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F.E. Walter Reservoir Water Quality Sampling Program & Environmental Considerations

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- **Project Environmental Resources**
- **Environmental Considerations -
Reservoir Pool Elevation and Release
Changes**
- **Minimize Negative Risk Potential and
Maximize Benefits**
- **Monitoring Plan and Water Quality
Modeling**



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Francis E. Walter Reservoir: A Diverse and Thriving Environment

Total project acreage of 2,949 acres

-Numerous stream and river miles

Lehigh River, Bear Creek, Shades Creek,
Stony Run, Lime Hollow, Whitehouse Run,
Cider Run...

-PA Wild and Scenic River System downstream

-Threatened and endangered species and habitat

-Riparian, wetland, and terrestrial plant
communities



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Francis E. Walter Reservoir: A Diverse and Thriving Environment

-Aquatic, riparian, wetland, and terrestrial
wildlife and habitat

-Outdoor recreation

Angling (land and water craft)

Rafting/Boating

Hunting

Hiking

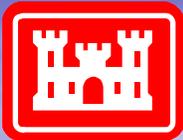
Others....



Francis E. Walter Reservoir



One Corps Serving the Army and the Nation



Pennsylvania Fish and
Boat Commission
Reservoir and River Fish
Stocking Efforts





Walter Reservoir Wildlife- Timber Rattlesnake





Walter Reservoir Wildlife- Small Footed Bat





Walter Reservoir
Wildlife-

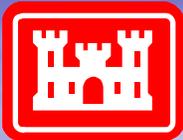
Osprey





Walter Reservoir Wildlife- Red Fox





Walter Reservoir Wildlife- Black Bear





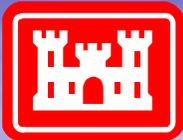
Walter Reservoir Wildlife- Whitetail Deer





Reservoir Environmental Resources- Stream Habitat





Reservoir Environmental Resources- Wetlands





Walter Reservoir Wildlife- Redtail Hawk





Walter Reservoir Wildlife- Bald Eagle





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Environmental Considerations Associated With Reservoir Pool Elevation and Release Changes

- **Impact on in-lake and river recreation and use of environmental resources**
- **Impact on water chemistry in-lake and Lehigh River**
- **Impact on upstream and downstream aquatic and terrestrial habitat and species use**
- **Impact on threatened and endangered species and their habitat**
- **Others.....**



Walter Reservoir During Elevated Pool Operations





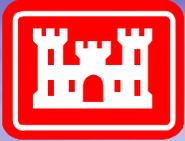
Inundated Access Road During Elevated Pool Operations



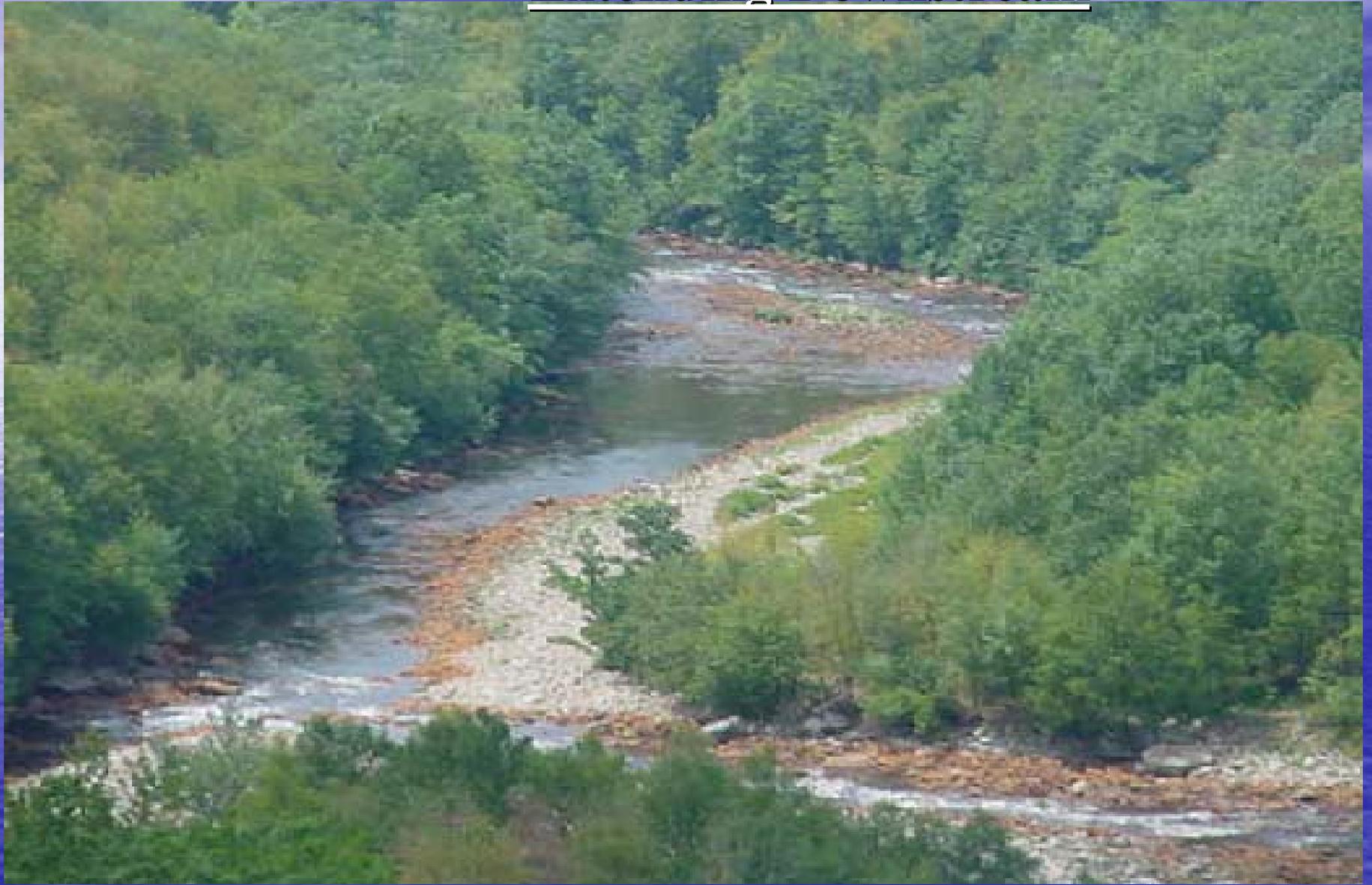


Iron Precipitate and Poor Water Quality During Extended High Pool Level Operations





Iron Precipitate on Lehigh River Sediments Extending Downstream





Iron Precipitate on Lehigh River Sediments Impact the Ecology of the River





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Environmental Changes in a Range of Alternative Pool Elevations

- 1300 Foot Pool Elevation (Water Depth ~45 feet)
 - 80 Pool surface acres (current operation)
- 1392 Foot Pool Elevation (Water Depth ~137 feet)
 - 824 Pool surface acres
 - 9.6 miles of upstream stream and river inundation
 - Documented negative WQ impacts (in-lake and Lehigh)
 - Documented biological impacts (in-lake and Lehigh)



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Environmental Changes in a Range of Alternative Pool Elevations

- 1370 Foot Pool Elevation (Water Depth ~115 feet)
 - 390 Pool surface acres
 - 6.3 miles of upstream stream and river inundation
 - Anticipated negative WQ impacts (in-lake and Lehigh)
 - Anticipated biological impacts (in-lake and Lehigh)



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Environmental Changes in a Range of Alternative Pool Elevations

- 1335 Foot Pool Elevation (Water Depth ~80 feet)
 - 240 Pool surface acres
 - 3.8 miles of upstream stream and river inundation
 - Anticipated no significant negative WQ impacts (in-lake and Lehigh)
 - Anticipated no significant biological impacts (in-lake and Lehigh)



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Minimize Risk and Maximize Benefit

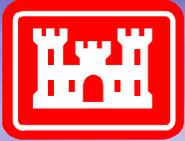
- 2005 plan at pool elevation 1335'
 - Reduce potential for species of concern Impact
 - Reduce potential for aquatic and terrestrial habitat impact
 - Reduce potential for negative water chemistry changes



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Minimize Risk and Maximize Benefit Cont.....

- Improve recreational whitewater rafting potential
- Protect and potentially improve downstream fishery with higher minimum low flow
- Potentially improve downstream water quality under low flow conditions



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Minimize Risk and Maximize Benefit Cont...

- Protect and potentially improve in-lake fishery by minimizing pool fluctuation during in-lake spawning periods

- Reduce likelihood of emptying pool as a flood control response



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2005 Monitoring Plan

- Increase Corps water quality sampling for 2005
 - Annual water quality sampling since 1975
 - Established sampling stations and protocol
 - Historic WQ record and trends
- Biological monitoring of Lehigh River
 - Invertebrate sampling at previously established river stations



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F.E. WALTER ANNUAL WQ **SAMPLING STATIONS**

WA-1 Downstream of Walter Reservoir (surface sample)

WA-2 In-lake near tower (surface, middle and deep sample)

WA-3 Tobyhanna Creek upstream of reservoir (surface sample)

WA-4 Lehigh River upstream of reservoir (surface sample)

WA-5 Bear Creek upstream of reservoir (surface sample)

WA-6 Bear Creek arm of the reservoir (surface, middle and deep sample)

WA-7 Lehigh River arm of the reservoir (surface, middle and deep sample)



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CONTINUOUS WATER TEMP. MONITORING LEHIGH RIVER 2001-Present

Stations

- LH-2 Walter Reservoir Outfall
- LH-3 White Haven
- LH-10 Lehigh
- LH-15 Walnutport
- LH-17 Northampton



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Watershed Sampling Locations from the 2001 Lehigh River WQ Study



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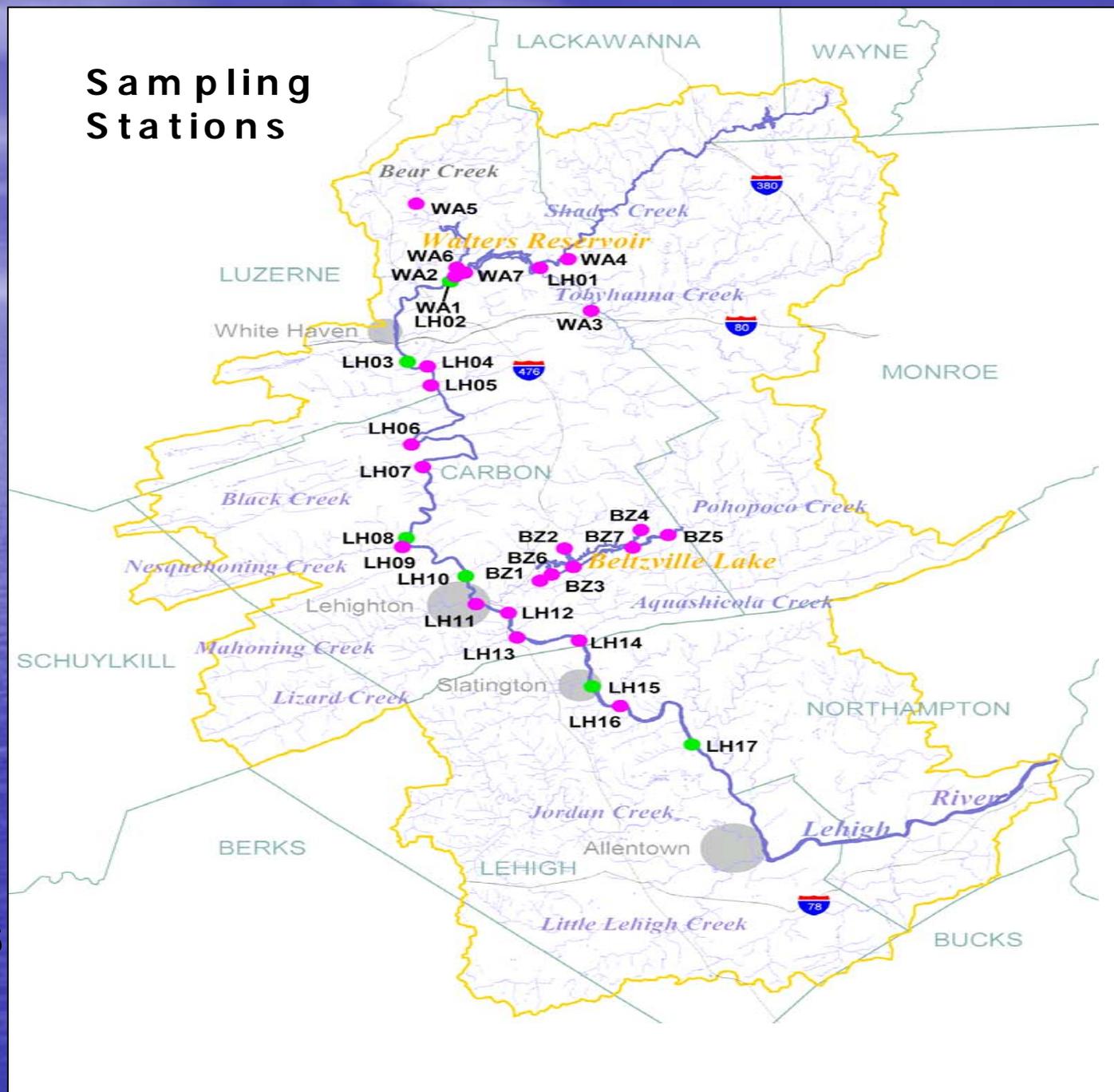
(GREEN)

RIVER
STATIONS



(PINK)

TRIBUTARY and
LAKE STATIONS





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FUTURE WATER QUALITY MODELING

- Large amount of available data from various sources
- 2001 Lehigh Study designed for model input
- Various modeling options that require a minimum of 1-year to develop
- Cost and development is dependent on model complexity

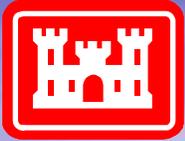


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AVAILABLE DATA

Data placed on the website includes.....

- 2001 Lehigh River Water Quality Report
- 2001-2004 Walter Reservoir Water Quality Reports
- 2001-2004 Lehigh River Temperature Data
- 2002 Hydrogen Sulfide/Iron Report
- 2002 Macro-invertebrate Impact Assessment
- Other.....



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