

Floodplain Species Assessment

Louisville-Jefferson County, KY



February 20, 2023

Overview

Floodplain Species Assessments and the Community Rating System

The Community Rating System (CRS) is a voluntary program that recognizes activities implemented by communities to save lives, prevent and reduce property damage due to floods, and protect natural floodplain functions. It is administered by the Federal Emergency Management Agency as a part of the National Flood Insurance Program (NFIP) and provides discounted flood insurance premium rates for policy holders in participating communities. Louisville Metro participates in the CRS program with the Louisville-Jefferson County Metropolitan Sewer District (MSD) being responsible for enforcing the local Floodplain Management Ordinance and administering the NFIP and Floodplain Management Program. As of 2016, Louisville Metro has achieved a CRS Class 3 Rating, which awards residents in the community with up to a 35% discount on flood insurance premiums.

The CRS is encouraging local efforts at conservation and recovery of threatened and endangered species and critical habitats by providing credit points under the CRS when a community completes a two-stage process: the floodplain species assessment and plan. Because MSD is responsible for the CRS verification process, they have taken the lead on creating the following floodplain species assessment.

The floodplain species assessment helps guide communities through a process to identify the listed and proposed species and critical habitat present in the community as well as to determine which CRS credits may recognize and encourage conservation and recovery actions for those species. The assessment involves a review of online information from federal sources to identify listed and proposed species, map the species' range and/or critical habitat, and review CRS activities appropriate for conservation and recovery of threatened and endangered species in general.

This floodplain species assessment is expected to treat all listed and proposed species equally. It is not designed to identify special situations, area priorities, or programs implemented by non-governmental organizations.

Once the floodplain species assessment is drafted by the community, it is shared with experts involved in conservation and recovery of threatened and endangered species. These include the U.S. Fish & Wildlife Service, the National Marine Fisheries Service, their state counterparts, and private organizations concerned with certain species or protection of species in general.

These agencies and organizations are asked to help select those species most likely to benefit from community actions and to provide general advice and/or references on recovery of those species. They also are asked to identify actions the community could undertake, based on their knowledge of conservation and recovery priorities for the listed species in the local area.

A future floodplain species plan would build on the floodplain species assessment to develop a more detailed plan of action focused on those species identified as most likely to benefit from community actions. The end result is an action plan that identifies actions for the community to take to help the selected species.

Floodplain Species Assessment

Louisville - Jefferson County, Kentucky

Introduction

In 2003, the City of Louisville merged with Jefferson County, creating the Louisville-Jefferson County Metro Government, known as Louisville Metro. Louisville Metro encompasses the Louisville metropolitan region as well as its surrounding communities and neighborhoods. Louisville Metro contains 25,993 acres of floodplain with approximately 9,079 acres of the floodplain being located in open space (i.e. MSD easements, parks, deed restricted open space or wetlands, etc.).

Louisville Metro is home to a diverse treasure of terrestrial and aquatic plant and animal species including certain endangered species that are listed federally. According to the Endangered Species Act of 1973, these species "...are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people."¹

The intent of this assessment is to identify threatened and endangered species and habitats which are impacted by our use of the floodplain and prioritize those for which improvements are most feasible. This assessment will only outline general actions that could be taken. At a future date, a full floodplain species plan can be assembled to present more detailed activities based on the findings of this assessment.

Why Save Endangered Species?

"None of these creatures exists in a vacuum. All living things are part of a complex, often delicately balanced network called the biosphere. The earth's biosphere, in turn, is composed of countless ecosystems, which include plants and animals and their physical environments. No one knows how the extinction of organisms will affect the other members of its ecosystem, but the removal of a single species can set off a chain reaction affecting many others. This is especially true for "keystone" species, whose loss can transform or undermine the ecological processes or fundamentally change the species composition of the wildlife community." – US FWS at www.fws.gov/endangered

¹ Endangered Species Act (ESA), 1973.

Federally Listed Species in Louisville Metro

Using FEMA's Flood Risk and Endangered Species Habitat (FRESH) website, nineteen vulnerable species were found in Louisville Metro. These species, along with their legal status, are identified in Table 1. According to the U.S. Fish and Wildlife Service, the status terms are defined as²:

- Endangered: a species in danger of becoming extinct within the bulk of its range in the foreseeable future.
- Threatened: any species which is likely to become an endangered species within the foreseeable future.
- Proposed: species has been formally entered into the Federal Register, awaiting review.

Table 1 Threatened and Endangered Species in Louisville Metro				
Fauna	Species Common Name	Scientific Name	Status	Agency
Birds	Least tern	<i>Sterna antillarum</i>	Endangered	FWS
	Eastern black rail	<i>Laterallus jamaicensis</i>	Proposed Threatened	FWS
Mammals	Gray bat	<i>Myotis grisescens</i>	Endangered	FWS
	Indiana bat	<i>Myotis sodalis</i>	Endangered	FWS
	Northern long-eared bat	<i>Myotis septentrionalis</i>	Endangered* (*March 31, 2023)	FWS
Mussels	Clubshell	<i>Pleurobema clava</i>	Endangered	FWS
	Fanshell	<i>Cyprogenia stegaria</i>	Endangered	FWS
	Fat pocketbook	<i>Potamilus capax</i>	Endangered	FWS
	Longsolid	<i>Fusconaia subrotunda</i>	Proposed Threatened	FWS
	Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Endangered	FWS
	Pink mucket	<i>Lampsilis abrupta</i>	Endangered	FWS
	Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	Threatened	FWS
	Rayed bean	<i>Paetulonio fabalis</i>	Endangered	FWS
	Ring pink	<i>Obovaria retusa</i>	Endangered	FWS
	Rough pigtoe	<i>Pleurobema plenum</i>	Endangered	FWS
	Round Hickorynut	<i>Obovaria subrotunda</i>	Proposed Threatened	FWS
	Sheepnose mussel	<i>Plethobasus cyphus</i>	Endangered	FWS
	Snuffbox mussel	<i>Epioblasma triquetra</i>	Endangered	FWS
	Spectaclecase	<i>Cumberlandia monodonta</i>	Endangered	FWS
Plants	Kentucky gladeceess	<i>Leavenworthia exigua var. lacinata</i>	Threatened	FWS

²USFWS, "Midwest Region Endangered Species Glossary," US Department of the Interior, [URL](#)

Range and Critical Habitat

A species' 'range' is the geographical region in which it may be found throughout its life cycle. The 'critical habitat' of a species are specific regions that contain essential geographic features for the survival of the species.³ All nineteen species have range throughout Louisville Metro.

The majority of identified species were freshwater mussels, such as the Federally Endangered Sheepnose (Figure 1). Freshwater mollusks are considered one of the most imperiled group of organisms in North America and are extremely sensitive to unstable, altered stream and river conditions. Mussels partially bury themselves in the substrates of streams and rivers and filter water during their life span, which makes them highly susceptible to chemical pollutants and habitat degradation. Causes of degradation to water chemistry and habitat are often the result of channelization, deforestation, urbanization, and the presence of dams. In addition, exotic species in waterways competes with native mussels for habitat and food, causing stress to localized populations.



Figure 1 Sheepnose Shell
Source: Kristen Lundh, USFWS

The Indiana bat and Kentucky gladechess will require additional attention in the Floodplain Species Plan. The vulnerable Indiana bat may be found in most Midwestern states and as far north as New York. Despite this wide range, populations within those states are dwindling due to white nose syndrome, habitat degradation, cave commercialization, and environmental contaminants.⁴ The Indiana bat's critical habitat lies directly across the Ohio River in Indiana. Louisville Metro borders this region. According to the Office of Kentucky Nature Preserves (OKNP), Indiana bats reside in floodplain areas and dead trees during summer months.⁵ The Ohio River floodplain in Louisville-Metro likely already supports Indiana bat populations.



Figure 2 Indiana bat
Source: Rich Fields, [USFWS](#)

The current Louisville Metro Floodplain Management Ordinance preserves existing stream buffers at least 25 feet from the top of bank on each side of the stream for all intermittent and perennial streams to protect existing vegetation, including overstory and understory trees, as well as shrubs and ground covers. Exceptions to the requirement may be granted for projects essential to protecting the health, safety, and welfare of local residents; however, native vegetation must be replanted to replace the impacted buffer area. Projects that remove trees in Jefferson County must also follow the U.S. Fish and Wildlife Service requirements to avoid adverse impacts to the

³ USFWS, "Midwest Region Endangered Species Glossary," US Department of the Interior, [URL](#).

⁴ USFWS, "Endangered Species: Indiana Bat," US Department of the Interior, [URL](#).

⁵ KSNPC, "Endangered Threatened, and Special Concern Plants, Animals, and Natural Communities of KY with Habitat Description," KY Nature Preserves, [URL](#).

Indiana Bat. The Floodplain Species Plan could analyze additional measures to protect habitat for this species.

The Kentucky gladeceess' entire range is limited to Jefferson and Bullitt Counties in the state of Kentucky⁶, which makes it particularly vulnerable to human development in the region. Development, increased flooding, and off-road vehicle traffic, for instance, have contributed to the gladeceess' dwindling population.⁷ To combat this population decrease, the U.S. Fish and Wildlife Service proposed critical habitat for the gladeceess based upon peer-reviewed articles, biological opinions, agency reports, and Geographic Information Systems (GIS) data. Two of those proposed critical habitats lie in Louisville Metro, as depicted in KY Gladeceess Proposed Critical Habitat Units 1 and 2 (see attachments).

Louisville-Jefferson County Metro Government owns McNeely Lake Park, where critical habitat



Figure 3 Kentucky gladeceess
Source: [Courier Journal](#)

Unit 1 is located. The 100-year floodplain overlaps with Unit 1 along Pennsylvania Run. The three subunits comprising Unit 2, on the other hand, are privately-owned. According to USFWS, Subunit 2B holds the healthiest remaining gladeceess population within Louisville Metro. The floodplain also lies within the critical habitat boundaries there. These units could be great locations to start developing preservation strategies for the Floodplain Species Plan.

While not yet considered threatened or endangered, the Louisville crayfish (*Faxonius jeffersoni*) and the MoWild crayfish, (*Faxonius elix*) are two narrow endemic species present in Jefferson County, Kentucky. The Louisville crayfish can be found in first to third order streams in Bullitt, Hardin, Jefferson, and Oldham Counties in Kentucky. The MoWild crayfish was once considered the Louisville Crayfish, but populations in the Pond Creek and Abrams Run systems in Bullitt, Jefferson, and Meade counties, Kentucky have now been recognized as a distinct species. Consideration should be given to these species when planning for any projects in stream areas where they are known to be present.

Potential for Floodplain Development

Floodplain development could impact the existing and future habitats of threatened and endangered species. The current Louisville Metro Land Development Code as well as the Floodplain ordinance require stream buffers as part of development requirements to encourage preservation of stream bank and other sensitive areas. As part of their vision to provide safe, clean waterways, MSD completes stream restoration projects which have the added benefit of improving natural areas and habitats.

⁶ USFWS, "Kentucky Gladeceess," US Department of the Interior, [URL](#).

⁷ USFWS, "Kentucky Gladeceess, 5-year Review: Summary and Evaluation", [URL](#).

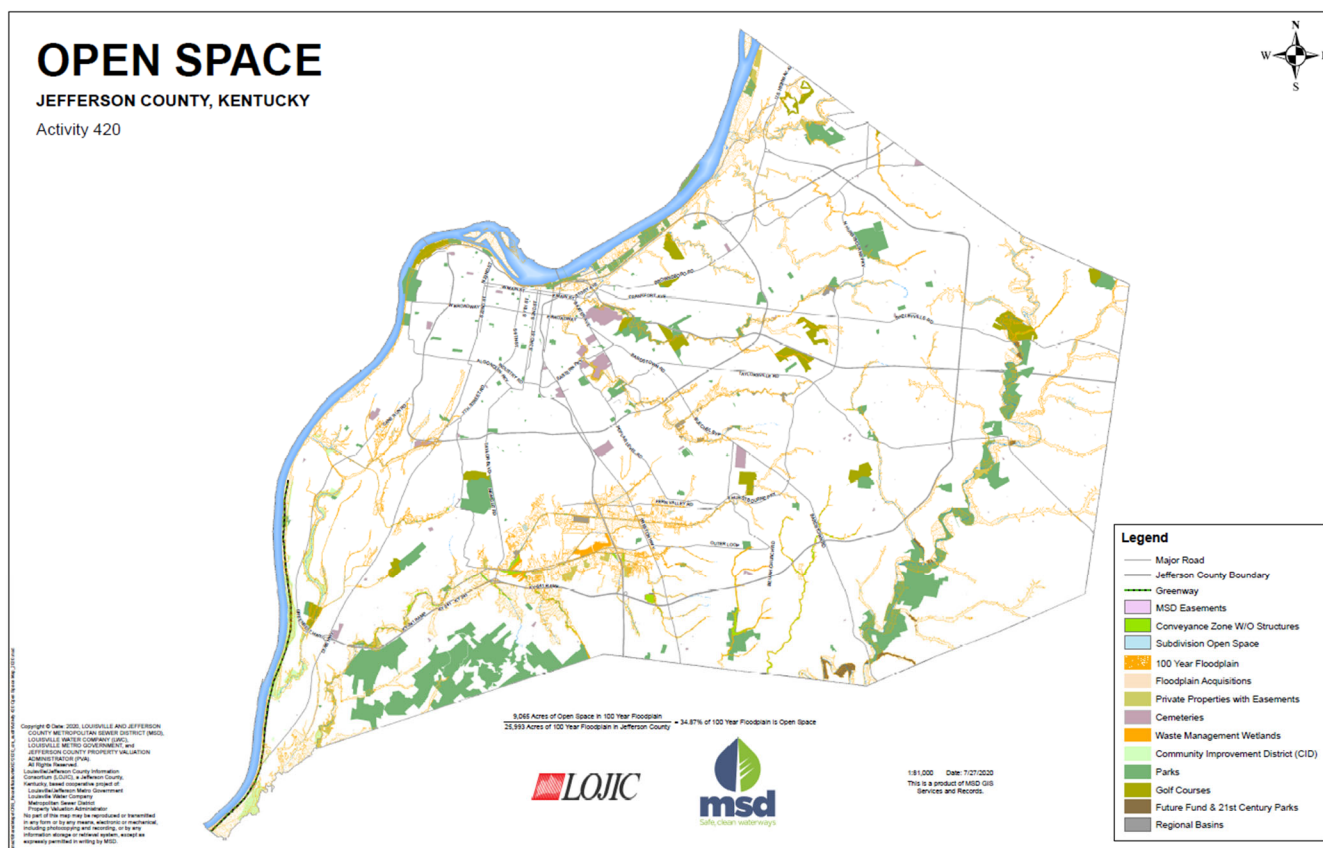


Figure 4 Louisville Metro Open Space and Floodplain Map

Open Space within the Floodplain

Of the 25,993 acres of floodplain located in Louisville Metro, approximately 9,079 acres of the floodplain are located in open space (i.e. MSD easements, parks, deed restricted open space or wetlands, etc.). Areas of open space which overlap with the floodplain are depicted in Figure 4 Louisville Metro Open Space and Floodplain Map. Many of these areas are publicly owned and could provide an opportunity for habitat improvement or other beneficial activities to support endangered species.

Community Rating System Credit for Conservation and Recovery

Louisville has participated in the Community Rating System (CRS) program since 1990. The CRS program, which operates under the Federal Emergency Management Agency (FEMA), reduces the cost of a community's flood insurance premiums if the community completes activities that prevent or reduce flood losses and protect natural protect floodplain functions. FEMA rates communities on a scale of 1 to 10 according to those activities, where a rating of 1 results in the highest discount. Louisville was rated a CRS Class 3 in 2020, which saves floodplain residents and businesses a total of \$2.1 million per year on flood insurance premiums.

To obtain this high rating, MSD participates in a multitude of CRS flood-related activities. Those that pertain to threatened and endangered species preservation are listed in Table 2 below. The "Points" column shows Louisville Metro's current CRS credit points and the maximum credit available. The "Feasible" column identifies if it would be feasible to start an activity or increase the credit points for the listed activities.

Table 2 CRS Credited Conservation and Recovery Actions				
CRS Activity/Element	Doing	Credited	Points	Feasible?
300 Public Information Activities				
MI7 Providing information on areas that serve natural floodplain functions, such as wetlands	Yes	Yes ¹	20/20	Maximum Credit Received
OP Outreach projects on protecting natural functions	Yes	Yes ¹	200/200	Maximum Credit Received
PPI Designing and disseminating messages on protecting natural floodplain functions in a Program for Public Information	Yes	Yes ¹	80/80	Maximum Credit Received
LPD Having materials in the local public library on protecting local natural floodplain functions	Yes	Yes ¹	10/10	Maximum Credit Received
WEB Having materials on protecting local natural floodplain functions in the community's website	Yes	Yes ¹	79/105	Could update website to include messages on this topic
420 Open Space Preservation				
OSP Preserving open space in the floodplain	Yes	Yes	508/1450	Continue to preserve open space through flood prone acquisitions and encouraging low impact development
NFOS Preserving open space in the floodplain in its natural state	Yes	Yes ¹	2/350	Could look at long range plan to connect habit corridors and promote conservation
CEOS Preserving open space on eroding shorelines	NA	NA	NA	NA
OSI Offering incentives to developers to keep the floodplain open	Yes	Yes	13/250	Could possibly offer more incentives or work with Louisville Metro to update the Land Development Code
LZ Zoning flood prone areas for large lot sizes to preserve low density uses	No	No	0/600	No, there are not substantial zoning areas > 5 acres lots
NSP Preserving stream banks and shorelines in their natural state	No	No	0/120	Not feasible at this time
430 Higher Regulatory Standards				
DL1a Prohibiting filling in the floodplain	No	No	0/280	Not feasible at this time
CER Regulating development in areas subject to coastal erosion	NA	NA	NA	Not Applicable
OHS Other regulations to protect natural floodplain functions not specifically listed in the Coordinator's Manual	No	No	0/100	Not feasible at this time
450 Stormwater Management				
SMR-DS Requiring new developments in the watershed to account for the total volume of runoff released	No	No	150/225	Not feasible at this time
SMR-LID Setting stormwater management standards based on an overall plan for the watershed	No	No	0/25	Not feasible at this time
WMP Setting stormwater management standards based on an overall plan for the watershed	Yes	Yes	169/315	Could expand wetland and natural spaces identified in mapping and incorporate these into the next Watershed master plan revision
510 Floodplain Management Planning				
NFP Adopting one or more plans that address protecting natural floodplain functions	No	No	0/100	Not feasible at this time
FSA Floodplain Species Assessment	No	No	0/15	Yes, in progress
540 Drainage System Maintenance				
CDR Having a habitat-friendly program to clear debris in drainage ways	No	No	76/200	Not feasible at this time
¹ These elements are being implemented in Louisville-Jefferson County, but the messages and materials do not address threatened and endangered species.				

Summary of Potential CRS Activities (CRS Activity Code)

Activity 300 Public Information Activities (PPI): Projects Louisville-Jefferson County MSD is currently implementing as part of the public information activities and elements are listed in Table 2. Outreach projects could be expanded to better address threatened and endangered species by including messages related to how actions impact species and habitat. A map for credit under Activity 320 (Map Information Service) MI7 could be prepared using FRESH information and it could be included in LOJIC maps available to the public and internal MSD Upstream mapping.

Library references and website could also be revised or expanded to provide more information on protecting threatened and endangered species within the community. Coordination with existing groups who are already promoting or researching threatened and endangered species should be undertaken to determine effective references and information.

Activity 420 Open Space Preservation (OSP): Currently 35% of the City's Special Flood Hazard Area is located in open space. MSD will continue to acquire floodplain properties through FEMA and locally funded floodplain acquisition projects. As subdivision development of parcels including floodplain occur, MSD will continue to encourage these sensitive areas to be included in a recorded open space.

CRS credit is provided for Natural Functions Open Space (NFOS) which is floodplain open space areas preserved or restored to their natural state. The current NFOS report could be reviewed to determine if areas qualifying for NFOS1, NFOS2, and NFOS3 could be improved to prioritize wildlife corridors or connected networks.

Activity 420 Low density zoning (LZ): The Louisville Metro zoning ordinance does contain zoning for low-density lots of 5 acres or greater; however, there are not large enough areas of this zoning in the floodplain to make it feasible to gain points in this activity.

Activity 420 Natural shoreline protection (NSP): A map for this activity has been prepared; however, the current floodplain ordinance does not prevent the hardening of stream bank below the top of bank. In order to qualify for credit under this activity the ordinance would need to be revised. Ordinance revision is not likely feasible at this time but may be considered at a later date. MSD does implement and encourage stream restoration projects and could consider utilizing more natural alternatives to help stabilize streams in the future. MSD has undertaken multiple stream restoration projects which improve the habitat of the streams for aquatic life.

Activity 430 Higher Regulatory Standards (DL1a): At this time, it would not be feasible to enact regulations prohibiting all filling or development in the floodplain. Currently, MSD requires a permit to develop in the floodplain and development must be in accordance with the requirements outlined in the floodplain ordinance. Compensation is required if any fill placed in the floodplain and most areas require 1.5 to 1 compensation. Additionally, freeboard and local regulatory floodplain requirements receive points for this activity.

Activity 450 Stormwater Management Design Storm (DS): Louisville Metro currently receives credit for storing the 2, 10, 25 and 100 year storms. To receive additional credit, storm volume

would also need to be managed which is not be feasible at this time given the limited space in developed areas and poorly draining soils located throughout most of the county.

Activity 450 Low impact development (LID): Louisville Metro does not currently have regulatory language that would require low impact development. Such requirements would not be feasible at this time but could be considered at a later date.

Activity 450 Watershed master plan (WMP): MSD receives credit for its Watershed Master Plan. The current Watershed Master Plan is being updated and could include information on protecting natural features and creating sustainable areas for threatened and endangered species in the update. Additional mapping could be provided to enhance ease of access to this data for the public.

Activity 510 Floodplain Management Planning (NFP): Louisville Metro does not current receive any credit under for this activity. It may be possible to create plans for specific species or areas of critical habitat which would quality for credit under NFP2.

Activity 540 Drainage System Maintenance (CDR): Louisville Metro receives only about 40% of the total available points for this activity. Louisville Metro is an MS4 community and possesses a public drainage system. Maintenance procedures are in place but could be reviewed to confirm they do not adversely affect habitat. Some credit is received for Drainage System Maintenance for inspection and maintenance of its stormwater management facilities. To increase points, MSD would need to inspect more of the natural channel inventory on an annual basis. This would be challenging due to the great number of channels in the system. An increase in inspections would increase staff workload on staff that would need to be considered before any change was adopted.

Relevant Agencies and Organizations

Multiple federal, state, and local agencies and private organizations exist to help protect threatened and endangered species. The following could assist MSD in defining activities or future implementation. The Nature Conservancy, the Office of Kentucky Nature Preserves (OKNP), Louisville Metro Parks, Future Fund, and 21st Century Parks are already employing efforts to promote the critical habitat of the Kentucky glade. Many of these organizations have collaborated with MSD in the past and could serve as excellent partners on a Floodplain Species Plan.

21st Century Parks

471 W. Main St., Ste. 202, Louisville, KY 40202

(502) 584-0350

Aaron Boggs | Director of Horticulture & Natural Areas | aboggs@21cparks.org

www.21cparks.org/

Center for Mollusk Conservation

3761 Georgetown Rd, Frankfort, KY 40601

(502) 573-0330

Monte A. McGregor, Ph.D. | Director | monte.mcgregor@ky.gov

<https://fw.ky.gov/Wildlife/Documents/CenterforMolluskConservationBrochure2019.pdf>

Federal Emergency Management Agency (FEMA)

500 C Street, SW, Washington, DC 20472

Zane Hadzick, National Endangered Species Act Coordinator

| (202) 646-4622 | Zane.Hadzick@fema.dhs.gov

Future Fund Inc.

1357 Bardstown Road, Louisville, KY 40204

| (502) 383-991 | futurefundlandtrust@gmail.com

www.savingfloydsfork.org/

Jefferson County Soil and Water Conservation District

Chrysler Bldg., Suite 100-A, 4233 Bardstown Road, Louisville, KY 40218-3280

Erin James | (502) 499-1900 | erin@wildcommonwealth.com

www.jeffcd.org

Kentucky Department of Fish and Wildlife Resources

#1 Sportsman's Lane, Frankfort, KY 40601

Ralph Swallows | (502) 564-3400 | fw.commissiondistrict3@ky.gov

www.fw.ky.gov

Kentucky Division of Water

300 Sower Boulevard, Third Floor, Frankfort, KY 40601

Perry Thomas | perryt@ky.gov

www.eec.ky.gov/Environmental-Protection/Water/Pages/default.aspx

Kentucky Natural Lands Trust

433 Chestnut Street, Physical Address: 213A Short Street, Berea, KY 40403

Greg Abernathy | (859) 986-0744 | gabernathy@KNLT.org

Preston Lacy | (859) 986-0744 | placy@KNLT.org

www.knlt.org

Office of Kentucky Nature Preserves (OKNP)

Kentucky Energy & Environment Cabinet, 300 Sower Blvd, Frankfort, KY 40601

Nour Salam | (502) 782-1054 | nour.salam@ky.gov

www.eec.ky.gov/Nature-Preserves/Pages/default.aspx

Kentucky Waterway Alliance

330 North Hubbards Ln, Louisville, KY 40207

Michael Washburn | (502) 589-8088 | Michael@kwalliance.org

Louisville and Jefferson County Environmental Trust

Louisville Metro Public Works

444 South 5th Street, Suite 400, Louisville, Kentucky 40202

Lisa Hite | (502) 574-4140 | Lisa.Hite@louisvilleky.gov

www.louisvilleky.gov/government/parks/louisvillejefferson-county-environmental-trust

Louisville Nature Center

3745 Illinois Ave, Louisville, KY 40213

Rebecca Minnick | (502) 458-1328 | rebecca@louisvillenaturecenter.org

www.louisvillenaturecenter.org

Louisville Parks and Natural Areas

PO Box 467, Fairdale, KY 40118

Main Office: (502) 574-7275

Jessica Kane | (502) 368-6856 | Jessica.Kane@louisvilleky.gov

www.louisvilleky.gov/government/parks

National Marine Fisheries Service

1315 East-West Hwy, F/ST1, Silver Spring, MD 20910

Ron Salz, NMFS HQ ESA Lead | (301) 713-2328 | ron.salz@noaa.gov

The Nature Conservancy

414 Baxter Ave, Suite 265, Louisville, KY 40206

Main Office: (502) 742-4521

Christopher Chandler | (502) 640-1479 | christopher.chandler@tnc.org

Shelley Morris | (270) 748-0259 | mmorris@tnc.org

www.nature.org/en-us/about-us/where-we-work/united-states/kentucky/contact-us/

Salt River Conservation Collaborative

Erin Wagoner | (502) 540-6307 | erin.wagoner@louisvillemtd.org

Salt River Watershed Watch

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Becca Trueman | (502) 644-4009 | beccatruemanky@gmail.com

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U.S. Army Corps of Engineers

Romano L Mazzoli Federal Building

600 Dr Martin Luther King Jr Pl, Louisville, KY 40202

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U.S. Fish and Wildlife Service - Kentucky Ecological Services Field Office

J C Watts Federal Building, 330 West Broadway, Suite 265, Frankfort, KY 40601

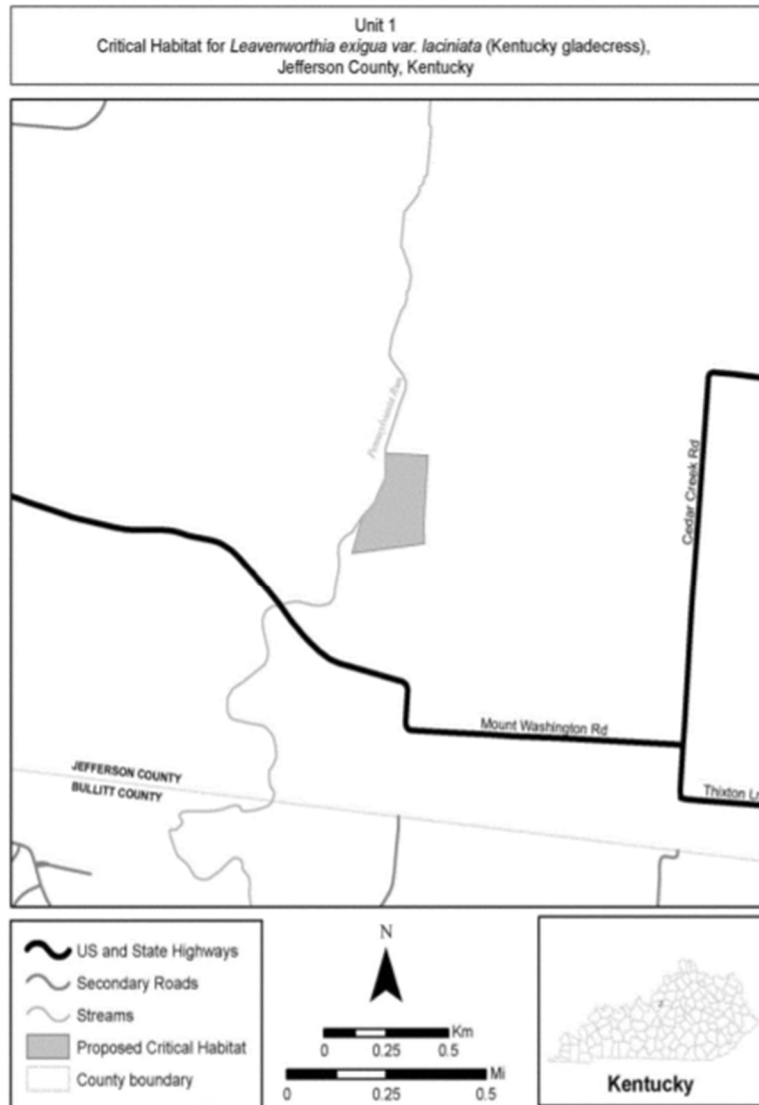
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(7) Unit 2: Old Mans Run, Bullitt and Jefferson Counties, Kentucky.

(i) Unit 2 includes 1,014 ac (410 ha):
Subunit A includes 102 acres (41 ha);

subunit B includes 870 acres (352 ha);
and subunit C includes 42 ac (17 ha).
(ii) Map of Unit 2 follows:



(8) Unit 3: Mount Washington, Bullitt County, Kentucky.

(i) Unit 3 contains 42 ac (17 ha):
Subunit A contains 25 ac (10 ha);

subunit B contains 7 ac (3 ha); and
subunit C contains 10 ac (4 ha).
(ii) Map of Unit 3 follows: