Monterey County

1441 Schilling Place
Saffron Room
Salinas, CA 93901

Meeting Agenda

Thursday, August 25, 2022

1:30 PM

IMPORTANT COVID-19 NOTICE ON PAGE 2-4
AVISO IMPORTANTE SOBRE COVID-19 EN LA PAGINA 2-4

Water Resources Agency Reservoir Operations Advisory Committee

John Baillie, Chair
Ken Ekelund
Mark Gonzalez
Matthew Simis

Jon Anthony	***Eric Morgan***
Bill Lipe	***Kevin Piearcy***
Wes Thomson	***Patrick Collins***
Layla Decker	***Doug Scattini***
Richard Ortiz	***Zach Barnes***
Matthew Panziera	***Steve Blois***

Vacancy (1)

IMPORTANT NOTICE REGARDING COVID 19 AND PARTICIPATION IN THE RESERVOIR OPERATIONS ADVISORY COMMITTEE MEETING

In order to minimize the spread of the COVID 19 virus, please do the following:

While the meeting is open to the public, you are strongly encouraged to observe and address the Committee telephonically or electronically. If you attend the meeting in person, you will be required to maintain appropriate social distancing, i.e., maintain a 6-foot distance between yourself and other individuals.

To participate in this Reservoir Operations Advisory Committee meeting remotely instructions for public participation are below:

1. For ZOOM participation please join by computer audio at:
https://montereycty.zoom.us/j/92085702216
OR to participate by phone call any of these numbers below:
+1 669 900 6833 US (San Jose)
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Enter this Meeting ID number: 920 8570 2216 PASSWORD 877574 when prompted. Please note there is no Participant Code, you will just hit # again after the recording prompts you.

You will be placed in the meeting as an attendee; when you are ready to make a public comment, if joined by computer audio, please Raise your Hand; and by phone, please push *9 on your keypad.

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the 5:00 p.m. Wednesday deadline will be distributed to the Committee and will be placed in the record.

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8. The Chair and/or Secretary may set reasonable rules as needed to conduct the meeting in an orderly manner.

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limitado a 250 palabras o menos, a WRApubliccomment@co.monterey.ca.us. Para ayudar al personal de la Agencia a identificar el artículo de la agenda con el cual se relaciona el comentario, se solicita al público que indique el nombre del Comité (por ejemplo: Comité Asesor de la Operación de Embalses) y el número del artículo de la agenda (por ejemplo: Artículo # 10). Se hará todo lo posible para leer el comentario en el registro, pero algunos comentarios pueden no leerse en voz alta debido a limitaciones de tiempo. Los comentarios recibidos después del cierre del período de comentarios públicos sobre un artículo de la agenda serán parte del registro si se reciben antes que termine la reunión del Comité.

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8. El Presidente y / o Secretario pueden establecer reglas razonables según sea necesario para llevar a cabo la reunión de manera ordenada.

Call to Order

Roll Call

Public Comment

Committee Member Comments

Consent Calendar

1. Approve the Minutes of the Reservoir Operations Advisory Committee Meeting held on July 28, 2022.

Attachments: Draft ResOps Minutes July 28, 2022

Scheduled Items

2. Consider recommending that the Monterey County Water Resources Board of Directors find the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs qualifies as a Class 6 Categorical Exemption pursuant to section 15306 of the CEQA Guidelines; and Adopt the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs based on natural condition triggers, in response to consecutive dry year conditions.

Attachments: Board Report
Revised Draft Interim Operations Plan

Staff Reports

3. Reservoir Storage and Release Update

Attachments: Reservoir Storage Release Update
Reservoir Elevation and Storage

4. Release Schedule Update

Attachments: Reservoir Release Schedule Update

5. Update on Operations and Maintenance Activities at the Reservoirs

Status Reports

6.

- Lake Recreation by Concessionaire and Parks Department
- Quagga/Zebra Mussel Plan
- San Luis Obispo County Activities
- Cloud Seeding
- National Marine Fisheries Service

Calendar

7. Set next meeting date and discuss future agenda items

Adjournment

Monterey County

Board Report

Legistar File Number: WRARO 22-072

Item No.1

Board of Supervisors
Chambers
168 W. Alisal St., 1st Floor
Salinas, CA 93901

August 25, 2022

Introduced: 8/18/2022
Version: 1

Current Status: Draft
Matter Type: WRA ResOps Item

Approve the Minutes of the Reservoir Operations Advisory Committee Meeting held on July 28, 2022.

Monterey County

1441 Schilling Place
Saffron Room
Salinas, CA 93901

Meeting Minutes

Thursday, July 28, 2022

1:30 PM

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Water Resources Agency Reservoir Operations Advisory Committee

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8. El Presidente y / o Secretario pueden establecer reglas razonables según sea necesario para llevar a cabo la reunión de manera ordenada.

Call to Order

The meeting was called to order at 1:33 p.m.

Roll Call

Present: John Baillie, Ken Ekelund, Mark Gonzalez, Matthew Simis, Jon Anthony, Bill Lipe, Wes

Thomson, Eric Morgan, Steve Blois (arrived after roll call)
Absent: Layla Decker, Richard Ortiz, Matthew Panziera, Kevin Piearcy, Patrick Collins, Zach Barnes

Public Comment

None

None **Committee Member Comments**

None

Presentation

1. Overview of the Nacimiento Dam Low Level Outlets

Attachments: Presentation Slides

Public Comment: Nancy Isakson

2. Presentation on the life cycle of Oncorhynchus mykiss (Steelhead), by National Marine Fisheries Service

Attachments: Presentation Slides

Consent Calendar

Upon Motion by Matthew Simis and Second by Eric Morgan the Committee approved the Consent Calendar.

Ayes: John Baillie, Ken Ekelund, Mark Gonzalez, Matthew Simis, Jon Anthony, Bill Lipe, Wes Thomson, Eric Morgan
Noes: None
Absent: Layla Decker, Richard Ortiz, Matthew Panziera, Kevin Piearcy, Patrick Collins, Zach Barnes, Steve Blois

3. Approve the Minutes of the Reservoir Operations Advisory Committee Meeting held on May 26, 2022.

Attachments: Draft Minutes May 26, 2022

Scheduled Items

4. Consider receiving an update on the development of a revised Interim Operations Plan for San Antonio and Nacimiento Dams.

Attachments: Board Report

Letters from National Marina Fisheries Service dated 3/25/22; 5/14/21

Upon Motion by Mark Gonzalez and Second by Bill Lipe the Committee received an update on the development of a revised Interim Operations Plan for San Antonio and Nacimiento Dams.

Ayes: John Baillie, Ken Ekelund, Mark Gonzalez, Matthew Simis, Jon Anthony, Bill Lipe, Wes Thomson
Noes: Eric Morgan, Steve Blois
Absent: Layla Decker, Richard Ortiz, Matthew Panziera, Kevin Piearcy, Patrick Collins, Zach Barnes,

Public Comment: Nancy Isakson

Staff Reports

5. Reservoir Storage and Release Update

Attachments: Reservoir Storage Release Update Report

Presentation Slides

6. Release Schedule Update

Attachments: Release Schedule Update

7. Update on Operations and Maintenance Activities at the Reservoirs

Attachments: Presentation Slides

Status Reports

8.

- Lake Recreation by Concessionaire and Parks Department
- Quagga/Zebra Mussel Plan
- San Luis Obispo County Activities
- National Marina Fisheries Service

Calendar

9. Set next meeting date and discuss future agenda items

Adjournment

The meeting adjourned at 3:20 p.m.

Introduced: 8/18/2022
Version: 1

Current Status: Agenda Ready
Matter Type: WRA ResOps Item

Consider recommending that the Monterey County Water Resources Board of Directors find the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs qualifies as a Class 6 Categorical Exemption pursuant to section 15306 of the CEQA Guidelines; and Adopt the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs based on natural condition triggers, in response to consecutive dry year conditions.

RECOMMENDATION:
The Reservoir Operations Advisory Committee recommends that the Monterey County Water Resources Board of Directors:

a. Find the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs qualifies as a Class 6 Categorical Exemption pursuant to section 15306 of the CEQA Guidelines; and
b. Adopt the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs based on natural condition triggers, in response to consecutive dry year conditions.

DISCUSSION:

Current Reservoir Conditions and Operations

Monterey County Water Resources Agency (Agency) owns and operates the Nacimiento and San Antonio Reservoirs, within the Salinas River Watershed, for the combined goals of water conservation through groundwater recharge, river diversions for supply to the Castroville Seawater Intrusion Project, flood protection, and recreation. As of August 17, 2022, San Antonio Reservoir has a water surface elevation of approximately 677.5 feet (NGVD 29), with 33,623 acre-feet of storage. Nacimiento Reservoir has a water surface elevation of approximately 724.7 feet, with 79,245 acre-feet of storage. San Antonio Reservoir is currently at 10% of storage capacity and Nacimiento Reservoir is at 21% of capacity. Combined reservoir storage volume is currently 112,868 acre-feet.

The *Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River* (Flow Prescription), was incorporated into water rights Licenses 7543 and 12624, and Permit 21089. It targets providing steelhead migration to and from the lower Salinas River Basin, which includes the Arroyo Seco and the lower Nacimiento River, and Monterey Bay, through the mainstem of the Salinas River. The Agency continues to release approximately 60 cfs from Nacimiento Reservoir and 10 cfs from San Antonio Reservoir to support spawning and rearing of federally listed steelhead below the dams. Streamflow triggers that could require reservoir releases to augment natural flows in support of adult steelhead upstream migration are in effect from February 1st through March 31st. However, current combined reservoir storage continues to be well below the 220,000 acre-feet threshold volume specified in the Flow Prescription.

The last substantial steelhead passage opportunities occurred during the wet winter and spring of 2018/19. The winters of 2019/20, 2020/21, and 2021/22 did not provide any adult steelhead passage opportunities as defined by the Flow Prescription. All three of these winters included short duration natural flow events that resulted in sandbar management at the Salinas Lagoon and flow to the ocean but none met the established steelhead passage criteria defined by the Flow Prescription and no supplemental reservoir releases were triggered during these events.

Need for an Interim Action

As documented by a review of historical reservoir operations and ongoing correspondence with National Marine Fisheries Service (NMFS) staff, NMFS has determined that flow enhancement triggers first defined in the Flow Prescription and in effect since 2010 have so far fallen short of providing the anticipated passage opportunities during some hydrologic year types. This was not considered in the analysis that resulted in the Flow Prescription. This finding coincides with the U. S. Army Corps of Engineers (USACE) confirmation that there was no federal action requiring section 7 of the Endangered Species Act, which resulted in revocation of the NMFS Biological Opinion (BO) in 2019 and the loss of incidental take coverage (ITC) for operation of Salinas Valley Water Project (SVWP) facilities. During the first 13 years of SVWP operations (2010-2022) no adult upstream passage days were recorded in any of the four dry-normal category years. The target for dry-normal year types is 16 passage days. According to the National Integrated Drought Information System, the entirety of Monterey County is currently affected by drought conditions, with over 25% (including the majority of the Salinas Valley) categorized as under “Extreme Drought” conditions. San Luis Obispo County is currently experiencing 70% of its area in the “Extreme Drought” category. Drought conditions are predicted to persist beyond the summer months.

Original Interim Operations Plan Proposal

In response to current conditions, Agency staff proposed an Interim Operations Plan (IOP) for Nacimiento and San Antonio Reservoirs at the February Reservoir Operations Advisory Committee (ROAC) meeting. The ROAC recommended that the Board of Directors (BOD) adopt the IOP which was designed to allow releases for the augmentation of a natural flow event to enhance steelhead migration opportunities in the absence of Flow Prescription triggers and address concerns of NMFS regarding migration flows during dry periods. The proposal was limited to a short time period since the Drought Operations Technical Advisory Committee (DTAC) was concurrently working on development of a release schedule proposal and a Dry Winter Scenario Narrative (DWSN) that expressed reservoir operational goals related to dry conditions.

At its March 21, 2022 meeting, the BOD voted against adoption of the IOP for 2022, recommending that staff prepare a follow-up plan for future dry or dry-normal winters.

Subsequently, in a March 25, 2022 letter, NMFS notified the Agency that ongoing take of S-CCC steelhead may be occurring at the Nacimiento and San Antonio dams, and downstream in the Salinas River, citing a lack of adequate progress on development of a Habitat Conservation Plan (HCP) and failure to adopt an IOP as previously recommended by NMFS in letter dated May 14, 2021. In its more recent letter, NMFS requested that the Agency complete certain tasks and proceed to implement an IOP for the 2022/2023 migration season and subsequent seasons until the HCP is in place. At its May meeting, the ROAC received a report summarizing these recent events and

outlining proposed plans for moving forward with development of a revised IOP this year. The ROAC also received an update on the DTACs DWSN which has been considered during the development of the revised IOP.

Revised Interim Operations Plan

Over the last few months, Agency staff has invited preliminary stakeholder input through regular meetings with NMFS and USFWS as well as through ROAC, on the development of a revised IOP. In general, there was support for piloting interim operations for various different benefits. Staff received stakeholder feedback related to upstream flow triggers and on Salinas River Lagoon status. Agency staff has considered the various comments and responded by removing the original upstream flow trigger related to the Salinas River near Paso Robles gage which had originally stated, "A minimum mean daily Upper Salinas River flow of 60 cfs is observed based on reports from the USGS gage site 11147500 SALINAS R A PASO ROBLES CA." Further historical streamflow analysis indicated that this upstream flow trigger would not appreciably inform the decision to commence interim operations.

The USFWS also seeks to limit impacts to federally listed species (western snowy plover and tidewater goby) that may arise from additional manual breaching of the sandbar at the Salinas River mouth, especially during periods when these species may be most vulnerable. This proposal relies on the lagoon already being open to the ocean to avoid those types of impacts. The Agency lacks a permit for incidental take of Federally listed species during manual sandbar breaching but is developing a habitat conservation plan to address this issue in collaboration with USFWS. In response to comments received, Agency staff added language to the Salinas River Lagoon trigger to clarify that activities would be in conformance with the current Salinas River Lagoon Sandbar Management Plan.

As was the case for the original IOP, the aim of the revised IOP will be to augment storm events that trigger a watershed-wide response to increase the likelihood of successfully providing multiple benefits valley-wide including steelhead passage opportunities while minimizing impacts to reservoir elevations. The proposal would allow Agency staff discretion to respond quickly to supplement naturally occurring streamflow events. Such actions would provide multiple benefits, including: providing steelhead passage opportunities in the absence of currently existing operational flow enhancement triggers, while adhering to all existing water rights, operational agreements and adopted release schedules; supporting the ongoing development of the Salinas River HCP through the gathering of pertinent supportive data and information; and providing enhanced recharge of Salinas Valley water supply aquifers through Salinas River percolation. A key difference is that the revised IOP is proposed to be in effect until an HCP is adopted. If an interim operation is triggered, it would provide Agency staff with valuable data collection opportunities to help inform studies regarding proposed reservoir re-operations that may ultimately be permitted through the HCP process currently underway. The draft revised IOP included in the August ROAC mailout and presented at the August ROAC meeting, is currently under review by USFWS and NMFS,.

CEQA Compliance

The IOP is the mechanism that the Agency would like to use to pilot different reservoir operations and study how the system is responding. This will allow staff to make adjustments to the timing and magnitude of reservoir releases to try and reach the goal of the plan and collect valuable data for future

modeling and analysis. California Environmental Quality Act ("CEQA") Guidelines Section 15306 categorically exempts projects that consist of basic data collection, research, experimental management, and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. (14 C.C.R. § 15506). Implementing the IOP falls under this exemption because, as detailed above, it is an interim project to research and collect data for preparation of the HCP, and is experimental management and resource evaluation for protection of the environment in response to continued drought conditions and the current operations not providing adequate migration opportunities for steelhead.

Strategic Plan Goals and Objectives
Agency effort on this process aligns with Monterey County Water Resources Agency Strategic Plan Goal B (planning and new projects); Strategy 7 (Use data and analysis to make informed decisions) and Goal E (Community Relations) Strategy 4 (Provide information on Agency Operations to stakeholders).

OTHER AGENCY INVOLVEMENT:
National Marine Fisheries Service and U.S. Fish and Wildlife Service

FINANCING:
Staff time associated with reservoir operations are included in the FY23 approved budget in Fund 116 - Dam Operations.

Prepared by: Shaunna Murray, Senior Water Resources Engineer
Approved by: Brent Buche, General Manager, (831) 755-4860

Attachments:
1. Revised Draft Interim Operations Plan

Introduced: 8/18/2022 **Current Status:** Draft

Version: 1 **Matter Type:** WRA ResOps Item

Consider recommending that the Monterey County Water Resources Board of Directors find the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs qualifies as a Class 6 Categorical Exemption pursuant to section 15306 of the CEQA Guidelines; and Adopt the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs based on natural condition triggers, in response to consecutive dry year conditions.

RECOMMENDATION:
The Reservoir Operations Advisory Committee recommends that the Monterey County Water Resources Board of Directors:

a. Find the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs qualifies as a Class 6 Categorical Exemption pursuant to section 15306 of the CEQA Guidelines; and
b. Adopt the revised Interim Operations Plan for San Antonio and Nacimiento Reservoirs based on natural condition triggers, in response to consecutive dry year conditions.

DISCUSSION:

Current Reservoir Conditions and Operations

Monterey County Water Resources Agency (Agency) owns and operates the Nacimiento and San Antonio Reservoirs, within the Salinas River Watershed, for the combined goals of water conservation through groundwater recharge, river diversions for supply to the Castroville Seawater Intrusion Project, flood protection, and recreation. As of August 17, 2022, San Antonio Reservoir has a water surface elevation of approximately 677.5 feet (NGVD 29), with 33,623 acre-feet of storage. Nacimiento Reservoir has a water surface elevation of approximately 724.7 feet, with 79,245 acre-feet of storage. San Antonio Reservoir is currently at 10% of storage capacity and Nacimiento Reservoir is at 21% of capacity. Combined reservoir storage volume is currently 112,868 acre-feet.

The *Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River* (Flow Prescription), was incorporated into water rights Licenses 7543 and 12624, and Permit 21089. It targets providing steelhead migration to and from the lower Salinas River Basin, which includes the Arroyo Seco and the lower Nacimiento River, and Monterey Bay, through the mainstem of the Salinas River. The Agency continues to release approximately 60 cfs from Nacimiento Reservoir and 10 cfs from San Antonio Reservoir to support spawning and rearing of federally listed steelhead below the dams. Streamflow triggers that could require reservoir releases to augment natural flows in support of adult steelhead upstream migration are in effect from February 1st through March 31st. However, current combined reservoir storage continues to be well below the 220,000 acre-feet threshold volume specified in the Flow Prescription.

The last substantial steelhead passage opportunities occurred during the wet winter and spring of 2018/19. The winters of 2019/20, 2020/21, and 2021/22 did not provide any adult steelhead passage opportunities as defined by the Flow Prescription. All three of these winters included short duration natural flow events that resulted in sandbar management at the Salinas Lagoon and flow to the ocean but none met the established steelhead passage criteria defined by the Flow Prescription and no supplemental reservoir releases were triggered during these events.

Need for an Interim Action

As documented by a review of historical reservoir operations and ongoing correspondence with National Marine Fisheries Service (NMFS) staff, NMFS has determined that flow enhancement triggers first defined in the Flow Prescription and in effect since 2010 have so far fallen short of providing the anticipated passage opportunities during some hydrologic year types. This was not considered in the analysis that resulted in the Flow Prescription. This finding coincides with the U. S. Army Corps of Engineers (USACE) confirmation that there was no federal action requiring section 7 of the Endangered Species Act, which resulted in revocation of the NMFS Biological Opinion (BO) in 2019 and the loss of incidental take coverage (ITC) for operation of Salinas Valley Water Project (SVWP) facilities. During the first 13 years of SVWP operations (2010-2022) no adult upstream passage days were recorded in any of the four dry-normal category years. The target for dry-normal year types is 16 passage days. According to the National Integrated Drought Information System, the entirety of Monterey County is currently affected by drought conditions, with over 25% (including the majority of the Salinas Valley) categorized as under “Extreme Drought” conditions. San Luis Obispo County is currently experiencing 70% of its area in the “Extreme Drought” category. Drought conditions are predicted to persist beyond the summer months.

Original Interim Operations Plan Proposal

In response to current conditions, Agency staff proposed an Interim Operations Plan (IOP) for Nacimiento and San Antonio Reservoirs at the February Reservoir Operations Advisory Committee (ROAC) meeting. The ROAC recommended that the Board of Directors (BOD) adopt the IOP which was designed to allow releases for the augmentation of a natural flow event to enhance steelhead migration opportunities in the absence of Flow Prescription triggers and address concerns of NMFS regarding migration flows during dry periods. The proposal was limited to a short time period since the Drought Operations Technical Advisory Committee (DTAC) was concurrently working on development of a release schedule proposal and a Dry Winter Scenario Narrative (DWSN) that expressed reservoir operational goals related to dry conditions.

At its March 21, 2022 meeting, the BOD voted against adoption of the IOP for 2022, recommending that staff prepare a follow-up plan for future dry or dry-normal winters.

Subsequently, in a March 25, 2022 letter, NMFS notified the Agency that ongoing take of S-CCC steelhead may be occurring at the Nacimiento and San Antonio dams, and downstream in the Salinas River, citing a lack of adequate progress on development of a Habitat Conservation Plan (HCP) and failure to adopt an IOP as previously recommended by NMFS in letter dated May 14, 2021. In its more recent letter, NMFS requested that the Agency complete certain tasks and proceed to implement an IOP for the 2022/2023 migration season and subsequent seasons until the HCP is in place. At its May meeting, the ROAC received a report summarizing these recent events and

outlining proposed plans for moving forward with development of a revised IOP this year. The ROAC also received an update on the DTACs DWSN which has been considered during the development of the revised IOP.

Revised Interim Operations Plan

Over the last few months, Agency staff has invited preliminary stakeholder input through regular meetings with NMFS and USFWS as well as through ROAC, on the development of a revised IOP. In general, there was support for piloting interim operations for various different benefits. Staff received stakeholder feedback related to upstream flow triggers and on Salinas River Lagoon status. Agency staff has considered the various comments and responded by removing the original upstream flow trigger related to the Salinas River near Paso Robles gage which had originally stated, "A minimum mean daily Upper Salinas River flow of 60 cfs is observed based on reports from the USGS gage site 11147500 SALINAS R A PASO ROBLES CA." Further historical streamflow analysis indicated that this upstream flow trigger would not appreciably inform the decision to commence interim operations.

The USFWS also seeks to limit impacts to federally listed species (western snowy plover and tidewater goby) that may arise from additional manual breaching of the sandbar at the Salinas River mouth, especially during periods when these species may be most vulnerable. This proposal relies on the lagoon already being open to the ocean to avoid those types of impacts. The Agency lacks a permit for incidental take of Federally listed species during manual sandbar breaching but is developing a habitat conservation plan to address this issue in collaboration with USFWS. In response to comments received, Agency staff added language to the Salinas River Lagoon trigger to clarify that activities would be in conformance with the current Salinas River Lagoon Sandbar Management Plan.

As was the case for the original IOP, the aim of the revised IOP will be to augment storm events that trigger a watershed-wide response to increase the likelihood of successfully providing multiple benefits valley-wide including steelhead passage opportunities while minimizing impacts to reservoir elevations. The proposal would allow Agency staff discretion to respond quickly to supplement naturally occurring streamflow events. Such actions would provide multiple benefits, including: providing steelhead passage opportunities in the absence of currently existing operational flow enhancement triggers, while adhering to all existing water rights, operational agreements and adopted release schedules; supporting the ongoing development of the Salinas River HCP through the gathering of pertinent supportive data and information; and providing enhanced recharge of Salinas Valley water supply aquifers through Salinas River percolation. A key difference is that the revised IOP is proposed to be in effect until an HCP is adopted. If an interim operation is triggered, it would provide Agency staff with valuable data collection opportunities to help inform studies regarding proposed reservoir re-operations that may ultimately be permitted through the HCP process currently underway. The draft revised IOP included in the August ROAC mailout and presented at the August ROAC meeting, is currently under review by USFWS and NMFS,.

CEQA Compliance

The IOP is the mechanism that the Agency would like to use to pilot different reservoir operations and study how the system is responding. This will allow staff to make adjustments to the timing and magnitude of reservoir releases to try and reach the goal of the plan and collect valuable data for future

modeling and analysis. California Environmental Quality Act ("CEQA") Guidelines Section 15306 categorically exempts projects that consist of basic data collection, research, experimental management, and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. (14 C.C.R. § 15506). Implementing the IOP falls under this exemption because, as detailed above, it is an interim project to research and collect data for preparation of the HCP, and is experimental management and resource evaluation for protection of the environment in response to continued drought conditions and the current operations not providing adequate migration opportunities for steelhead.

Strategic Plan Goals and Objectives
Agency effort on this process aligns with Monterey County Water Resources Agency Strategic Plan Goal B (planning and new projects); Strategy 7 (Use data and analysis to make informed decisions) and Goal E (Community Relations) Strategy 4 (Provide information on Agency Operations to stakeholders).

OTHER AGENCY INVOLVEMENT:
National Marine Fisheries Service and U.S. Fish and Wildlife Service

FINANCING:
Staff time associated with reservoir operations are included in the FY23 approved budget in Fund 116 - Dam Operations.

Prepared by: Shaunna Murray, Senior Water Resources Engineer
Approved by: Brent Buche, General Manager, (831) 755-4860

Attachments:
1. Revised Draft Interim Operations Plan

Interim Operations Plan for the Nacimiento and San Antonio Reservoirs

Monterey County Water Resources Agency

Adopted by the Board of Directors
TBD

Recommended by the Reservoir Operations Advisory Committee
Tentatively: August, 2022

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Introduction

The proposed Interim Operations Plan (IOP) described below would allow Monterey County Water Resources Agency (Agency) staff discretion to respond quickly to supplement naturally occurring streamflow events. Such actions would provide multiple benefits, including:

- Provide steelhead passage opportunities in the absence of currently existing operational flow enhancement triggers, while adhering to all existing water rights, operational agreements and adopted release schedules.
- Support the ongoing development of the Salinas River Habitat Conservation Plan (HCP) through the gathering of pertinent supportive data and information;
- Provide enhanced recharge of Salinas Valley water supply aquifers through Salinas River percolation.

As documented by a review of historical reservoir operations and ongoing correspondence with National Marine Fisheries Service (NMFS) staff, NMFS has determined that flow enhancement triggers first defined in the Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River (Flow Prescription) and in effect since 2010 have so far fallen short of providing the anticipated passage opportunities during some hydrologic year types which was not considered in the 2007 analysis. This coincided with the U.S. Army Corps of Engineers (USACE) confirming that there was no federal action requiring section 7 of the Endangered Species Act resulting in revocation of the NMFS Biological Opinion (BO) in 2019 and the loss of incidental take coverage (ITC) for operation of Salinas Valley Water Project (SVWP) facilities (See Appendix A).

This IOP is being offered as a supplement to the existing Flow Prescription while the Salinas River Habitat Conservation Plan (HCP) and reoperation protocols are being developed to address future operations. During this time the Agency will continue to follow the existing Flow Prescription in addition to the supplemental actions defined in this IOP. Operational triggers and goals identified in this IOP are intended to address specific conditions where the Agency's adherence to the Flow Prescription over the first 13 years of operation indicates that further exploration and refinements to operations are needed to achieve the intended goals of the Flow Prescription. As HCP development continues, this IOP may be updated to reflect the increasing understanding of species needs and the development of more effective operational strategies.

As written, this IOP adheres to the current Nacimiento Dam Operation Policy (Operation Policy) which was adopted by the Agency Board of Directors in February 2018. That document reflects reservoir operational policies incorporated since the SVWP began operating in 2010 and encompasses objectives of the Flow Prescription that were added to Agency water rights in 2008.

Current Efforts Related to Reservoir Operations

Flow Prescription and Recent Passage Opportunities

The Flow Prescription was incorporated into the Agency's water rights Licenses 7543 and 12624, and Permit 21089, for the Nacimiento and San Antonio Rivers. One of the Flow Prescription's central aims is to provide steelhead migration conditions to and from the lower Salinas River Basin, including the Arroyo Seco and lower Nacimiento Rivers, and the Monterey Bay, through the

mainstem of the Salinas River. Spawning and rearing habitat in the Arroyo Seco is recognized to be the highest quality and most accessible in the lower Salinas River Basin. When triggered under the Flow Prescription, releases of water from Nacimiento and San Antonio Reservoirs are made to facilitate fish passage to the Arroyo Seco, lower Nacimiento River and other potential spawning and rearing habitat in the upper Salinas River watershed.

The Flow Prescription states that an adaptive management approach is essential to ensuring that proposed actions achieve their desired effects given the complexity and variability of the hydrology and hydraulics of the Salinas River and its tributaries. The Agency has the ability to influence only a portion of this system. During the development of the original Flow Prescription, it was acknowledged that fully understanding the system would take considerable time. A typical steelhead life-cycle is on the order of 4 to 5 years, with a high degree of variability. Understanding how operational changes can benefit one species of fish without severe harm being caused to other species and beneficial water uses within the system will require extensive analysis spanning multiple hydrologically variegated periods. The Agency recognizes that the long-term solution to addressing operational impacts to steelhead and other listed species is the completion and adoption of an HCP. While HCP development proceeds and the Agency lacks ITC, interim action, as presented in the proposed IOP, provides an adaptive management approach to reservoir operations that will simultaneously provide data allowing Agency staff to study different operational approaches to address environmental factors and ultimately will inform the HCP process.

As of the date of this report, the most recent substantial steelhead passage opportunities occurred during the wet winter and spring of 2018/19. The winters of 2019/20, 2020/21, and 2021/22 provided no adult steelhead passage opportunities as defined by the Flow Prescription. All three of these winters included short duration natural flow events that resulted in sandbar management at the Salinas River Lagoon and provided connected flow from the Arroyo Seco to the ocean. None of these events met established thresholds to trigger supplemental releases under the Flow Prescription and therefore no supplemental reservoir releases were made during these events.

Need for an Interim Action

The ability to modify reservoir releases to capitalize on storm events in the absence of Flow Prescription triggers would provide critical information needed for possible re-operation scenarios that will then be used during the development of the HCP while beginning to address concerns regarding migration flows during dry periods. Limited migration opportunities for smolts to reach the ocean and anadromous adults to return to spawn have been linked to limited steelhead populations, possibly because a low rate of reproduction may not be sufficient to seed available rearing habitat (Dagit et al 2017). The IOP will also inform our understanding of how the river system behaves outside of the analysis period in the Flow Prescription.

The Flow Prescription sets target 10-year average numbers of adult steelhead upstream passage days (defined as 260 cfs at the Salinas River near Chualar gage when the Lagoon is open to the ocean), for each water year type. The target 10-year average for dry-normal year types is 16 passage days. During the first thirteen years of SVWP and Flow Prescription operations (2010-2022) no adult upstream passage days were recorded in any of the four dry-normal category years that occurred.

Most recently, in Water Year 2022, following a wet December 2021, drought conditions quickly re-emerged throughout the watershed. Limited adult steelhead passage opportunities had occurred during the past two water years and it became increasingly unlikely that any upstream migration passage days would occur in 2022, as extensive reaches of the Salinas and lower Arroyo Seco Rivers became dry and long-term forecasts indicated the likely persistence of drought conditions through the spring. To address concerns presented by NMFS, Agency staff developed an IOP proposal that would have authorized rapid operational action in February and March of 2022 to supplement a naturally occurring streamflow event to provide a window of steelhead passage opportunity in the absence of flow prescription triggers. On March 21, 2022, the Agency Board of Directors (BOD) declined to adopt a proposal that would expire in 10 days, citing a lack of opportunity within the abbreviated timeframe for stakeholder consideration and input and the unlikeliness of any action being necessary, based on the weather forecast. The BOD requested that staff keep working on the proposal and bring back a revised version for consideration before the next rainy season.

The Agency is working in cooperation with NMFS, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW) on a long-term solution to address operational impacts to steelhead and other listed species through the development and adoption of an HCP. For the years remaining until adoption of an HCP, authorization for Agency staff to act as defined in this IOP, in the absence of Flow Prescription triggers, affirms the Agency's good faith effort to address issues articulated by NMFS (Appendix B).

Agency staff is therefore recommending immediate adoption of the IOP detailed in this document to enable interim modification to reservoir release operations allowing the augmentation of natural flow events to enhance steelhead migration opportunities between January 1st and March 31st in the absence of Flow Prescription triggers.

Habitat Conservation Plan Development

The USACE permit for the construction of the Salinas Valley Water Project included a formal consultation with NMFS under Section 7 of the Endangered Species Act (ESA). As a result of that process, NMFS issued a BO for the project in 2007. The BO incorporated the Flow Prescription which was later incorporated into Agency water rights Licenses 7543 and 12624, and Permit 21089, for Nacimiento and San Antonio reservoirs. The Flow Prescription included operational guidelines to minimize impacts of SVWP operations on steelhead in the Salinas River and its tributaries. The Flow Prescription determines baseline spawning and rearing flows, and relies on certain hydrologic conditions to trigger supplemental reservoir releases to enhance migration opportunities for steelhead.

In 2016, USACE reinitiated consultation with NMFS on the BO. With construction activities complete and no federal nexus related to operation of the project, the Agency began investigating the development of an HCP as a means of acquiring required permits under the ESA. In 2018 the Agency began a phased approach to develop the Salinas River HCP. The first phase, creation of the Salinas River Long-term Management Plan (LTMP), was completed in 2019. Also in 2019, NMFS withdrew its 2007 BO and associated permits. Analysis of the Flow Prescription performance by NMFS and Agency staff indicates that although the Agency has followed the Flow Prescription correctly, the protocols have not met their intended goals under certain

circumstances. The issue has been compounded by two periods of extended drought and what appear to be changing baseline hydrologic conditions.

The Agency is currently working on phase 2 development of the HCP. At a minimum, the HCP will result in a new flow prescription for SVWP operations, and a lagoon sandbar management plan that addresses the needs of steelhead in the Salinas River and tributaries as well as the needs of steelhead, tidewater goby, and western snowy plover at the Salinas River Lagoon.

Studies are currently being conducted to assess species presence, habitat, migration barriers, and streamflow needs that will help inform the HCP and the discussion of SVWP reoperation protocols. Some of these studies require specific hydrologic conditions or must be conducted during certain times of year that coincide with the lifecycle of the species being studied. A thorough investigation of these issues and development of meaningful long-term reoperation protocols will take multiple years to complete.

Interim Operations Plan Proposal

This IOP is being offered as a supplement to the existing Flow Prescription and is designed to acquire information fundamental to development of the Salinas River HCP and reoperation protocols. Operational triggers and goals identified in this IOP are intended to address specific conditions where the Flow Prescription has not fully met its intended goals over the first 13 years of operation. As HCP development continues, this IOP should be updated to reflect our increasing understanding of species needs and the development of more effective operational strategies.

The interim reservoir release proposal will attempt to mimic the natural hydrograph of the Salinas River watershed during storm events that have the potential to produce connected flow throughout the system, but may not create adequate steelhead passage conditions without supplemental releases. Recharge of Salinas River flows to groundwater supply aquifers is amplified when conditions are dry in the Salinas Valley. Supplemental releases will provide the added benefit of enhanced groundwater recharge. A substantial portion of water released under IOP operations, up to 85%, will recharge aquifers of the Salinas Valley Groundwater Basin.

During the interim operational period the Agency will make reservoir releases, at the discretion of the General Manager, if staff determines there is a reasonable probability of successfully augmenting a natural streamflow event for steelhead passage between January 1st and March 31st when the interim operations triggers enumerated below are in place. During the interim operational period, all existing water rights and agreements will remain in effect and may override interim operations as determined by the General Manager. Any release schedule adopted by the Board of Directors will be focused on the Agency's Conservation Program and minimum flow requirements, and will not include Flow Prescription or IOP triggering events. Staff will continue to provide actual reservoir release and storage data updates to the Reservoir Operations Advisory Committee (ROAC) on a monthly basis.

Interim Operations Triggers:

Interim operations will be considered if all of the following triggers are met:

1. Fewer than sixteen Passage Days, as defined in the Flow Prescription, have occurred during the current water year.
2. Inflow to Nacimiento and San Antonio Reservoirs is observed via reports from the USGS gage sites: USGS 11149900 SAN ANTONIO R NR LOCKWOOD CA and 11148900 NACIMIENTO R BL SAPAQUE C NR BRYSON CA and exceeds minimum releases at each reservoir.
3. Continuous flow is established from the Arroyo Seco River to its confluence with the Salinas River at a rate of 173 cfs or greater (+/- 10%) as reported at USGS gage 11152050 ARROYO SECO BL RELIZ C NR SOLEDAD CA.
4. The Salinas River Lagoon is open to the ocean or facilitated lagoon breaching has been initiated in conformance with the current Salinas River Lagoon Sandbar Management Plan.

Interim Reservoir Operations:

Once all of the triggers are met and Agency staff has determined that interim reservoir operations will meet the goals of the IOP, the General Manager will authorize interim reservoir operations, as follows:

1. The Agency will implement reservoir releases such that the total release volume will not exceed the volume of the inflow event triggering the release action. Release rates and durations will be based on safe operations of the outlet works and comply with all Agency operational policies, at both reservoirs.
2. If after seven days of interim releases, flows in the Salinas River are not observed at the USGS gage site 11151700 SALINAS R A SOLEDAD CA, the interim releases will cease and Agency will resume normal operations.
3. If Salinas River flows connect to Arroyo Seco flows, interim releases will be maintained to achieve a maximum of 16 passage days per calendar year, as long as Arroyo Seco flows, as defined above, exceed 10 cfs.
4. To ensure minimal instream impacts, interim releases will be ramped down gradually, over multiple days if needed.
5. The current adult steelhead upstream passage threshold of 260 cfs (+/- 10%) at the Salinas River near Chualar will be targeted, but the Agency recognizes that this target may not be achievable under all conditions and that there remains potential for steelhead migration to occur below the threshold. Completion of fish passage studies scheduled for 2022 and 2023 may refine our understanding of migration conditions and result in updated IOP passage threshold targets.
6. Reservoir releases for this action will not occur below the minimum pool elevations of 687.8 ft at Nacimiento and 666.0 ft at San Antonio or cause elevations below the minimum pool elevations to occur during the IOP operations.
7. With the goal of achieving upstream passage opportunities between January 1st and March 31st, IOP release actions may be initiated prior to January 1st if all triggers are met and Agency staff has determined that such action will achieve IOP goals. Release actions may continue to conclusion after March 31st if triggers are met on or before that date.

Duration of Interim Operations Plan

Adoption of this IOP is intended to address Steelhead passage issues expressed by NMFS in its 2021 Memo and its subsequent March 2022 letter (Appendix B), and provide data and information

integral to HCP development, beginning in the upcoming winter of 2023 and until completion and adoption of an HCP provides for long term incidental take coverage related to Agency operations. Revocation of this adopted IOP prior to adoption of an HCP shall require action of the Water Resources Agency Board of Directors.

If adopted, Agency staff will report on IOP actions as part of monthly Reservoir Release Updates to the ROAC. A summary of IOP actions taken or considered each year will also be incorporated into Salinas Valley Water Project Annual Flow Reports during the IOP implementation period.

Appendix A

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

February 20, 2019 **In response refer to:** SWR-2003-2080

Rick M. Bottoms, Ph.D.
Regulatory Branch Chief
Department of the Army
San Francisco District, Corps of Engineers
450 Golden Gate Avenue, 4th Floor
San Francisco, California 94102-3406

Shauna Lorance
Interim General Manager
Monterey County Water Resources Agency
1441 Schilling Place, North Building
Salinas, California 93901

Re: Withdrawal of NOAA's National Marine Fisheries Service's 2007 Salinas Valley Water Project Biological Opinion

Dear Dr. Bottoms and Ms. Lorance:

This letter is to inform you that our June 21, 2007, biological opinion and associated incidental take statement issued to the U.S. Army Corps of Engineers (Corps) for Department of Army Clean Water Act section 404 Permit No. 24976S (Permit) for the Monterey County Water Resources Agency's (MCWRA) Salinas Valley Water Project (Project) in Monterey County, California is hereby withdrawn.

By email to NOAA's National Marine Fisheries Service (NMFS) on February 20, 2019, the Corps confirmed that there is no further Federal action or terms and conditions associated with the Corps' Permit requiring reinitiation of consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq*.). Also, we believe there is new information that reveals effects of the Project may affect threatened South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) or its designated critical habitat in a manner or to an extent that was not considered in our 2007 biological opinion. For these reasons, we hereby withdraw the biological opinion.

In order to obtain an exemption from the take prohibitions of section 9 of the Endangered Species Act, we encourage MCWRA to expedite their section 10(a)(1)(B) incidental take permit application process. Incidental take permits must be accompanied by a conservation plan, often referred to as a habitat conservation plan. NMFS and MCWRA have been working together to develop a framework of habitat conservation plan guidelines (e.g., "drought plan," modification of reservoir release triggers, modification of winter releases, etc.), and we look forward to continuing to assist MCWRA in the development of their conservation plan.

Please direct questions regarding this letter to William Stevens of the NMFS Santa Rosa Office at (707)575-6006 or William.Stevens@noaa.gov.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

cc: Katerina Galacatos, Corps, San Francisco, CA
Elizabeth Krafft, MCWRA, Salinas, CA
Copy to ARN File #151422SWR2003SR8711

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

March 25, 2022

Brent Buche
General Manager
Monterey County Water Resources Agency
1441 Schilling Place, North Building
Salinas, California 93901
bucheb@co.monterey.ca.us

Re: Potential Ongoing Take from Monterey County Water Resource Agency's Dams and Reservoir Operations

Dear Mr. Buche:

NOAA's National Marine Fisheries Service (NMFS) is the federal agency responsible for managing, conserving, and protecting living marine resources in inland, coastal, and offshore waters of the United States. We derive our mandates from numerous statutes, including the Federal Endangered Species Act (ESA). The purpose of the ESA is to conserve threatened and endangered species and their ecosystems. Threatened South-Central California Coast (S-CCC) steelhead[1] (*Oncorhynchus mykiss*) occur in the Nacimiento, San Antonio, and Salinas rivers, as well as the Salinas River lagoon. The mainstem Salinas River is a migration corridor for adult steelhead migrating upstream during the winter from the ocean to tributary spawning areas. Spawning and rearing habitats are located in tributary streams. Kelts (post-spawned adults), smolts, and rearing juveniles use the mainstem Salinas River in late winter and spring to migrate downstream to the ocean or lagoon.

We are issuing this letter to notify the Monterey County Water Resources Agency (MCWRA) that ongoing take[2] of S-CCC steelhead may be occurring at the Nacimiento and San Antonio dams, and downstream in the Salinas River, in San Luis Obispo and Monterey counties, California. MCWRA owns and operates the dams on the Nacimiento and San Antonio rivers for the combined goals of flood protection, water conservation, Salinas Valley Water Project (SVWP) operation, and recreation. MCWRA operates the reservoirs pursuant to the Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River (hereafter referred to as the "Flow Prescription") (MCWRA 2005).

The Flow Prescription has provided limited benefits to steelhead in part due to the number of dry and dry-normal water years since 2010, and because the vast majority of natural runoff into the

[1] S-CCC steelhead Distinct Population Segment was listed as threatened in 2006 (71 FR 834), and critical habitat for S-CCC steelhead was designated on September 2, 2005 (70 FR 52488).
[2] The ESA defines "take" to mean "…harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 USC § 1532(19). The term "harm" has been defined by NMFS to mean the following: "… an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering." 50 CFR 222.102

reservoirs is stored by MCWRA for spring and summer releases for agriculture instead of being released in the winter or bypassed at natural flow rates. The negative impacts to steelhead and steelhead habitat in the Nacimiento, San Antonio, and Salinas rivers from MCWRA's operation of Nacimiento and San Antonio dams are well established, and can be summarized as follows:

- Diminishes the value of physiological or biological features (e.g., migration, rearing, spawning, and estuarine areas) needed for steelhead life history through the alteration of natural stream flow dynamics; and
- Impedes access to 157 miles of high intrinsic potential over-summering rearing/refugia habitat in the Salinas River watershed upstream of the impassable dams.

In 2019, MCWRA initiated discussions with NMFS and U.S. Fish and Wildlife Service (FWS) about pursuing a section 10(a)(1)(B) incidental take permit to obtain ESA take coverage for the operation of the dams and reservoirs. NMFS is concerned that in the three years since MCWRA initiated habitat conservation plan (HCP) discussions, little progress has been made towards developing the HCP's steelhead conservation strategy or NMFS' recommended operations plan that would have lessened the impacts on S-CCC steelhead in the interim.

We offer the following recommendations on how to efficiently develop an interim operation plan that could reduce the potential for take of steelhead as a result of MCWRA's operations:

- Work cooperatively and transparently with NMFS and FWS to develop an interim operations plan by winter 2022/2023, which entails providing data and analyses to NMFS in a timely manner and meeting on a regular basis;
- Ensure sufficient funding is available to analyze, model, and evaluate interim operations proposals, as well as monitor and report the effectiveness of the interim operations;
- Refer to our May 14, 2021 memo, "Interim Streamflow Operations and Fish Passage Actions in the Salinas River Watershed" (enclosed) for guidance on establishing an interim flow operation plan;
- Finalize a draft interim operations plan for NMFS' review by October 15, 2022 so that it could be implemented during the 2022/2023 migration season and subsequent migration seasons pending issuance of an incidental take permit; and
- MCWRA and/or the Board of Directors streamline and/or delegate decision-making that will enable MCWRA staff to adaptively manage reservoir operations per the interim operation plan in coordination with NMFS and FWS, as needed.

Regarding fish passage at the dams, we urge the HCP development team (MCWRA and ICF) to initiate a fish passage feasibility study as soon as possible. We look forward to providing technical assistance on this study.

Please note that until a section 10(a)(1)(B) incidental take permit is issued by NMFS, any take of S-CCC steelhead resulting from MCWRA's dam/reservoir operations is unauthorized and, therefore, in violation of the ESA.

Please direct any questions regarding this matter to Mandy Ingham, Central Coast Branch Chief, at (707) 575-6083 or Mandy.Ingham@noaa.gov. We request the courtesy of your response by May 15, 2022, regarding your plans for interim flow operations. Thank you for your cooperation in this matter.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Paul Ortiz, NOAA Office of General Counsel, Enforcement Section, paul.ortiz@noaa.gov
Leilani Takano, Assistant Field Supervisor, FWS, Ventura, lelani_takano@fws.gov
John Baillie, Chair, MCWRA Board of Directors, c/o HenaultAG@co.monterey.ca.us
Mary Adams, Chair, Monterey County Board of Supervisors, Monterey, district5@co.monterey.ca.us
Julie Vance, Regional Manager, California Department of Fish and Wildlife, Fresno, julie.vance@wildlife.ca.gov
Copy to NMFS E-Folder FRN 151422WCR2019SR00271

REFERENCES

Monterey County Water Resources Agency. 2005. Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River. Prepared by: Monterey County Water Resources Agency and Hagar Environmental Science, with technical support from: RMC Water & Environment, Inc., WEIME, Inc., and ENTRIX, Inc. October 11, 2005. 140 pages.

National Marine Fisheries Service. 2013. South-Central California Steelhead Recovery Plan. NOAA Fisheries. West Coast Region, California Coastal Office, Long Beach, California.

Interim Streamflow Operations and Fish Passage Actions in the Salinas River Watershed

Prepared for: Salinas River HCP Coordination Team
Prepared by: Bill Stevens, National Marine Fisheries Service
Date: May 14, 2021

As discussed during the February 17, 2021, Salinas River Habitat Conservation Plan (HCP) Monthly Coordination Call, NOAA's National Marine Fisheries Service (NMFS) is interested in providing technical assistance to Monterey County Water Resources Agency (MCWRA) in the development of a water operation regime that MCWRA can implement during development of the HCP and potentially incorporate into the HCP's conservation strategy. This would primarily entail MCWRA providing interim streamflows that facilitate migration of both juvenile and adult South-Central California Coast (S-CCC) Distinct Population Segment (DPS) steelhead during all water-year types while developing the HCP. We believe such a collaborative approach is consistent with the intent of MCWRA's *Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River (*dated October 11, 2005 with a November 8, 2005 errata), which stated, "This Flow Prescription is considered a stand-alone document, which may be modified upon mutual agreement of the (MCWRA) and NMFS outside formal (Endangered Species Act) Consultation."

Below we outline key principles to consider when developing an interim streamflow regime. We have also attached a memo (Attachment) that informs and supports the recovery strategy for the Salinas River (as outlined in NMFS' S-CCC Steelhead Recovery Plan) and provides a better understanding of the Salinas River and its role in the recovery of the S-CCC DPS.

First, MCWRA should develop interim (and long-term) flow prescriptions based on a scientifically sound environmental flow regime. Environmental flows consist of instream flow criteria that balance human and ecological needs for water. We suggest you evaluate the appropriateness of the California Environmental Flows Framework (ceff.ucdavis.edu), or a similar approach, for the Salinas River watershed. A good starting point may be to evaluate unimpaired streamflow patterns (e.g., see eflows.ucdavis.edu) to understand the ecological baseline condition in which S-CCC steelhead evolved. This would help frame developing desired future conditions that work towards the survival and recovery of S-CCC steelhead.

Second, the flow prescription should manage for conditions that accommodate the various life-history forms and migratory patterns of native steelhead within the Salinas River watershed. Specifically, we recommend, in collaboration with NMFS, MCWRA establish a flow prescription that provides the hydrologic and hydraulic conditions that supports steelhead migratory behavior and ecology. This would entail establishing a flow prescription that mimics the natural hydrograph from November through May, when steelhead migrations occur. It would also encompass wet periods in November that prime the Salinas River channel so that when winter flows increase, these releases reach the lagoon more efficiently. Mimicking the natural hydrograph would require releasing more water during the fall-winter and less during spring-

summer, likely alleviating many of the current flow prescription's impacts on redds and/or juveniles (e.g. redd scour and juvenile displacement).

In addition to the flow-related actions described above, we recommend MCWRA begin investigating ways to facilitate the out-migration of juvenile steelhead (exhibiting smolting characteristics) trapped above the impassible Nacimiento and San Antonio dams. This would be an immediate step towards providing partial fish passage around the dams while MCWRA investigates upstream fish passage strategies. Providing downstream passage of juvenile steelhead (of which there are currently many more than adults) will likely meaningfully increase adult steelhead escapement in the watershed and in turn increase the momentum behind developing adult fish passage solutions at Nacimiento and San Antonio dams. MCWRA will need to initiate technical studies, such as steelhead habitat assessments and genetics analyses, soon to inform juvenile steelhead passage strategies. One possible funding source that MCWRA could explore for these technical studies is through ESA Section 6 grant monies. NMFS is available to help provide technical support in the design of the technical studies.

Attachment

February 24, 2021

To: William L. Stevens, NMFS West-Coast Region, California Coastal Office, Santa Rosa, CA

From Mark H. Capelli, NMFS South-Central/Southern California Steelhead Recovery Coordinator, California Coastal Office, Santa Barbara, CA

Re: Role of Salinas River in Meeting NMFS' South-Central California Coast Steelhead Viability/Recovery Criteria.

This is an updated response to the questions regarding the role of the tributaries to the Salinas River in meeting the viability/recovery criteria in the Salinas River watershed, and by extension the viability/recovery South-Central California Coast Steelhead Distinct Population Segment (DPS). The basic analysis conclusion remains the same but is supplemented by recently published research on the ecology and genetics of southern steelhead populations.

In summary, the tributaries to the Salinas River (including the Nacimiento and San Antonio) are essential to meeting the viability/recovery criteria (both the DPS-Wide and Population-Level viability criteria) set forth in NMFS' South Central Southern California Steelhead Recovery Plan (2013). Management of the surface and groundwater resources associated with these tributaries, as well as the mainstem Salinas River is critical to the recovery of this Core 1 population within the Interior Coast Range Biogeographic Population Group (BPG) of the threatened South-Central California Coast Steelhead DPS.

This role of the Salinas River tributaries in the recovery of the steelhead populations of the Salinas River raises a number of related issues and warrants a fuller response, which is provided below.

Introduction

NMFS' Technical Recovery Team (TRT) for the South-Central/Southern California Steelhead Recovery Planning Domain published a series of Technical Memoranda that provides the scientific framework for the recovery of the two listed species in this domain: the threatened South-Central California Coast DPS and the endangered Southern California Steelhead DPS. These Technical Memoranda provide information on:

- the historic distribution of native steelhead and the contraction of the southern range limit;
- a characterization of the ecology of southern steelhead populations;
- an assessment of the intrinsic habitat potential of individual watersheds;

- a suite of viability criteria (for the individual population and the DPS as a whole);

- a general strategy to achieve recovery; and

- a set of research questions to advance understanding of the species and further direct recovery activities.

See Boughton 2010a, 2010b, Boughton *et al.* 2007, 2006a, 2006b, and 2005.

Some of the TRT findings are directly pertinent to your question. These include:

- above artificial barrier *O. mykiss* populations are most closely related to below barrier populations;

- above artificial barrier populations (in a majority of the watersheds) are not descendent from planted hatchery rainbow trout;

- *O. mykiss* populations above artificial barriers have the potential to resume an anadromous life-history; and

- populations of *O. mykiss* above artificial barriers are an integral and important component of the anadromous populations.

See Boughton *et al.* 2006a, Girman and Garza 2006, Garza *et al.* 2004.

These findings have been further substantiated in more recent research: Arostegui *et al.* 2019, Adadia-Cardoza *et al.* 2016, Pearse 2016, Garza *et al.* 2014, Pearse *et al.* 2014, Clemento *et al.* 2009; see also Pearse 2016.

Pearse (2019) and others have further illuminated the genomic mechanisms by which both basic life-history forms of *O. mykiss* (anadromous and non-anadromous) mutually support the persistence of both forms. Pearse *et al.* (2019) and Kelson *et al.* (2019) looked at associations with migration behavior; and Leitwein *et al.* (2017) and Apgar *et al* (2017) examined environmental predictors for a high frequency of the "A" haplotype that is associated with the anadromous form of *O. mykiss*. These recent studies underscore the importance of the non-anadromous form of *O. mykiss* (including those currently land-locked above impassible barriers) and the importance of reestablishing connectivity between the various reaches of the watershed Salinas River watershed (including those reaches above the various dams within the watershed).

Some of their more pertinent findings are summarized below:

- Many of the genes in the inverted section of chromosome 5 of *O. mykiss* (Omy5) are associated with circadian rhythms, sensitivity to photosensory cues, the timing of age at maturity, and other traits associated with life-history variation. Genetic recombination

among these different genes of the tightly linked Omy5 segment of the chromosome can occur during the generation of homozygous "RR" fish and "AA" fish, but not during the generation of heterozygous "AR" fish due to the inversion which prevents cross-over during meiosis. This feature allows the "A" and "R" haplotypes to adaptively diverge in response to selection for two distinct life-histories, while still being maintained together in the same population of *O. mykiss* within a watershed (Pearse 2016).

- The two Omy5 haplotypes appear to be associated with different expression of life-history forms (anadromous and resident). Pearse *et al.* (2019) found that in a small steelhead population, juvenile females with the homozygous "AA" and heterozygous "AR" genotypes were much more likely to migrate to the ocean than females with the homozygous "RR" genotype. Juvenile males with the homozygous "AA" and "RR" genotypes were similar to the females, but the male heterozygous "AR" genotype was much less likely to migrate than the female heterozygous "AR" genotype. This is consistent with adaptive evolution of contrasting life-history strategies in males and females: female fitness is more associated with large body size than is male fitness, because of the energetic demands of manufacturing eggs versus sperm. Thus, females should be more likely than males to pursue anadromy because *O. mykiss* can generally achieve larger size at maturity in the ocean than in freshwater, and this provides more of a fitness benefit to females than to males. Kelson *et al.* (2019) made similar observations, finding that the expression of the downstream-migrant phenotype was associated both with being female and with having the "A" haplotype. In their smaller sample, they did not detect a difference in the migration rate of heterozygous "AR" females versus "AR" males, but they did find that in general the migration frequency of the "heterozygous AR" genotype was intermediate between the "RR" and "AA" genotypes.

- This intermediate life-history expression of the heterozygous "AR" genotype provides a mechanism by which the steelhead life-history can disappear from an *O. mykiss* population when environmental conditions are adverse but rapidly reappear when conditions favor it. When conditions are adverse, the "A" haplotype may become rare enough that homozygous "AA" individuals are very unlikely and the haplotype is maintained by resident fish carrying the heterozygous "AR" genotype. Notably, some of the progeny of such fish are "AR" rainbow trout that perpetuate the "A" haplotype in the resident population, whereas other progeny would be heterozygous "AR" smolts that migrate to the ocean. These heterozygous "AR" smolts would likely be lost to mortality when conditions for anadromy are adverse (e.g., presence of anthropogenic barriers to fish passage, prolonged drought, debris flows degrading freshwater habitat, etc.), but could rapidly reconstitute steelhead runs when conditions for anadromy are favorable.

- When favorable conditions persist, adult steelhead would become common enough to start producing "A" individuals, and genetic recombination of the anadromous genome would resume and facilitate continuing adaptive evolution of the anadromous phenotype to changing conditions. A resident-only population may not sustain the A haplotype indefinitely because the "wasted" smolts produced by heterozygous "AR" parents represent a fitness cost, but the loss appears to be a slow process (Apgar *et al.* 2017). Significantly, a similar, reciprocal logic applies to the resident life-history, for example

providing a mechanism by which heterozygous "AR steelhead could colonize vacant freshwater habitat that eventually transforms to a population of rainbow trout when conditions for anadromy are adverse; hence the emphasis placed on maintaining or restoring volitional access to coastal watersheds. Even when the "A" haplotype is rare in a population, so that homozygous "AA" individuals are unlikely to occur, anadromy is still subject to natural selection due to its partial expression in heterozygous "AR" individuals; and likewise for freshwater-residency and the "R" haplotype.

NMFS South-Central California Coast Steelhead Recovery Plan (2013) recognizes the interdependence of anadromous and non-anadromous life-history forms of native *O. mykiss*. As a result, the Recovery Plan concluded, "Recovery of the threatened SCCCS DPS will require a minimum number of viable populations within each of four Biogeographic Populations Groups (BPGs) within the SCCCS Recovery Planning Area. Recovery of these individual populations is necessary to conserve the natural diversity (genetic, phenotypic, and behavioral) spatial distribution, and abundance of the SCCCS DPS." (p. xiii) NMFS' Technical Review Team (Boughton *et al.* 2007) also identified "a need to maintain not just the fluvial-anadromous life-history form, but also lagoon-anadromous and freshwater-resident forms in each population" and noted, "Depending on the rate of transition, a group of resident and anadromous fish may function as a single population; two completely distinct populations; or something in between." (p. 8). Consequently, the resident form of *O. mykiss* is included in the viability criteria developed by the TRT and incorporated into NMFS South-Central California Coast Steelhead Recovery Plan. (p. 6-4).

Because of the close association of the two life-history forms (anadromous and nonanadromous), and the complex of factors controlling the expression of anadromous and resident life-histories, all native *O. mykiss* in anadromous waters (*i.e.*, waters within the geographic boundary of the listed DPS and that are accessible to fish migrating from the ocean) are generally considered anadromous and afforded the protections of the ESA.

New research has also documented dispersal of anadromous *O. mykiss* from their natal watershed to non-natal watersheds (Donohoe, *et al.* 2021) which have implications for steelhead recovery and management within the South-Central/Southern California Steelhead Recovery Planning Domain. A study of small coastal stream in the central portion of the SCCCS DPS (Big Creek) revealed that of seven fish opportunistically sampled, all seven had dispersed from their natural watersheds. Three adults had originated from nearby streams (<72 km) on the Big Sur coast, while three had originated from more distant rivers, including the Klamath River (680 km to the north). Significantly, of the seven dispersed individuals, one was the progeny of a nonanadromous female. The rate of dispersal from natal watersheds to non-natal watersheds could not be estimated based on the small sample size, but the study did demonstrate that steelhead can disperse considerable distances and nonanadromous females can produce anadromous progeny that can disperse (thus providing genetic connectivity among widely dispersed watersheds). This phenomenon could be an important mechanism for naturally re-colonizing habitats that have been de-populated as a result of either (or both) anthropomorphic modifications (*e.g.*, construction of artificial barriers such as dams or road crossings) or natural environmental perturbations (*e.g.*, debris flows, droughts, or catastrophic floods).

NMFS' TRT specifically examined the role of artificial impassible barriers in the extirpation of populations of anadromous *O. mykiss* and the contraction of the southern range limit of the anadromous form. One of the major conclusions of this study was that the majority (68%) of the documented extirpations of the anadromous form of *O. mykiss* were associated with artificial barriers (*e.g.*, dams, culverts, flood-control channels). As a corollary, the probability of occurrence of anadromous *O. mykiss* in a watershed was correlated with the size of the watershed and the amount of accessible spawning and rearing/refugia habitat. Put simply, artificial barriers that affectively impede the migration of anadromous *O. mykiss,* or reduce the amount of spawning and rearing habitat available to the species, increases the likelihood of extirpation of a population. Conversely, restoring access (and therefore the amount of habitat available) increases the viability of the population.

See Boughton *et al.* 2005.

Aside from reducing the amount of spawning and rearing habitat available to steelhead, barriers, such as dams without effective fish passage provisions, have the effect of restricting anadromous *O. mykiss* to below-barrier, lower elevation habitats that are often both hydrologically and thermally less reliable than above-barrier habitats; these adverse conditions are often exacerbated by the artificial flow regimes associated with dams such as San Antonio and Nacimiento dams.

Above-barrier habitats in headwater, tributaries are often spring-fed, which provides suitable year-round rearing habitat (including important refugia habitat during periods of drought).[1] Additionally, above barrier habitats are often characterized boulder pools, with well-developed riparian habitat. These features provides both an important sources of invertebrate food for rearing juvenile *O. mykiss* as well as help to maintain suitable water temperatures, particularly during hot summer months.

Conversely, below-barrier habitats, particularly mainstem habitats are impacted by variety of anthropogenic activities; these include, diversions, floodplain encroachment for agricultural and various urban developments, and related flood control structures and activities that adversely affect the suitability of spawning and rearing habitats. While some studies have shown that below-barrier habitats (including mainstems) can provide high-growth rate opportunities, which lead to larger juvenile size at ocean entry (and thus greater ocean survival), this growth pattern is often associated with the ability of rearing individuals to access the estuary during periods of descending flows. Under unimpaired conditions, many of those juveniles rearing in the mainstem had moved downstream from upstream tributary habitats; but this instream movement is inhibited, or in many completely blocked, as a result of the construction of dams (and diversions) without the inclusion of effective fish passage provisions (including associated flows).

See for example, Quinones, *et al.* 2014, Boughton, *et al.* 2009, Olden and Naiman, 2009, Boughton *et al.* 2007, 2005, Nilsson and Berggren 2000.

[1] The TRT specifically identified the important role of refugia habitat in headwater tributaries, and recommended that the recovery strategy "identify and maintain sustainable refugia against severe droughts and heat waves". Boughton *et al.* 2007, p. 24.

Given the different advantages of above- and below-barrier habitats, both are necessary to support a viable anadromous population. Where the up and downstream migration of adults and juveniles have been interrupted by impassible barriers, these habitats need to be reconnected. This can be accomplished through either the removal or modification of the barrier, to allow up and downstream migration of both juvenile and adult *O. mykiss*, and the provision of an appropriate flow regime that will promote and facilitate volitional migratory behavior.[2] Where spawning and rearing occurs below the dam (or diversion), a flow release regime must also support these essential fish behaviors.[3]

Consistent with NMFS's TRT recommendations, NMFS' South-Central California Coast Steelhead Recovery Plan identifies recovery actions that address the issue of reconnecting steelhead habitats that have been blocked by fish passage barriers. The DPS-Wide Recovery Actions include the following:

> "Physically modify passage barriers (including dams and diversion facilities identified in Table 7-2 and the BPG [Biogeographic Population Group] recovery action tables) to allow natural rates of migration to upstream spawning and rearing habitats."

See NMFS 2013, p. 8-2, 8.1 "DPS-Wide Recovery Actions".

NMFS' South-Central California Coast Steelhead Recovery Plan also includes watershed-specific recovery actions dealing with barrier removal or modification and related fish passage flows (these are dealt with in more detail in a separate section below on the Salinas River). Additionally, NMFS' Recovery Plan sets forth viability criteria for the DPS, which includes DPS-Wide and Population-Level viability criteria. These criteria describe the characteristics of both the DPS and individual populations that, if met, would indicate that the DPS is viable, and therefore at a low risk of extinction, rendering the DPS eligible for delisting.

The DPS-Wide viability criteria identify a suite of watersheds (steelhead populations) distributed across the landscape in four geographically distinct BPGs, with a minimum number of watersheds[4] in each BPG, and that are intended to address two important elements of the DPS-Wide viability criteria: "Biographic Diversity" and "Life-History Diversity". The Population-Level viability criteria include a number of separate metrics that address various aspects of individual populations ("Mean Annual Run Size", "Ocean Conditions", "Spawner Density", and "Anadromous Faction").

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[2] To address this issue, NMFS' TRT recommended that the recovery strategy secure the extant parts of the inland populations, including the Salinas River in the Interior Coast Range Biogeographic Population Group. The TRT also noted, "The original inland populations were relatively few in number, large in spatial extent, and inhabited challenging environments." Boughton *et al.* 2007, p. 24

[3] The mainstem of the Salinas River is characterized by long alluvial stretches. NMFS' TRT noted that the mainstem of the Salinas River currently does not provide suitable spawning or rearing habitat for steelhead; however, the mainstem prior to Spanish settlement may have been quite different ecologically, and these conditions would have been more conducive to steelhead spawning and rearing. See Boughton, *et al.* 2006, pp. 12, 24, 29, and 98-99.

[4] While the TRT did not have sufficient information to assert that these individual populations were functionally independent (*i.e.*, individually viable in an unimpaired stated), it believed that these populations were distinct enough to be considered as separate populations for the purposes of developing the DPS-Wide and Population-Level viability criteria

See NMFS's South-Central California Steelhead Recovery Plan, Chapter 6, Steelhead Recovery Goals, Objectives & Criteria, and Appendix C. Composition of South-Central California Coast Steelhead Recovery Planning Area BPGs.

These are discussed in more detail as they relate to the Salinas River watershed in the separate section below.

Salinas River

The Salinas River is situated within the Interior Coast Range BPG (along with the Pajaro River)[5] and is classified as a Core 1 population within the South-Central California Coast Steelhead Recovery Plan. Core 1 populations are populations identified as having the highest priority for recovery planning based on the following factors:

- intrinsic potential of the population to support a viable population in an unimpaired condition (based on the amount of spawning and rearing habitat);
- the role of the population in meeting the DPS-Wide population viability criteria (minimum number of population per BPG, including spatial distribution, "Biogeographic Diversity", and "Life-History Diversity");
- severity of the threats facing the populations (or current condition of the population;
- potential ecological or genetic diversity of the watershed that contributes to the species overall diversity; and
- capacity of the watershed and population to respond to critical recovery actions needed to address identified threats.

Core 1 populations form the foundation of the recovery implementation strategy and must meet the Population-Level viability criteria identified in NMFS' South-Central California Coast Steelhead Recovery Plan.

See NMFS 2013, Chapter 6, "Steelhead Recovery Goals, Objectives & Criteria" and discussion below for details.

To meet these Population-Level viability criteria NMFS' TRT specifically identified "securing extant inland populations in the Interior Coast Range BPG (Pajaro and Salinas Rivers) and the Carmel Basin BPG (Carmel River)" as a critical component of the recovery strategy for the South-Central California Coast Steelhead DPS.[6] NMFS' TRT further noted, "The populations of the

[5] See map of Biogeographic Population Groups in the South-Central California Coast Steelhead Recovery Planning Area in NMFS 2013, p. 2-10.

[6] NMF's TRT also recognized the importance of other inland populations within the South-Central/Southern California Steelhead Recovery Planning Domain: "The extant habitat of these populations— especially the anadromous waters of the Pajaro River, Arroyo Seco, the southern Salinas Valley, the Sisquoc River, the Santa Ynez River, the Ventura River and the Santa Clara River—merit high priority for immediate protection and recovery so

Interior Coast Range are particularly important because they appear to have produced the largest run sizes in the SCCCS DPS during years of high rainfall and runoff (Boughton *et al*, 2006, Good *et al*. 2005)."

The Salinas River watershed is unique in several respects that are relevant to the question you have posed.

First, it is the largest watershed within the South-Central California Coast Steelhead Recovery Planning Area (and within the South-Central/Southern California Coast Recovery Planning Domain). Its watershed encompasses approximately 4,391 square miles and extends over almost two degrees of latitude; it is also distinctive in that it runs south to north. The major tributaries of the Salinas (*e.g.*, Arroyo Seco, Nacimiento, and San Antonio) are themselves considerably larger than the other individual watersheds within the South-Central California Coast Steelhead Recovery Planning Area.

See Figure 1, map of "Salinas River Major Subbasins".

Second, because of its geographic location and physical features, the Salinas River watershed exhibits the most diverse range of habitat types of all the watersheds within the South-Central/Southern California Coast Recovery Planning Domain: coastal dunes, estuarine marsh, oak woodland, coniferous forest, chaparral, grassland savannah, desert-like scrub, and riparian woodland. This diversity is reflected in the diversity of the native *O. mykiss* populations that occupy and utilize the Salinas River watershed (including anadromous, non-anadromous, and lagoon anadromous forms of *O. mykiss*).

Third, the Salinas River is also unique in that is the only watershed within the South-Central California Coast Steelhead Recovery Planning Area (and within the South-Central/Southern California Steelhead Recovery Planning Domain) for which the TRT has identified multiple populations of anadromous *O. mykiss* in a single watershed.

Multiple Recovery Populations of the Salinas River Watershed

For recovery planning NMFS' TRT for the South-Central/Southern California Coast Steelhead Recovery Planning Domain adopted the one-basin = one population rule. The only exception to this one-watershed/one population rule is the Salinas River watershed[7]. In this watershed, the TRT posited three separate recovery populations. The reason and significance for this characterization of the population structure of the Salinas River is described below.

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that fish passage does not decline further (and should be improved whenever possible, though this is a longer-term effort)." Boughton *et al.* 2007, p. 24.

[7] The TRT identified several other potential situations that could deviate from this rule, but did not have adequate information to propose an alternative population structure: 1) sets of small neighboring basins, such as in Big Sur, the southern Santa Barbara coast, and the Santa Monica Mountains; and 2) neighboring basins with unreliable flow, such as those in the "South of Los Angeles" section of the study area. In these situations, rather than a single watershed supporting multiple discrete populations, individual populations may function as a metapopulations, utilizing multiple watersheds.

As noted, the Salinas River watershed is unusually large, with several significant tributaries (including the Arroyo Seco, Nacimiento, and San Antonio rivers) that join the mainstem of the Salinas River from the west, which are characterized by perennial flow within some reaches, particularly upper reaches and sub-tributaries. These western tributaries are distinctively different from those tributaries that enter the Salinas River from the east (*e.g.*, Estrella River, San Juan Creek) which are more like desert washes. The exception to the eastern tributaries is Gabilan Creek that enters the Salinas System on the extreme northern end of the system. For an overview of the Salinas River watershed See Casagrande, *et al.* 2003; also Hager 2001, Franklin 1999.

Because of the size of the Salinas River watershed, NMFS' TRT examined the possibility that the watershed supported more than one population of anadromous *O. mykiss*. The TRT found that the Salinas River watershed contained five distinct steelhead habitat areas – Gabilan Creek, Arroyo Seco, San Antonio River, Nacimiento River, and the Upper Salinas River system (which includes a number of tributaries, including the Santa Margarita River).

Within these five distinct steelhead habitat areas, the TRT identified three distinguishable populations of anadromous *O. mykiss* within the Salinas River watershed:

1) Gabilan Creek

2) Arroyo Seco

3) Nacimiento River *et al.* (which includes Santa Antonio River and the upper Salinas tributaries)

See Figure 3, map of "Salinas Recovery Populations".

This three-population structure is based on a) the large size of the Salinas River watershed, b) the distance between the point of entry of anadromous *O. mykiss* into the estuary and the distances between the confluences of the various tributaries with the mainstem of the Salinas River, c) the ephemeral migratory flows within the mainstem, and d) the presumed migratory behavior of the steelhead within the watershed. While the direct evidence from documented fish movement is not sufficient to make a definitive determination regarding total number of distinguishable populations of in the Salinas River watershed, the preponderance of evidence indicates that the Salinas River is capable of supporting at least three discrete populations of anadromous *O. mykiss* within the five distinct steelhead habitat areas.

See Figure 1, map of "Salinas River Major Subbasins" for stream miles and Figure 2, map of "Salinas River Intrinsic Potential Steelhead Spawning and Rearing Habitat" for stream/river miles between confluences.

Gabilan Creek is considered a distinct population because of its unique connection with the ocean via the Temaldero Slough and the Old Salinas River channel with is connected to the Salinas River Estuary via the Elkhorn Slough. The principal steelhead spawning and rearing habitat is in the upper reaches of Gabilan and has the shortest access route to the Pacific Ocean.

Arroyo Seco is considered a distinct population for several reasons. First, it is separated from the three other upstream steelhead habitat areas by an extended reach of the Salinas River mainstem

as a result of naturally ephemeral flow (further exacerbated by dams, diversions, and extensive groundwater pumping). This situation presents significant challenges to juvenile steelhead movement, acting as a mechanism isolating this population from others within the Salinas River watershed. Second, under natural hydrologic conditions *(i.e.*, unimpaired by groundwater extractions, surface water diversions, or dams), there is no evidence that natural low flows would have prevented returning adult steelhead from accessing Arroyo Seco (and thus *forcing* them to spawn in the other steelhead habitat areas of the Salinas River watershed). Third, from a recovery perspective, the adverse consequences of treating Arroyo Seco as indistinct and therefore lumping in it with the other steelhead habitat areas, are greater than splitting or distinguishing it from the other identified populations. (See additional comments below regarding lumping and splitting populations.)

Nacimiento, San Antonio, and Upper Salinas River together comprise a single, distinct population. The combination of the long distance between the point of entry of anadromous *O. mykiss* into the estuary and the confluences of the San Antonio, Nacimiento, and upper Salinas rivers (in conjunction with the ephemeral nature of migration flows, even under unimpaired conditions), frequently prevents adult steelhead from returning to these upper tributaries. As a result, anadromous *O. mykiss* entering the Salinas River are *forced* to spawn in one of the other four steelhead areas supporting the other two distinct recovery populations of the Salinas System (Gabilan Creek or Arroyo Seco), thus segregating the Nacimiento, *et al.* population from the other two recovery populations. Under natural flow conditions, the Nacimiento River exhibits the more reliable migration flows, and so fish natal to the San Antonio River (or Upper Salinas River) that would be forced by low flows in these waters to spawn in the Nacimiento River. NMFS' TRT noted that the Nacimiento and San Antonio rivers both have a high potential as steelhead spawning and rearing habitats, and that these habitats are concentrated in the upper reaches in each watershed above the Nacimiento Dam and San Antonio Dam, respectively.

Contributing to the habitat suitability of the upper reaches of both the Nacimiento and San Antonio rivers is the higher average annual rainfall in these two sub-watersheds. The Salinas River watershed has an overall average annual rainfall of 16.6 inches. By comparison, the Nacimiento River watershed has an average annual rainfall of 26.9 inches, and the San Antonio River watershed an average annual rainfall of 20.2 inches (a 38% and 18% higher average annual rainfall total than the Salinas River watershed, respectively).

See attached Figure 1, map of "Salinas River Major Subbasins" for average annual rainfall totals for the various subbasins of the Salinas River watershed.

In analyzing the population structure of the Salinas River watershed, NMFS' TRT discussed the relative risks, from a recovery perspective, of mistakenly lumping or splitting multiple populations in the Salinas River watershed. The TRT found that the more risky strategy would be to erroneously lump recovery populations. Applying the Population-Level viability criteria to a lumped pair, for example, would not necessarily be sufficient to protect either of the pair (*i.e.*, if neither of the lumped pair of populations met the Population-Viability-Level criteria). Conversely, the opposite strategy - of identifying (splitting) two populations when in reality there is only one functional population - only creates a margin of safety if both populations are recovered to the point that the they individually meet the Population-Level viability criteria. This approach is

consistent with the general precautionary principle that the TRT adopted for the two listed species of steelhead at the southernmost end of their range. As the TRT noted, ". . . the bigger risk with respect to recovery appears to be erroneous lumping".

For a detailed analysis of this issue of multiple populations of *O. mykiss* in the Salinas River watershed see, Boughton *et al.* 2005, especially, Section 2.6. "Three Discrete Populations in the Salinas System", Part 4. "Distribution of Steelhead Habitat" and Part 10 Appendices, 10.1. "Evidence for Two or More Populations in the Salinas Basin".

To put this discussion of multiple steelhead populations in the Salinas River watershed in a broader context, it should be recognized that the Salinas River watershed contains approximately two-thirds of the total amount of stream mileage within the South-Central California Coast Steelhead Recovery Planning Area. See NFMS 2013, particularly Tables 9-1, 10-1, 11-1 and 12-1 for comparative stream mileages of the watersheds within the Interior Coast Range BPG and the three other BPGs comprising the South-Central California Coast Steelhead Recovery Planning Area.

Within the Salinas River watershed there are approximately 5,924 stream miles, with the major tributaries historically supporting *O. mykiss* containing 2,081 stream miles, distributed among the tributaries comprising the five steelhead areas, as follows:

Gabilan Creek: 175 miles

Arroyo Seco: 478 miles

San Antonio River: 578 miles

Nacimiento: 527 miles

Santa Margarita Creek: 153 miles

Upper Salinas and tributaries (above Salinas Dam): 170 miles

Of this 2,081 miles, approximately 694 stream miles have been identified has having high intrinsic potential over-summering rearing/refugia habitat (c. 33% of the total stream miles supporting *O. mykiss* within the Salinas River watershed). As noted above, a majority of this over-summering habitat is located in the upper reaches of the tributaries comprising the five steelhead habitat areas within the Salinas River watershed.

Of the three distinguishable recovery populations within the Salinas River, the Nacimiento *et al.* population (which includes the San Antonio River, Nacimiento River, Paso Robles Creek, Santa Margarita River, and Upper Salinas River and tributaries) contains 330 miles of identified high intrinsic potential over-summering rearing/refugia habitat; this represents approximately half (c. 48%) of the total amount of intrinsic potential over-summering habitat associated with the three distinct steelhead populations of the Salinas River watershed. Together, the San Antonio River and Nacimiento River watersheds contain approximately 157 miles of high intrinsic potential over-summering rearing/refugia habitat (74 and 83 miles respectively), and approximately half (c. 48%) of the over-summering habitat within the Nacimiento *et al.* population. Importantly, of the

intrinsic potential habitat identified by the TRT in the San Antonio and Nacimiento watersheds, *all* of it is located above the San Antonio and Nacimiento dams.

For stream and intrinsic potential steelhead spawning and rearing habitat mileages, see Figure 1, maps of "Salinas River Major Subbasins", and Figure 2, map of "Salinas River Intrinsic Potential Steelhead Spawning and Rearing Habitat". Also, Boughton, *et al.* 2006 for a detailed discussion of the "envelope method" used to identify intrinsic potential steelhead over summering habitat, and the associated intrinsic potential maps.

NMFS' TRT Viability Criteria

The DPS-Wide viability criteria for South-Central/Southern California Coast Steelhead Recovery Planning Domain provides that each BPG be comprised of a suite of restored core watersheds, each of which must meet the Population-Level viability criteria. As noted above, individual watersheds were generally presumed to support a single population that would meet the Population-Level viability criteria. However, in the case of the Salinas River, NMFS' TRT recognized multiple populations, each of which must meet the Population-Level viability criteria to address the "Geographic Diversity and "Biological Diversity" elements of the viability criteria. Failure to reconnect the upper and lower watersheds of the San Antonio River and Nacimiento River by providing fish passage around the San Antonio and Nacimiento dams for both juvenile and adult *O. mykiss* would effectively preclude meeting the Population-Level viability criteria for the Nacimiento *et al.* population of the Salinas Watershed, where all of the high intrinsic potential over-summering rearing/refugia habitats exists in the headwater tributaries above the two dams.

Thus, not providing effective fish passage over the Nacimiento and San Antonio dams effectively precludes the recovery of the South-Central California Coast Steelhead DPS because it would prelude meeting the DPS-Wide viability criteria that requires a suite of restored core watersheds. NMFS' South-Central California Coast Steelhead Recovery Plan, specifically requires recovery of the Pajaro River, Gabilan Creek, Arroyo Seco, and Upper Salinas Basin in the Interior Coast Range BPG.

See NMFS 2013, Appendix C. "Composition of South-Central California Coast Steelhead Recovery Planning Area BPGs".

Salinas River Recovery Actions

To meet both the DPS-Wide and Population-Level viability criteria identified by NMFS' TRT for the South-Central California Coast Steelhead Recovery Planning Area, NMFS' South-Central California Coast Steelhead Recovery Plan identified a suite of recovery actions, including those dealing with flows and fish passage at impassible barriers on the suite of Core 1 populations identified in the Recovery Plan.

The DPS-Wide Recovery Actions include a general recovery action involving the physical modification of fish passage barriers identified in Table 7-2 and the BPG recovery action tables. Table 7-1 identifies the Core 1, 2 and 3 *O. mykiss* populations within the South-Central California

Coast Steelhead Recovery Planning Area. Core 1 populations are highlighted in bold face, and include the "Salinas River Watershed (all populations)". See NMFS 2013, p. 7-7.

NMFS' South-Central California Coast Steelhead Recovery Plan also identifies critical recovery actions for each Core 1 population for each BPG. Table 9-3, "Critical recovery actions for Core 1 populations within the Interior Coast Range BPG" identified critical recovery actions for the Salinas River, including the Arroyo Seco, San Antonio, and Nacimiento rivers. These critical recovery actions include physically modifying the dams "to allow steelhead natural rates of migration to upstream spawning and rearing habitats, and passage of smolts, kelts downstream to the estuary and the ocean" for the San Antonio Dam, Nacimiento Dam, and Salinas Dam, on the San Antonio, and Nacimiento, and Salinas rivers, respectively. See NMFS 2013 p. 9-18.

In addition, NMFS' South-Central California Coast Steelhead Recovery Plan identifies watershed-specific recovery actions dealing with the provision of flows and fish passage at the San Antonio Dam, Nacimiento Dam, and Salinas Dam, as well as other fish passage barriers or impediments within the Salinas River watershed.

The most pertinent to the question of providing fish passage and related flows at the San Antonio and Nacimiento dams are:

- Recovery Actions: SAnt-SCCCS-4.1, SAnt-SCCCS-4.2, and SAnt-SCCCS-4.3 (San Antonio River Dams and Surface Water Diversions);

- Recovery Actions: Nac-SCCCS-4.1, Nac-SCCCS-4.2, and Nac-SCCCS-4.2 (Nacimiento Dams and Water Diversions).

There is also a comparable recovery action for the Salinas Dam.

- Recovery Actions: Sal-SCCCS-4.1, Sal-SCCCS-4.2, and Sal-SCCCS-3.3 (Salinas River Dams and Surface Water Diversions)

In addition, there are specific recovery actions dealing with other types of fish passage impediments within the Salinas River watershed; these include:

- Recovery Actions: Sal-SCCCS-3.1 and Sal-SCCCS-3.2 (Salinas River Culverts and Road Crossings);

- Recovery Actions: SAnt-SCCCS-3.1 and SAnt-SCCCS-3.2 (San Antonio River Culverts and Road Crossings);

- Recovery Actions: Nac-SCCCS-3.1 and Nac-SCCCs-3.2 (Nacimiento Culverts and Road Crossings).

See NMFS 2013, pp. 9-31 – 9-32; 9-45 – 9-46; and 9-50; also, NMFS 2016a.

These recovery actions are intended to provide appropriate flows below dams and diversions and related fish passage (for both adult and juvenile *O. mykiss*) around the and San Antonio,

Nacimiento, and Salinas dams. The basic of goal of these recovery actions is to reconnect up and downstream migratory, spawning and rearing habitats to accommodate the various life-history forms and migratory patterns of native *O. mykiss* within the Salinas River watershed. They are also intended to enable the Salinas River to meet the Population-Level viability criteria identified by NMFS' TRT, and incorporated into NMFS' South-Central California Coast Steelhead Recovery Plan (including the "Biogeographic Diversity" and "Life-History Diversity" elements of the viability criteria).

There are also other recovery actions that are pertinent to the management of San Antonio, Nacimiento, and Salinas dams and the steelhead populations within the Salinas River watershed; these include recovery actions dealing with flood control, non-native species, recreational facilities, and variety of up-slope activities. See NMFS 2013, particularly Table 9-5. "South-Central California Coast Steelhead DPS Recovery Action Table for Lower Salinas River and Sub-Watersheds (Interior Coast Range BPG)", pp. 9-31 – 9-53.

Summary and Conclusion

Failure to provide passage at the San Antonio and Nacimiento dams would result is separating 157 miles of high intrinsic potential over-summering rearing/refugia habitat from the anadromous waters of the Salinas River watershed. This represents c. 48%c. of the total amount of high intrinsic potential over-summering spawning/refugia habitat within the Nacimiento *et al.* recovery population, and c. 23% of the total amount of high intrinsic potential over-summering rearing/refugia habitat within the Salinas River watershed. Importantly 100% of the total amount of high intrinsic potential over-summering rearing/refugia habitat (sustained by higher annual average rainfall) within the San Antonio River/Nacimiento River portion of the Nacimiento *et al.* recovery population is located above the San Antonio and Nacimiento dams.

In addition, failure to rectify the fish passage impediments (and related flows) at the San Antonio and Nacimiento dams would preclude meeting the "Geographic Diversity" and "Biological Diversity" elements of the Population-Level viability criteria within the Salinas River watershed, and within the South-Central California Coast Steelhead DPS as a whole.

As NMFS' South-Central California Coast Steelhead Recovery Plan noted:

> "Regarding the impacts of impassable anthropogenic barriers on threatened steelhead, the recovery objectives include restoring steelhead distribution to previously occupied areas and restoring genetic diversity and natural interchange within populations and metapopulations. One of the threats abatement criteria identified to meet these objectives is allowing sustainable effective access to historical spawning and rearing habitats."

NMFS South-Central California Coast Steelhead Recovery Plan includes the following critical recovery actions for the Salinas River:

> "Develop and implement operating criteria to ensure the pattern and magnitude of groundwater extractions and water releases from Salinas Dam[s] to provide the essential habitat functions to support the life history and habitat requirements of adult and juvenile steelhead. Physically modify all fish passage impediments, including the Salinas Dam[s],

to allow steelhead natural rates of migration to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and ocean. Management instream mining to minimize impacts to migration, spawning , and rearing habitat, and protect spawning and rearing habitat in major tributaries, including the Arroyo Seco. Identify, protect, and where necessary restore estuarine rearing habitats, including management of artificial breaching of the sandbar at the river's mouth."

Table 9-3. "Critical recovery actions for Core 1 populations within the Interior Coast Range BPG", p. 9-18.

The San Antonio and Nacimiento dams were specifically identified in NMFS' South-Central California Coast Steelhead Recovery Plan "Critical Recovery Actions":

> "Physically modify San Antonio Dam to allow steelhead natural rates of migration to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and the ocean."
>
> "Physically modify Nacimiento Dam to allow steelhead natural rates of migration to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and the ocean."

NMFS' 2013, Recovery Actions SAnt-SCCCS-4.1, SAnt-SCCCS-4.2, Sant-SCCCS-4.3 and Nac-SCCCS-4.1, Nac-SCCCS-4.2, Nac-SCCCS-4.3, pp 9-45 through 9-46, 9-50.

I hope that this analysis will provide a useful framework in which to consider NMFS' recovery actions for the Salinas River watershed identified in NMFS' South-Central California Coast Steelhead Recovery Plan.[8]

[8] For examples of the analyses of impacts and approaches to providing effective fish passage at other major dams within the South-Central/Southern California Steelhead Recovery Planning Domain, see, California State Water Resoruces Control Board 2019, and NMFS 2016b, 2008.

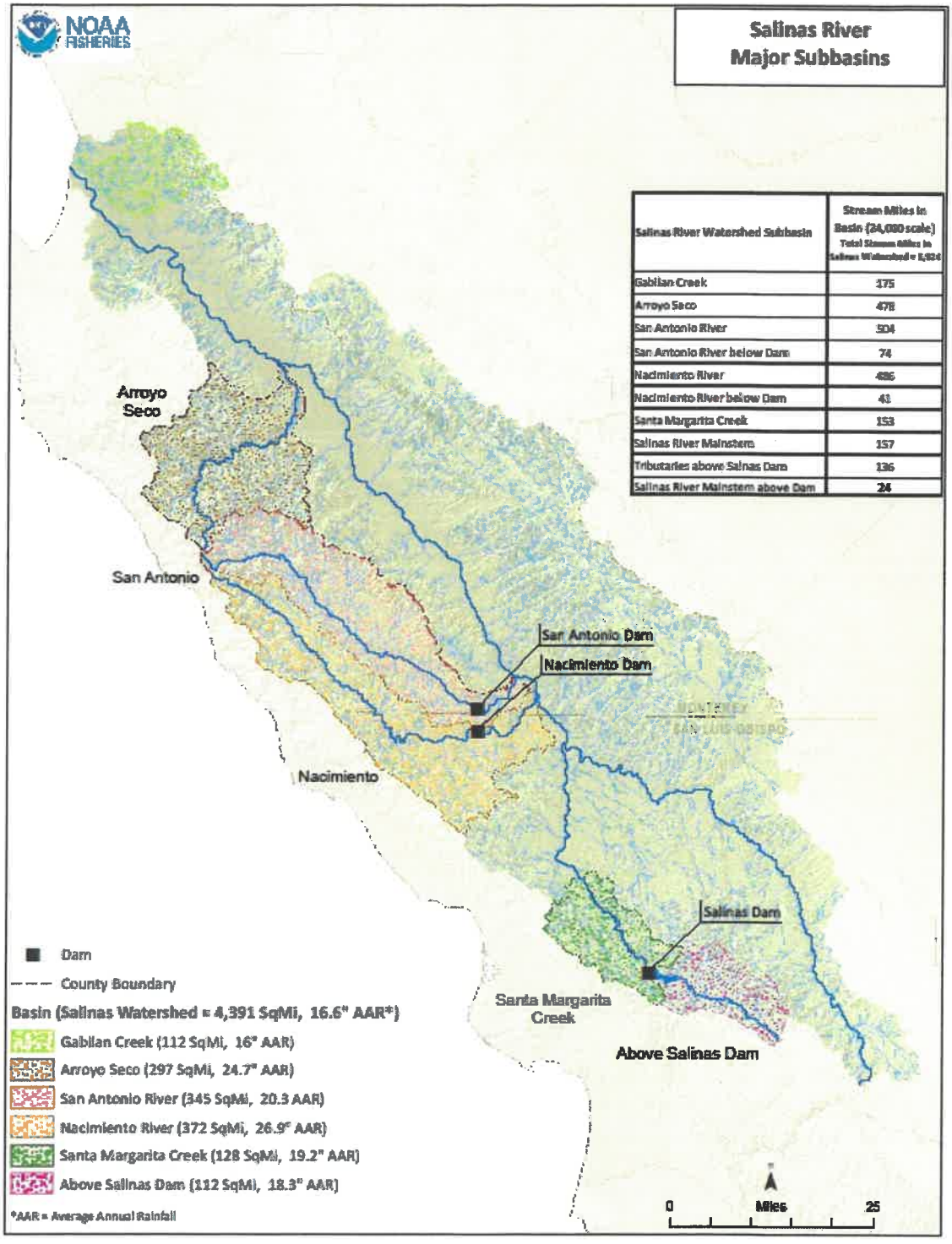
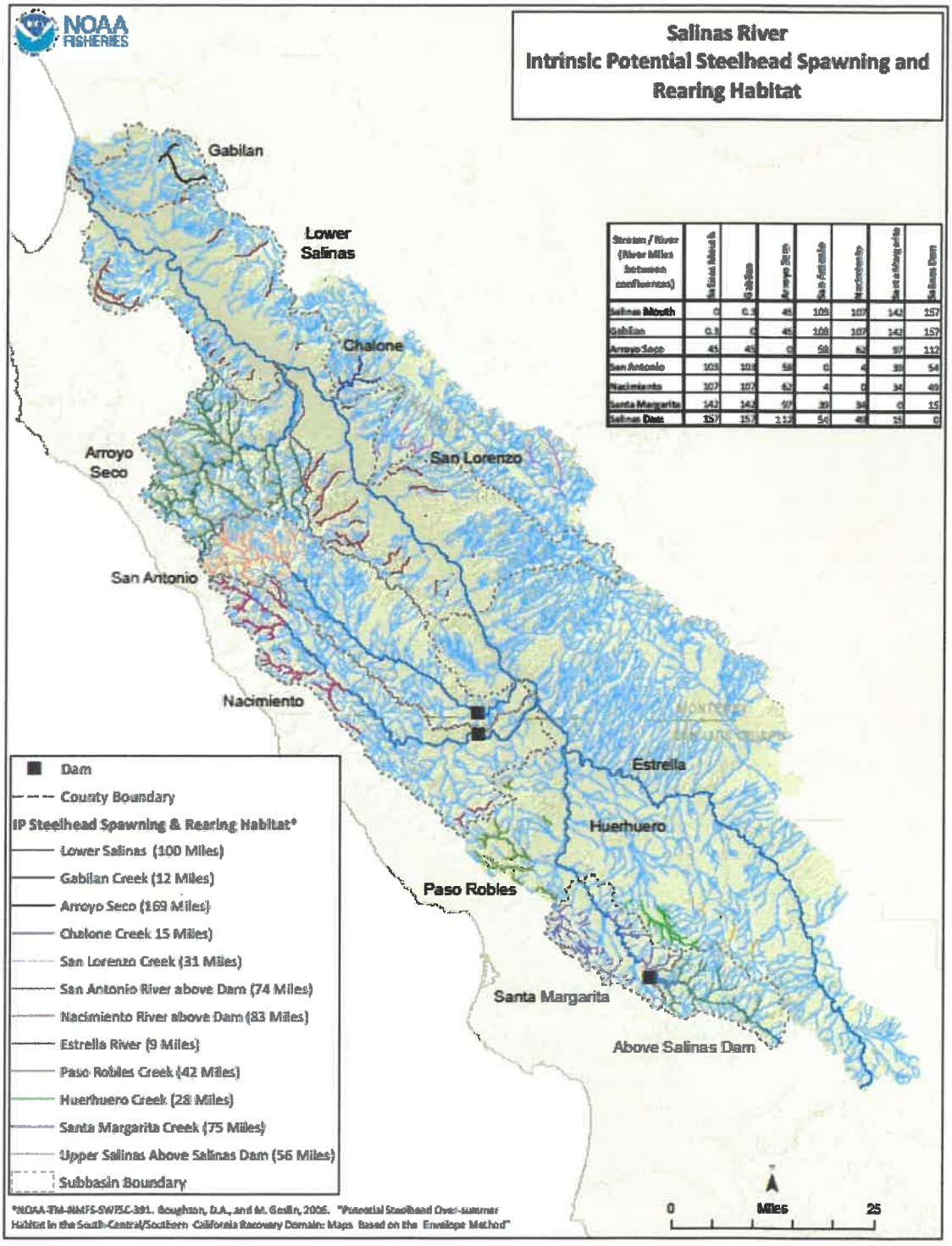


Figure 1. Salinas River Major Subbasins.



Stream / River (River Miles between confluences)	Salinas Mouth	Gabilan	Arroyo Seco	San Antonio	Nacimiento	Santa Margarita	Salinas Dam
Salinas Mouth	0	0.3	45	103	107	142	157
Gabilan	0.3	0	45	103	107	142	157
Arroyo Seco	45	45	0	58	62	97	112
San Antonio	103	103	58	0	4	39	54
Nacimiento	107	107	62	4	0	34	49
Santa Margarita	142	142	97	39	34	0	15
Salinas Dam	157	157	112	54	49	15	0

*NOAA-TM-NMFS-SWFSC-391. Boughton, D.A., and M. Goslin, 2006. "Potential Steelhead Over-summer Habitat in the South-Central/Southern California Recovery Domain: Maps Based on the Envelope Method"

Figure 2. Salinas River Intrinsic Potential Steelhead Spawning and Rearing Habitat.

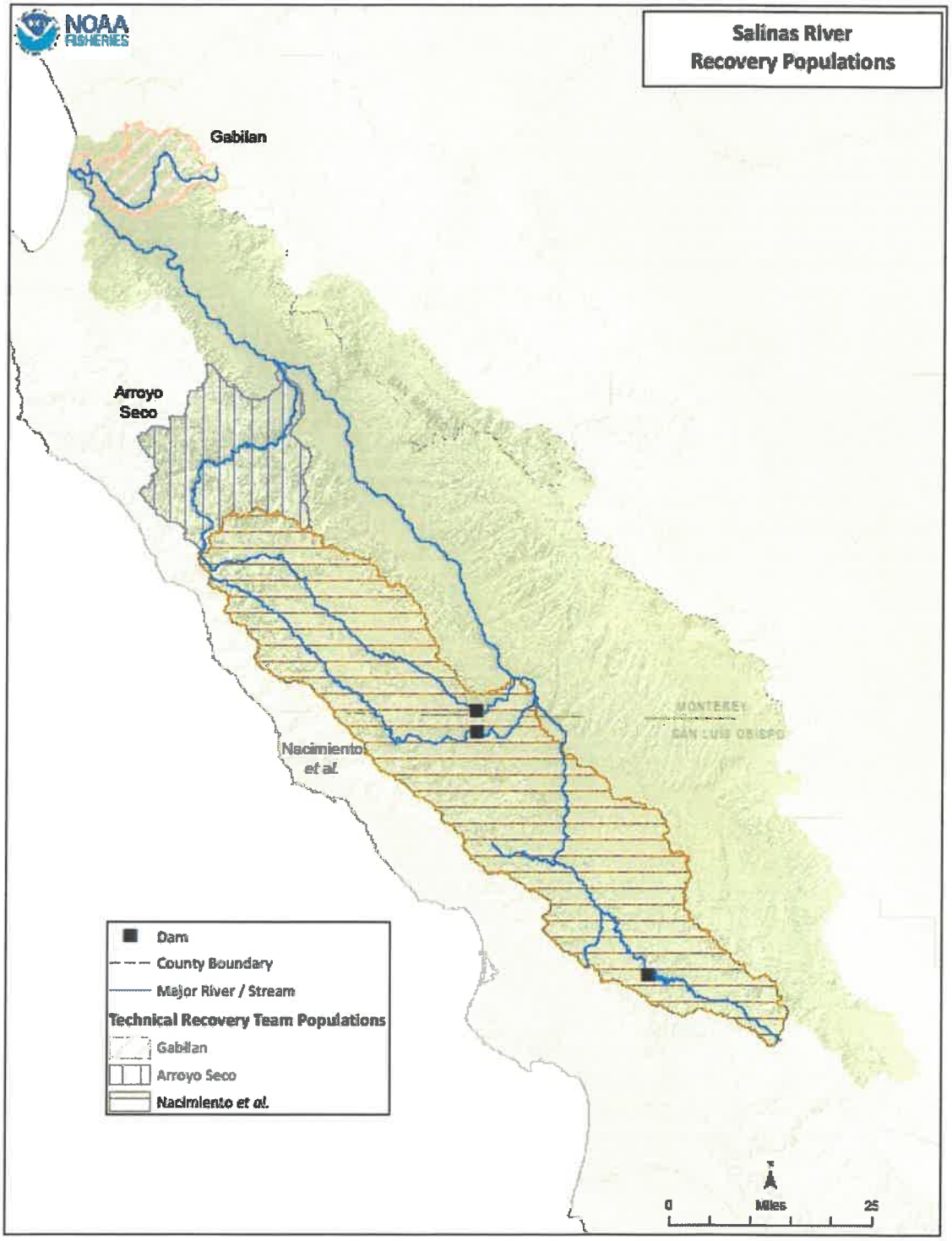


Figure 3. Salinas River Recovery Populations.

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Monterey County

Board Report

Legistar File Number: WRARO 22-073

Item No.3

Board of Supervisors
Chambers
168 W. Alisal St., 1st Floor
Salinas, CA 93901

August 25, 2022

Introduced: 8/18/2022
Version: 1

Current Status: Draft
Matter Type: WRA ResOps Item

Reservoir Storage and Release Update

Reservoir Storage & Release Update

SUMMARY/DISCUSSION:
The Board of Directors receives monthly updates on the status of Agency reservoirs.

RESERVOIR ELEVATION / STORAGE: As of today August 17, 2022, San Antonio Reservoir has a water surface elevation of approximately 677.45 feet (NGVD 29), with 33,623 acre-feet of storage. Nacimiento Reservoir has a water surface elevation of approximately 724.65 feet, with 79,245 acre-feet of storage. San Antonio Reservoir is currently at 10% of storage capacity and Nacimiento Reservoir is at 21% of capacity.

RESERVOIR RELEASES: The Agency continues to release approximately 60 cfs from Nacimiento Reservoir and 10 cfs from San Antonio Reservoir to support fish habitat below the dams.

The Lagoon has been closed to the ocean since February 17th.

Minor deviations in release rates are not presented in this report but are documented in the Salinas Valley Water Project Annual Flow Reports.

Releases as of August 17, 2022:

- Nacimiento Reservoir: 60 cfs
- San Antonio Reservoir: 10 cfs

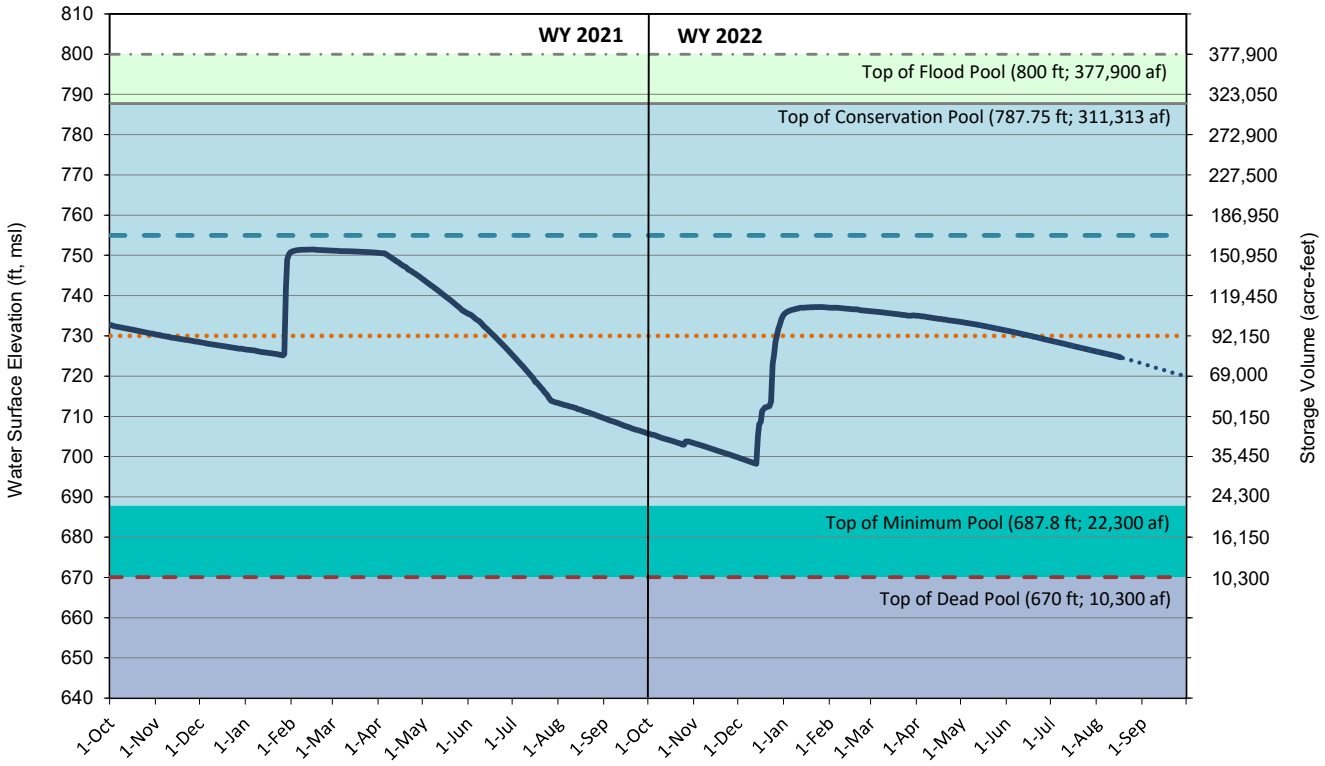
Total releases from both reservoirs to the Salinas River are approximately 70 cfs. The following "provisional" flows have been recorded by the USGS:

- Salinas River near Bradley: 55 cfs
- Salinas River at Soledad: 0 cfs
- Salinas River near Chualar: 0 cfs
- Salinas River near Spreckels: 0 cfs

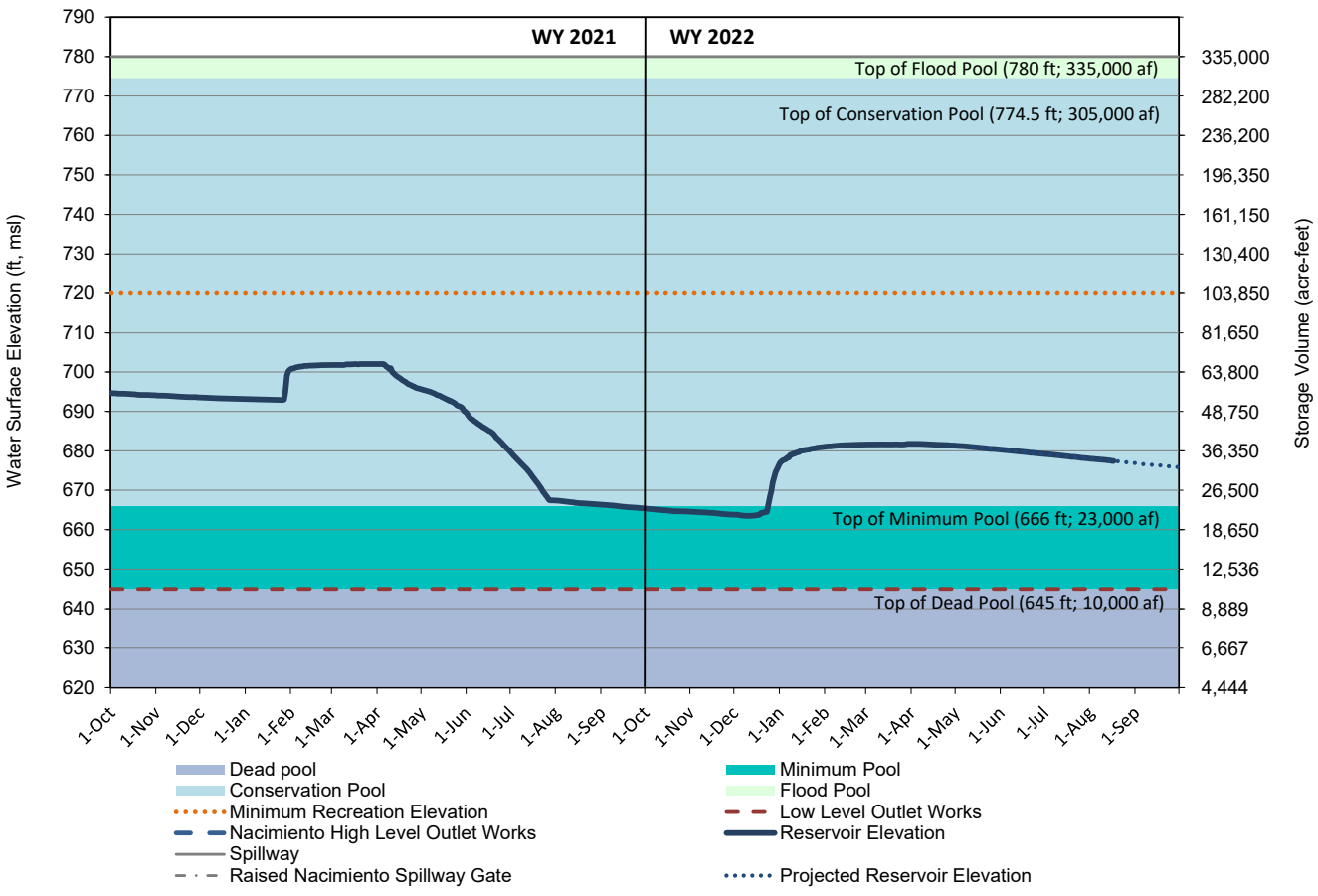
Prepared by: Joseph Klein, Hydrologist (831) 755-4860

Reservoir Elevation and Storage

Nacimiento Reservoir



San Antonio Reservoir



Monterey County

Board Report

Legistar File Number: WRARO 22-074

Item No.4

Board of Supervisors
Chambers
168 W. Alisal St., 1st Floor
Salinas, CA 93901

August 25, 2022

Introduced: 8/18/2022

Version: 1

Current Status: Draft

Matter Type: WRA ResOps Item

Release Schedule Update

RESERVOIR RELEASE SCHEDULE FOR 2022

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
			NACIMIENTO								SAN ANTONIO					
Month	Combined Releases (cfs)[1]	Combined Releases (ac-ft)	Evap. Losses (ac-ft)	Reservoir Releases (cfs)[1]	Reservoir Releases (ac-ft)	NWP Orders (ac-ft)	NWP Diversions (ac-ft)	Beginning of Month Storage (ac-ft)	(%)	Elev. (ft)	Evap. Losses (ac-ft)	Reservoir Releases (cfs)[1]	Reservoir Releases (ac-ft)	Beginning of Month Storage (ac-ft)	(%)	Elev. (ft)
Jan	76	4,645	424	66	4,030	483	353	**106,350**	28%	**735.4**	151	10	615	**33,045**	10%	**676.9**
Feb	76	4,394	364	66	3,819	653	448	**110,750**	29%	**737.0**	158	10	575	**37,557**	11%	**681.1**
Mar	74	4,546	642	64	3,931	905	506	**108,138**	29%	**736.1**	263	10	615	**38,190**	11%	**681.6**
Apr	72	4,288	888	62	3,693	1,242	506	**105,115**	28%	**735.0**	409	10	595	**38,420**	11%	**681.8**
May	74	4,580	1,308	64	3,965	1,481	651	**100,828**	27%	**733.4**	598	10	615	**37,845**	11%	**681.3**
Jun	70	4,165	1,874	60	3,570	2,043	1,122	**95,170**	25%	**731.2**	795	10	595	**36,638**	11%	**680.3**
Jul	70	4,304	1,648	60	3,689	2,131	1,091	**88,843**	24%	**728.7**	749	10	615	**35,415**	11%	**679.2**
Aug	70	4,304	1,524	60	3,689	2,181		**82,400**	22%	**726.0**	669	10	615	**34,200**	10%	**678.0**
Sep	70	4,165	1,207	60	3,570	2,143		**75,477**	20%	**723.0**	537	10	595	**32,984**	10%	**676.8**
Oct	70	4,304	828	60	3,689	1,535		**68,588**	18%	**719.8**	382	10	615	**31,856**	10%	**675.8**
Nov	70	4,165	407	60	3,570	1,115		**62,564**	17%	**716.8**	198	10	595	**30,866**	9%	**674.8**
Dec	70	4,304	241	60	3,689	496		**57,500**	15%	**714.2**	122	10	615	**30,077**	9%	**673.9**
Jan 2023								**53,219**	14%	**711.8**				**29,365**	9%	**673.2**
Totals		**52,167**	**11,354**		**44,907**	**16,408**	**4,679**				**5,032**		**7,260**			

Draft Date: 8/17/22

Notes:

1. Mean daily flow for the month in cubic feet per second.
2. Shaded areas denote actual values. Non-shaded areas are projected values.
3. Nacimiento Reservoir storage capacity: 377,900 acre feet; San Antonio Reservoir storage capacity: 335,000 acre feet.
4. Reservoir Operations Advisory Committee may make release considerations for fish spawn and holiday periods to benefit recreation.
5. Schedule assumes no inflow to reservoirs after April 1st. Actual elevations may be influenced by inflow.
6. "NWP Diversions" are San Luis Obispo County - Nacimiento Water Project conveyance facilities diversions. Max. allowable water year (Oct. 1 - Sept. 30) diversions: 15,750 ac-ft.
7. Nacimiento "NWP Diversions" do not include lakeside water use which is estimated at approximately 1,750 acre feet per year.
8. Updated Release Schedule developed by the Drought Operations Technical Advisory Committee, Adopted by Agency Board of Directors, 4/18/2022

Monterey County

Board Report

Legistar File Number: WRARO 22-075

Item No.5

Board of Supervisors
Chambers
168 W. Alisal St., 1st Floor
Salinas, CA 93901

August 25, 2022

Introduced: 8/18/2022
Version: 1

Current Status: Draft
Matter Type: WRA ResOps Item

Update on Operations and Maintenance Activities at the Reservoirs

Introduced: 8/18/2022 **Current Status:** Draft

Version: 1 **Matter Type:** WRA ResOps Item

- Lake Recreation by Concessionaire and Parks Department
- Quagga/Zebra Mussel Plan
- San Luis Obispo County Activities
- Cloud Seeding
- National Marine Fisheries Service

Monterey County

Board Report

Legistar File Number: WRARO 22-077

Item No.7

Board of Supervisors
Chambers
168 W. Alisal St., 1st Floor
Salinas, CA 93901

August 25, 2022

Introduced: 8/18/2022
Version: 1

Current Status: Draft
Matter Type: WRA ResOps Item

Set next meeting date and discuss future agenda items