson, National Park Service
(NPS)
Bruce Ellis, Reclamation

Leslie Fitzpatrick, Fish and Wildlife Service
(FWS)
Donald Frevert, Reclamation
Laura Fujii, Environmental Protection
Agency (EPA)
Andrew Gilmore, Reclamation
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Glen Gould, Reclamation
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Administration (Western)
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(USGS)
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(BIA)
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Federal Agencies

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Kenneth Rakestraw, US IBWC
Tim Ramish, US IBWC
Clifford Regensberg, US IBWC
John Ritchie, IBWC
Kitty Roberts, NPS
Eugene Romanski, Mohave National Preserve
Tom Ryan, Reclamation
David Sabo, Reclamation
Barbara Schuelke, LC Region Liaison Officer
Sally Spener, USIBWC
Sam Spiller, Fish and Wildlife Service
Ken Turner, NPS, Lake Mead National Recreation Area
Larry Walkoviak, Reclamation
Pam Williams, USDOJ, Secr. Indian Water Rights Office
Cathy Wilson, BIA
Brian Young, Western

Indian Tribes

Herman Agoyo, Pueblo of San Juan
Kenny Anderson, Las Vegas Paiute Tribe
Shane Anton, Salt River Pima-Maricopa Indian Community
Honorable Myron Armijo, Pueblo of Santa Ana
George Arthur, Navajo Nation Council
Honorable Raphael Bear, Fort McDowell Yavapai Nation
Stephen Begay, Navajo Nation Historic Preservation
Honorable Gilbert Bigil, Pueblo of Tesuque
Alex Blaine, Tohono O'odham Nation
Grant Buma, Colorado River Indian Tribes
Betsy Chapoose, Northern Ute Indian Tribe
Kerry Christensen, Hualapia Indian Tribe
Brenna Clani, Navajo Nation
Neil Cloud, Southern Ute Indian Tribe
Honorable Sherry Cordova, Cocopah Indian Tribe
Cultural Resource Representative Jemez Pueblo
Dr. Jonathan Damp, Pueblo of Zuni Historic Preservation
Wally Davis Jr., Tonto Apache Tribal Council
Alan Downer, Navajo Nation Historic Preservation Department

Distribution List

Indian Tribes

Luke Duran, Pueblo of Pojoaque

Honorable Daniel Eddy Jr., Colorado River Indian Tribes

Ron Escobar, Chemehuevi Indian Tribe

Honorable Herminia Frias, Pascua Yaqui Tribe

Honorable Clement Frost, Southern Ute Indian Tribe

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Celestino Gauchupin, Pueblo of Zia

Greg Glassco, Yavapai Prescott Indian Tribe

Kelly Gomez, Pascua Yaqui Tribe

Vernelda Grant, San Carlos Apache Indian Tribe

Honorable Denny Gutierrez, Pueblo of Santa Clara

Nancy Hayden, Yavapai Prescott Indian Tribe

Loretta Jackson, Hualapai Tribe

Johathon Jantzen

Jason John, Navajo Department of Water Resources

Jason Johnson, Pueblo of Acoma

Norman Johnson, Navajo Nation

Honorable Ernest Jones Sr., Yavapai-Prescott Indian Tribe

Honorable Pauline Jose, Fort Yuma Quechan Indian Tribe

Honorable Vivian Juan-Saunders, Tohono O'odham Nation

Terry Knight, Ute Mountain Ute Tribe

Leigh Kuwanwisiwma, Hopi Tribe

Barnaby Lewis, Gila River Indian Community

Honorable Raymond Lucero, Pueblo of Jemez

Selic Lucero, Pueblo of San Felipe

Ronnie Lupe, White Mountain Apache

Honorable Manual Health, Ute Mountain Ute Tribe

Honorable Manuel Heart, Ute Mountain Ute Tribe

Doreena Martineau, Paiute Indian Tribe of Utah

Ron Maldonado, Navajo Nation Historic Preservation Office

Ronald Manakaja, Havasupai Tribe

Jill McCormick, Cocopah Indian Tribe

Honorable Nora McDowell, Fort Mohave Indian Tribe

Clarence Miquel, Tohono O'Odham Nation

Lalovi Miller, Moapa Paiute Tribe

Mark Mitchell, Pueblo of Tesque

Honorable Michael Jackson Sr., Quechan Indian Tribe

Indian Tribes

Ernest Mirable, Pueblo of Nambe

Honorable Alfreda Mitre, Las Vegas Paiute Tribe

Sam Montoya, Pueblo of Sandia

Mason Morisset, Quechan Indian Tribe

Honorable Maxine Natchees, Northern Ute Indian Tribe

Bridget Nash, Quechan Tribal Historic Preservation Office

Nancy Nelson, San Carlos Apache Indian Tribe

Wendsler Nosie, San Carlos Apache Indian Tribe

Linda Otero, Fort Mohave Indian Tribe

Adelaide Paiz, Jicarilla Apache Nation

Robert Palmquist, Strickland Law for Ak-Chin

Jacob Pecos, Pueblo of Cochiti

Honorable Levi Pesata, Jicarilla Apache Nation

Tim Pierson, Gila River Indian Community

Honorable Peter Pino, Pueblo of Zia

Roni Polk, Pueblo of Acoma

Honorable Arlen Quetawki Sr, Pueblo of Zia

Honorable Joni Ramos, Salt River Pima-Maricopa Indian Community

Karen Ray, Fort McDowell Yavapai Nation

Marian Reves, Pascua Yaqui Tribe

Honorable William Rhodes, Gila River Indian Community

Honorable George Rivera, Pueblo of Pojaoque

Honorable Joe Shirley Jr., Navajo Nation

Ivan Sidney Sr., Hopi Tribe

Honorable Thomas Siyuja Sr., Havasupai Tribe

Honorable Ivan Smith, Tonto Apache Tribal Council

Peter Steere, Tohono O'odham Nation

Honorable Stewart Paisano, Pueblo of Sandia

Lee Suina, Pueblo of Cochiti

Honorable Simon Suipa, Pueblo of Cochiti

Honorable Phil Swain, Moapa Paiute Tribe

Lorraine Swanick, Pueblo of San Felipe

Gilbert Tafoya, Pueblo of Santa Clara

Honorable Tom Talache Jr., Pueblo of Nambe

Arnold Taylor Sr., Hopi Tribe

Honorable Wayne Taylor Jr., Hopi Tribe

Gloria Thomas, Tohono O'odham

Honorable Gary Tom, Kaibab Band of Paiute Indians

Honorable Laura Tom, Paiute Indian Tribe of Utah

Tonto Apache Reservation

Distribution List

Indian Tribes

Tohono O'odham Nation

Honorable Lawrence Troncosa, Pueblo of San Felipe

Michael Tsosie, Colorado River Indian Tribes

Honorable Fred Vallo Sr., Pueblo of Acoma

Charles Weise, Tohono O'odham Utility Authority

Honorable Kathleen Wesley-Kitcheyan, San Carlos Apache Indian Tribe

Lorene Willis, Jicarilla Apache Nation

Norm Edwards

Jeffrey English

Jim Essler

Tom Ferguson

Timothy Flood

Gordon Freeny

Angela Garcia-Lewis

John Garrett

Michael Gordon

Joshua Gordon

Robert Hack

James Hines

Ed Hunt

Jeffrey Hunt

Cliff Hurley

John Kuebler

Bill Lane

Skip Larson

Rick Johnson

Jaremy Lynch

Carey Ochs

Dano Phillips

Patricia Poirier

Dennis Portnoy

John Reed

Individuals

Frank Beers

Dennis Bell

Mark Belles

Jim Brooker

Dan Budd

Stanley Cazier

Dean Cobb

Wayne Cook

Mark Cooper

Rick Dewitt

Dr. Jeffrey Dickemann

Patrick Diehl

Individuals

Dr. David Relman

Rob Roush

Angela Scarlata

Catherine Schiaffo

Dr. John Simon

Shirley Smith

Jennifer Soza

Ruth Sperling

Russell Sullivan

Ben Tettlebaum

Rachel Thomas

Henry Tonkewicz

Kathleen Weyforth

Claudia Whitnah

William Wolfe

Earl Zarbin

Libraries

Cynthia Amador, Mohave County Library District

Department of Interior Natural Resources Library

James I. Gibson Library

Judy Smith, Colorado State University Libraries

Las Vegas Clark County Library

Laughlin Library

Mohave County Library

Palo Verde Valley Library

Mary Roberts, Mohave County Library District

Library, Reclamation Denver Federal Center

Yuma County Library

Local Agencies

John Baggs, Clark County Department of Comprehensive Planning

Walter Cairns, Clark County Government Center

John Carter

Carlos Colvin, Bard Water District

Joseph Hsu, Director of Utilities, Azusa Light & Water

David Huggins, City of San Diego

Larry Didion, Lake Havasu City

Chief, City of Flagstaff

David Garcia, Yuma County

Charles Groyke, City of Blythe

Elston Grubaugh, Imperial Irrigation District

Scott Hanson, City of Boulder City

Terry Hinton, Town of Thatcher

Doug Karase, CWCB

Distribution List

Local Agencies

Peter Kavounas, Glendale Water & Power

Mike King, Imperial Irrigation District

Las Vegas, Reference Department

Laughlin, Reference Department

Law Offices of Maureen Rose George

Bill Mace, Burbank Water and Power

Manager, City of Yuma

Teresa Maropoulos, Metropolitan Water District of Southern California (MWD)

Paul Marsh, Arizona State University

Jan Matusak, MWD

Robert Micalizio, Palo Verde Irrigation District

Tom McCann, Central Arizona Water Conservation District

Patrick Morgan, Unit B Irrigation District

Patricia Mulroy, SNWA

Karen Murphy, MWD

Janice Paul, Development Services Director, City of Bullhead City

David Pettijohn, Los Angeles Department of Water & Power

Project Evaluation Program Phoenix

Larry Purcell, San Diego County Water Authority

Joseph Saz, Univ. of California, Berkley

Jose D. Sales, Dept Of Civil Engineering, Colorado State University

Environmental Coordinator San Diego

Steve Schmitzer, Denver Water Department

Jeffry Scroggins, Clarkdale-Jerome School District

Laura Simonek, MWD

Planning Department Somerton

Southern Nevada Water Authority

Peter Stasiak, Town of Parker

William Swan, Imperial Irrigation District

Government Documents Tempe

Colby Temple, Southern Nevada Water Authority (SNWA)

Joseph Vanderhorst, Metropolitan Water District of Southern California

Ed Weeks, Navajo Generating Station

Jennifer Wellman, City of Blythe

Special Interest Groups and Non-Governmental Organizations

Clifford Barrett, Colorado River Energy Distributors Association

Michael Cohen, Pacific Institute

Geoff Craig, Southwest Water Conservation District

Special Interest Groups and Non-Governmental Organizations

Zachary Crumbo, Grand Canyon Wildlands Council

Kurt Dongoske, Colorado River Energy Distributors Association

Michael Garabedian, Desert Law & Water Science Forum

Kara Gillion, Defenders of Wildlife

Steve Glazer – High Country Citizens' Alliance, Sierra Club

Robert Hall, Nevada Environmental Coalition, Inc.

John Hiatt, Red Rock Audubon Society

Pamela Hyde, Rivers Foundation of the Americas

Mark Lellouch, Sonoran Institute

Gordon Lind, Sierra Club, Rocky Mountain Chapter

Robert Lynch, Robert S. Lynch & Associates

Living Rivers

The Nature Conservancy

Pacific Institute

Christopher Peterson, Glen Canyon Institute

Jennifer Pitt, Environment Defense

Brian Segee, Defenders of Wildlife

Gaylord Staveley, Canyoneers, Inc.

Garrit Voggessler, National Wildlife Federation

James Wechsler, Utah Water & Sierra Club Southwest Water Committee

Dave Wegner

John Weisheit, Living Rivers

Robert Wigington, Nature Conservancy

Jeff Woner, CREDA

State Agencies

Abbas Amirteymoor, Colorado River Board of California

Perri Benemelis, Arizona Department of Water Resources (ADWR)

Katie Blevins, Southern Nevada Water Authority

Richard Bunker, Colorado River Commission of Nevada (CRC)

California State Clearinghouse

Joan Card, Arizona Dept. of Environmental Quality

State of California, Office of Planning and Research

Carson City, Department of Administration

Dr. Gedi Cibas, Environmental Impact Review Committee

Jennifer Crandell, State of Nevada, Off. Of the Attorney General

John D'Antonio, State Engineer, New Mexico Interstate Stream Commission

Distribution List

State Agencies

Jim Davenport, CRC

Nicole Everrette, CRC

Environmental Coordinator, San Diego
County Water Authority

Nannette Flores, ADWR

Russell George, Department of Natural
Resources

Christopher Harris, Colorado River Board of
California (CRB)

William Hasencamp, Metropolitan Water
District of Southern California

Tim Henley, ADWR

Jay Jerde, Wyoming Attorney General's
Office

Jeanine Jones, State of California

Matthew Jones, Wyoming State Office of
the Governor

Robert King, Utah Water Resources

Nevada State Clearinghouse

Suzy Noecker, Wyoming Farm Bureau
Federation

Don Ostler, Upper Colorado River
Commission

Larry Myers, California Native American
Heritage Commission

State of Montana, Department of Fish
Wildlife and Parks

Bill Persons, Arizona Game and Fish
Department

Tom Piechota, UNLV

Joanna Prukop, Energy, Minerals & Nat'l
Resources Department

Hugh Ricci, State of Nevada, Division of
Water Resources

Randy Seaholm, Colorado Department of
Natural Resources

John Shields, Wyoming State Engineers
Office

Carlos Sierra, U.S. Senator John McCain

Hal Simpson, Division of Water Resources

Zofia Targosz, Nevada Clearing House

James Taylor, San Diego County Water
Authority (SDCWA)

Patrick Tyrrell, State Engineer, Wyoming
State Engineer's Office

State of Utah, Public Lands Policy
Coordination Office

John Whipple, Interstate Stream
Commission

Gerald Zimmerman, CRB