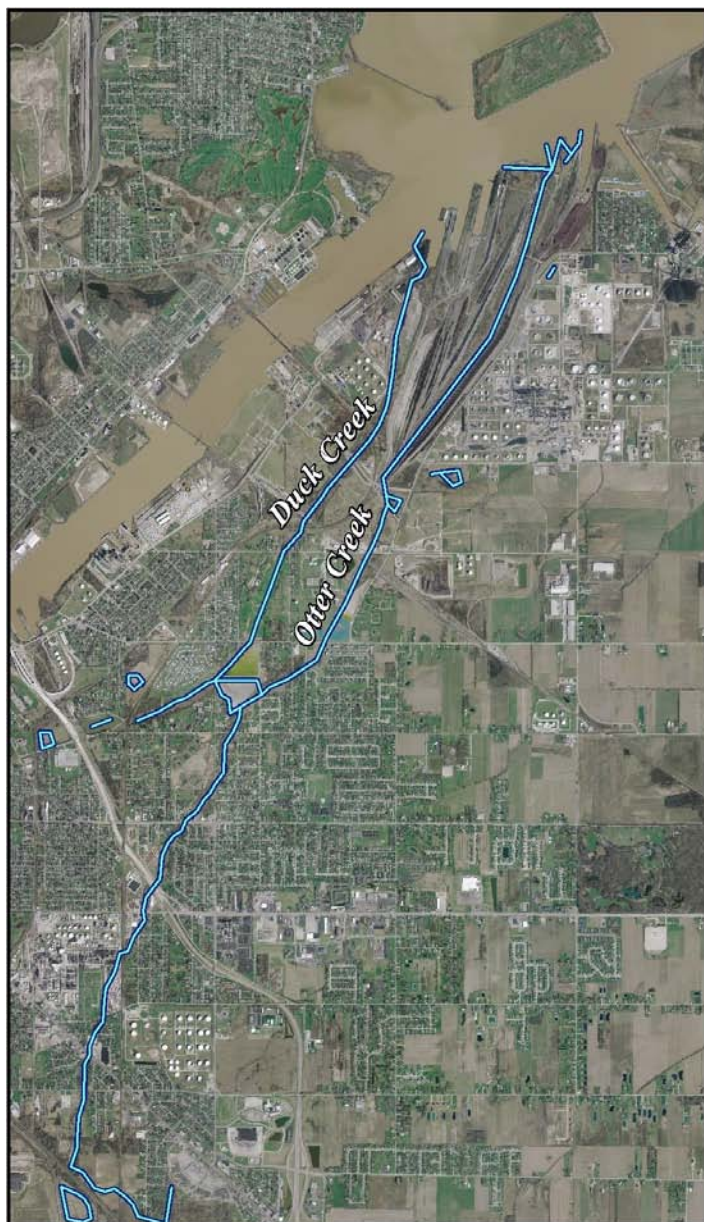


# Duck & Otter Creeks

## Natural Resource Damage Assessment

### Fish Tissue Residue Work Plan



*Prepared by:*



**U.S. Fish and Wildlife Service  
Columbus Ohio Field Office  
4625 Morse Road, Suite 104  
Columbus, Ohio 43230  
614-416-8993  
612-670-5530**

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## **Fish Tissue Collection Work Plan for Duck and Otter Creeks**

The United States Department of the Interior (DOI) represented by the U.S. Fish and Wildlife Service (FWS) (the Trustee) is conducting a natural resource damage assessment (NRDA) to address injuries to natural resources resulting from the release of hazardous substances from several Potentially Responsible Parties (PRPs) to Duck and Otter Creeks in Toledo, Ohio (“Duck and Otter Creeks Assessment Area” or the “Assessment Area”). The Assessment Area as defined in the Duck & Otter Creeks Natural Resource Damage Assessment Plan includes Duck Creek from its upstream terminus downstream four miles to its confluence with the Maumee River, Otter Creek from its upstream terminus seven miles downstream to its confluence with the Maumee Bay, and the entirety of Driftmeyer Ditch and the Duck and Otter Creek watersheds.

Decades of refining and manufacturing activity and improper waste disposal practices have resulted in the release of hazardous substances to both Duck and Otter Creeks and their watersheds, and potentially Driftmeyer Ditch. Hazardous substances have migrated to Duck and Otter Creeks from refineries and other industrial complexes along their banks, as well as through numerous spills and other releases from these facilities. Hazardous substances have potentially injured surface waters, sediments, fish and wildlife in the Duck and Otter Creeks Assessment Area.

The Fish Tissue Collection Work Plan for Duck and Otter Creeks (the “Work Plan” or “Study” ) is a part of the NRDA that will be conducted by the Trustee <sup>1</sup>. This Work Plan describes fish collection and analysis to be conducted by the FWS in August of 2010. The purposes of this Study are:

1. Establish exposure of various fish species present in Duck and Otter Creeks to a range of hazardous substances released, or potentially released, by PRPs.
2. Begin establishing the pathway by which hazardous substances have reached trust resources.
3. Evaluate current fish tissue concentrations of select hazardous substances relative to various regulatory endpoints. Specifically, to determine whether concentrations of a hazardous substance exceed action or tolerance levels established under section 402 of the Food, Drug and Cosmetic Act, 21 U.S.C. 342, in edible portions of organisms [43 CFR § 11.62(f)(1)(ii)] or exceed levels for which an appropriate state health agency has issued directives to limit or ban consumption of such organism [43 CFR § 11.62(f)(1)(iii)].

The Screening and Baseline Ecological Risk Assessment prepared for Partners for Clean Streams (Tetra Tech EM, 2008) separated Duck and Otter Creeks each into five exposure areas (Duck Creek exposure areas A through E, and Otter Creek exposure areas A through E, collectively referred herein as “Exposure Areas”). For consistency with previous work at the Duck and Otter Creeks Assessment Area, the FWS will attempt to collect and analyze fish within each of these respective Exposure Areas. However, the Trustee recognizes that, based on collection success, it may be necessary to combine samples from one or more Exposure Areas for data analysis.

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<sup>1</sup> The Trustee is preparing a comprehensive Natural Resource Damage Assessment Plan (the “Assessment Plan”) for the Duck and Otter Creeks Site. The Assessment Plan will be noticed for public comment for a period of thirty (30) days.

A review of available data for the Assessment Area confirms that there are few historical datasets from Duck and Otter Creeks that provide either fish tissue hazardous substance concentrations or fish species community composition and abundance. It is, therefore, not possible to determine what species and numbers will be collected for analysis. However, both streams are Lake Erie tributaries and could be expected to contain fish species assemblages similar to other Lake Erie tributaries. This could include yellow perch (*Perca flavescens*), white bass (*Morone chrysops*), pumpkinseed (*Lepomis gibbosus*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), goldfish (*Carassius auratus*), emerald shiner (*Notropis atherinoides*), gizzard shad (*Dorosoma cepedianum*), carp (*Cyprinus carpio*), brown bullhead (*Ictalurus nebulosus*), yellow bullhead (*Ameiurus natalis*), alewife (*Alosa pseudoharengus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), rainbow smelt (*Osmerus mordax*), Johnny darter (*Etheostoma nigrum*), walleye (*Stizostedion vitreum*), rainbow trout (*Oncorhynchus mykiss*), spottail shiners (*Notropis hudsonius*), stone roller (*Campostoma anomalum*), blunt nose minnow (*Pimephales notatus*), creek chub (*Semotilus atromaculatus*), log perch (*Percina caprodes*), freshwater drum (*Aplodinotus grunniens*), lake sturgeon (*Acipenser fulvescens*), bowfin (*Amia calva*), and white suckers (*Catostomus commersoni*).

Within each Exposure Area, the Trustee will collect all available fish species using boat and/or backpack electro-shocking devices. If necessary, trap nets may also be deployed. The majority of fish will be analyzed as whole body samples. Selected samples of large bass (large and or small mouth) and common carp may be analyzed as skin on fillets for comparison to regulatory endpoints. The upstream and downstream ends of each zone will be recorded using a geographical positioning system.

Most fish will be identified to species, while some, such as minnows or hybrids may be identified to genus. All will be measured for length and weight, individually wrapped in aluminum foil and placed in Ziplock bags. Each fish sample will be labeled with a distinct sample number and stored on ice. Samples will be shipped overnight to the FWS, Columbus, Ohio Field Office the day they are collected. Upon arrival at the Field Office, the samples will be frozen and kept frozen until arrival at the analytical laboratory.

At the analytical laboratory, fish will be homogenized and analyzed for polychlorinated biphenyl congeners, chlorinated pesticides, heavy metals, polycyclic aromatic hydrocarbons and metabolites, and percent lipids (Table 1). Larger fish will be analyzed as individual fish, with small fishes being composited as necessary to achieve the biomass required by the analytical laboratory.

**Table 1. Analytical Parameter List****Organochlorines including quantification of the following compounds:**

pp'-DDE	alpha BHC	gamma chlordane
pp'-DDD	beta BHC	cis-nonachlor
pp'-DDT	gamma BHC	trans-nonachlor
op'-DDE	dieldrin	endrin
op'-DDD	heptachlor epoxide	mirex
op'-DDT	oxychlordane	toxaphene
HCB	alpha chlordane	PCB – 209 congeners

**Aliphatic hydrocarbons including quantification of the following compounds:**

n-decane	n-undecane	n-dodecane	n-tridecane
n-tetradecane	n-pentadecane	n-hexadecane	n-heptadecane
n-octadecane	n-nonadecane	n-eicosane	n-heneicosane
n-docosane	n-tricosane	n-tetracosane	n-pentacosane
n-hexacosane	n-heptacosane	n-octacosane	n-nonacosane
n-triacontane	n-hentriacontane	n-dotriacontane	n-tritriacontane
n-tetratriacontane	pristine	phytane	

**Aromatic hydrocarbons including quantification of the following compounds:**

naphthalene	C1-naphthalenes	C2-naphthalenes
C3-naphthalenes	C4-naphthalenes	biphenyl
acenaphthalene	acenaphthene	fluorene
C1-fluorenes	C2-fluorenes	C3-fluorenes
phenanthrene	anthracene	C1-phenanthrenes
C2-phenanthrenes	C3-phenanthrenes	C4-phenanthrenes
dibenzothiophene	C1-dibenzothiophenes	C2-dibenzothiophenes
C3-dibenzothiophenes	fluoranthene	pyrene
(C1-fluoranthenes+C1-pyrenes)	benz(a)anthracene	chrysene
C1-chrysenes	C2-chrysenes	C3-chrysenes
C4-chrysenes	benzo(b)fluoranthene	benzo(k)fluoranthene
benzo(e)pyrene	benzo(a)pyrene	perylene
indeno(1,2,3-cd)pyrene	dibenz(a,h)anthracene	benzo(g,h,i)perylene
2-methylnaphthalene	1-methylnaphthalene	2,6-dimethylnaphthalene
2,3,5-trimethylnaphthalene	1-methylphenanthrene	

**Metals:**

Arsenic, selenium, mercury, aluminum, boron, barium, beryllium, cadmium, chromium, copper, iron, magnesium, manganese, molybdenum, nickel, lead, strontium, vanadium, and zinc

Standard U.S. Fish and Wildlife Service quality assurance protocols will be followed. See [http://www.fws.gov/chemistry/acf\\_qaqc.html](http://www.fws.gov/chemistry/acf_qaqc.html), [http://www.fws.gov/chemistry/acf\\_org\\_sow.html](http://www.fws.gov/chemistry/acf_org_sow.html) and [http://www.fws.gov/chemistry/acf\\_inorg\\_sow.html](http://www.fws.gov/chemistry/acf_inorg_sow.html) for details.

**Public Review and Comment**

The Trustee intends for this Work Plan to communicate the approach for this Study to the public, so that the public can become engaged and comment on, the proposed approach. The Trustee will soon publish and seek public comment on the “Natural Resource Damage Assessment Plan for Duck and Otter Creeks”. This will describe the overall assessment process the Trustee intends to follow for Duck and Otter Assessment area. The current Work Plan is being released in advance of the broader “Natural Resource Damage Assessment Plan for Duck and Otter Creeks” to increase efficiency and reduce costs by

coordinating with the “Great Lakes Legacy Act Data Gap Investigation For Duck and Otter Creeks in The Maumee River Area of Concern” being conducted by the U.S. Environmental Protection Agency – Great Lakes National Program Office and several local industry partners.

The Work Plan is available for public review and comment for 30 days, with reasonable extensions granted, if appropriate. The public comment period for this Work Plan begins on the day the notice of availability is published in newspapers in the northwest Ohio area and lasts for 30 calendar days. Comments may be submitted in writing or by email to:

Kevin Tloczynski  
U.S. Fish and Wildlife Service  
4625 Morse Road, Suite 104  
Columbus, Ohio 43230  
Kevin\_Tloczynski@fws.gov

**References:**

Tetra Tech EM. 2008. Screening and Baseline Ecological Risk Assessment Duck and Otter Creeks, Toledo, Ohio