BEAR CREEK DAM & RESERVOIR
WATER SUPPLY REALLOCATION STUDY

Agency/Public Scoping Meeting
14 October 2021

US Army Corps of Engineers
Omaha District

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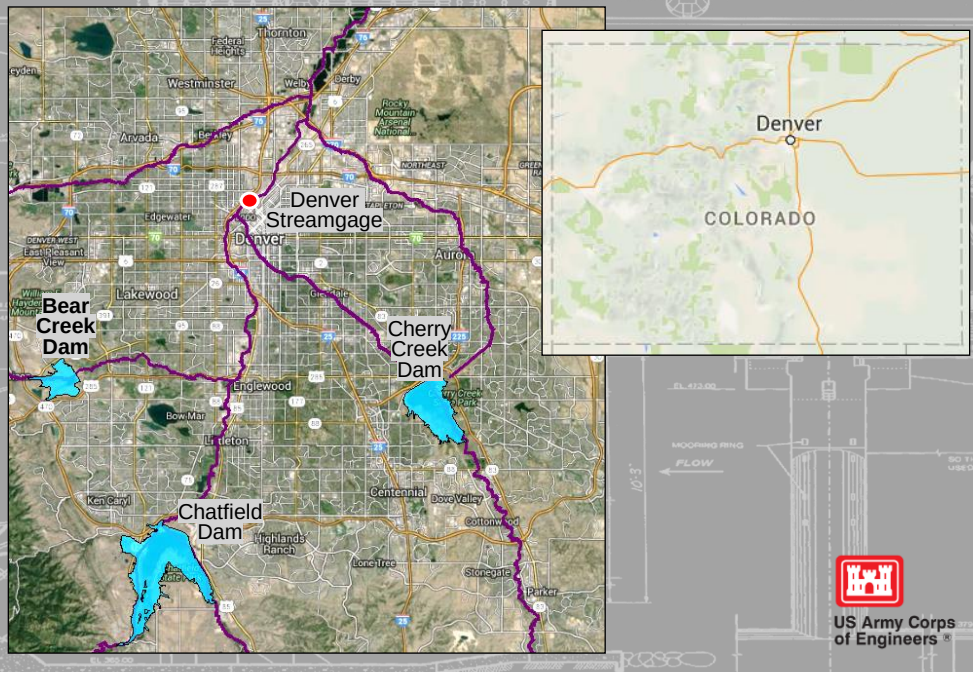
PROJECT LOCATION



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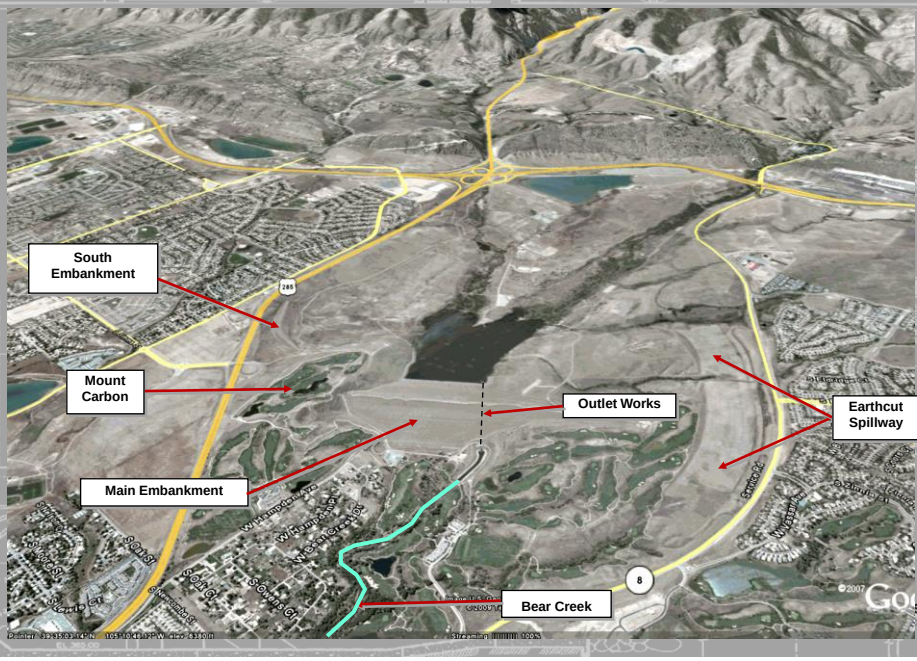
PROJECT FEATURES



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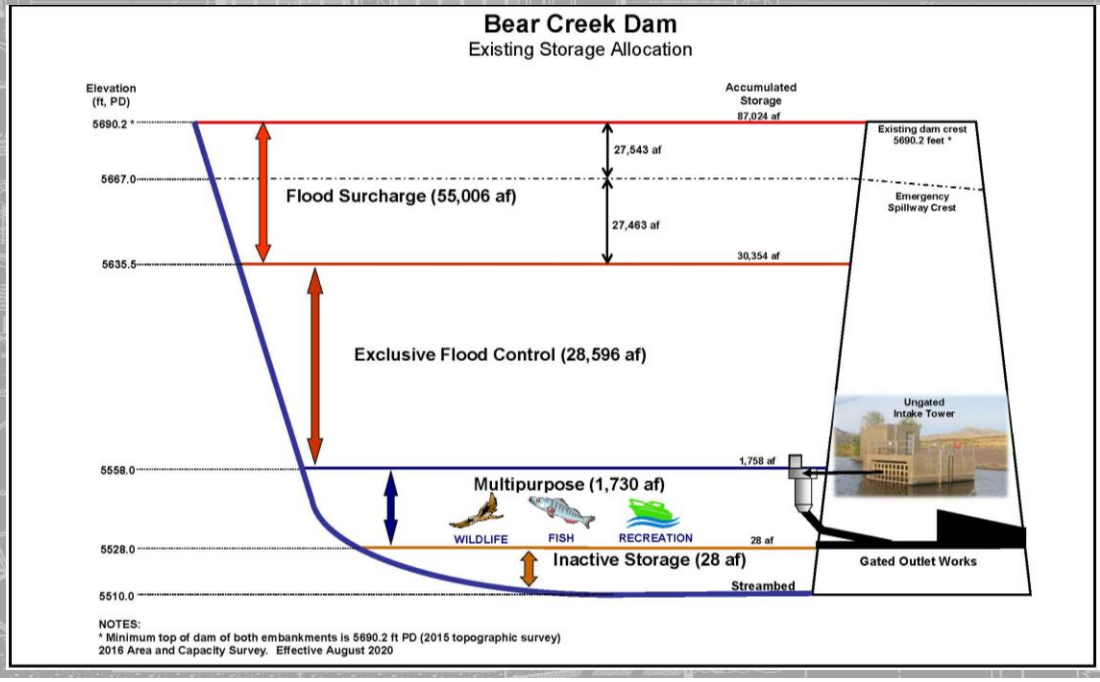
RESERVOIR POOL ZONES



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STUDY PURPOSE & NEED

- Problem: State of Colorado has identified significant water supply shortfall statewide – 400K ac-ft by 2050.
- Colorado Water Conservation Board (CWCB) requested study to determine whether storage in Bear Creek Reservoir can be reallocated to water supply.
- Bear Creek Dam is Dam Safety Action Classification (DSAC) 3 dam; current authorized purposes are flood risk management, fish and wildlife enhancement, and recreation.
- Due to DSAC 3 classification, USACE was required to request exception from ER 1110-2-1156, Safety of Dams – Policy and Procedures, which restricts reallocation studies at dams with DSAC 1, 2, or 3 ratings. Exception was granted 23 May 2018.

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STUDY BACKGROUND

- Feasibility Cost Sharing Agreement for study executed between USACE and CWCB on 30 August 2019.
- 1st Iteration Planning Meeting held with CWCB, Colorado State Engineer, and City of Lakewood on 07 October 2019.
- Study suspended at CWCB's request from November 2019 to June 2021 to address concerns regarding dam safety considerations related to reallocation and questions regarding estimation of probable maximum precipitation and Inflow Design Flood (IDF).
- 2nd Iteration Planning Meeting held with CWCB, Colorado State Engineer, and City of Lakewood on 31 August 2021.

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PUBLIC SCOPING MEETING

This Public Scoping Meeting is being conducted to solicit public input prior to establishment of initial array of alternatives for consideration in study.

USACE requests public input regarding:

- Potential benefits of reallocation.
- Potential impacts of reallocation.
- Potential study outcomes you would like to see realized or avoided.
- Any other aspects of study.

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STUDY OPPORTUNITIES

- May be opportunity to reallocate storage in Bear Creek Reservoir to water supply, helping reduce risk of future water supply shortfall.
- May be opportunity to store agricultural augmentation water in Bear Creek Reservoir for future use.
- May be opportunity to improve reservoir water quality and/or prevent Bear Creek downstream of Bear Creek Dam from running dry in drought periods by incorporating environmental considerations.
- IDF can be updated to better understand dam safety risk and allow for more accurate analysis of alternatives.
- Bear Creek Reservoir's location directly on Bear Creek and Turkey Creek allows for immediate capture of all available flows that may legally be stored.
- Bear Creek Reservoir's location at relatively high elevation within basin affords opportunity to deliver any stored water by gravity flow.

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STUDY OBJECTIVES

- Evaluate availability of existing storage in Bear Creek Reservoir, including consideration of potential for updated hydrologic analysis to change IDF.
- Determine whether there is Bear Creek Reservoir storage available that can be reallocated to water supply and/or whether it may be technically and economically feasible to modify Bear Creek Project to create additional storage for water supply. Note that project modifications could include physical modifications (e.g. raise dam) or operational modifications (e.g. modify Water Control Plan).

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STUDY CONSTRAINTS

- Bear Creek Dam's current DSAC 3 rating may limit opportunities for water supply reallocation. Reallocation may require measures to address dam safety issues.
- Bear Creek Dam's primary authorized purpose is Flood Risk Management (FRM), and any impacts of water supply reallocation on FRM, including transfer of flood risk to other dams or basins (e.g. Chatfield or Cherry Creek), must be carefully considered.
- Any potential increase to overall project risk (e.g. increased loading of Bear Creek Dam due to higher reservoir pool) must be carefully considered. Updated risk assessment will be required to ensure that any changes in overall project risk are acceptable.
- Any water supply reallocation alternative must comply with all applicable laws and policy requirements, including requirements to mitigate any environmental, cultural, or recreational resource impacts.

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STUDY CONSIDERATIONS

- Impacts to recreational resources could significantly affect character of Bear Creek Lake Park. Although impacts must be mitigated, maintaining park's overall character (e.g. land-based vs. water based) may be difficult.
- Water supply reallocation could result in increased reservoir hypolimnetic volume, which could adversely impact reservoir water quality. Increased reservoir use by waterfowl could result in increased E. coli/fecal coliform bacteria contamination.
- Existing sewer pipe crossing over Bear Creek downstream of Bear Creek Dam constrains flows to approximately 500 cfs, especially with debris blockages, limiting current release capacity of dam.
- Harriman Ditch pipe that runs under Turkey creek could be impacted by water supply reallocation, depending on whether/how much reallocation raises normal reservoir pool level.

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POTENTIAL WATER SUPPLY REALLOCATION MEASURES

Retained for Further Consideration

No Change

1. No action.

Increase Reservoir Capacity & Normal Operating Pool (up to 20,000 ac-ft)

2. Structural modifications to dam (e.g. dam raise and spillway raise) to increase reservoir storage for water supply.
3. Excavate reservoir (remove accumulated sediment or deepen reservoir) to increase in-pool storage for water supply.
4. Excavate forebays upstream of reservoir to increase storage capacity for water supply.

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POTENTIAL WATER SUPPLY REALLOCATION MEASURES

Retained for Further Consideration

Trade-off Purposes/Increase Normal Operating Pool (up to 20,000 ac-ft)

5. Reallocation of reservoir storage from flood control and/or flood surcharge zones to conservation zone for water supply.

Trade-off Purposes/Do Not Increase Normal Operating Pool

6. Reallocation of reservoir storage from multipurpose zone to conservation zone for water supply.

Operational Changes (Release More Water/Release Water Sooner)/Increase Normal Operating Pool

7. Structural modifications to dam (e.g. lower spillway, widen spillway, raise spillway with fuse plug, modify outlet works) to increase dam freeboard.
8. Modify reservoir Water Control Plan and Tri-Lakes System Regulation Plan to release more water sooner to increase dam freeboard.

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POTENTIAL WATER SUPPLY REALLOCATION MEASURES

Retained for Further Consideration

Nonstructural

9. Nonstructural measures downstream of dam (e.g. floodproofing or relocation of structures) to decrease consequences.

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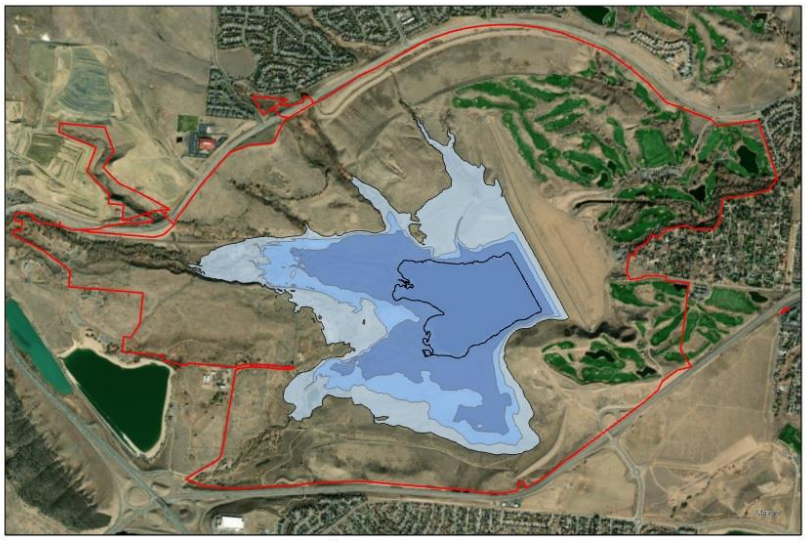
POTENTIAL INUNDATION AREAS FOR REALLOCATION



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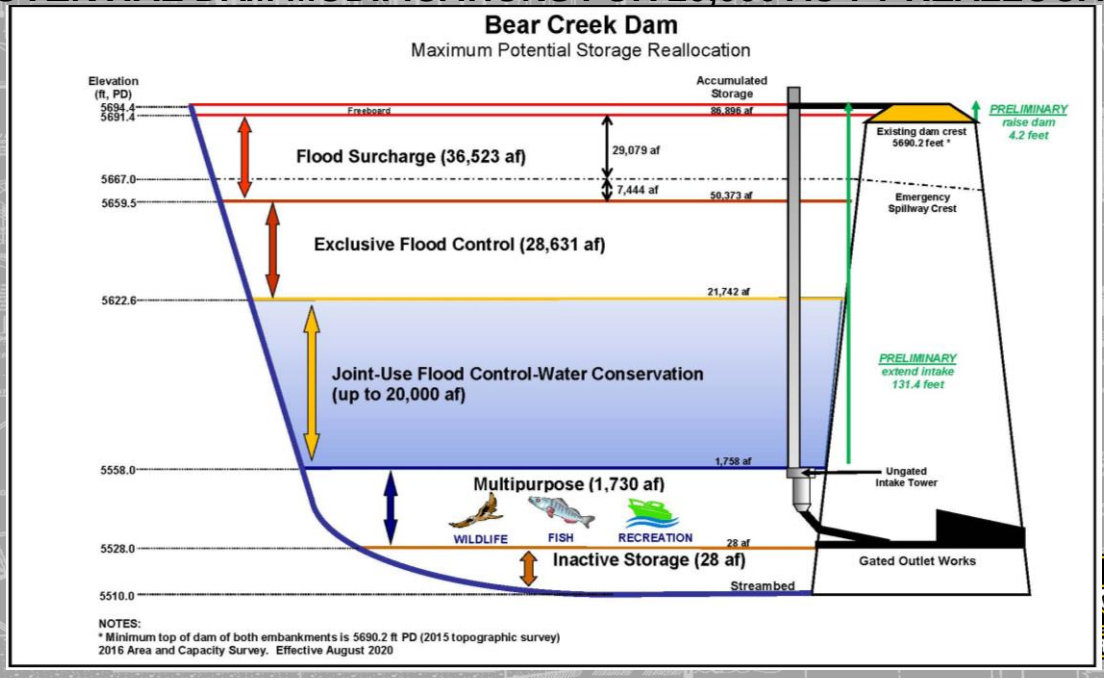
POTENTIAL DAM MODIFICATIONS FOR 20,000 AC-FT REALLOCATION



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REALLOCATION STUDY & QRA EXPECTED OUTCOMES

- Reallocation Study:
  - Determine availability of water to reallocate (storage-yield analysis, etc.);
  - Determine cost of storage and any required mitigation measures;
  - Compare to cost of other water supply alternatives to evaluate economic feasibility;
  - Analyze environmental, recreational, and cultural resource impacts;
  - Determine whether reallocation can be recommended.
- Quantitative Risk Assessment (QRA):
  - Update hydrologic analysis to support QRA;
  - Update Potential Failure Modes Analysis (PFMA);
  - Perform QRA to better characterize existing conditions dam safety risk;
  - Perform QRA to evaluate potential dam safety risk of alternative reallocation plans;
  - Determine whether reallocation can be recommended.

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ENVIRONMENTAL RESOURCES

- Reference Information:
  - USFWS Information for Planning & Consultation (IPaC) Report
    - No critical threatened/endangered (T/E) species habitat in directly affected area.
    - Six known T/E species may be in directly affected area.
    - At least 14 migratory birds with varying breeding seasons may be in directly affected area.
    - Downstream extent of effect under consideration.
  - National Wetlands Inventory indicates at least eight different types of wetlands in directly affected area.
- Geographic Information System (Desktop) Analysis:
  - Used data from USFWS, imagery from USDA, and approximate inundation extents.
  - No Action alternative has no impacts as nothing would be done to address purpose and need of project.

Alternative	550 ac-ft	10,000 ac-ft	20,000 ac-ft
Stream Length	721 ft	3,886 ft	5,813 ft
Wetlands	2.55 acres	50.59 acres	72.29 acres

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RECREATIONAL RESOURCES

- City of Lakewood provided detailed assessment of potential recreational resource impacts by reallocation alternative.
- Analysis of recreational resource impacts will be performed in coordination with City of Lakewood.

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STUDY SCHEDULE

- September 2019 – Study start
- October 2019 – First Iteration Planning Meeting
- November 2019 – June 2021 – Study suspension requested by CWCB
- August 2021 – Second Iteration Planning Meeting
- October 2021 – Public Scoping Meeting
- November 2021 – Alternatives Milestone Meeting
- Schedule beyond November is to be determined, but study is expected to take approximately three years to complete.

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PUBLIC INVOLVEMENT

Provide your feedback regarding water supply reallocation, including:

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- Any other aspects of study.

Mail or E-Mail Comments or Questions

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THE CONTACT INFORMATION ON THIS SLIDE IS OUTDATED
CURRENT CONTACT INFORMATION ON NEXT SLIDE

PUBLIC INVOLVEMENT

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Mail or E-Mail Comments or Questions

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