Study Plan for Fiscal Years 2012 and 2013 Supplemental 106 Funding

Field Year 2013 State Resource Water Assessment Monitoring

Division of Surface Water
Ecological Assessment Section
May 15, 2013

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Grant # I01E00992
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EA^3 Project Name:
LWH/SRW Assessments (FFY12/13 106 Supplemental Gr.) 2013-15

Monitoring Objective

Sampling will be conducted to determine the appropriate tiered antidegradation category for significant streams currently assigned to the State Resource Water (SRW) category within (1) the Wolf Creek and Olive Green Creek watersheds in the lower Muskingum River basin and (2) the Turkey Creek watershed, a direct tributary to the Ohio River in south central Ohio. The SRW category has been replaced by a tiered system of antidegradation categories which includes: 1) outstanding national resource waters, 2) outstanding state waters, 3) superior high quality waters, 4) general high quality waters, and 5) limited quality waters. By rule, all stream and river segments assigned to the SRW category are considered general high quality waters. SRW streams sampled as part of this initiative will focus on those for which there is some information or evidence suggesting that a category other than general high quality water may be warranted and which are clustered in watersheds for efficiency of sampling. Most of the streams selected also have unverified Coldwater Habitat (CWH) or Exceptional Warmwater Habitat (EWH) aquatic life uses, so an additional benefit will be the verification of the appropriate aquatic life use. A map of Ohio streams currently assigned to the SRW category is attached (Figure 1) and Table 1 lists all the 2013 streams to be sampled and provides relevant details for each. Figures 2-4 depict stream sampling sites in each of the three watersheds.

Sampling Activities

Biological Community Assessment
The fish communities will be assessed once at each sampling site using headwater electrofishing methods. Macroinvertebrate communities will be assessed once at each sampling site with a qualitative multihabitat composite sample.

Physical Habitat Assessment
Physical habitat will be evaluated at each biological sampling site and pertinent attributes will be used in the overall assessment of the each streams' antidegradation category and aquatic life use.

Water Quality Field Parameters
Periodic site visits (1-3) to measure site water temperature, dissolved oxygen, pH, and conductivity will be conducted and results will be used in the overall assessment of the each streams' antidegradation category and aquatic life use. Biological field sampling crews should coordinate with SEDO staff to determine if they need to assist in this effort.

Results

- Results will be used to look at key biological community and physical habitat parameters used by Ohio EPA to determine the appropriate antidegradation category including: 1) presence of federal or state endangered, threatened, or special concern fish and invertebrate species, 2) number and prevalence of declining fish species, 3) quality of the physical habitat as documented by Qualitative Habitat Evaluation Index (QHEI) scores, and 4) quality of fish and macroinvertebrate communities as reflected with biological index scores (Index of Biotic Integrity - IBI) and macroinvertebrate narrative evaluations.

- Results will be used to conduct aquatic life use attainability analyses supported by the data collected including IBI scores, macroinvertebrate narrative evaluations, and QHEI scores.

- Results of the above assessments will be used to recommend the appropriate tiered antidegradation category and verify the existing or recommend an appropriate tiered aquatic life use based on those currently defined in the Ohio Water Quality Standards.

Quality Assurance/Sampling Methods

Ohio EPA Manuals

All biological, physical habitat, field water quality, data processing, and data analysis methods and procedures adhere to those specified in the Surface Water Field Sampling Manual for water column chemisty, bacteria and flows (Ohio EPA 2013a) for field parameter measurement, Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio EPA 1987, 1989a, 1989b, 2013b, 2013c) for biological assemblage assessment, and The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Ohio EPA 1989c, 2006) for physical habitat assessment.

Aquatic Life Use Attainment

Attainment/non-attainment of aquatic life uses will be determined by using biological criteria codified in Ohio Administrative Code (OAC) 3745-1-07, Table 7-15. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community.

Performance expectations for the basic aquatic life uses (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH] were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1988). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of an aquatic life use is FULL if all three indices (or those available) meet the applicable criteria, PARTIAL if at least one of the indices did not attain and performance did not fall below the fair category, and NON if all indices either fail to attain or any index indicates poor or very poor performance. Biological sampling results will be compared to WWH or EWH biocriteria for applicable ecoregions in Ohio.

Biological Community Assessment

The macroinvertebrates from each waterbody sampling location will be sampled qualitatively by collecting a multihabitat composite sample. This sampling effort consists of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). Fish will be sampled once at each sampling location with pulsed DC headwater electrofishing gear. Detailed biological field and laboratory sampling protocols are documented in the Ohio EPA manual *Biological Criteria for the Protection of Aquatic Life, Volume III* (1989b, 2013c).

Stream Physical Habitat Evaluation

Physical habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Ohio EPA 1989c, 2006). Various attributes of the available habitat are scored based on their overall importance to the establishment of viable, diverse aquatic faunas. Evaluations of type and quality of substrate, amount of instream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to evaluate the characteristics of a stream segment, not just the characteristics of a single sampling site. As such, individual sites may have much poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values higher than 60 were generally conducive to the establishment of warmwater faunas while those which scored in excess of 75-80 often typify habitat conditions which have the ability to support exceptional faunas.

Water Quality Field Parameters

Water quality field parameters (temperature, dissolved oxygen, pH, and conductivity) will be measured 1-3 times at each location using field meters calibrated and maintained according to procedures specified in the Surface Water Field Sampling Manual for water column chemisty, bacteria and flows (Ohio EPA 2013a).

Table 1. 2013 FY12/13 106 Supplemental Grant Sampling: SRW Stream Segments (>1.0 sq. mi. drainage)

Name	HUC12	Stream Code	Station	Latitude	Longitude	Unverified ALU	River Mile	Drainage Area	Location	County
Wolf Creek Basin										
1) Hayward Run (Trib. to Wolf Cr. @ RM 0.05)	05040004 10 04	17-031-000	302157	39.549350	-81.656945	EWH	0.57	3.4	Co. Rd. 102 (Milner Rd.)	Washington
2) Duck Creek (Trib. to Wolf Cr. @ RM	05040004 10 04	17-032-000	302158	39.534724	-81.643294	EWH	0.10	2.8	upst. Co. Rd. 102 (Main St.)	Washington
3) Flint Run (Trib. to Wolf Cr. @ RM 2.42)	05040004 10 04	17-034-000	302159	39.534777	-81.660993	EWH	0.14	2.8	Twp. Rd. 68 (Flint Run Rd.)	Washington
4) Painter Run (Trib. to S.Br. Wolf Cr. @ RM 10.10)	05040004 09 03	17-036-000	302160	39.465026	-81.628417	EWH	0.40	2.8	Co. Rd. 2 (Anderson Rd.)	Washington
5) Turkeyhen Run (Trib. to S.Br. Wolf Cr. @ RM 19.46)	05040004 09 02	17-040-000	302161	39.415931	-81.571514	EWH	1.20	3.3	Co. Rd. 126/Twp. Rd. 557	Washington
6) Lucas Run (Trib. to W.Br. Wolf Cr. @ RM 6.36)	05040004 10 04	17-045-000	302163	39.491467	-81.734137	EWH	0.80	4.1	Co. Rd. 88 (Orndoff Rd.)	Morgan
7) Whitewater Creek (Trib. to W.Br. Wolf Cr. @ RM 8.82)	05040004 10 04	17-046-000	302164	39.477837	-81.731287	EWH	0.10	3.6	upst. Pugh Rd.	Washington
8) Laurel Run (Trib. to W.Br. Wolf Cr. @ RM 12.90)	05040004 10 04	17-047-000	302165	39.454543	-81.769628	EWH	0.05	6.8	at mouth fr. West Branch off Creek Rd.	Washington
9) Shrader Run (Trib. to Coal Run @ RM 4.64)	05040004 10 03	17-049-000	201308	39.462302	-81.820984	EWH	0.05	2.2	upst. St. Rt. 676	Washington
10) N. Br. Coal Run (Trib. to Coal Run @ RM 5.60	05040004 10 03	17-050-000	302168	39.462735	-81.854124	EWH	1.80	4.3	adj. Twp. Rd. 11 (Crews Lane) dst Trib. @ RM 1.85	Morgan
11) Mile Run (Trib. to Coal Run @ RM 8.37)	05040004 10 03	17-052-000	302169	39.421680	-81.828504	EWH	0.72	1.3	St. Rt. 550	Washington
12) Scott Run (Trib. to Aldridge Run @ RM 1.90)	05040004 10 02	17-054-000	302170	39.503089	-81.804782	EWH	0.05	3.0	at mouth fr. Aldridge Run at Co. Rd. 66 (Ellis Rd.)	Morgan
13) Chaneyville Run (Trib. to L. Wolf Cr. @ RM 4.50)	05040004 10 01	17-060-000	302172	39.611099	-81.893703	EWH	0.05	1.4	at mouth adj. Twp. Rd. 131 (Earich Lane) nr. L. Wolf confluence	Morgan

14) Buck Run (Trib. to W.Br. Wolf Cr. @ RM 38.90)	05040004 10 01	17-061-000	302173	39.605965	-81.928796	EWH	0.10	5.5	upst. St. Rt. 78	Morgan
15) Hedgehog Creek (Trib. to W.Br. Wolf Cr. @ RM 41.43)	05040004 10 01	17-063-000	302174	39.637744	-81.939259	EWH	0.10	2.5	upst. Niceswanger Lane	Morgan
16) Kickapoo Creek (Trib. to W.Br. Wolf Cr. @ RM 43.58)	05040004 10 01	17-064-000	302175	39.662770	-81.948675	EWH	0.10	2.3	St. Rt. 37	Morgan
17) Peeper Run (Trib. to W.Br. Wolf Cr. @ RM 47.50)	05040004 10 01	17-065-000	302176	39.676240	-82.011626	EWH	0.55	0.9	residential drive off St. Rt. 37	Morgan
Olive Green Creek Basin										
1) Cow Run (Trib. to Olive Green Cr. @ RM 1.13)	05040004 11 04	17-071-000	302177	39.594221	-81.662656	EWH	0.10	1.4	Twp. Rd. 633 (New Rd.)	Morgan
2) Scott Run (Trib. to L. Olive Green Cr. @ RM 3.05)	05040004 11 03	17-074-000	302178	39.633330	-81.649892	EWH	0.10	3.0	Twp. Rd. 941 (N. Creek Rd. NE)	Morgan
3) Allen Run (Trib. to L. Olive Green Cr. @ RM 4.97)	05040004 11 03	17-075-000	302179	39.660727	-81.668782	EWH	0.60	1.5	Twp. Rd. 238 (Allen Hollow Rd.)	Morgan
4) Stony Creek (Trib. to Olive Green Cr. @ RM 6.13)	05040004 11 04	17-076-000	302180	39.588066	-81.616897	EWH	0.50	1.0	Twp. Rd. 242 (Stony Run Rd.)	Morgan
5) Reasoners Run (Trib. to Olive Green Cr. @ RM 11.10)	05040004 11 04	17-077-000	302181	39.622862	-81.593670	EWH	0.05	4.6	upst. Twp. Rd. 246 (Center Township Rd.)	Morgan
6) Limestone Run (Trib. to Keith Fork @ RM 0.37)	05040004 11 02	17-079-000	302182	39.649338	-81.601536	EWH	0.20	1.2	Twp. Rd. 247 (Slater Rd.)	Morgan
7) Dinner Fork (Trib. to Sharon Fork @ RM 4.23)	05040004 11 01	17-081-000	302288	39.714730	-81.593450	EWH	1.22	2.5	Twp. Rd. 34 (Dinner Fork Rd.)	Noble

Turkey Creek Basin										
1) Odell Creek (Trib. to Turkey Cr. @ RM 5.29)	05090201 02 02	10-516-000	302183	38.705998	-83.116886	CWH	0.30	5.3	driveway off Odell Creek Rd.	Scioto
2) Pond Lick Run (Trib. to Turkey Cr. @ RM 6.50)	05090201 02 02	10-517-000	302184	38.706279	-83.138080	CWH	0.20	5.3	adj. NF-1 (Shawnee Rd.) off St. Rt. 125	Scioto
3) Brush Fork (Trib. to Pond Lick Run @ RM 2.41	05090201 02 02	10-519-000	302185	38.697763	-83.177374	CWH	0.05	1.1	adj. NF-1 (Shawnee Rd.) upst. Pond Lick Lake	Scioto
4) Wes Run (Trib. to Turkey Cr. @ RM 6.71)	05090201 02 02	10-520-000	302186	38.709913	-83.135376	CWH	0.05	1.0	nr. mouth from Turkey Creek off Cemetery Rd./Piatt Rd.	Scioto
5) Harber Fork (Trib. to Turkey Cr. @ RM 8.40)	05090201 02 02	10-523-000	302187	38.726277	-83.154526	CWH	0.05	4.7	NF-1 (Shawnee Rd.) off St. Rt. 125	Scioto
6) Mackletree Run (Trib. to Turkey Cr. @ RM 10.00)	05090201 02 01	10-524-000	302188	38.723754	-83.181816	CWH	0.40	5.8	Mackletree Rd.	Scioto
7) Lampblack Run (Trib. to Turkey Cr. @ RM 11.37	05090201 02 01	10-526-000	302189	38.737507	-83.199732	CWH	0.10	2.7	parking lot off NF-126 nr. mouth	Scioto
8) Old Lade Run (Trib. to Turkey Cr. @ RM 11.90)	05090201 02 01	10-527-000	302190	38.748154	-83.201182	CWH	0.20	2.2	dst. NF-3 (Big Run Rd.)	Scioto

Figure 1. Ohio streams assigned State Resource Water designations with locations of watersheds where verification of antidegradation category and aquatic life use will be determined in 2013.

Figure 2. Wolf Creek watershed sampling locations, 2013. Site numbers correspond to those in Table 1.

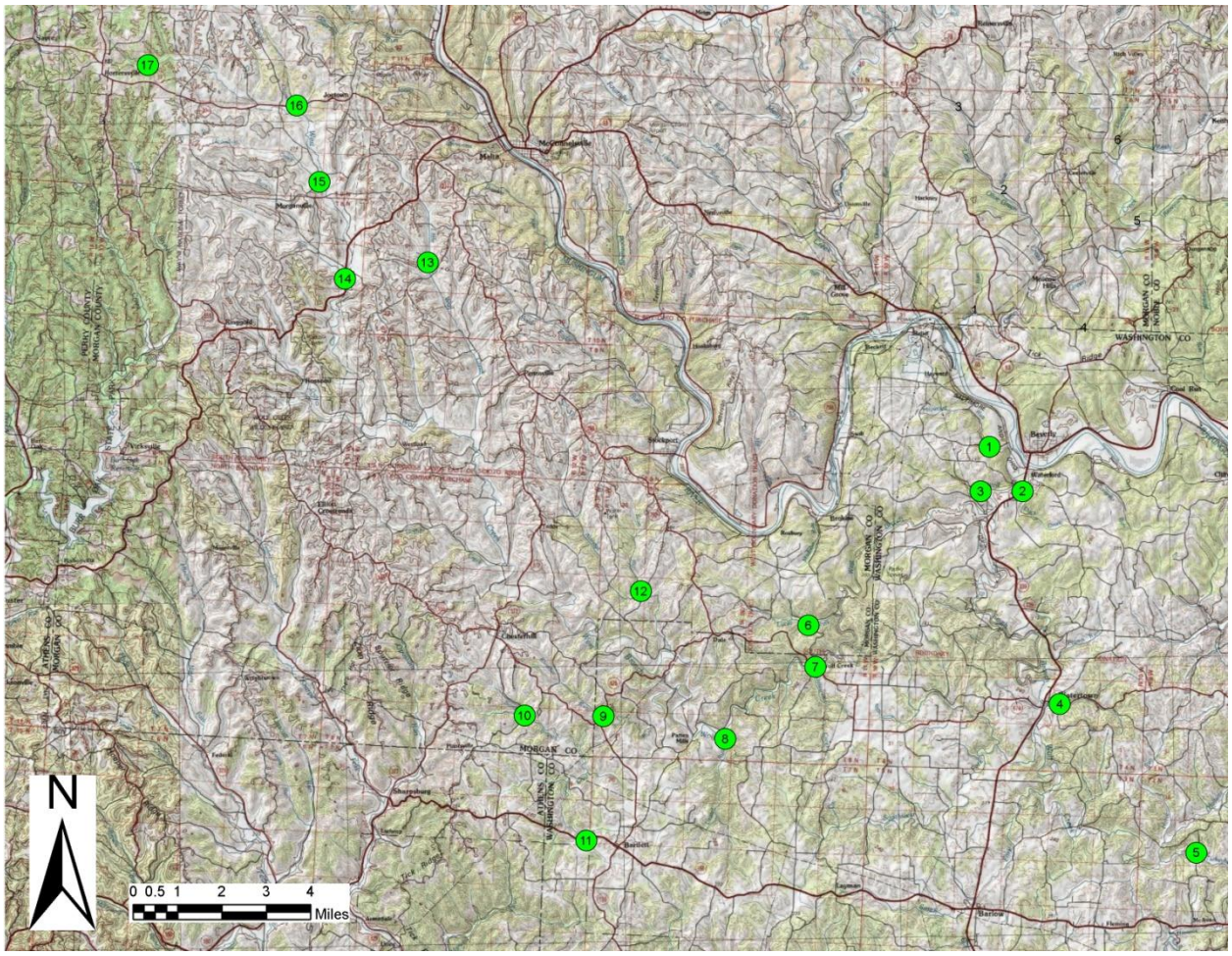


Figure 3. Olive Green Creek watershed sampling locations, 2013. Site numbers correspond to those in Table 1.

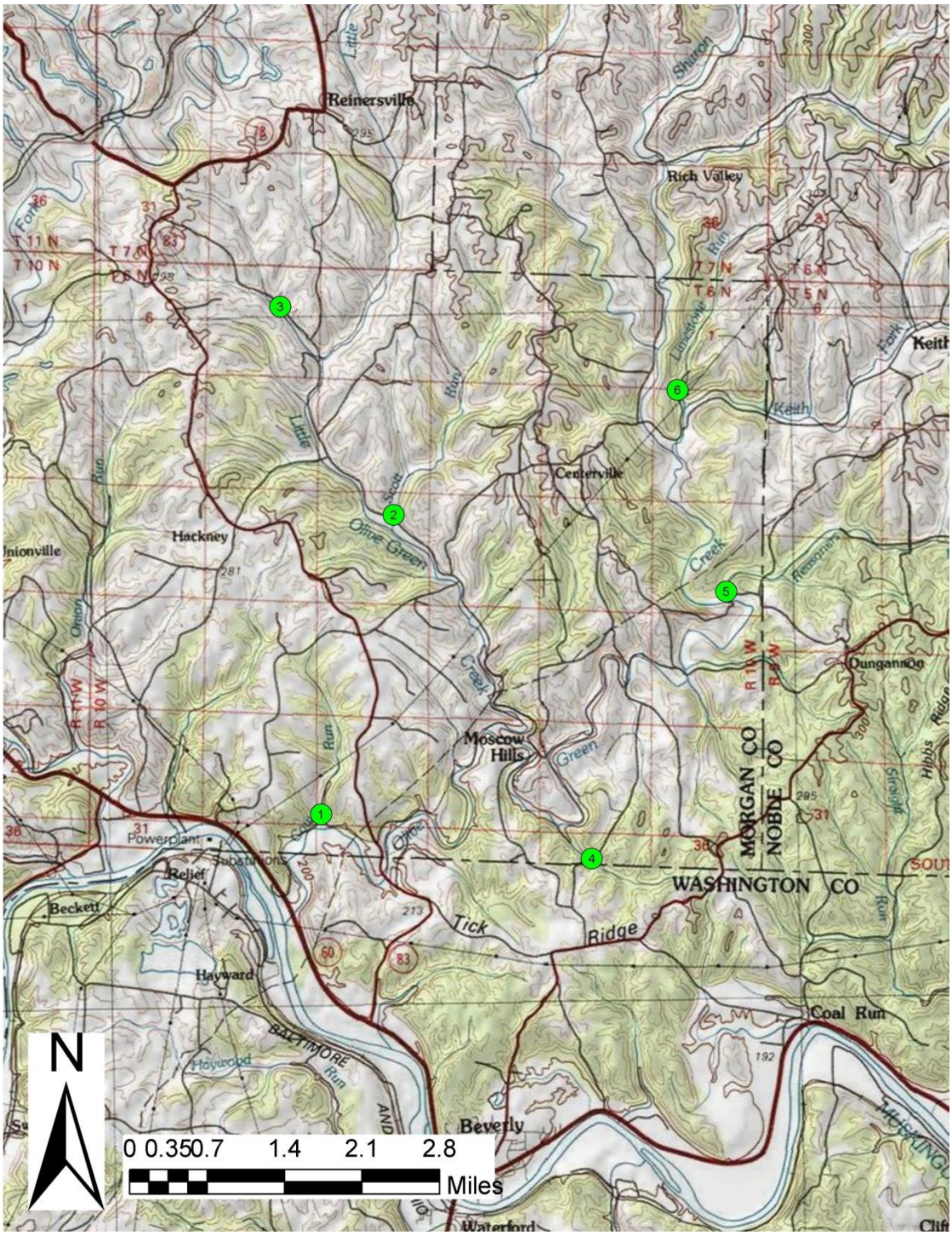
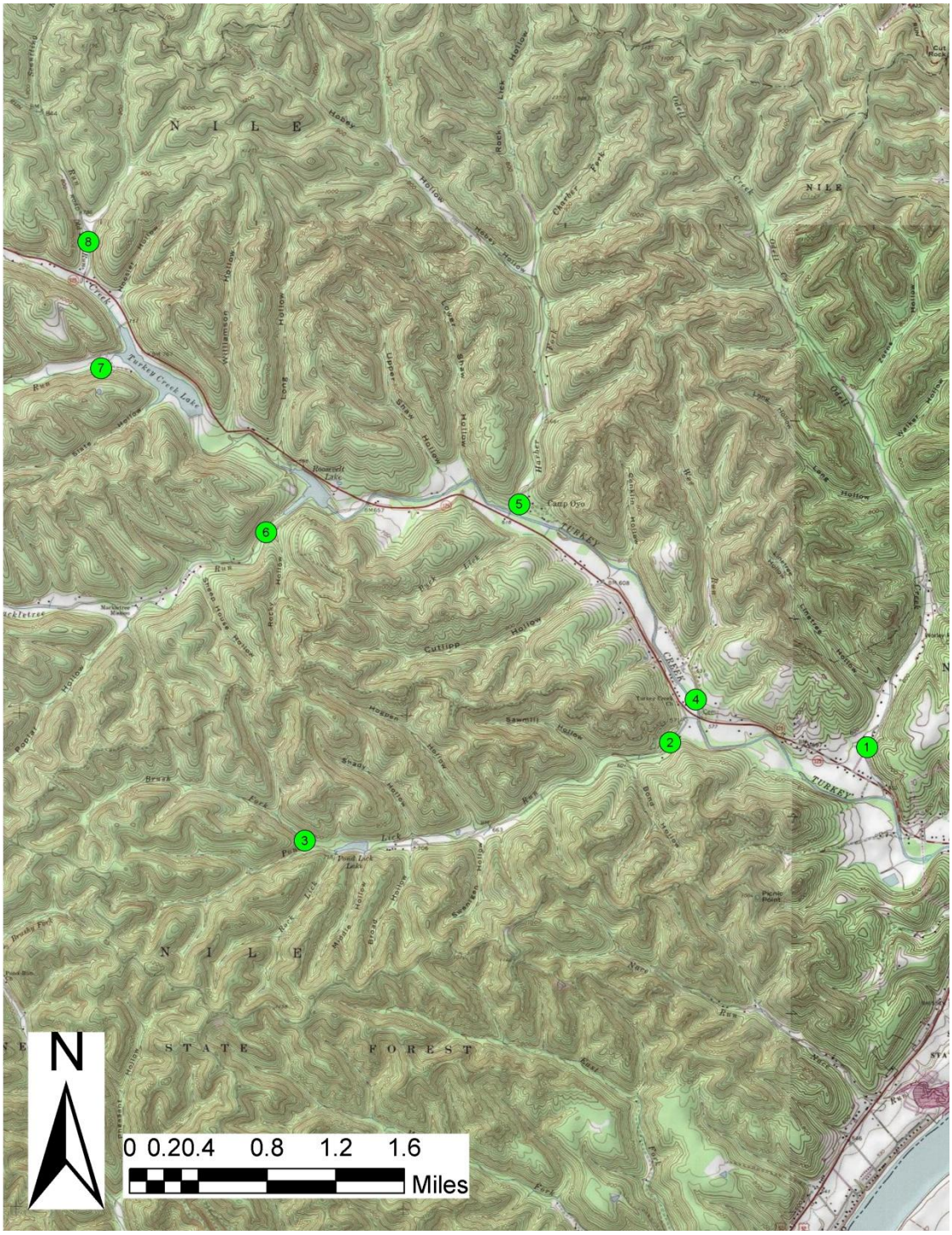


Figure 4. Turkey Cr. watershed sampling locations, 2013. Site numbers correspond to those in Table 1.



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