

US EPA ARCHIVE DOCUMENT



# **National Rivers and Streams Assessment Site Evaluation Guidelines**

February 2009



## NOTICE

The goal of the National Rivers and Streams Assessment (NRSA) is to provide a comprehensive assessment of the condition of the Nation's flowing water resources, the rivers and streams of the United States. The complete documentation of overall NRSA project management, design, methods, and standards is contained in four companion documents, including:

- National Rivers and Streams Assessment: *Quality Assurance Project Plan* (EPA-841-B-07-007)
- National Rivers and Streams Assessment: *Site Evaluation Guidelines* (EPA-841-B-07-008)
- National Rivers and Streams Assessment: *Field Operations Manual* (EPA-841-B-07-009)
- National Rivers and Streams Assessment: *Laboratory Methods Manual* (EPA-841-B-07-010)

This document (Site Evaluation Guidelines [SEG]) contains an overview of the process involved in locating a sampling site, evaluating the site, and selecting appropriate alternate sites when necessary, and is based on the guidelines developed and followed in the Western Environmental Monitoring and Assessment Program (Peck et al. 2003). Methods described in this document are to be used specifically in work relating to the NRSA. Mention of trade names or commercial products in this document does not constitute endorsement or recommendation for use. More detail of the project overview and of specific methods for field sampling, sample handling, and sample processing can be found in the appropriate companion document.

The suggested citation for this document is:

USEPA. 2007. National Rivers and Streams Survey: Site Evaluation Guidelines. EPA-841-B-07-008 . U.S. Environmental Protection Agency, Washington, DC.

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## NATIONAL RIVERS AND STREAMS ASSESSMENT (NRSA) SITE EVALUATION GUIDELINES

This document is provided to clarify all of the steps involved in the process of locating and evaluating a sampling site for the National Rivers and Streams Assessment (NRSA). There are 5 steps involved in this process (Figure 1):

- Locate the index site ("x-site") on a topographic map and verify that the x-site is aligned with an actual channel segment
- Obtain permission to access the site
- Verify that the site is sampleable
- Sample the site *OR* replace with an alternate site

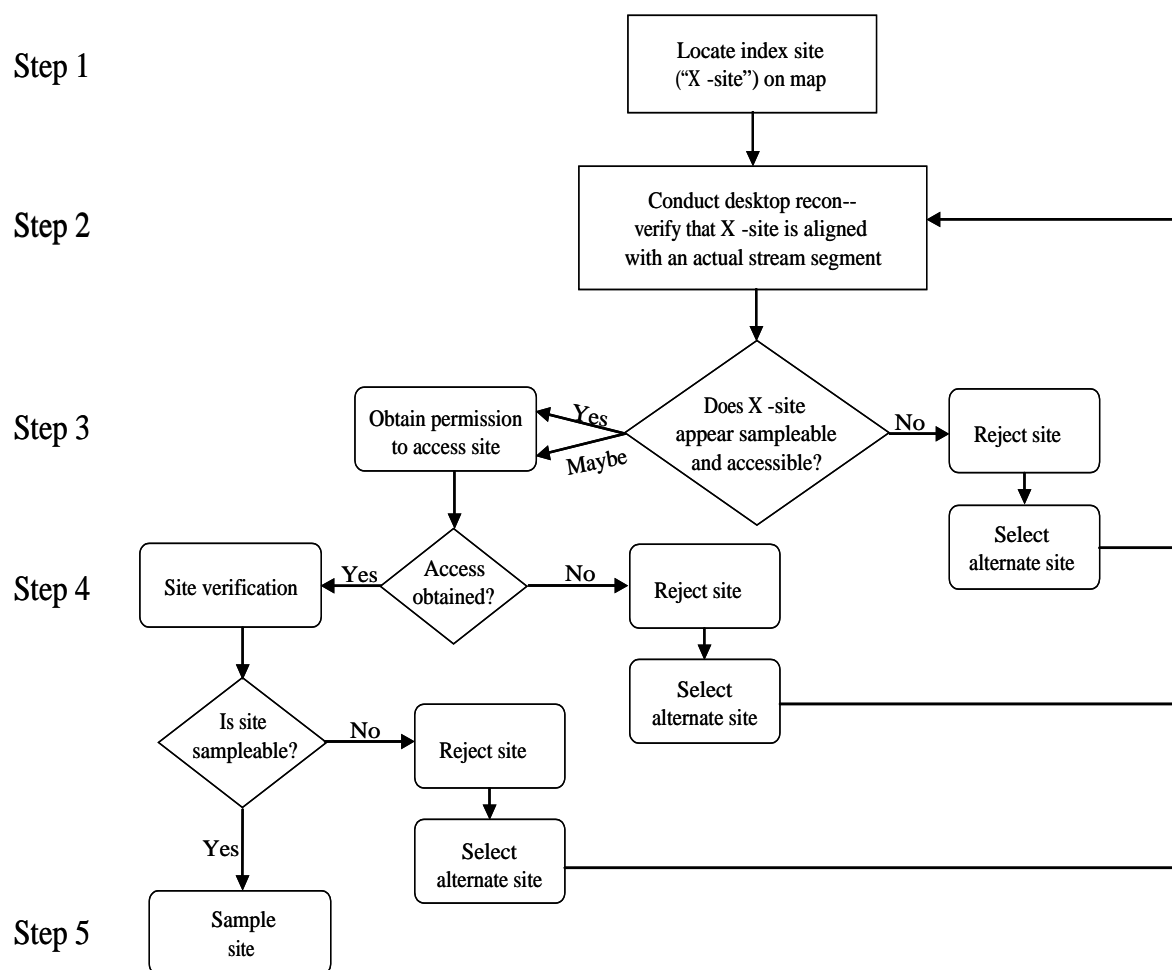


Figure 1. Process of site evaluation

Field crews must assemble a dossier containing important locational and access information for each site they are scheduled to visit. The dossier must contain the appropriate maps, contact information, copies of permission letters (if applicable), and access instructions. If the field crew is not a state agency, he/she must interact with the state to verify site locations. Before a site visit, each field team should confirm access to the waterbody if possible. The landowner(s) listed in the dossier should be contacted to confirm permission to sample and to identify any revisions to the information in the dossier.

## 1.0 LOCATING THE INDEX SITE ON MAPS

Stream sampling points were chosen from the "blue line" stream network represented on 1:100,000 scale USGS maps, following a systematic random site selection process developed for NRSA sampling by the Office of Research and Development-Western Ecology Division. Each point is referred to as the "index site" or "X-site." The "X-site" is the mid-point of the segment to be sampled. The latitude/longitude of the X-site was listed on a regional sampling site spreadsheet that was distributed electronically to the EPA Regional Monitoring Coordinators in July 2007. The Regional Monitoring Coordinators distributed the spreadsheets to each State or Tribe within his/her region. Hardcopy maps (both large scale and small scale) were distributed to each Cooperator with site locations marked. The maps include the X-site location(s), at scales appropriate for 1) locating the site more generally in a region of the state, and 2) isolating the most efficient approach(es) to the site. The sites are identified as base or oversample in the "panel" column of the spreadsheet. The base, or primary, sites are those of interest for this project. The alternate "oversample" sites are only considered if the primary sites are rejected.

At their discretion, Cooperators can print out additional maps from topographic or other software to locate and reference the X-point on the appropriate stream. The linework for US EPA's National Hydrologic Database –Plus (NHD-Plus) is based on 1:100,000-scale Digital Line Graphs and, therefore, will not match exactly with the 1:24,000-scale maps. Use the NHD-Plus linework to locate important features such as confluences or bends in the channel to assist in placing the X-site accordingly on the 1:24,000-scale (or 7.5") map. All NHD-Plus lines are shown even though many are not channel traces. Line segments for lakes, inundated areas, wetlands and, occasionally, even map boundaries are shown as NHD-Plus linework. EPA Region, USGS Cataloging Unit number, state, county and UTM zone are also included. All information, including the longitude/latitude, refers to the location of the X-point.

If you have any questions about the maps or how to use them please contact [Ellen Tarquinio](mailto:ellen.tarquinio@epa.gov) (202-566-2267, [tarquinio.ellen@epa.gov](mailto:tarquinio.ellen@epa.gov)) or Treda Smith (202-566-1187). Specific questions about how the sample frame was drawn can be directed to Tony Olsen (541-754-4790; [olsen.tony@epa.gov](mailto:olsen.tony@epa.gov)).



## 2.0 OBTAINING PERMISSION TO ACCESS CANDIDATE SITE

Each field crew is responsible for obtaining permission for their sampling team to access their sampling sites. Obtaining permission prior to the sampling day is often important to minimize loss of time on the part of the field team. Contact with the landowner can be done either through an “in-person” recon visit or through mailing out landowner permission request letters, similar to the attached cover letter signed by the Regional Monitoring Coordinator **(Figure 2)** with a permission slip **(Attachment 1)** for the landowner to return. In either case, a signed permission slip is important to use as documentation on the day of sampling. Some teams will choose to deal with access issues on the day of the sampling event. This method is usually adequate if a “desk-top reconnaissance” shows that the area around the site includes enough public land to gain access to the waterway. If the site is in an area that is largely privately owned land, waiting until the day of sampling could pose unnecessary delays and access issues that should have been resolved prior to the scheduled sampling day.

Landowner information can be obtained from the county tax assessor office. Tax assessor maps will display landowner boundaries, addresses and, oftentimes, phone numbers. This information enables the team to contact landowners before the sampling day, and identifies which landowner owns which portions of the stream or river banks. The provision of county maps for the field crews will help clarify access to the targeted sampling reach.

(Date)

Dear Landowner:

The US Environmental Protection Agency, in cooperation with State agencies, is conducting an environmental assessment of rivers and streams across the United States. A computer was used to randomly select these streams. A total of approximately 1,800 sampling sites in rivers and streams were selected for sampling in 2008 and 2009. Water quality chemistry, aquatic life, and habitat will be evaluated at each site. The findings of the study are not will not be used for enforcement or regulatory purposes.

We are contacting you prior to the site visit to obtain permission (form enclosed) to access the sampling site. We have enclosed a copy of a topographic map(s) with the site(s) identified by an “X” at the specific point on the stream to be sampled. We realize that working on your property is a privilege and we will respect your rights and wishes at all times.

Please return the completed Access Permission Form in the enclosed envelope by (date). If you have any questions concerning this request, please contact me (phone number). We are looking forward to hearing from you.

Sincerely,

(Name)

Regional Monitoring Coordinator

**Figure 2** Example of a permission cover letter

### 3.0 SITE VERIFICATION

While traveling from a base location to a site, record a detailed description of the route taken on page 1 of the Verification Form (**Attachment 2**). This information will allow others to find the site again if it is selected for a repeat visit in the future. Upon reaching the X-site for a stream or river channel, confirm its location and that the team is at the correct location. Record the information on page 1 of the Verification Form. Complete a Verification Form for each site visited (regardless of whether it is sampled), following the procedures described below.

#### SITE VERIFICATION PROCEDURES

1. Find the site location in the field corresponding to the X-site coordinates and the "X" marked on the map (X-site) prepared for each site. Record the routes taken and other directions on the Verification Form so that others can visit the same location in the future.
2. Use a GPS receiver to confirm the latitude and longitude of the X-site with the coordinates for the site. Make sure the GPS unit is set to reference the NAD 83 geospatial data set. Record these on the Verification Form.
3. Use all available means to ensure that you are at the correct location as marked on the map including: 1:24,000 USGS map, topographic landmarks, county road maps, local contacts, etc.
4. Scan the channel upstream and downstream from the X-site, determine whether the site is sampleable using the guidelines provided below, and mark the appropriate box on the Verification Form (**Attachment 2**).

#### Sampleable Categories

- *Wadeable* – There is continuous water flow and >50% of the sample reach is wadeable.
- *Boatable* – Boat is required for sampling >50% of sample reach
- *Partial Sampled by Wading* – >50% of reach sampled by wadeable protocols.
- *Partial Sampled by Boat* – >50% of reach sampled by nonwadeable protocols.
- *Wadeable or Boatable Interrupted* – The flow of water is not continual, but there is water in the sample reach (e.g., isolated pools); >50% of the reach has water present.
- *Altered Channel* – There is a stream at the location marked with the X-site on the map, but the stream channel does not appear the way it is drawn on the map. An example of this is a channel rerouting following a flood event that cut off a loop of the stream. Establish a new X-site at the same relative position in the altered channel. (Make careful notes and sketches of the changes on the Verification Form.)

#### Non-Sampleable Categories (*permanent condition; stream becomes non-target*)

- *Dry Channel* – A discernible stream channel is present but there is no water anywhere within a 150-m reach centered on the X-site. If determined at the time of the sampling visit, record as "Dry-Visited"; if site was determined to be dry (or otherwise non-perennial) from another source and/or field verified before the actual sampling visit, record as "Dry-Not visited."

- *Wetland* – (No definable stream channel) there is standing water present, but no definable stream channel. In cases of wetlands surrounding a recognizable stream channel, define the site as sampleable but restrict sampling to the stream channel.
- *Map Error* – No evidence that a water body or stream channel was ever present at the coordinates provided for the X-site.
- *Impounded stream* – The stream is submerged under a lake or pond due to man-made or natural (e.g., beaver dam) impoundments. If the impounded stream, however, is still wadeable, record the stream as "Altered" and sample.
- *Other* – The site is non-target for reasons other than those above. Examples include underground pipelines or a non-target canal. A sampling site must meet both of the following criteria to be classified as a non-target canal:
  - i. The channel is constructed where no natural channel has ever existed.
  - ii. The sole purpose/usage of the reach is to transfer water. There are no other uses of the waterbody by humans (e.g., fishing, swimming, boating).

Non-Sampleable Categories (*temporary condition; stream can be revisited*)

- *Other*--The site could not be sampled on that particular day, but is still a target site. Examples might include a recent precipitation event that has caused unrepresentative conditions.

No Access to Site Categories

- *Access Permission Denied*--You are denied access to the site by the landowners.
  - *Permanently Inaccessible*--Site is unlikely to be sampled by anyone due to physical barriers that prevent access to the site (e.g., cliffs).
  - *Temporarily Inaccessible*--Site cannot be reached at the present time due to barriers that may not be present at some future date (e.g. forest fire, high water, road temporarily closed, unsafe weather conditions)
5. Do not sample non-target or "Non-sampleable" or "No Access" sites. Place an "X" in the "NO" box for "Did you sample this site?" and check the appropriate box in the "Non-Sampleable" or "No Access" section of the Verification Form; provide detailed explanation in comments section.

The primary distinction between "Sampleable" and "Non-Sampleable" rivers or streams is based on the presence of a defined channel and water content. If the site is non-sampleable or inaccessible, the site visit is completed, and no further sampling activities are conducted.

#### 4.0 SELECTING ALTERNATE SITES

The sampling site lists for the NRSA are organized by state spreadsheets within each EPA Region. Each spreadsheet contains a list of all primary (panel=base) and alternate (panel=oversample) sites in the State. The sites are listed on the spreadsheet in the order in which they were randomly selected. All primary (base) sites must be evaluated for potential sampling and should be sampled unless they are determined to be non-sampleable or not accessible. If a primary site is rejected because it is non-sampleable or not accessible, then it will be replaced by an alternate (oversample) site within the same State. The replacement within the State also must be done by two Strahler order categories. A 1<sup>st</sup> through 4<sup>th</sup> order stream must be replaced by a 1<sup>st</sup> through 4<sup>th</sup> order stream. Similarly, a 5<sup>th</sup> through 10<sup>th</sup> order river must be replaced by a 5<sup>th</sup> through 10<sup>th</sup> order river. In both cases, the replacement site must be the next site in siteID order that is in the same Strahler order category.

When a primary site is rejected, the sampling/reconnaissance team must contact the EPA Regional Coordinator and Cooperator project lead to report it. The Cooperator lead will then pick the next site from the alternate list to replace it. The Field crew leader will be responsible for contacting the appropriate state, National Coordinator, or field team to inform them of the addition of the new site. The Cooperator must contact the Project Facilitator, so a record of all sites considered target or non-target can be documented.

The figure below (**Fig. 3**) outlines the process for replacing a site within a State. For example, if site FW08MA016 is reported as non-sampleable, the first alternate site within the same Strahler order category, FW08MA022, will be added as a replacement. If site FW08MA018 is rejected, the next alternate site to be added is site FW08MA020. As primary sites are rejected, the Cooperator lead will continue to replace them with alternate sites by selecting the next one on the list from the appropriate range of orders.

SiteID	Lon_dd83	Lat_dd83	mdcaty	panel	GNIS_NAME	Strahler	STATE	EPA_REG
FW08MA014	-71.309	42.650	0.0448436	Base	Merrimack River	7	MA	1
FW08MA015	-72.459	42.709	0.0003311	Base	Bottom Brook	1	MA	1
FW08MA016	-73.082	42.425	0.0005643	Base	Bennett Brook	2	MA	1
FW08MA017	-72.591	42.204	0.0317258	Base	Connecticut River	6	MA	1
FW08MA018	-70.934	41.958	0.0199090	Base	Taunton River	5	MA	1
FW08MA019	-71.134	42.710	0.0448436	Base	Merrimack River	7	MA	1
FW08MA020	-72.563	42.544	0.0317258	OverSamp	Connecticut River	6	MA	1
FW08MA021	-72.571	42.602	0.0317258	OverSamp	Connecticut River	6	MA	1
FW08MA022	-71.443	42.090	0.0003311	OverSamp		1	MA	1
FW08MA023	-71.094	42.766	0.0448436	OverSamp	Merrimack River	7	MA	1
FW08MA024	-71.661	42.454	0.0199090	OverSamp	Nashua River	5	MA	1
FW08MA025	-72.552	42.157	0.0199090	OverSamp	Chicopee River	5	MA	1

**Figure 3** Excerpt from Region 1 site spreadsheet

The Cooperator Lead will report the change to the appropriate field team, and to the Project Facilitation Team:

**Point of contact: Ellen Tarquinio (202-566-2267) or Treda Smith (202-566-0916)**

## **5.0 LITERATURE CITED**

- Peck, D.V., J.M. Lazorchak, and D.J. Klemm (editors). Unpublished draft.  
Environmental Monitoring and Assessment Program -Surface Waters: Western Pilot  
Study Field Operations Manual for Wadeable Streams. EPA/XXX/X-XX/XXXX. U.S.  
Environmental Protection Agency, Washington, D.C.
- U.S. EPA. 2004. Wadeable Streams Assessment: Site Evaluations Guidelines.  
EPA841-B-04-006. U.S. Environmental Protection Agency, Washington D.C.

## Attachment 1

### Example of Landowner Permission Slip

I grant permission to the biological field crew from (state agency, Cooperator, or contractor) to access the stream sampling site located on my property as part of the EPA's Wadeable Streams Assessment project.

\_\_\_\_\_ Do grant permission

\_\_\_\_\_ Do grant permission but with the following restrictions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ Do not grant permission

Landowner Name (Please print): \_\_\_\_\_

Landowner Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

\*If the operator is different than the landowner, please list the name and phone number below so that we may contact the operator before the site visit.

