

Barton Springs Master Plan: Next Steps for Improving Flow Regime --  
Feasibility Study for Water Quality/Flow Regime Improvements



# Barton Springs Master Plan

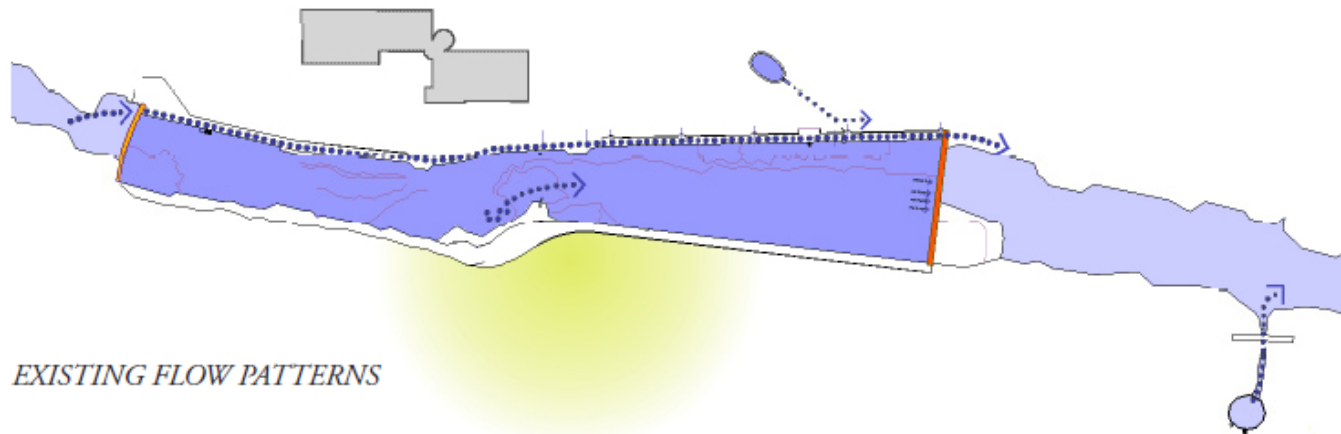
## BARTON SPRINGS POOL MASTER PLAN

*Concepts for Preservation and Improvement*



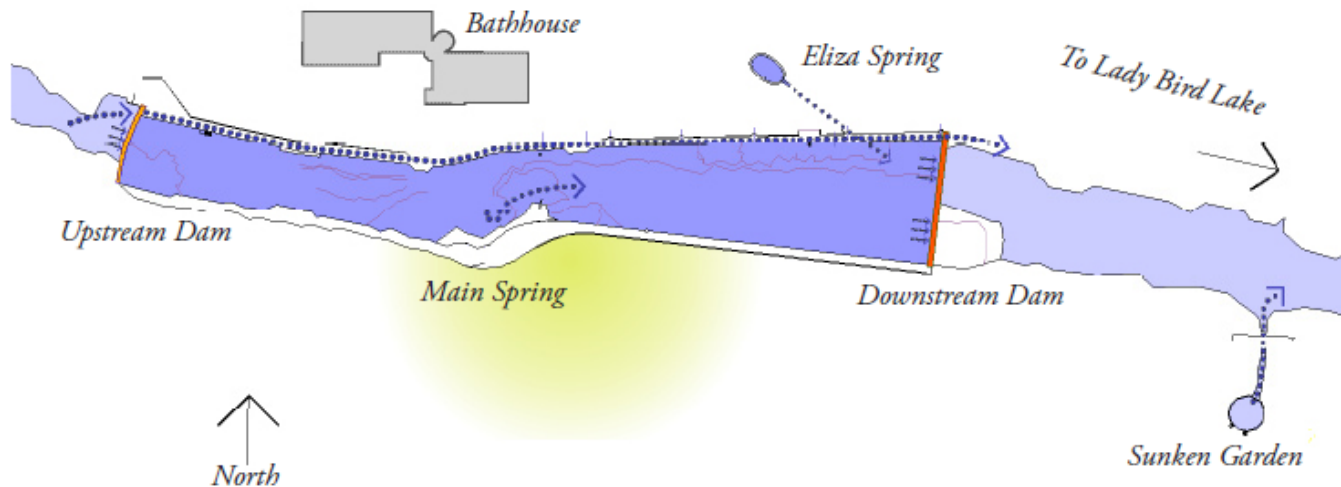
“Both swimmers and the endangered salamander prefer more stream-like conditions, therefore, improving the flow regime was identified from the beginning as an important goal of this master plan.”

# Barton Springs Master Plan



*EXISTING FLOW PATTERNS*

*“Conceptually, improvements to the flow regime might include creating new openings in the upstream dam, adding and relocating openings in the downstream dam and reconnecting the waters of Eliza Spring to the main body of the Pool.”*



*FLOW REGIME IMPROVEMENT CONCEPTS*

# Barton Springs Master Plan

*The recommendations are separated into short-term and long-term recommendations.*

Short-term recommendations were funded by the City Council in September, 2007, and included items in five categories:

#### *Water Quality Improvements*

- Remove gravel bar
- Replace bypass tunnel inlet grate
- Repair bypass tunnel joints
- Renovate Sunken Garden (part 1)

#### *Water Quality Studies*

- Topographic survey
- Hydrodynamic modeling
- Structural testing of dams
- Pilot study for water recirculation at beach
- Pilot study to determine effects of creek flows on pool water quality
- Pilot study for ultrasonic algae control

#### *Pool Cleaning Improvements*

- Additional electrical power at pool side
- New pump to increase water pressure and facilitate cleaning
- New algae skimmer
- Disposal for silt and nuisance algae

#### *Grounds Improvements*

- Tree assessment and treatment
- General grounds improvements
- New accessible route on south side and evaluation of existing accessibility improvements on north side
- Interpretive plan

#### *Building Improvements*

- Rehabilitate existing bathhouse (part 1)

Long-term recommendations are not currently funded, and include items in three categories:

#### *Water Quality Improvements*

- Flow Regime Improvements
- Renovate Eliza Spring
- Renovate Sunken Garden (part 2)

#### *Grounds Improvements*

- Rehabilitate Zilker Ponds
- "Dog Park" Improvements
- Further downstream improvements
- General grounds improvements, north side
- General grounds improvements, south side

#### *Buildings*

- Rehabilitate the existing bathhouse (part 2)
- Build a new south bathhouse

Short Term and Long Term Water Quality Improvement Recommendations

## Barton Springs Master Plan

*THOUGHTS ON THE EXISTING DAMS: Modifications to the existing dams have good potential to improve the flow regime. The purpose of the hydrodynamic modeling is to determine which of the studied design alternatives will yield optimal improvements.*

*One obvious solution that should be contemplated is to reintroduce openings to the upstream dam. Historically the upstream dam had three openings, but those were closed in 1975 as part of the bypass tunnel construction. Since then, creek flow has been entirely eliminated from the Pool, except when flood waters overtop the dam. During certain conditions, the waters in the creek are as clean as the waters in the Pool (source: Watershed Protection staff). Running them through the Pool could be beneficial to plant or invertebrate species in the Pool, and assist with algae management.*

*New openings in the downstream dam could also improve flow conditions in the Pool. New gates in the lower reach of the dam could enhance self-scouring and cleaning along the bottom of the Pool, mitigating some sediment build up. At the same time, it is important to realize that dam engineers caution that operable gates are more susceptible to being jammed in the open position, the closer they are placed to the bottom. They also warn against excessive optimism regarding sediment scouring potential, generally suggesting that scouring will be most prevalent near the openings.*

*For the planning team, these observations serve as reminders that the hydrodynamic modeling/schematic design process will grapple with a complicated set of factors, and that proposals for change should be offered cautiously.*

“Thoughts on the Existing Dams” from *Master Plan* (p. 65)

# Barton Springs Master Plan

Status of Barton Springs Pool Master Plan Recommendations on Flow Regime and Water Quality Improvements:

- Short Term Recommendations - Completed.
- Long Term Recommendations - Can Now Begin.

Next Steps: With the Short Term Project studies completed, the Long Term recommendations for a dam design work flow should start with a Feasibility Study for Water Quality/Flow Regime Improvements to explore conceptual designs and performance specs for different scenarios to improve the flow regime and water quality at Barton Springs Pool with possible dam changes including:

- (1) upstream dam modifications (e.g., "create operable openings") that were envisioned as occurring before any downstream dam modifications; and
- (2) downstream dam modeling/design improvements to study solutions that use, modify, or replace the existing dams, and if the results suggest that more appropriate solutions to improve the flow regime and water quality can be found with more aggressive solutions, like replacing or relocating the dams, then the study process should be halted and a process of public disclosure of the study results should be undertaken.

Project Status: Barton Springs Flow Regime/Water Quality Improvements

# Barton Springs Master Plan

The hydrodynamic design work should flow as follows:

- ✓ 1. City Watershed staff should conduct Pilot Studies, with results communicated to hydrodynamic design team.
- ✓ 2. A scientific team should be created whose charge is to provide scientific leadership and advice to this project. This can be any combination of in-house City Watershed expertise or outside consultants. It will likely include City Watershed engineers, geomorphologists experienced with fluvial processes and other professionals as may be deemed appropriate and necessary.
- ✓ 3. The scientific team should establish the goals for the modeling exercise that should include flow, temperature and other relevant criteria.
- ✓ 4. The hydrodynamic design team should write proposal criteria for a topographic survey. City of Austin should commission the survey.
- ✓ 5. With the topographic survey in hand, the hydrodynamic design team should write a proposal for a flood study. City of Austin should commission the study.
- ✓ 6. The hydrodynamic design team should write proposal criteria for structural testing of dams. City of Austin should commission the testing.
- ✓ 7. The hydrodynamic design team should install temperature and vector sensors in the Pool to gather information on temperature stratification and flow direction, as may be appropriate.
- 8. Using the gathered information and working with the criteria developed by the scientific team, the hydrodynamic design team should test flow regime improvement concepts. Concepts should include flow-regime impact of skimmer. Results should be evaluated by the scientific team, so that modified concepts can be identified and tested as required.
9. At regular intervals, and as promising concepts are developed, the public should be informed, and public input should be sought.
10. Final recommendations should be published in anticipation of future implementation funding. If, however, results are inconclusive or if they point to the need to replace dams, the public should be informed, and—with significant public input—a full range of options should be explored.

Dam Design Work Flow Recommendations from *Master Plan* (pp. 211-212)

## Barton Springs Master Plan

“One of the primary goals of this master plan is try to find ways to positively alter the flow regime to improve conditions for the salamanders and to disrupt the growth of nuisance algae. An improved flow regime should also improve the experience for swimmers....

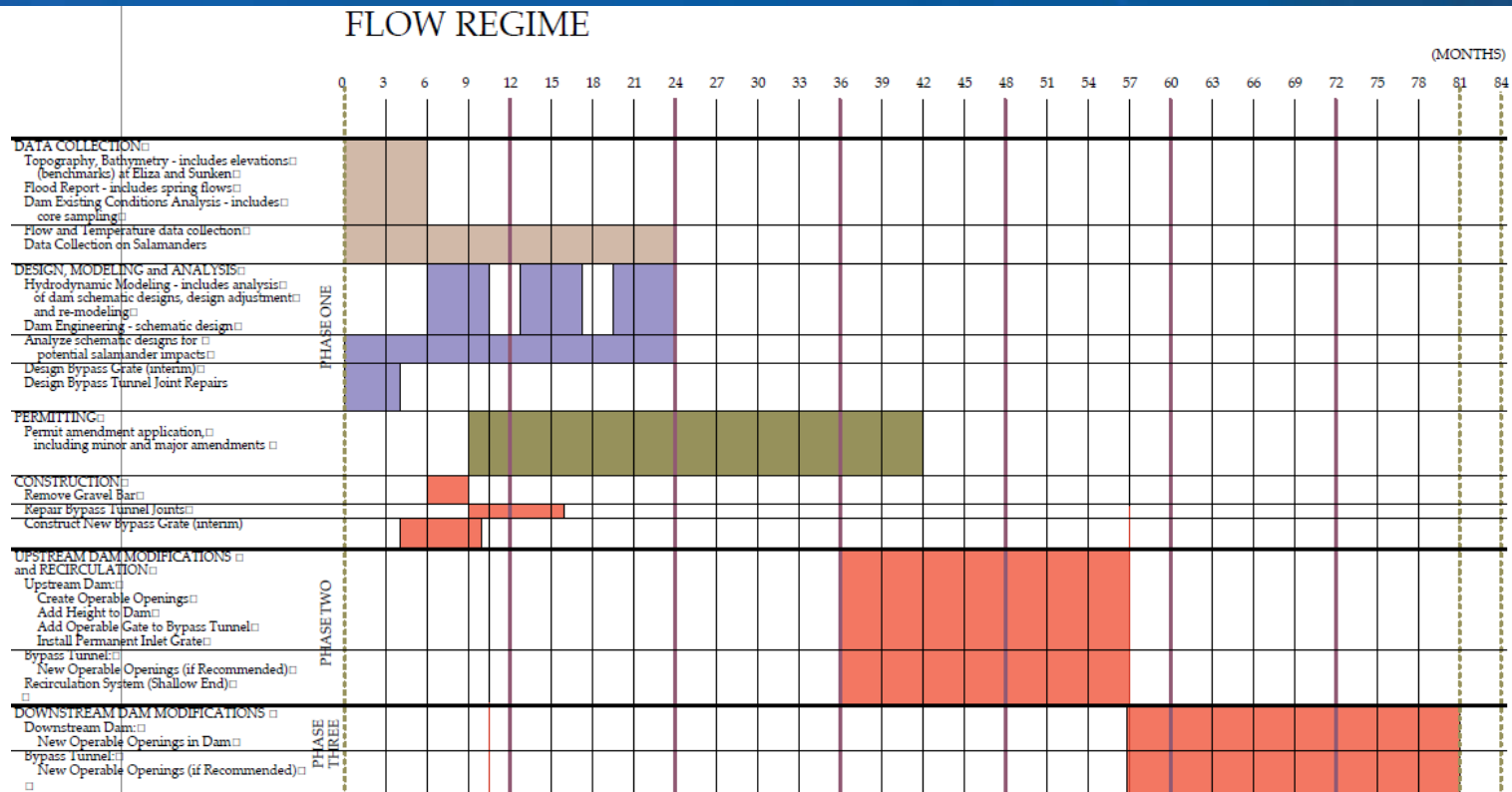
[T]his plan recommends that this modeling/design process first study solutions that use the existing dams. After that, should the results of this effort suggest that more appropriate solutions can be found **with more aggressive solutions, like replacing or relocating the dams**, then the study process should be brought to a halt, and a process of public disclosure of study results should be undertaken. Only in light of clear public direction, should other alternatives be studied.

While this work will not directly result in construction work, it should certainly be expected that it might propose some. With this in mind, the modeling/schematic design team should consult with regulatory officials on the permitting implications of preferred solutions.” *Barton Springs Master Plan*, pp. 70-72.

Master Plan Recommendations: Look at existing dams to improve flow regime, and if that doesn't work, then study design options for replacing/relocating the dams.



# Next Step: Feasibility Study



Next Steps: Conduct Feasibility Study for Water Quality/Flow Regime Improvements, including (1) upstream dam modifications (e.g., “create operable openings”) and (2) dam modeling/design process which will first study solutions that use, modify, or replace the existing dams with full public input, followed by consideration of replacing or relocating dams. **With broad stakeholder support from Bill Bunch (SOS Alliance), Save Barton Creek Association, Friends of Barton Springs Pool, and Barton Springs Conservancy,** we recommend a Feasibility Study as a cost-effective way to move this process forward that would be appropriate for the current status of the design efforts and the guidance from the Barton Springs Master Plan.

## WPD BSP Master Plan Memo

WPD Memo: “Given the results of all studies, Watershed Protection does not recommend pursuing additional feasibility studies or dam modifications. There is insufficient evidence to support significant improvements to flow regime, salamander habitat and pool water quality. Given other priorities of WPD and greater benefits of improvements at other salamander sites, WPD will not be pursuing any further action on BSP dam modifications. Should there be other drivers for dam modifications (e.g. future dam deterioration, desire to change conditions for swimmers), the Parks and Recreation Department would take the lead on directing the dam modifications. WPD would partner with PARD to optimize the dam conditions for salamander habitat, water quality and sediment movement.”

Stakeholder Response: If flow regime/water quality improvements can not be achieved with the current dams, then the Master Plan explicitly recommends that other options for replacing or relocating the dams be considered since “improving the flow regime” was identified from the beginning as an important goal of the Master Plan. In particular, the dam modeling/design process should “first study solutions that use the existing dams” (as we have thus far), and “[a]fter that, should the results of this effort suggest that more appropriate solutions [for improving the flow regime] can be found with more aggressive solutions, like replacing or relocating the dams, then the study process should be brought to a halt, and a process of public disclosure of study results should be undertaken. Only in light of clear public direction, should other alternatives be studied.” *See, Master Plan, pp. 71-72.*