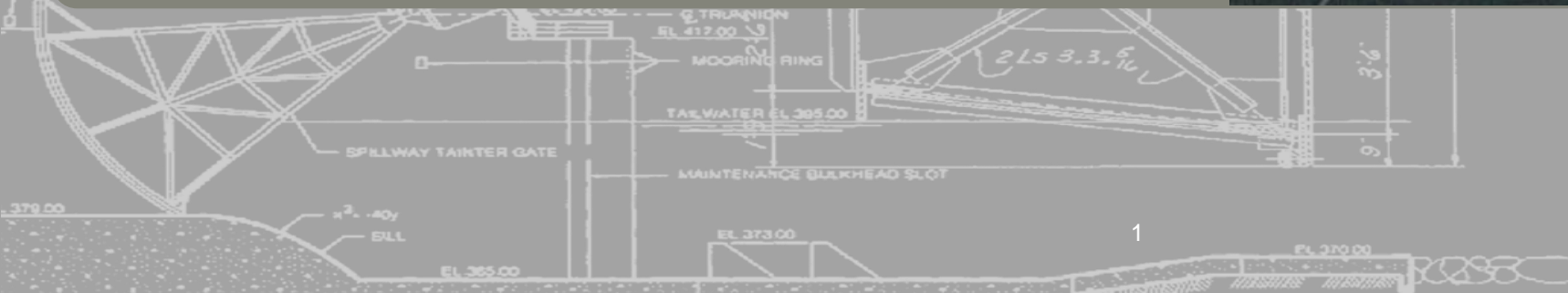
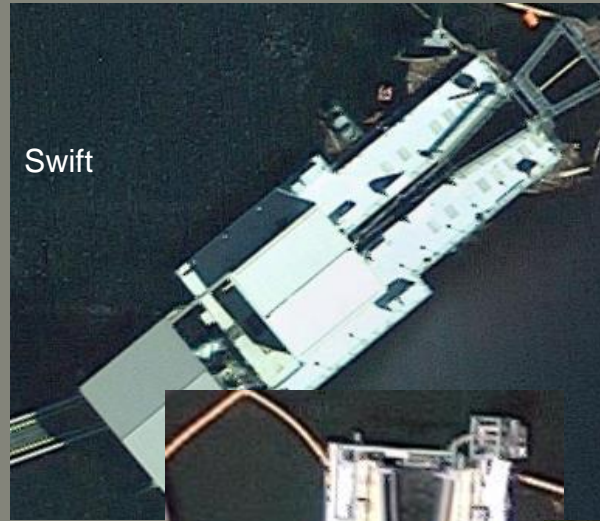


COUGAR DOWNSTREAM PASSAGE

Jeremy Britton, Technical Lead
Kelly Janes, Environmental Resource Specialist
8 February 2018



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PURPOSE

To brief McKenzie River watershed stakeholders on the status of the U.S. Army Corps of Engineers (Corps) Cougar Downstream Passage Project.

AGENDA

- Purpose and Need
- Biological Opinion Overview
- Project History
- Alternatives Analysis
- Preferred Alternative
- Project Schedule
- Affected Resources
- NEPA Process



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PURPOSE AND NEED

PURPOSE:

To enhance downstream passage for populations of Upper Willamette River spring Chinook salmon listed as threatened under the Endangered Species Act.

To comply with the Reasonably Prudent Alternatives measure 4.12 of the National Marine Fisheries Service 2008 Biological Opinion

NEED:

- Lack of passage - the ***most significant limiting factor*** to the viability of the affected populations of Upper Willamette River spring Chinook salmon (2008 Biological Opinion).

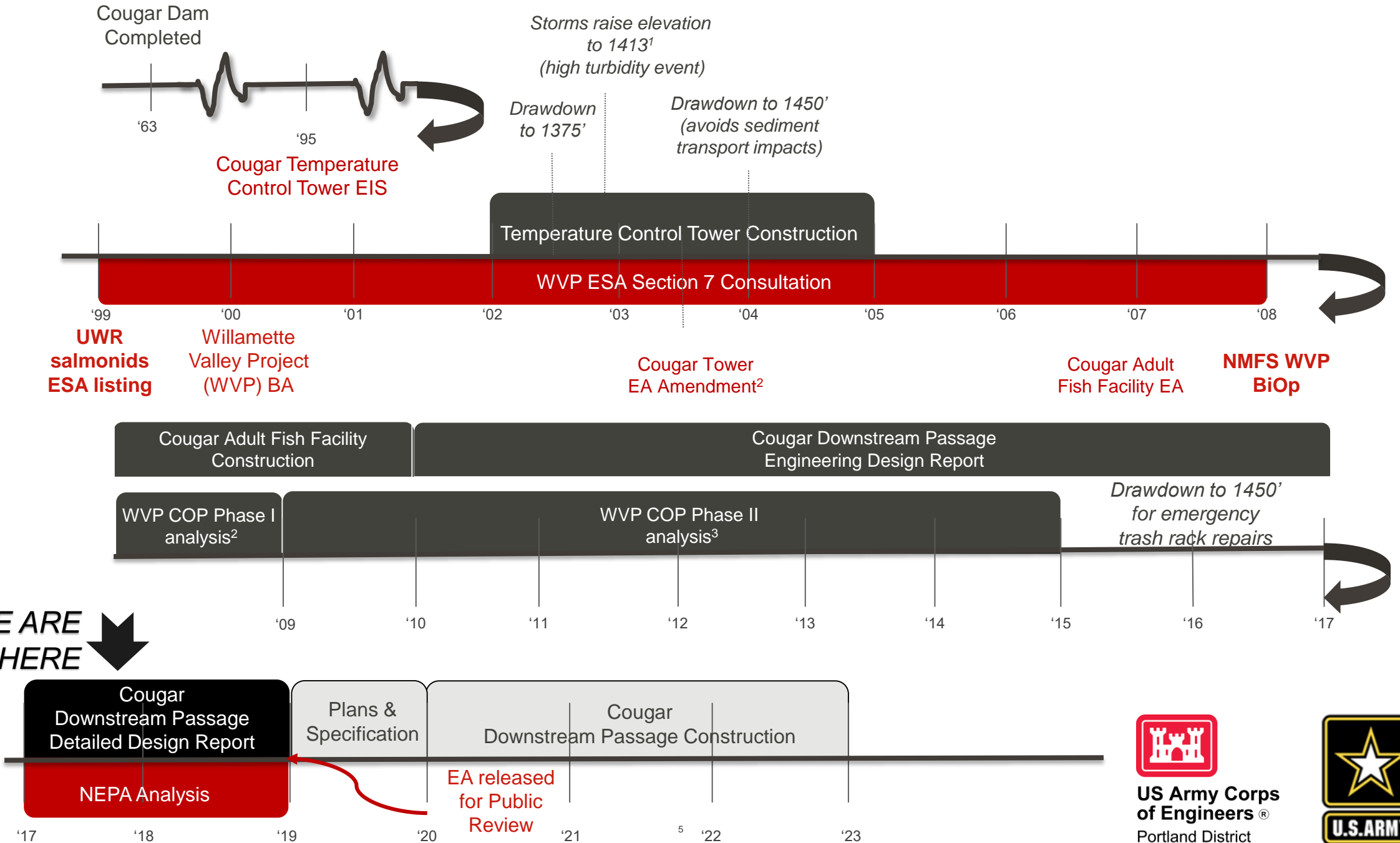


WILLAMETTE JEOPARDY BIOLOGICAL OPINION (BIOP)

- Issued in 2008 by National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS) – Willamette Valley Project Operations jeopardizes the Endangered Species Act listed Species
 - Upper Willamette River spring Chinook
- BiOp Reasonable and Prudent Action measure 4.12.1, Cougar Dam Downstream Passage – requires:
 - investigation into feasibility of improving downstream fish passage at Cougar Dam through **structural modifications and operational changes**, and
 - if found feasible to **construct and operate the downstream fish passage facility**.
- Action agencies (USACE and BPA) determined that fish passage at Cougar Dam was **feasible**



BACKGROUND: TIMELINE



GENERAL DOWNSTREAM PASSAGE PROJECT GOALS (COP PHASE II REPORT)

Chinook goals

- Establish a self-sustaining population upstream of Cougar Dam.
- Retain diverse life history pattern characteristics of the local stock.

Bull trout goals

- Increase genetic exchanges between populations above and below Cougar Dam.
- Avoid interrupting natural movement patterns between the tributaries and the reservoir.



ALTERNATIVES ANALYSIS HISTORY

Initial screening based on a qualitative evaluation of each alternative using criteria (from 2008 BiOp) to determine whether or not the alternative was:

- (1) biologically feasible (5 criteria),
 - (2) technically feasible (3 criteria), and
 - (3) cost effective (5 criteria).
- A numerical rating was developed based on PDT consensus (1- very bad/severe impact to 5 – very good/large benefit) .
 - The ratings were summed across all categories to provide an overall rating and the alternatives were sorted for prioritization.

An Initial Array of 30 alternatives developed

Prioritization and Screening

Top 11 alternatives: 6 Structural, 5 Operational further developed

EDR preliminary design & screening



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ALTERNATIVES ANALYSIS HISTORY

Engineering Design Report – Alternatives Analysis (*will be described in Environmental Assessment*)

Six structural alternatives for downstream passage at Cougar Dam were prioritized:

- Alternative No. 24: Weir Box/Collection Channel with holding barge and truck transport
- Alternative No. 25: Weir Box/Collection Channel with tower bypass
- Alternative No. 28: Floating Screen Structure with holding barge and truck transport
- Alternative No. 29: Floating Screen Structure with tower bypass
- Alternative No. 5: Floating Surface Collector with tower bypass
- Alternative No. 20: Floating Surface with holding barge and truck transport

Five operational alternatives for downstream passage at Cougar Dam were prioritized. These include:

- DP01c(RO) - Use Preferential Outlets (RO) within TDG Cap
- DP01c(RO) – Use Preferential Outlets (RO)
- DP01d – Pulsing Flow Releases
- DP01f – Below Minimum Conservation Pool
- DP01h – Delay Refill

Were deprioritized based on Research, Monitoring & Evaluation results from special operations tests and Fish Benefits Workbook scores.



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ALTERNATIVES ANALYSIS HISTORY

Quantitative Analysis based on COP Phase II Screening Criteria:

- Meet dam safety requirements
- Maintain flood risk management
- Above-dam fish reintroduction efforts must reach “replacement”
- Cost-effective, including consideration of hydropower impacts – considered but not a deciding factor.

Non-monetized impacts were also Scored (high negative impact (1) up to a high benefit (5)):

- Flood risk management
- Meeting Downstream Tributary Flows
- Meeting Mainstem Flows
- Reservoir Recreation
- River Recreation
- Water Supply- M&I and Irrigation (Future and Current)
- Constructability
- Implementation Timing
- Clean Water Act (TDG)
- Temperature

Initial Array of 30 alternatives developed

Prioritization and Screening

Top 11 Alternatives: 6 Structural, 5 Operational further developed

EDR preliminary design & screening

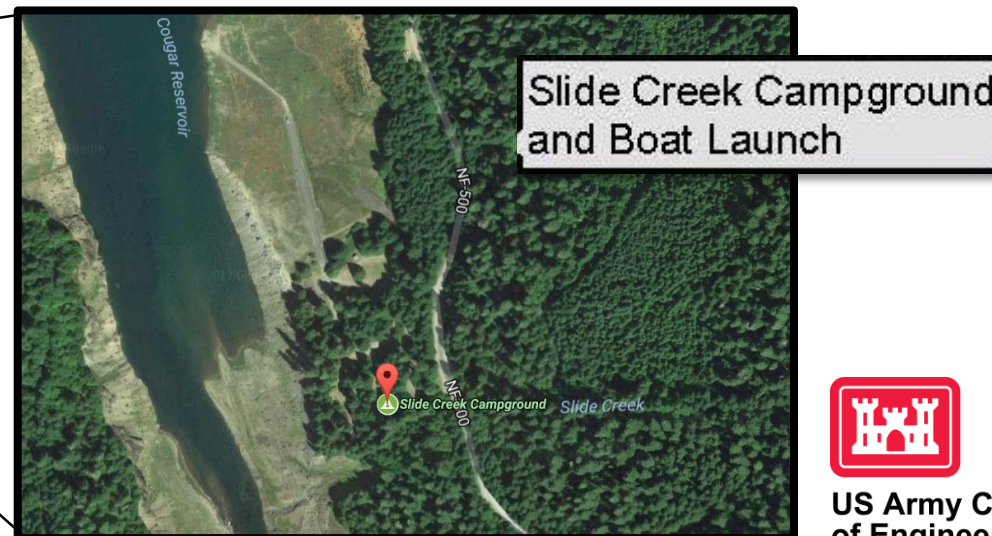
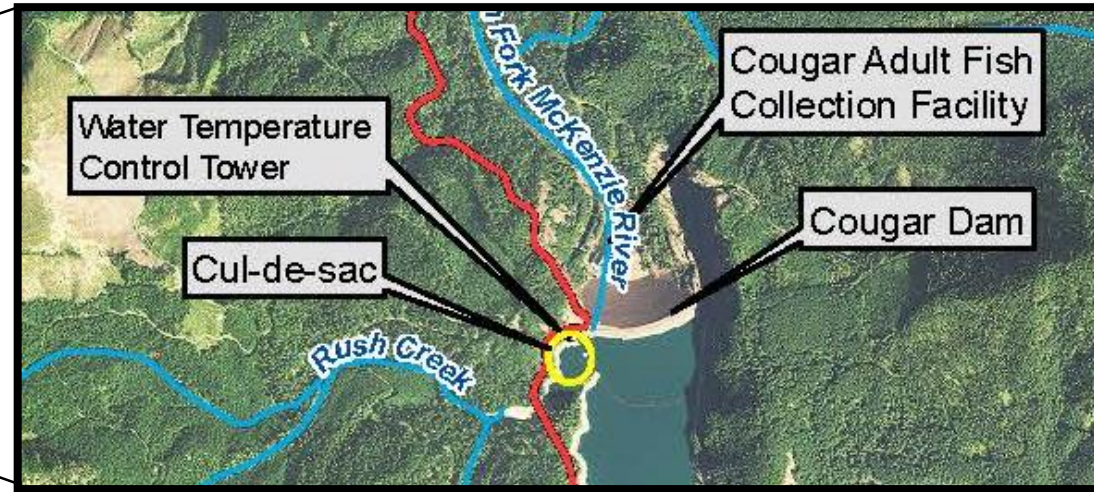
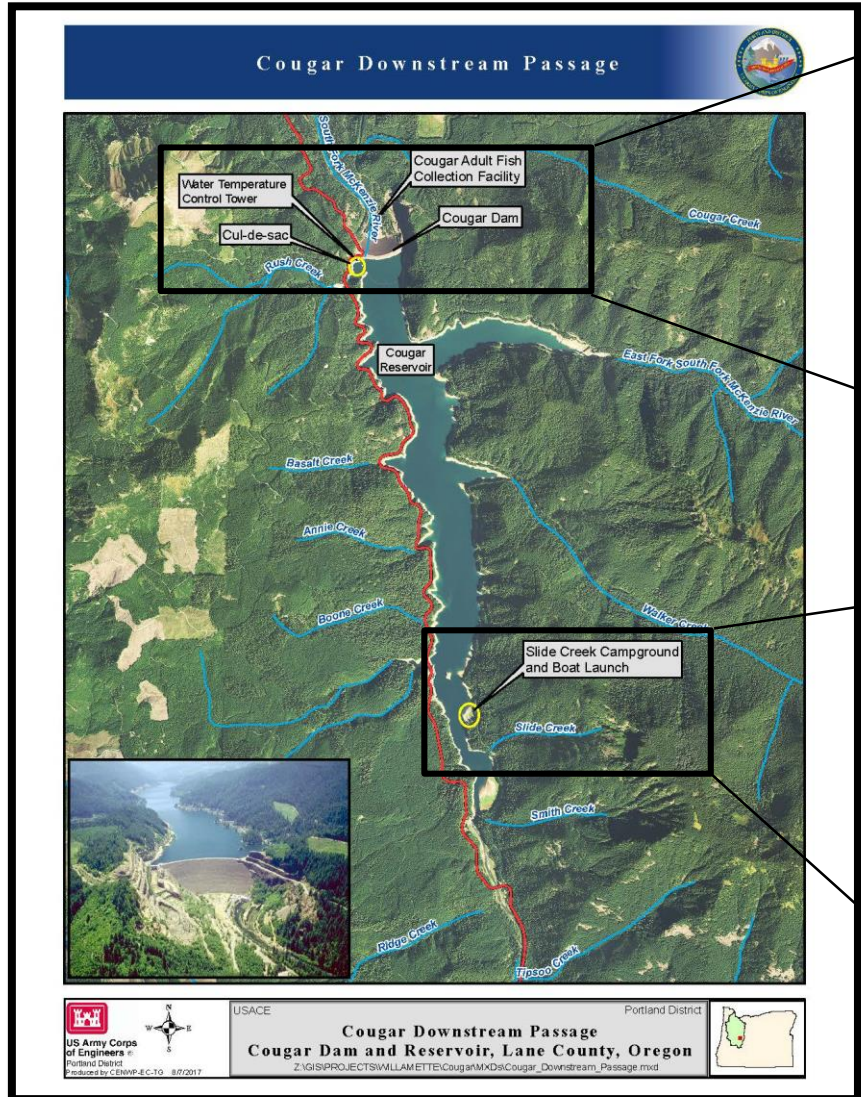
Preliminary Preferred Alternative:
**Floating Screen Structure w/
Truck and Haul**



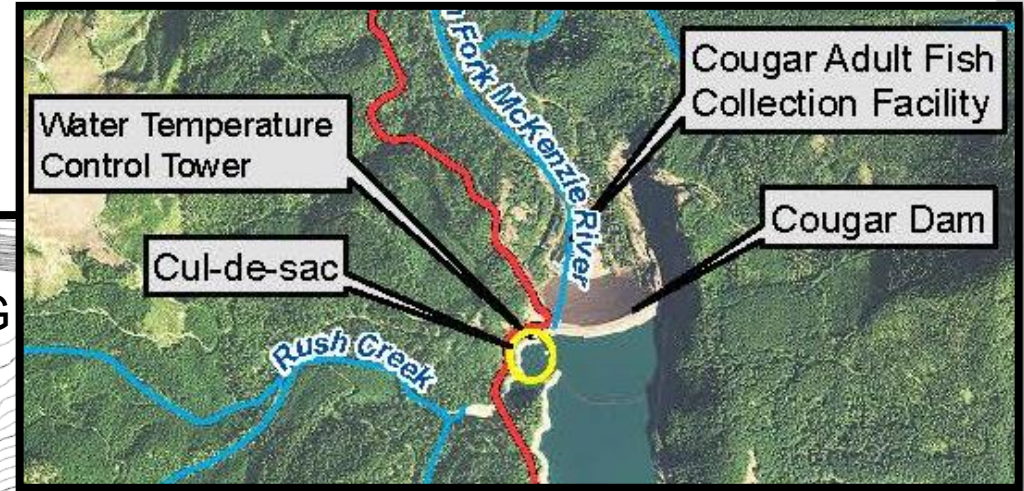
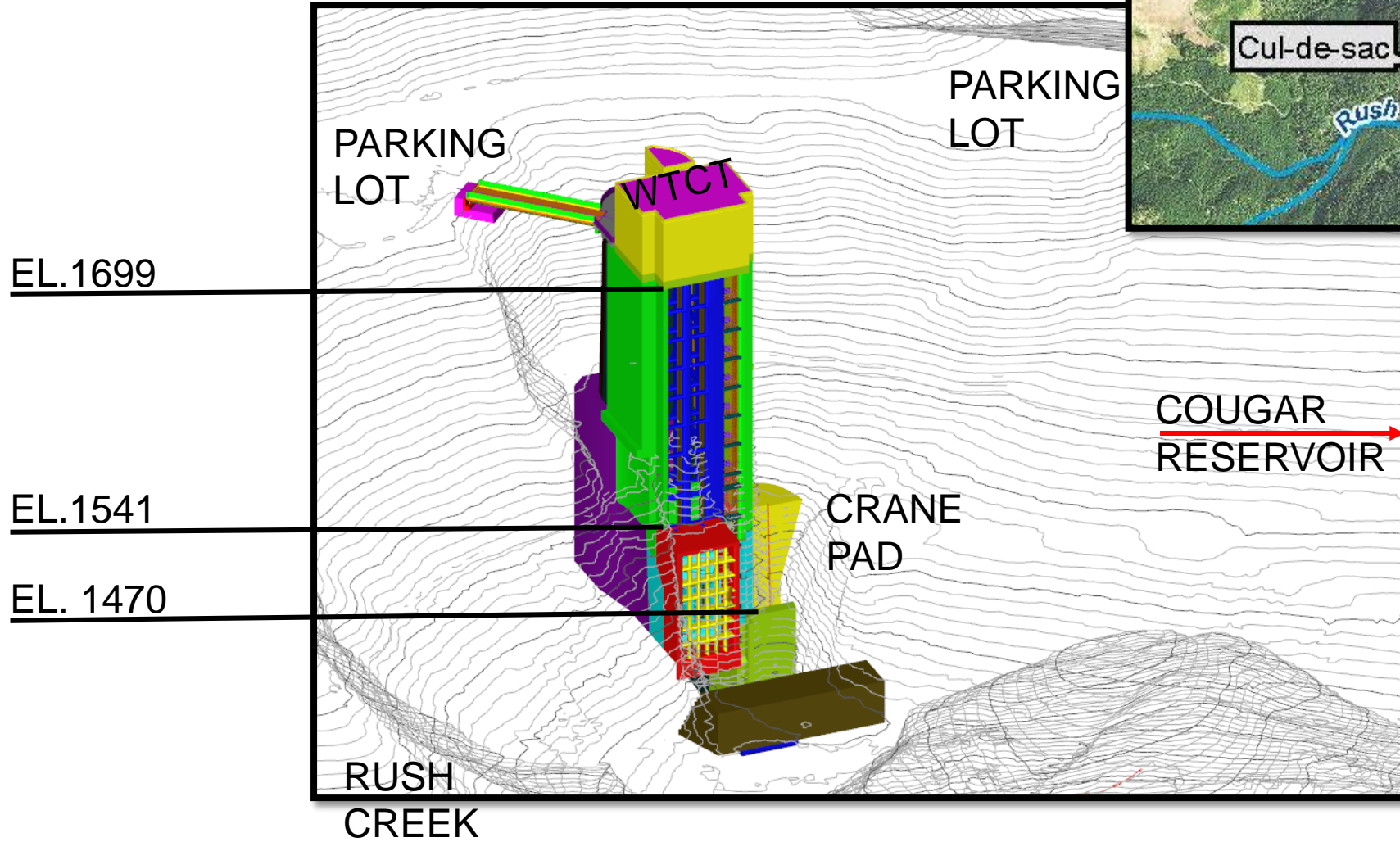
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LOCATION WITHIN RESERVOIR



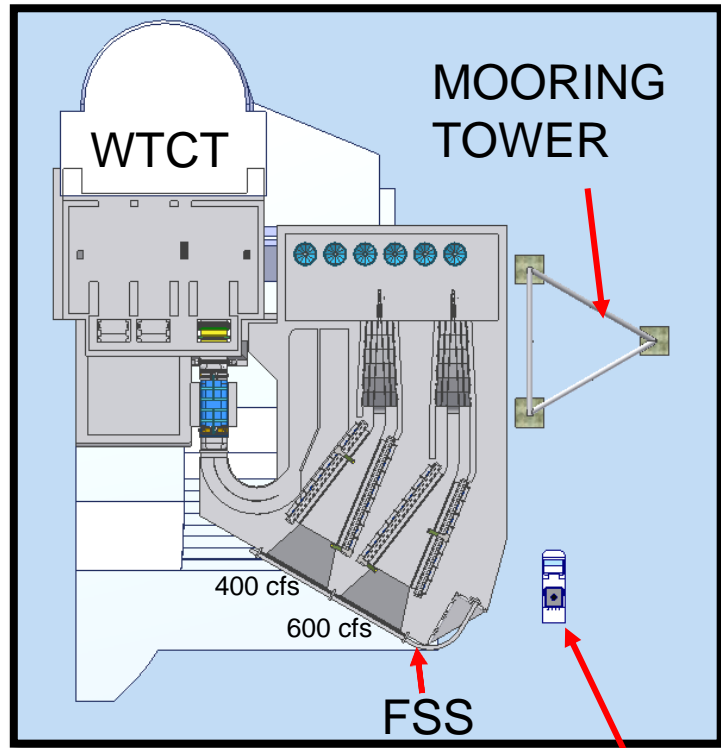
LOCATION IN THE CUL-DE-SAC



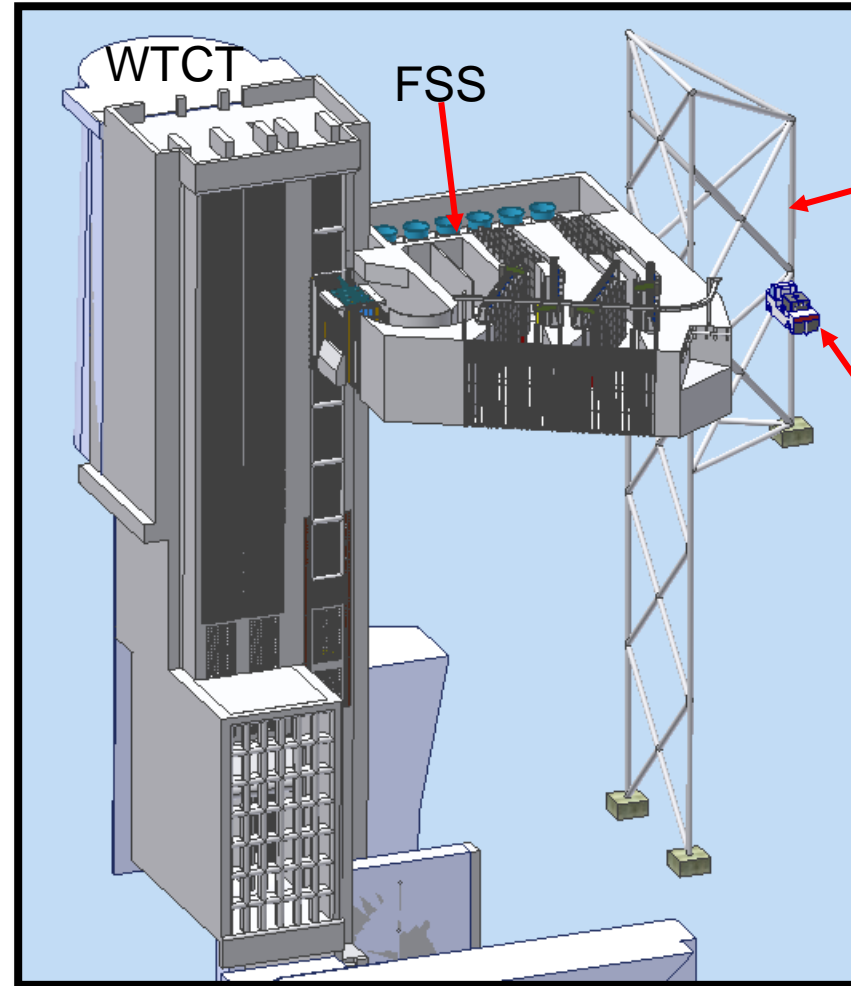
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LOCATION – NEAR WATER TEMPERATURE CONTROL TOWER



AMPHIBIOUS
VEHICLE



MOORING
TOWER

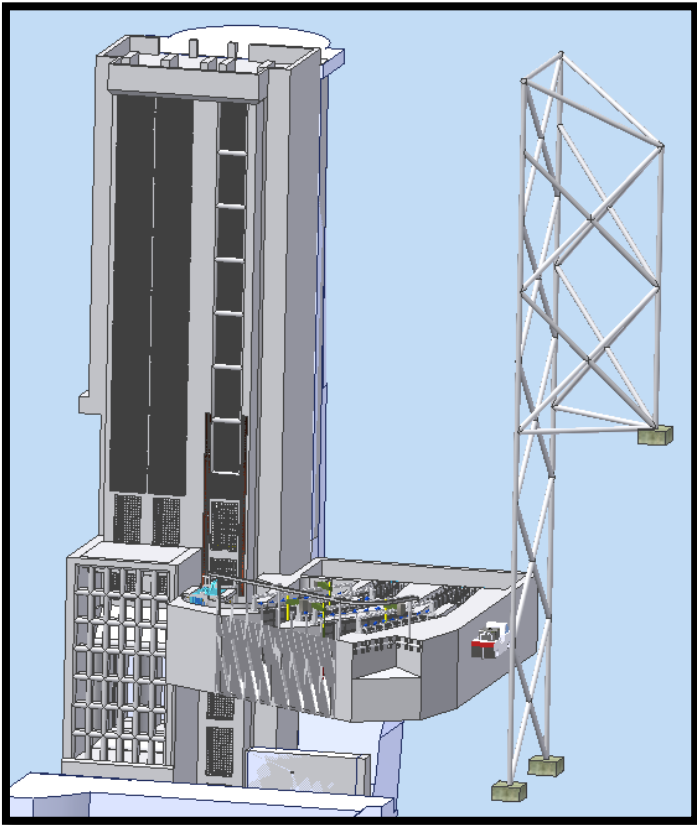
AMPHIBIOUS
VEHICLE



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POOL FLUCTUATIONS



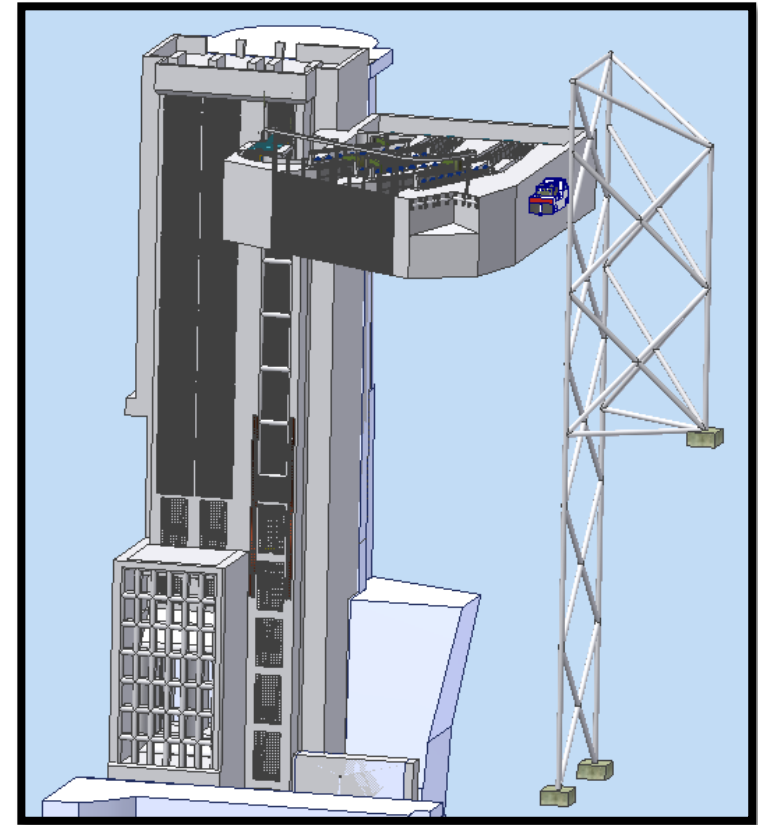
Elevation ~1,690



158 Ft.



Elevation ~1,532



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CONSTRUCTION

- Reservoir Drawdown to 1450 feet required to dewater construction area
- Similar to previous drawdowns



COUGAR RESERVOIR AT 1450' & KEY POOLS

 Boat Access Site

 Roads

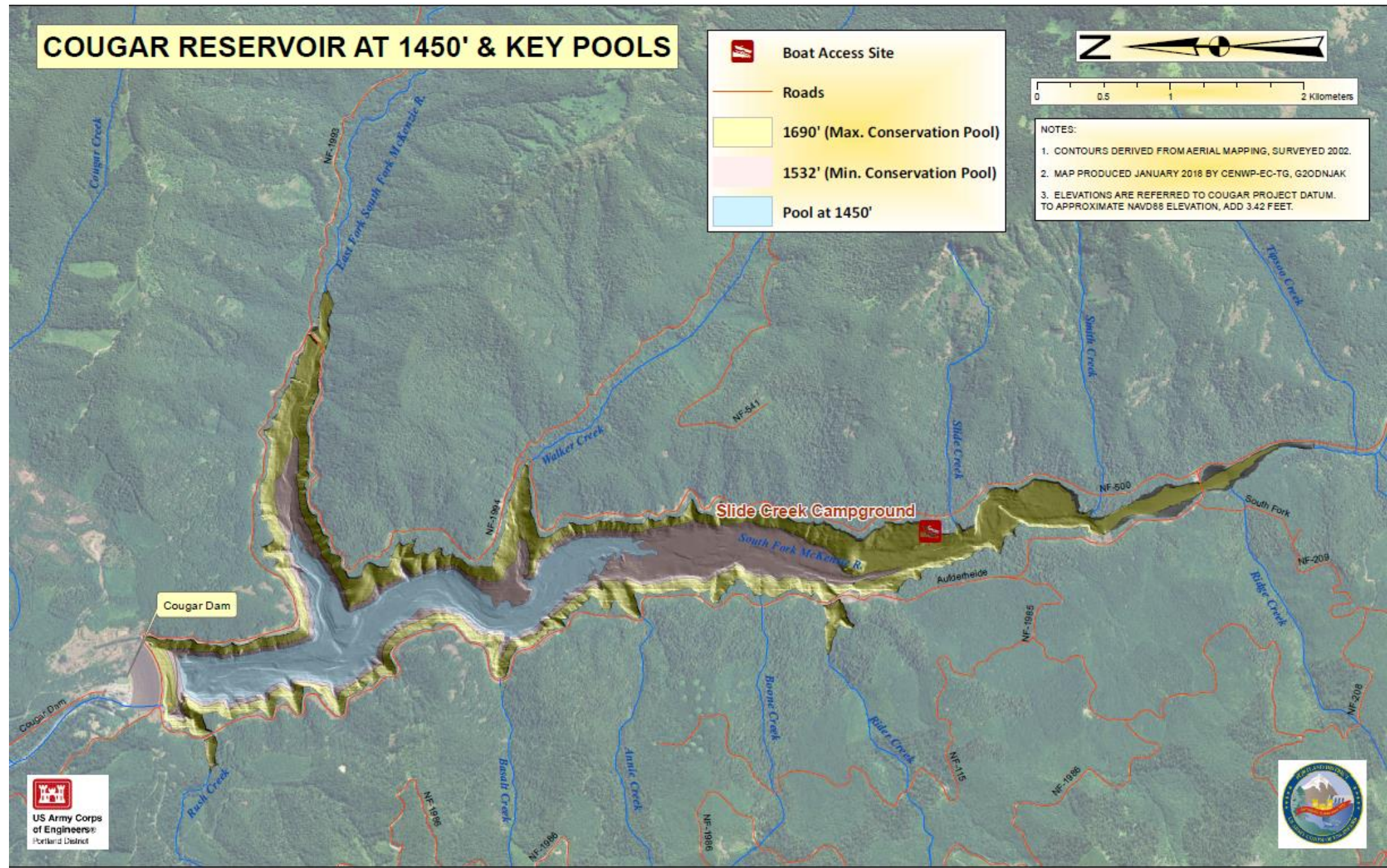
 1690' (Max. Conservation Pool)

 1532' (Min. Conservation Pool)

 Pool at 1450'

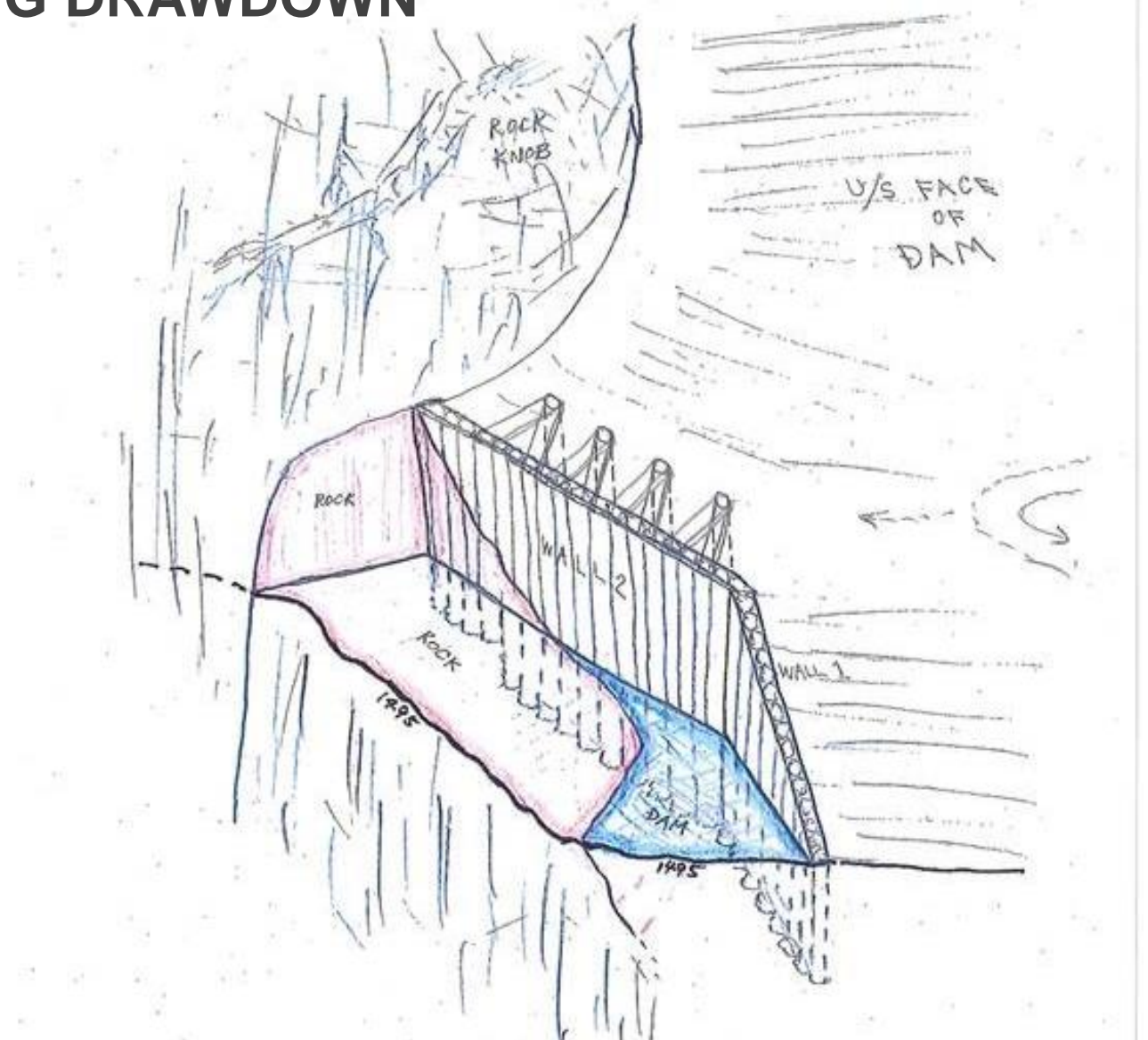


- NOTES:
1. CONTOURS DERIVED FROM AERIAL MAPPING, SURVEYED 2002.
 2. MAP PRODUCED JANUARY 2018 BY GENWP-EC-TG, G20DNJAK
 3. ELEVATIONS ARE REFERRED TO COUGAR PROJECT DATUM. TO APPROXIMATE NAVD88 ELEVATION, ADD 3.42 FEET.

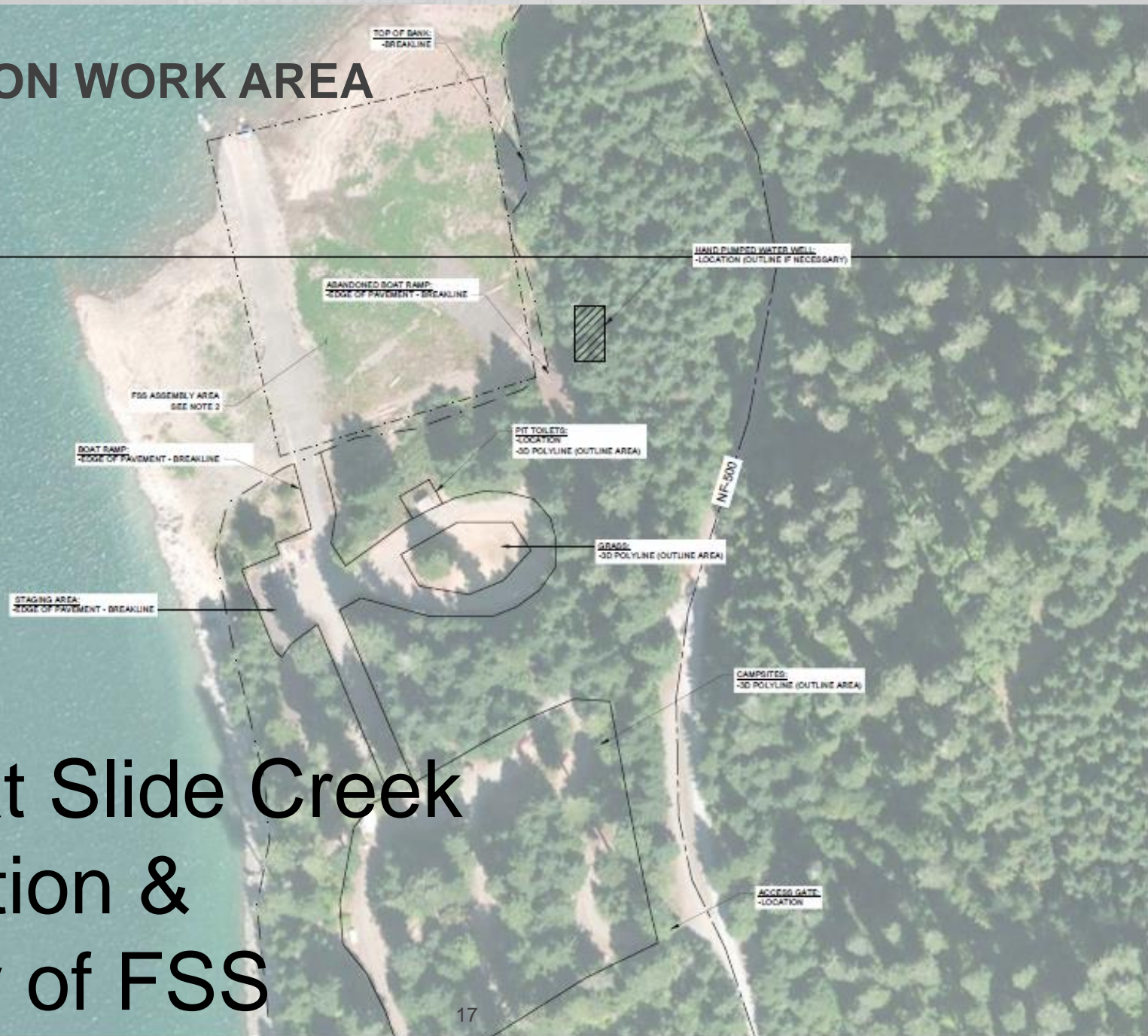


CONSTRUCTION FEATURES DURING DRAWDOWN

- Retaining wall
- Rock excavation
- Mooring structures
- Tower modifications



CONSTRUCTION WORK AREA



- Staging at Slide Creek
- Construction & assembly of FSS



SCHEDULE

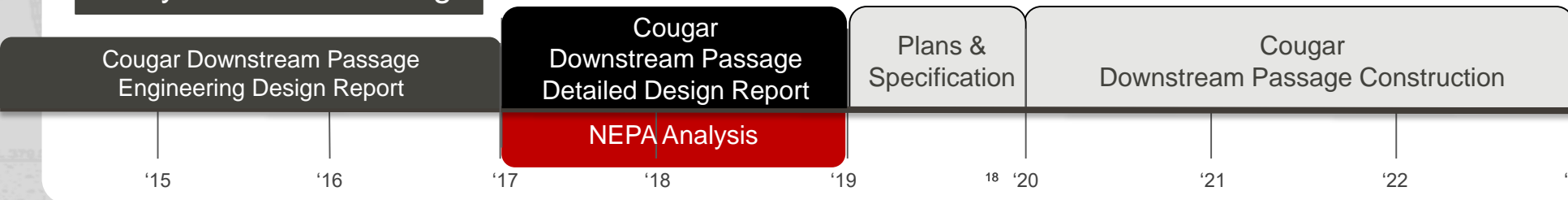
WE ARE
HERE 

Complete

- Determine problem
- Determine solutions that would solve the problem
- Initial Alternatives Analysis and Screening

- Construction Alternatives Analysis
Develop design, confirm constructability
- Environmental Impacts Assessment – NEPA public review and comment – Fall/Winter 2018
- Refine/optimize the recommended solution
- Detailed Cost Estimate

- Initial Drawdown of Reservoir to 1450' – 1 month
- Drawdown maintained at 1450' - 1 Year (~2021)
 - Temperature Control Tower Modifications for connecting Floating Screen Structure
 - Mooring construction
 - Rock removal for Floating Screen Structure (FSS)
 - Retention wall construction
 - Flow likely below minimum flow requirements (coordinating with NMFS)
- Staging/Construction at Slide Creek Campground - 2 years (~2021-2022)
 - Cofferdam off portion of near shore to construct FSS. Once complete, FSS will be floated downstream to Temperature Control Tower.
 - Will require large areas for large machinery and stockpiles



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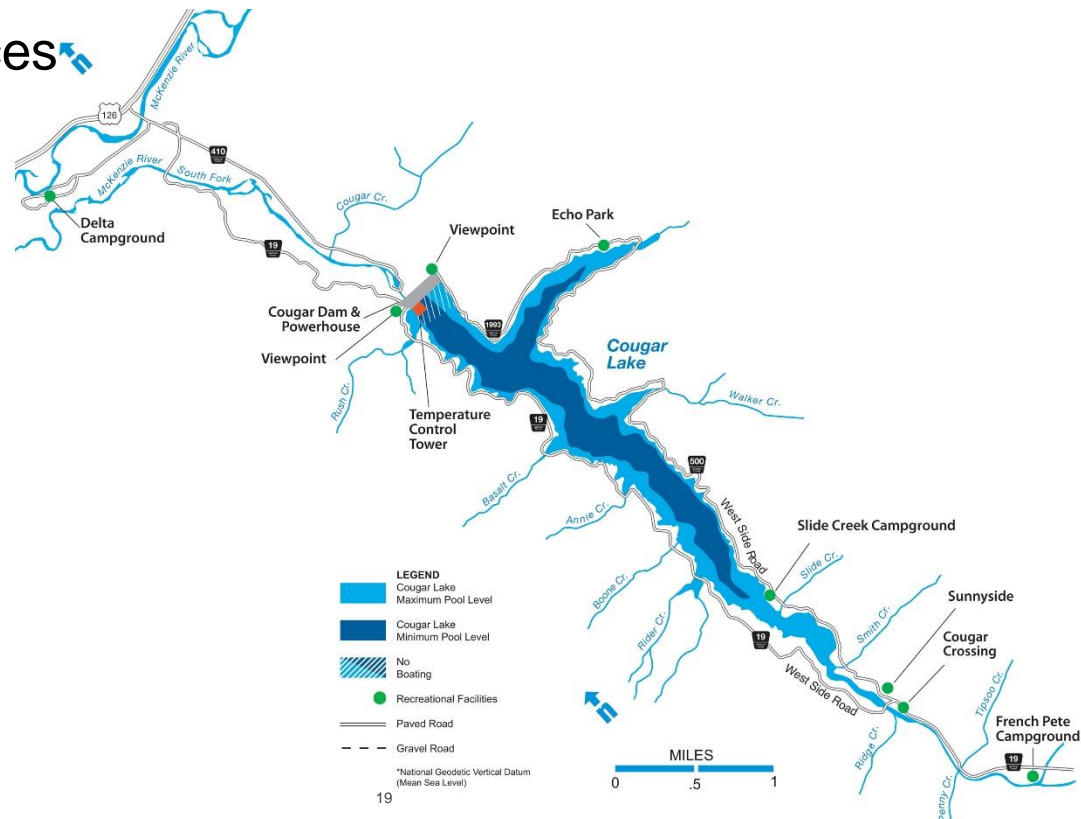
NEPA: ENVIRONMENTAL ASSESSMENT

The following will be evaluated in the EA:

- Aesthetics
- Air Quality
- Biological Environment (terrestrial and aquatic species)
- Historic and Cultural Resources
- Hydro Power
- Recreation
- Socioeconomics
- Transportation
- Water Quality
- Water Supply

This list does not reflect priority/importance of these potential impacts being evaluated.

The topics and subject matter that are evaluated may be further refined as work on the EA proceeds.



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HOW TO PROVIDE INPUT

Draft EA is planned to be available for public review in Fall, 2018.

Notice of availability will be provided via our stakeholder distribution list, facebook, and local news sources. A public meeting will be held during review period.



Input can be submitted by email:
[*cougar.fish.passage@usace.army.mil*](mailto:cougar.fish.passage@usace.army.mil)



Input can be submitted by mail:
***Kelly Janes, U.S. Army Corps of Engineers
Attn: PM-E, PO Box 2946 Portland, OR
97208-2946***



Input can be submitted in person:
Written input can be given to any project staff at public meetings



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IF YOU WOULD LIKE TO GET UPDATES ON THIS PROJECT

Send an email with the subject line:
“COUGAR DOWNSTREAM PASSAGE
DISTRIBUTION LIST”

to cougar.fish.passage@usace.army.mil



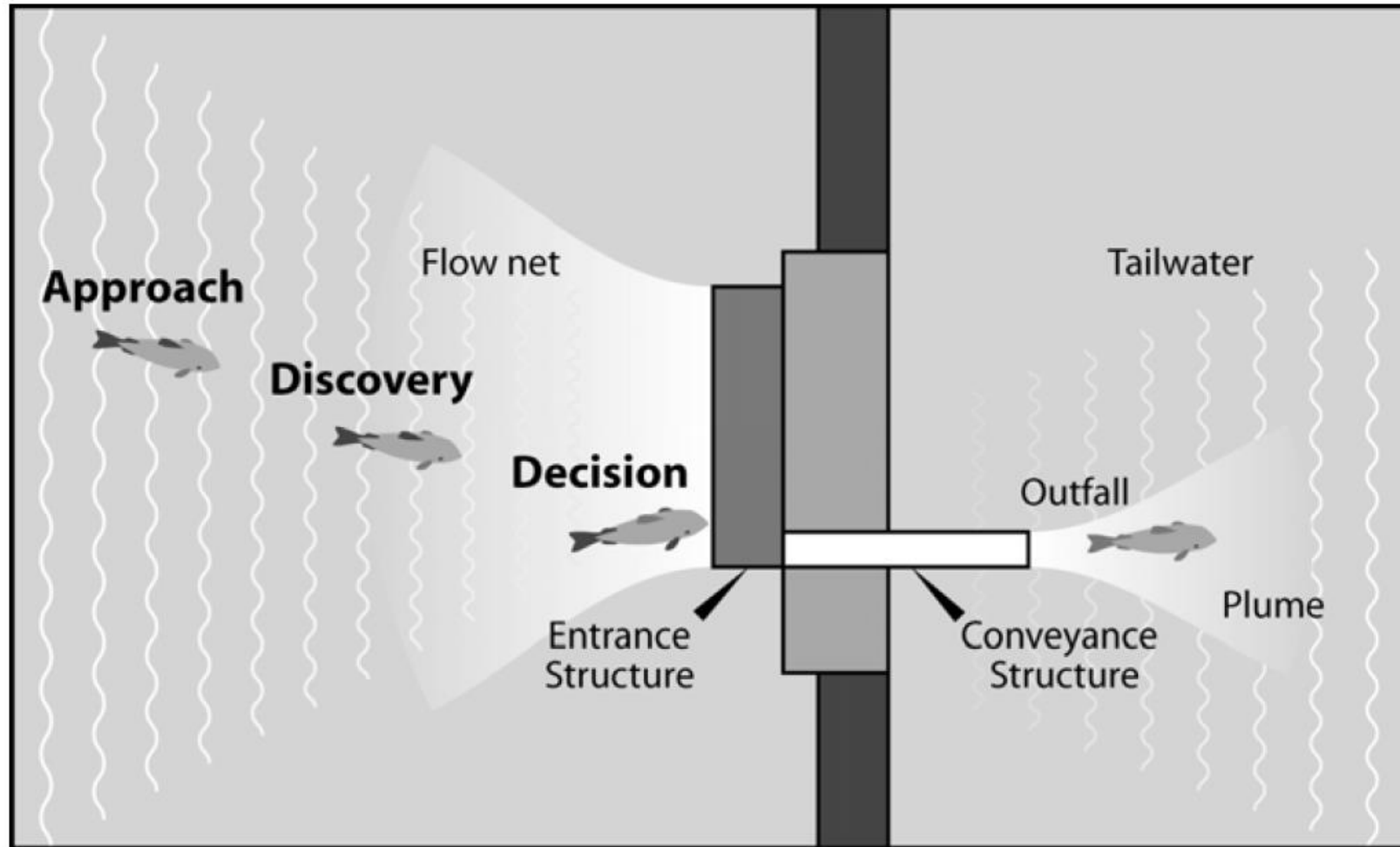
FSS TECHNICAL SLIDES



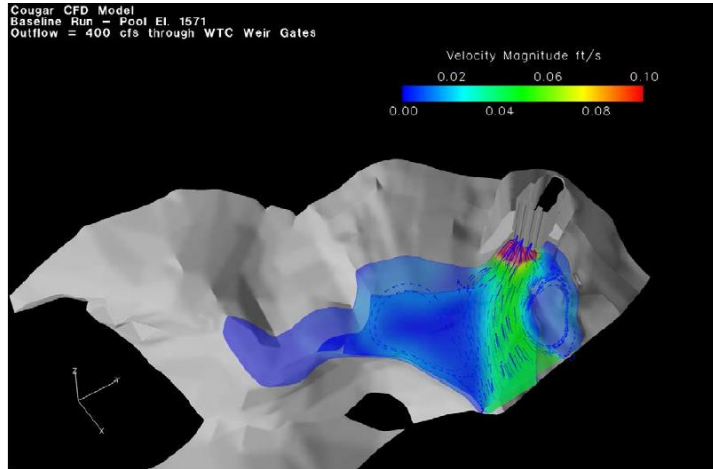
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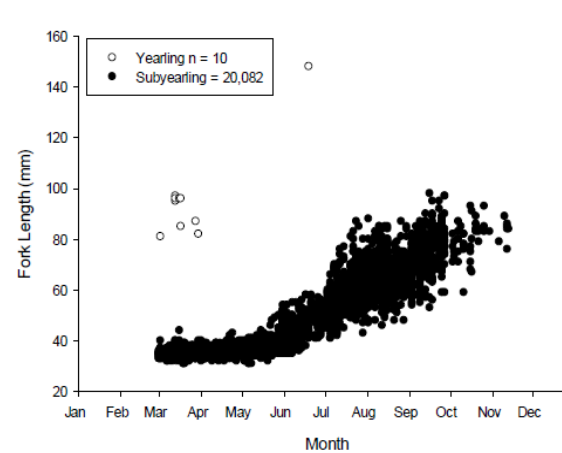
DESIGN CRITERIA BASED ON LIFE HISTORY TACTICS: SALMON ARE SURFACE ORIENTED AND ATTRACTED TO FLOW



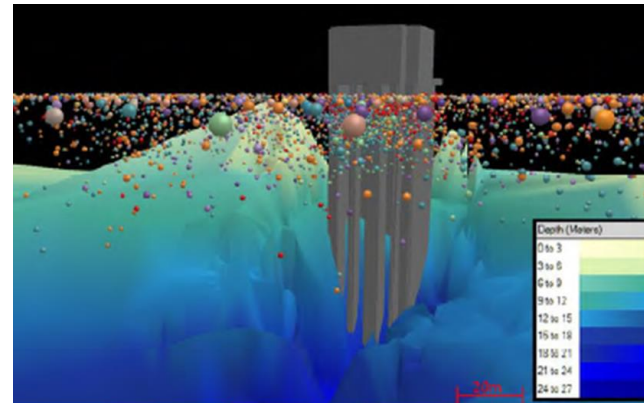
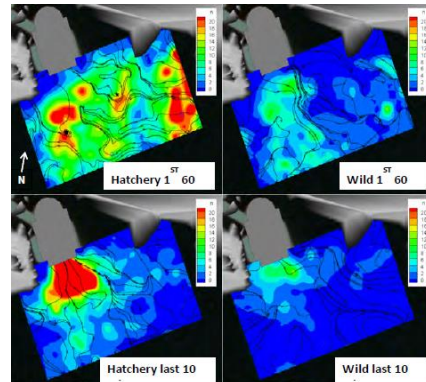
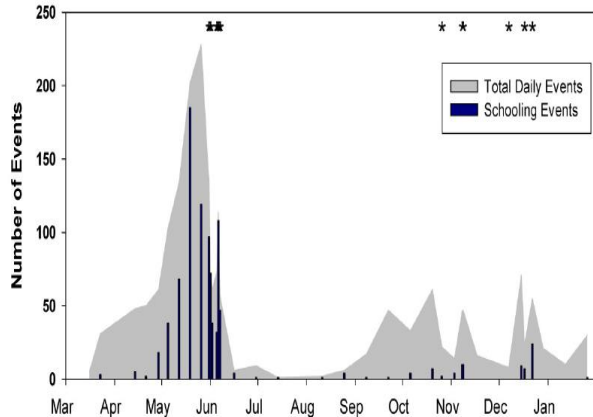
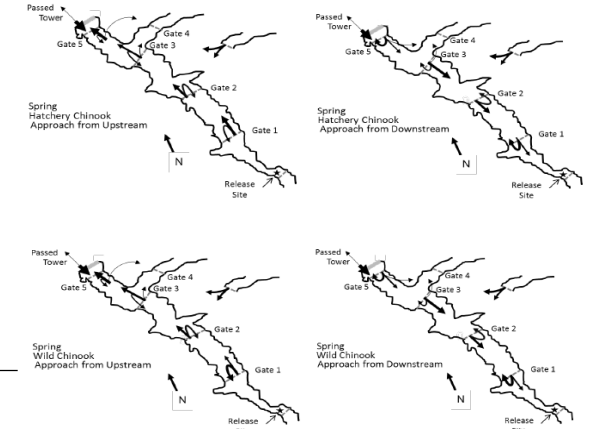
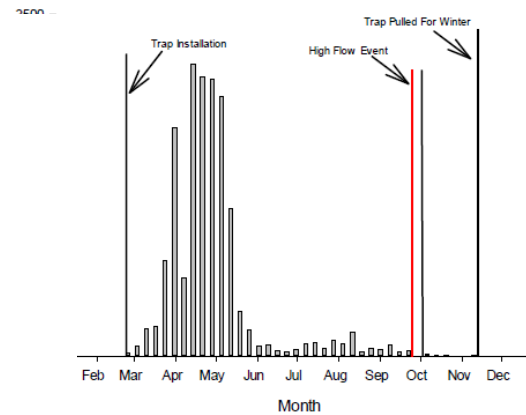
QUANTITATIVE ANALYSIS TOOLS



Computational Fluid Dynamics to model surface flow velocity



Biological monitoring to migration timing and the probabilities of fish movements through the reservoir



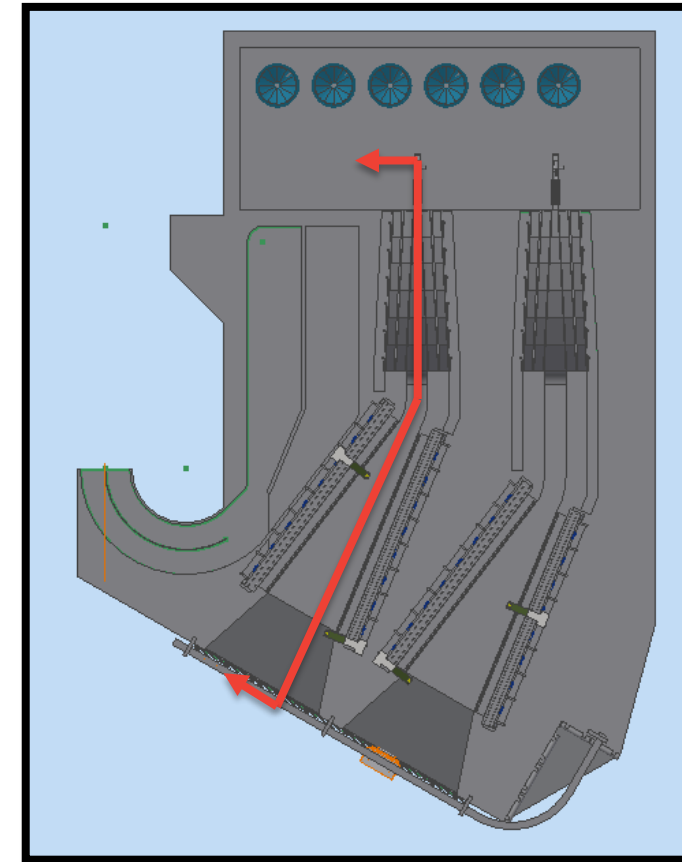
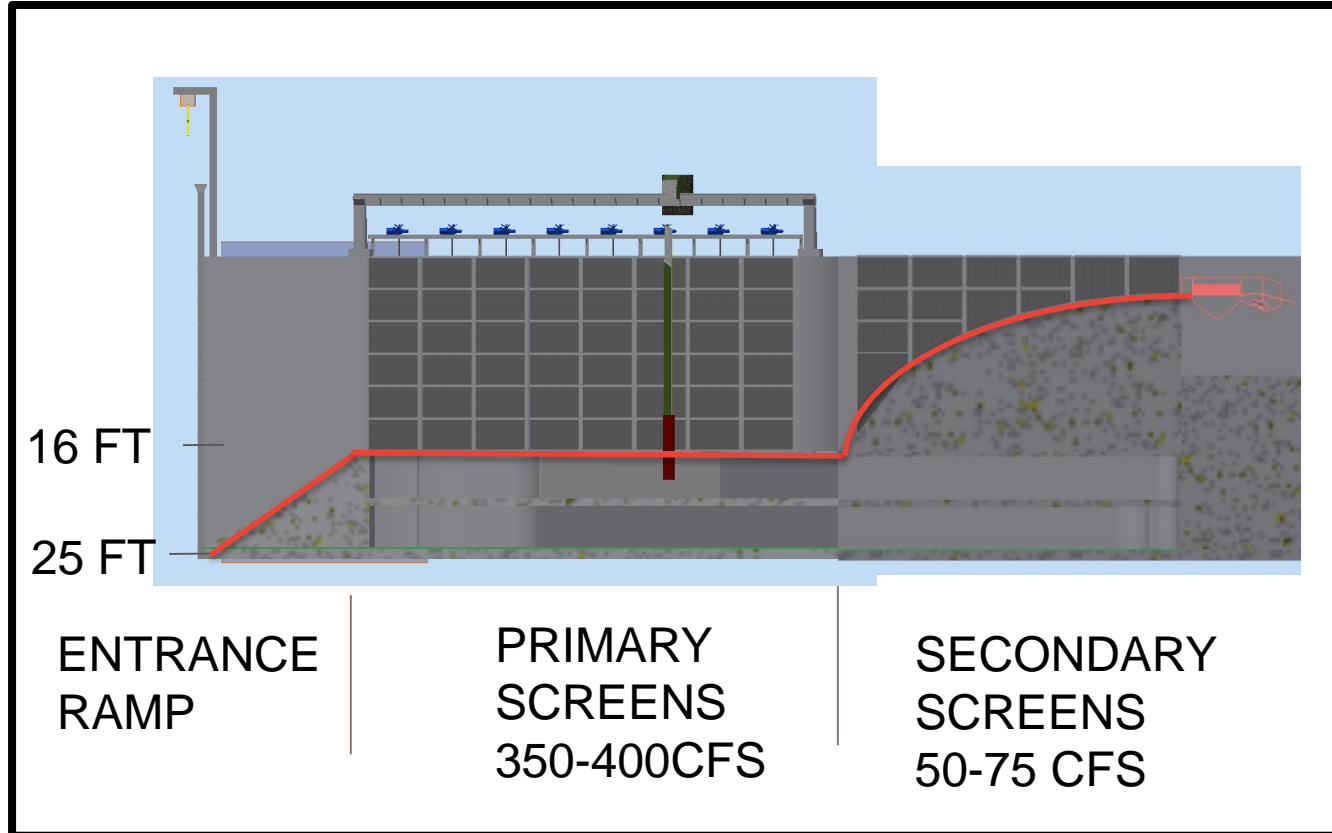
Biological monitoring to determine fish congregation and reservoir depth



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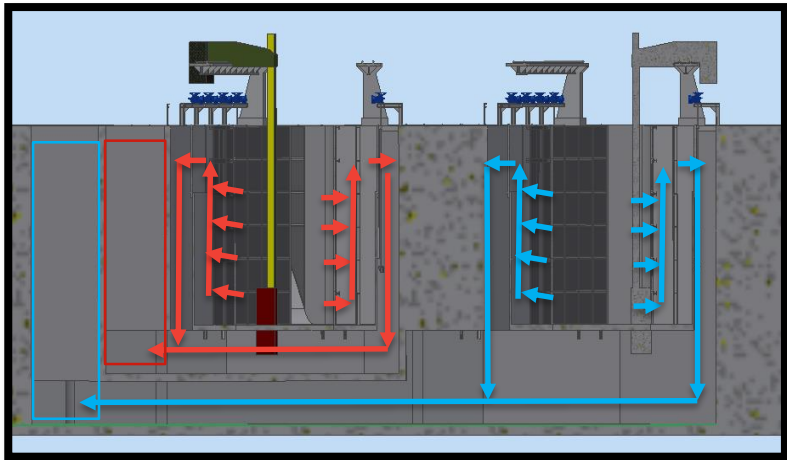


ENTRANCE SHAPE & CONFIGURATION

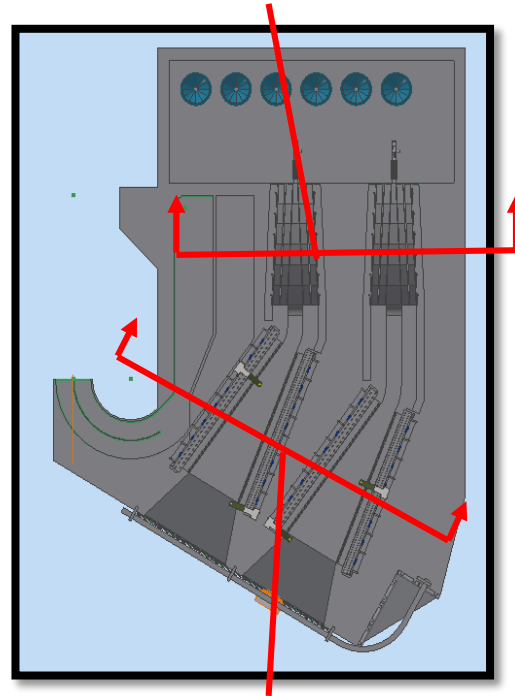


WATER MOVEMENT THROUGH SYSTEM

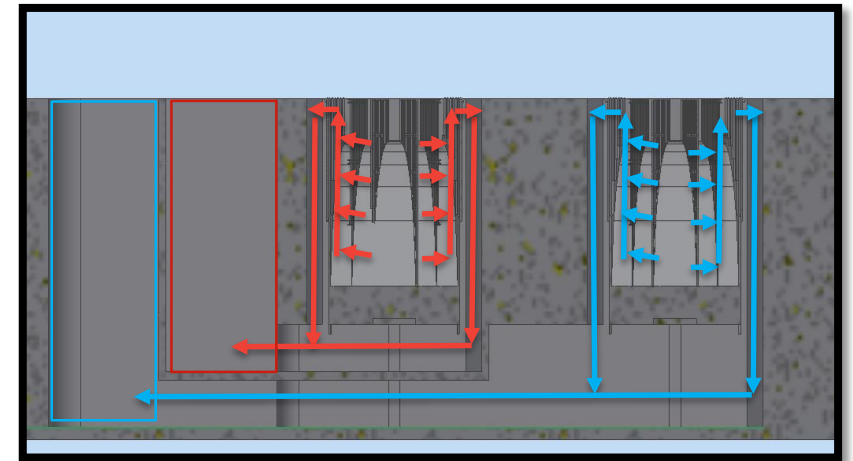
SECONDARY DEWATERING



PRIMARY DEWATERING



PRIMARY DEWATERING



SECONDARY DEWATERING



FISH MOVEMENT THROUGH SYSTEM

