

Riverfront Parks Committee

May 11th, 2022



Figure 15. Location of Restoration Alternatives in Newport (Levee System is present along shoreline).

US Army Corp of Engineers

Ecosystem Restoration

Purpose: to restore upstream environmental degradation to riparian ecosystems caused or contributed to by the construction and operation of Markland Lock and Dam.

Newport: covers approximately 6,100 linear feet of shoreline and 3 acres, including 2,700 linear feet of floodplain forest along Newport's Ohio River and Licking River.

Other Cities: Fort Thomas, Dayton, Bellevue, Covington, and Ludlow.

Overall: 12 miles of the Ohio River and 0.5 miles of the Licking River.

Markland Locks and Dam

Began Operation in 1959.

Has a lock lift of 35 feet and maintains a minimum navigation pool at elevation 455 North American Vertical Datum of 1988 (NAVD88) for a length of some 93 miles of the Ohio River.

The navigation pool was increased by 14 feet along the Ohio River.

Eliminated the need for five existing low lift lock and dams in the system.



Ecological Impact

Minimal consideration was given to the significant impacts by the dam's change in the river.

The Dam converted the free-flowing waters of the rivers into a lake-like, lacustrine environment during low flow periods due to the drastic increase in minimum pool level.

This has caused both the alteration of the natural erosion-transport deposition process and the development of new riverbed and riverbank landforms.

Hydrogeomorphic alterations of the ecosystem have significantly affected the upstream riparian plant and fish.

The major disturbance has driven the spread of invasive plant species throughout the area.

Water Quality

Historically low quality, but it has a large diversity of organisms.

Run-off from coal mining and coal-fired power plants, combined sewer overflows (CSO's), agricultural run-off, and other pollutants, such as mercury, reduce water quality.

High levels of nutrients from farming and CSOs can accumulate in the surface water, combined with warm weather, this leads to harmful algal blooms.

Licking River impairment caused by *Escherichia Coli* (E. coli).

Ohio River impairment caused by Dioxin, polychlorinated biphenyls (PCBs), or both. This caused the edible tissue of fish to exceed Kentucky's human health criteria for those contaminants.

Fish and Wildlife Habitats

Due to urbanization within the project area, the natural calcareous mesophytic forest comprised of native species has given way to unvegetated or mown lawns, planted non-native species as well as voluntary/invasive species.

The observed project area communities are impacted to the point where native species have been replaced by a high percentage of weedy, non-native species. The majority of this is caused by the elevated pool of the Markland Lock and Dam.

When a waterbody's riparian zone becomes dominated by non-native invasive species, it has the potential to disrupt the stability of the waterbody and cause adverse effects on habitat and organic matter inputs into the waterbody.

There has been a loss of shallow riffle/gravel bar habitat, which provides critical refuge and food sources for small fish and for juveniles of larger river species.



Poison
Hemlock

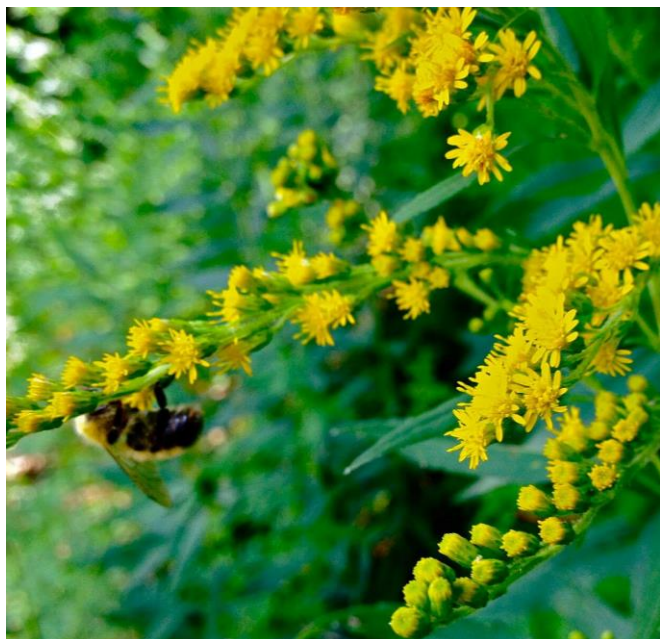
Purple
Loosestrife

Garlic Mustard



Honeysuckle

Non-Native Invasive Plants



Roundleaf
Ragwort

Yarrow

Black-eyed
Susan

Native Plants

Goldenrod

Rare Species Classification

Kentucky Department of Fish and Wildlife

1. Endangered: those that are in danger of extirpation and/or extinction throughout all or a significant part of their ranges in Kentucky.
2. Threatened: those that are likely to become endangered within the foreseeable future.
3. Special Concern: exists in a limited geographic area, may become threatened or endangered due to modification or destruction of the habitat, it has certain characteristics that make it vulnerable, researchers have identified factors that may jeopardize it, or it is rare or declining in the state.



Barn Owl

Sharp-Shinned
Hawk

Northern
Leopard Frog



Eastern Spotted
Skunk

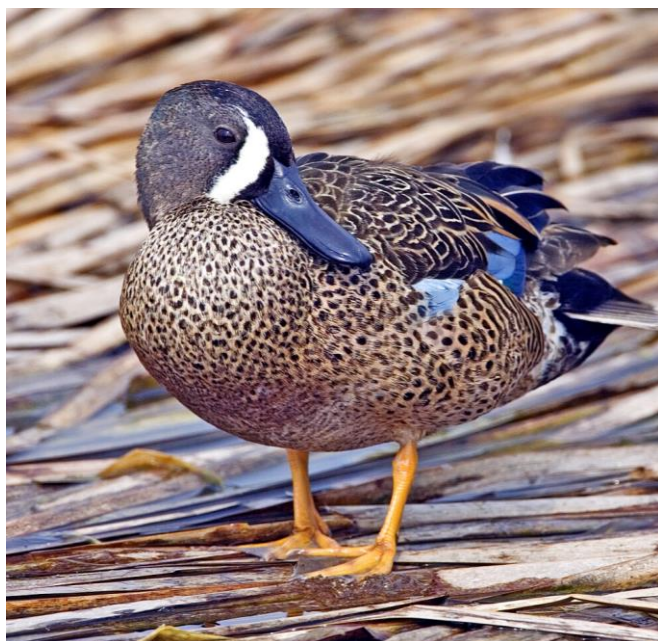
Species of Special Concern



Sixbanded
Longhorn Beetle

Kirtland's
Snake

Gray Bat



Threatened Species

Blue-Winged Teal



Peregrine
Falcon

Purple Cat's
Paw

Northern Long-
Eared Bat



Alligator Gar

Endangered Species

Ecosystem Restoration Approaches

Goal: not an exact replica of the past, but something that will last into the future.

Restoration targets are now formulated with the knowledge that ecosystems are fluid and dynamic and that the target may have many similar aspects of a historical condition but does not attempt to perfectly replicate any specific remnant or historical condition.

Urban stream restoration techniques generally include bank protection/stabilization, grade control, flow deflection, in-stream habitat, and riparian buffer zone.

Conceptual Ecosystem Model for Study Area

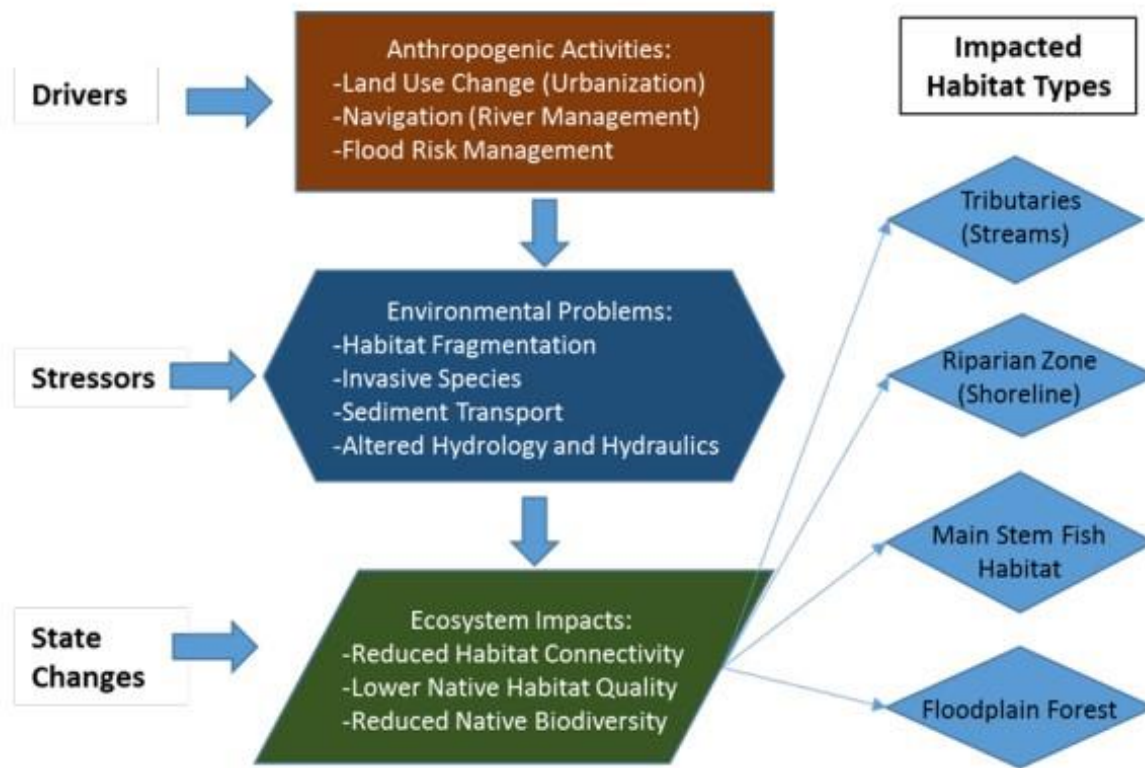


Figure 10. Conceptual Ecosystem Model for Study Area.

Conceptual models are descriptions of the general functional relationships among essential components of an ecosystem: they tell the story of how the system works.

List of Habitat Assessment Models and Habitat Types

Table 3. List of Habitat Assessment Models and Habitat Types

Environmental Models	Acronym	Developers	Targeted Habitat Types			
			Streams	Shoreline Zone	Main Stem Fish Habitat	Floodplain Forest
Gray Squirrel Habitat Suitability Index	Gray Squirrel	USFWS		X		X
Qualitative Habitat Evaluation Index	QHEI	State of OH-EPA*	X			
Smallmouth Bass Habitat Suitability Index	Smallmouth Bass	USFWS			X	

Eight Measurable Categories

1. Stream Connectivity – addresses fish passage needs.
2. In-stream Habitat – addresses physical in-stream habitat needs.
3. Geomorphic Contouring – addresses disturbance and alteration to natural geomorphic features.
4. Soil Amendments – addresses adverse effects to soils from invasive plant species, soil horizon mixing, farm practices, etc.

Eight Measurable Categories

5. Invasive Species Removal – addresses invasive plant species effects on the natural plant community. Physical and chemical measures are usually coupled for maximum effectiveness.
6. Native Plantings – addresses the absence of native plant species per natural community type.
7. Native, Threatened, and Endangered Species – mussels, bats, migratory birds (bird protected under the Migratory Bird Treaty Act and Bald and Golden Eagle Act).
8. Compatible Access to River – addresses multipurpose trails and maintenance access.

Description of Restoration Features

Bank Regrading – earth will be excavated to lower the elevation and gentle slope. Long term bank stability will occur through establishment of floodplain/riparian vegetation. Woody debris will be placed strategically along the toe of the shore.

Erosion Control Features – short and long-term strategies. Temporary measures may include erosion control blankets, coir logs, silt curtains, etc. Long terms may include woody debris to be placed along portions of the shoreline. Gravel and cobble strategic placement could be long term erosion control feature.

Woody Debris – in addition to erosion control, it provides important fish habitat along the nearshore zone.

Description of Restoration Features

Soil Amendments – areas with poor soil quality many need amendments in order to support native riparian vegetation. Potential amendments include organic carbon, pine saw dust, sand, and native topsoil.

Invasive Species Removal – techniques will be specific to the type of species needing removal. Control of invasive species allows for a fully functioning and diverse native plant community.

Native Plantings (Establishment) – Specific mixes of species will be compiled. Issues that will be accounted for in the compilation of specific mixes include diversity of functional groups, diversity of species pre-adapted to changes in climatic conditions, and species known to do well in urban environments.

Compatible Access to River – continued maintenance and operations requires personnel and machinery to access restored areas without harming native plant communities. Additionally, in order to main and allow intentional public access to restoration areas a combination of concrete/wood chip trails will be installed at appropriate locations.

Estimated Project Costs

Table 22. Estimated Project Costs

Feasibility	Total
Section 1135 - Post Conversion*	\$40,000
Design and Implementation Costs	Total
Planning, Engineering, and Design	\$1,223,000
Construction	\$6,768,000
Lands and Damages	\$664,000
Construction Management	\$611,000
Project First Cost**	\$9,265,000

*Note feasibility is cost shared 50/50 (see table below)

**Note project first costs include contingency

Federal: \$6,948,750

Non-Federal: \$2,316,250 – Southbank has match

Total: \$9,625,000 – total design and implementation

Next Steps

Project Partnership Agreement (PPA)

Southbank Partners has agreed to serve as the local cost-sharing sponsor for the feasibility project phase and the municipalities of Bellevue, Dayton, Newport, Covington, and Ludlow have agreed to serve as local cost-sharing sponsors for the design and implementation phase in one PPA.

*The City of Newport has signed the PPA.

Table 24. Implementation Schedule

NKY - P2# 471176			
Task	Start	Finish	Duration
Draft DPR	2-Apr-18	31-May-18	59
Draft DPR - DQC Review	1-Jun-18	15-Jun-18	14
Draft DPR - Legal / Policy Review	4-Jun-18	22-Jun-18	18
Public Review (before conversion)	25-Jun-18	25-Jul-18	30
ATR	25-Jun-18	2-Nov-18	130
MSC / HQUSACE Review - Draft DPR	28-Jun-18	17-Sep-18	81
GI Study Termination Memo - Draft	15-Dec-18	20-Dec-18	5
GI Study Termination Memo - OC Review	20-Dec-18	14-Jan-19	25
GI Study Termination Memo - Front Office Review	14-Jan-18	28-Jan-18	14
GI Study Termination Memo - COL Gant Signature		28-Jan-18	
GI Study Termination Memo - LRL Transmit to MSC		28-Jan-18	
GI Study Termination Memo - MSC Review / Approval	28-Jan-18	19-Mar-19	50
GI Agreement Termination Complete		19-Mar-19	
CAP SEC 1135 FCSA - Draft / Negotiation	20-Mar-19	27-Mar-19	7
CAP SEC 1135 FCSA - Sponsor Signs		5-Mar-19	
CAP SEC 1135 FCSA - USACE Signs		3-Apr-19	
GI Study Cost Share Record Closeout	22-Aug-19	24-Oct-19	63
Receive federal funds		9-Apr-19	
Draft DPR - DQC Review	29-Apr-19	16-Sep-19	140
Draft DPR - Legal Review	5-May-2019	6-June-2019	30
Release Draft DPR for Concurrent MSC / Public Review		19-Sep-19	
Public Review	23-Sep-19	23-Oct-19	30
ATR (after conversion)	23-Sep-19	08-Jan-20	
ATR Certification	08-Jan-20	30-Jul-20	
Draft Final DPR - DQC Review	20-Jan-20	01-Jul-20	
Draft Final DPR - Legal Review	25-Apr-21	03-Jul-21	
Final DPR – Policy Review	28-May-21	04-Jun-21	
Final Report Signed		14-Jul-21	
PPA - Draft / Negotiation	15-July-21	29-Nov-21	30
PPA - Sponsor Signs		Nov-21	
PPA - USACE Signs		March-22	
Plans and Specifications - Start		31-March-22	
Real Estate Certification		26-Jul-2024	
ATR Certified Construction Plans and Specifications		Oct-22	
Construction Contract Award		Oct-24	
Implementation Complete		Summer 2025	

We are here

Total construction is expected to be three years for work to be completed (earthwork, invasive species clearing/treatment, and native plant installation) with several growing seasons to establish the appropriate vegetative cover.

Monitoring and Adaptive Management (MAM) Plan

Monitoring takes place once per year for 10 years

Three monitoring components:

1. Structural sustainability of implemented features – assessing erosion along restored shoreline and assessing changes in accessibility for maintenance and public use.
2. Biological response of nature communities – assessing changes in native and invasive plant communities in all restored areas.
3. Planning goals and objectives – assessing performance such as quantitative flora assessments and ability to maintain compatible access.

The City of Newport has been working with the Campbell County Extension Office to identify native tree species that can be planted without impacting the Army Corp of Engineering project or their access to project site.

