
Beneficial Use Reconnaissance Program

Quality Assurance Plan

For Field Data Sheets and Data Handling
On Wadeable (Small) Streams

Updated by State Office of Technical
Services for State of Idaho Surface Water
Program

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Introduction

The Beneficial Use Reconnaissance Program (BURP) is based on methods of surface water quality monitoring which are documented in Beneficial Use Reconnaissance Program 2002 Annual Work Plan (Clark 2002) and Beneficial Use Reconnaissance Program Field Manual (DEQ 2002). A common protocol is used statewide for sampling wadeable streams, thus creating comparable data. The BURP protocol has been standardized into six pages of forms for habitat data collection, 2 pages for Fish, 2 pages for Macroinvertebrate (2 from Lab), Periphyton and between 2 and 6 pages for Bacteria data. Once data have been collected, and after Regional Office BURP Coordinators review, a copy of the field forms is sent to the State Office for entry into the BURP database.

This Quality Assurance Plan describes the quality control performed during data submittal, data rejection, and data entry. It is important that all involved individuals adhere to this plan. Regional review of BURP data should include systematic review of every field on each form, recognize possible mistakes, and take the necessary steps to make corrections. Figure 1 specifies responsibilities in the quality control process, from recording data in the field through data entry in the State Office.

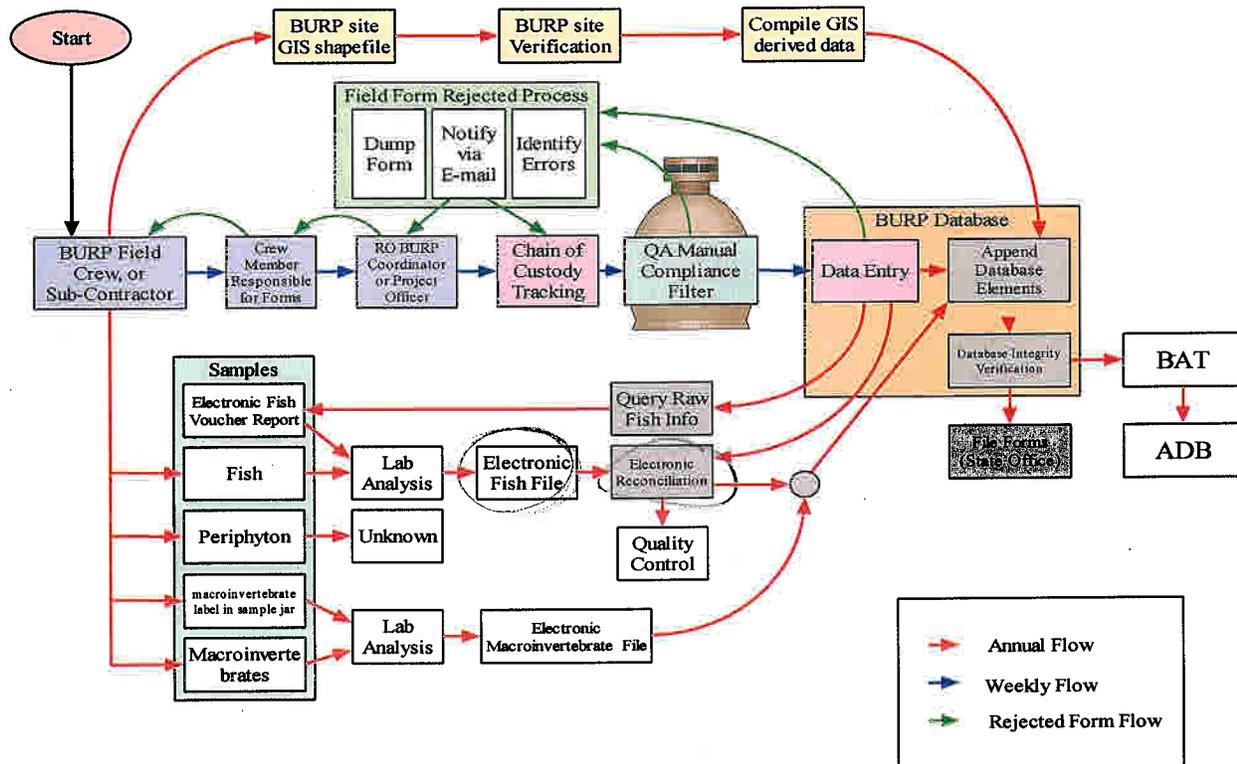


Figure 1. BURP data Flow

Field Form Rejection

The purpose of the BURP monitoring is to collect information to be used in assessing beneficial uses. The BURP data management strategy includes an electronic database that holds information collected in the field. The information from field forms cannot be entered into the BURP database if:

- required information is missing,
- the forms are illegible, or
- information is not in the correct format.

To ease future transition to TeleForms™ and in an attempt to reduce program costs it has been determined that forms not meeting quality criteria, defined in this document, will be rejected (discarded after an e-mail of the errors has been sent to the regional office) rather than following the de-batching process of years past.

When an individual field form has been rejected, the following process will be followed:

1. The rest of the form will be scanned for additional errors.
2. An e-mail will be sent to Regional BURP coordinator and individual tracking State Office form chain of custody (Brenda). This email will clearly list sites that have been rejected and list errors.
3. State Office copy (submitted) will be disposed of.

Regional Offices will need to re-submit field corrected forms for each site that has been rejected during the next weeks submittals (7days).

Rejections, corrections that the Regional Office must make

The following is a list of corrections which State Office personnel must **not** fix. These corrections require first hand knowledge or observation of events, in order to accurately and precisely depict.

1. Required fields on first page missing
2. Information cut off in copying, or copies illegible
3. Unsolvable problems with map information and stream names
4. Location descriptions that are missing.
5. No date
6. Missing, or incorrectly formatted crew members' names. These can be found on front page or macroinvertebrate samples
7. Macroinvertebrate habitat and/or sampler type missing
8. Pool Quality Index entries which are not numbers (e.g. all sand or >50)
9. Stream bank conditions which do not total exactly 100 percent for each bank
10. Valley type or sinuosity not circled
11. Rosgen Stream Type missing

12. Empty boxes in Canopy Closure table
13. Gradient Conversions.

Corrections State Office should make

State Office personnel are limited in the assumptions they can make regarding missing information. The following corrections should be made by the State Office prior to processing forms for data entry.

1. Changing Rosgen stream type classification from lower to upper case
2. Conversions of air and water temperatures recorded in F to C
3. Obvious math errors
4. Spelling errors
5. Other obvious typographical errors
6. Additions in characters to the date field to format correctly
7. May add negative sign to "Longitude Degrees" field when reported as positive
8. Time, conversion from 12hr to military time.

GIS Corrections

The following corrections that will be made when GIS derived data is incorporated into the BURP data base, at the end of the BURP monitoring season.

9. Stream name format problems, when recorded stream name does not exist within GNIS
10. Hydrologic Unit Code (HUC)
11. WBID Number
12. County (according to GIS position)
13. Public Land Survey
14. Ecoregion

Location Data Collection and Site Verification with GPS and ArcView™

The following is a summary of procedures used to develop, verify and submit a final shapefile to Technical Services Geographic Information System (GIS) for the 2001 Beneficial Use Reconnaissance Program season and beyond. This document is not intended to be technical manual, for technical procedures refer to the 2001 GPS training Short Course Manual or the Pathfinder™, GeoExplorer™ Manuals.

On a weekly/biweekly basis GPS data collected from the field crews should be downloaded, differentially corrected, imported into ArcView and the stream locations verified against the field forms. Waiting until the end of field season especially after the field crews have departed to verify the location data is not recommended for several reasons. GPS correctional files may no longer be archived and unavailable to differentially correct the data, and secondly, any misplaced sites or wrong stream names cannot be easily repaired

GPS Collection Procedures

Prior to field season a simple data dictionary should be created and uploaded to the GeoExplorers containing a text field for the field crews to enter the BURP site identification. Other fields or selection menu items may also be created containing stream name, weather conditions, activities, etc. A standardized data dictionary may also be created and distributed if common menu items are agreed upon. The use of a data dictionary immensely simplifies the data conversion and verification procedures because all pertinent information is available electronically during post processing and conversion to ArcView Shapefile format. Please refer to your Pathfinder Office Manuals or “GPS Short Course Manual 2001” on Data Dictionaries.

ArcView™ and Waypoints

To guarantee the accuracy of the BURPed location, waypoints of potential sites can be easily created in ArcView™, imported into Pathfinder Office™ and uploaded to the GeoExplorers™. As the field crews near their destination they can utilize the navigational features of the GeoExplorers™ to ensure they are in the right drainage and traveling to the correct reach. Additionally the Geo III's™ have the capability to upload actual GIS stream segments and provide “real time” maps to the field crews. For technical assistance of these features refer to your Pathfinder™ Office Manuals or contact DEQ Technical Services GIS.

GeoExplorer/Pathfinder Office™ Configurations

Refer to short course manual (DEQ 2001) or Pathfinder Office manual (Trimble 2001) for recommended settings utilizing NAD27 within the GeoExplorers and IDTM-NAD27 for Pathfinder Office.

ArcView™ Shapefile Export Format

Within Pathfinder Office™ the Shapefile Export menus should be configured to contain the following Attributes:

Pathfinder Office: Utilities>> Export>>Properties Menu

Checking the selected attributes will develop a shapefile containing accuracy information that we can use to simplify rectification to 24K Quads and 100k hydrography. The .dbf portion or attribute portion of the shapefile submitted to the State Office will contain the following information after each location has been checked against the field forms for accuracy.

Final Shapefile Format

By utilizing the data dictionary and setting the export attributes (see figure 2) little reconciliation work will need to be performed on the final shapefile (see figure 3). Sites Burped where GPS was not available can simply be appended to the final shapefile in ArcView™, within the GPSfile or Rcvr_type Fields enter in that they were “on screen” digitized

See following final formatted BURP Shapefile containing Burpid, stream name and associated accuracy information submitted to State Office. Original corrected GPS files should be archived for future reference.

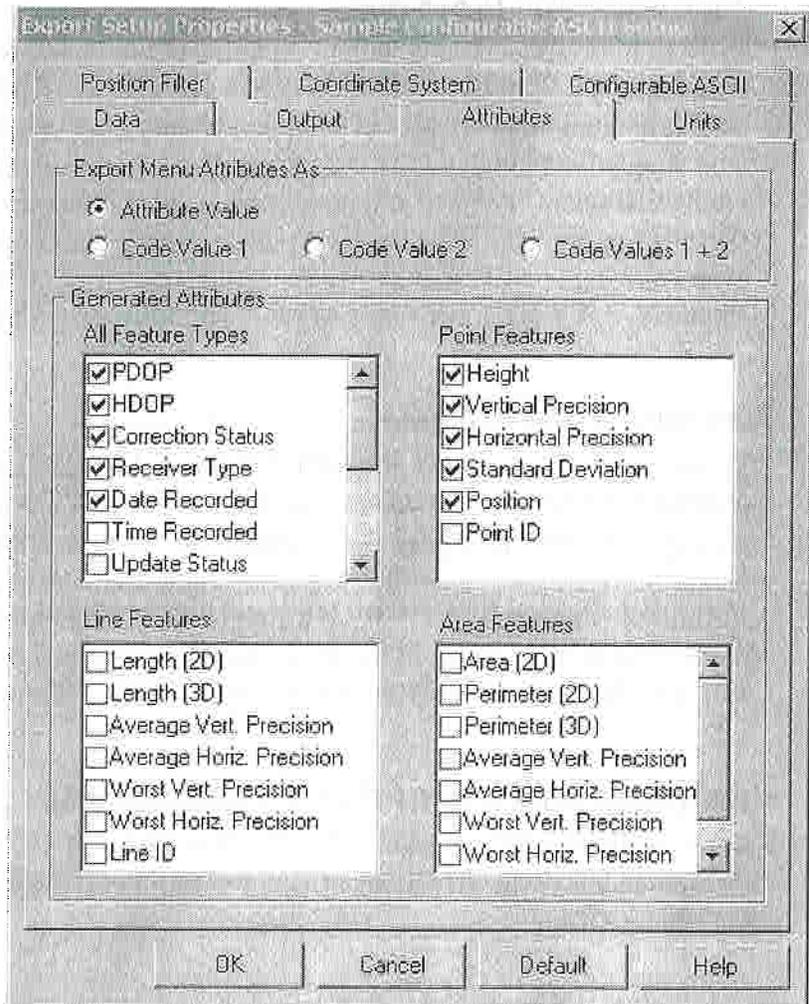


Figure 2. ArcView Shapefile Export Attributes

Attributes of Idlburp01.shp													
Shape	Shape	Stream	GNIDb	Max_pnts	Cont_type	Font_type	Exp_date	Exp_wat	Duration	Flow_dir	VEL_CRS	Longitude	
Point	2001SIDFA009	Antelope Creek	A070214A	6.0	Differential	GeoExplorer	20010702	08:33:19am	grouped.ssf	1.428	0.080	43.543148	111.531070
Point	2001SIDFA001	Pritchard Creek	A070217A	3.7	Differential	GeoExplorer	20010702	11:08:01am	grouped.ssf	1.582	0.089	43.445108	111.435910
Point	2001SIDFA010	June Creek	A070221A	5.2	Differential	GeoExplorer	20010702	03:51:07pm	grouped.ssf	2.743	0.080	43.363947	111.540170
Point	2001SIDFA002	Fall Creek	A070222A	4.9	Differential	GeoExplorer	20010702	04:40:46pm	grouped.ssf	1.628	0.094	43.370029	111.496190
Point	2001SIDFA011	Trell Creek	A070314A	4.5	Differential	GeoExplorer	20010703	08:07:05am	grouped.ssf	1.687	0.089	43.363668	111.540650
Point	2001SIDFA012	Monument Creek	A070314B	5.9	Differential	GeoExplorer	20010703	08:24:01am	grouped.ssf	1.379	0.086	43.365582	111.509680
Point	2001SIDFA013	Pelescom Creek	A070314C	3.3	Differential	GeoExplorer	20010703	08:48:24am	grouped.ssf	1.350	0.078	43.375434	111.562540
Point	2001SIDFA003	South Fork Fall Creek	A070315A	4.7	Differential	GeoExplorer	20010703	09:29:23am	grouped.ssf	1.490	2.587	43.392688	111.449220
Point	2001SIDFA004	Indian Creek	A070320A	4.9	Differential	GeoExplorer	20010703	02:23:35pm	grouped.ssf	1.730	0.094	43.406196	111.320910
Point	2001SIDFA014	Little Pine Creek	A070322A	4.9	Differential	GeoExplorer	20010703	05:00:14pm	grouped.ssf	1.829	0.073	43.589769	111.571740
Point	2001SIDFA005	Fall Creek	A070514A	2.9	Differential	GeoExplorer	20010705	08:49:35am	grouped.ssf	1.410	0.085	43.411836	111.429460
Point	2001SIDFA006	Palisades Creek	A070518A	5.3	Differential	GeoExplorer	20010705	12:24:34pm	grouped.ssf	3.511	0.102	43.396627	111.214193
Point	2001SIDFA007	Little Elk Creek	A070621A	4.7	Differential	GeoExplorer	20010705	03:31:42pm	grouped.ssf	3.121	0.109	43.325395	111.155180
Point	2001SIDFA008	Big Elk Creek	A070613A	5.9	Differential	GeoExplorer	20010706	07:52:42am	grouped.ssf	1.931	0.156	43.321352	111.115490
Point	2001SIDFA015	Pine Creek	A070914A	4.3	Differential	GeoExplorer	20010709	08:47:54am	grouped.ssf	1.856	0.094	43.537398	111.307250
Point	2001SIDFA016	Mike Spencer Creek	A070920A	5.1	Differential	GeoExplorer	20010709	02:21:30pm	grouped.ssf	1.679	0.096	43.535855	111.306060
Point	2001SIDFA017	Burns Creek	A071014A	5.1	Differential	GeoExplorer	20010710	08:15:34am	grouped.ssf	2.021	0.125	43.141414	111.041410
Point	2001SIDFA018	Trox Creek	A071018A	4.2	Differential	GeoExplorer	20010710	10:43:44am	grouped.ssf	1.785	0.125	43.160631	111.066210
Point	2001SIDFA019	McCoy Creek	A071019B	5.6	Differential	GeoExplorer	20010710	01:47:41pm	grouped.ssf	1.653	0.113	43.181388	111.116910
Point	2001SIDFA020	Jensen Creek	A071022A	5.0	Differential	GeoExplorer	20010710	05:00:00pm	grouped.ssf	1.433	0.115	43.176109	111.151860
Point	2001SIDFA021	Fish Creek	A071114A	5.1	Differential	GeoExplorer	20010711	08:50:15am	grouped.ssf	1.983	3.170	43.152811	111.175340
Point	2001SIDFA022	Iowa Creek	A071118A	5.5	Differential	GeoExplorer	20010711	12:22:07pm	grouped.ssf	2.060	0.110	43.147716	111.245810
Point	2001SIDFA023	Camp Creek	A071121A	5.6	Differential	GeoExplorer	20010711	03:11:41pm	grouped.ssf	3.111	0.132	43.145860	111.279230
Point	2001SIDFA024	West Pine Creek	A071214A	4.7	Differential	GeoExplorer	20010712	08:44:04am	grouped.ssf	1.507	0.095	43.553817	111.294560
Point	2001SIDFA025	McCoy Creek	A071616A	4.7	Differential	GeoExplorer	20010716	10:43:36am	grouped.ssf	1.732	0.110	43.151899	111.242720
Point	2001SIDFA026	Sping Creek	A071621A	4.8	Differential	GeoExplorer	20010716	03:29:42pm	grouped.ssf	1.578	0.118	43.140041	111.340990
Point	2001SIDFA027	McCoy Creek	A071623A	4.8	Differential	GeoExplorer	20010716	05:45:38pm	grouped.ssf	1.817	1.694	43.142786	111.335000
Point	2001SIDFA028	Pole Creek	A071717A	4.6	Differential	GeoExplorer	20010717	11:17:16am	grouped.ssf	1.500	0.101	43.174454	111.356720
Point	2001SIDFA029	South Fork Bear Creek	A071720A	4.5	Differential	GeoExplorer	20010717	02:15:31pm	grouped.ssf	1.578	0.887	43.223486	111.384630
Point	2001SIDFA030	Bear Creek	A071800A	5.6	Differential	GeoExplorer	20010717	06:25:46pm	grouped.ssf	1.536	0.111	43.275623	111.231520
Point	2001SIDFA031	Black Canyon Creek	A071815A	4.6	Differential	GeoExplorer	20010718	10:38:43am	grouped.ssf	3.316	0.082	43.587004	111.459350
Point	2001SIDFA032	Burns canyon Creek	A071819A	5.3	Differential	GeoExplorer	20010718	01:31:47pm	grouped.ssf	1.994	0.082	43.604646	111.468120
Point	2001SIDFA033	South Fork Sellars Cree	A071900A	2.9	Differential	GeoExplorer	20010718	06:46:41pm	grouped.ssf	1.365	0.067	43.263824	111.839630
Point	2001SIDFA034	Sellars Creek	A071914A	5.4	Differential	GeoExplorer	20010719	08:23:14am	grouped.ssf	1.781	2.273	43.260746	111.833870
Point	2001SIDFA035	Squaw Creek	A072315A	5.6	Differential	GeoExplorer	20010723	09:41:45am	grouped.ssf	1.647	0.128	43.349329	111.782540
Point	2001SIDFA036	Birch Creek	A072320A	3.7	Differential	GeoExplorer	20010723	02:01:14pm	grouped.ssf	1.598	0.107	43.329425	111.804630
Point	2001SIDFA037	Rock Creek	A072322A	6.7	Differential	GeoExplorer	20010723	04:50:36pm	grouped.ssf	1.887	0.280	43.336529	111.656670

Figure 3. Example of final shapefile.

1. The first part of the document is a list of names and titles.

The names listed are: [Illegible names and titles, including what appears to be a list of names and possibly a list of titles or positions.]

Data Review

DEQ BURP coordinators are responsible for overseeing the BURP crews working from the six DEQ Regional Offices. Oversight responsibilities include a responsible crew leader's review of all fields on the BURP field forms, prior to submission to State Office. [See Appendix A for examples of the field forms.] After review, the field forms are sent to the State Office for compilation into a database. The data review, Mondays, by regional coordinators is necessary to verify the data is complete and reasonable. Regional coordinators should ensure that:

- The data on all pages of the photocopied field forms are legible and can be seen clearly. If data are unreadable due to poor copy quality, the coordinator is asked to recopy the form on a better copier setting.
- All fields have been completed with the required information, as defined in this document.
- If only one set of photos was taken, copies have to be made for all photos for the State Office.
- Macroinvertebrate sample label has both T-1, T-2 T-3.
- If there was no large organic debris, then zero has been entered in the field.
- Actual tic marks and totals have been recorded for the Wolman pebble count. Pool Quality Index measurements and codes have been recorded. No "less than (<)", "greater than (>)" or "percent (%)" symbols have been used, and no word descriptions such as "silt" or "sand" have been recorded.
- The map on the last page is labeled with stream name, quad name, scale, and site ID, and the monitoring location is clearly marked.
- All forms are included for each biological assemblage collected.
- If the stream is dry, page one location information, page 2 comments (if recorded), page 5 photos and the map page are submitted.

Table 1. Typical Week's Data Handling Schedule

Mon	Tue	Wed	Thu	Fri
1. BURP coordinator checks forms and mails to State Office				1. BURP crew Finalizes Field Forms 2. State office receives previous weeks forms

Data Verification

After the regional data review, BURP field forms are received by State Office quality assurance personnel. The quality of BURP data are ensured by data quality objectives, including comparability, accuracy, completeness, and representativeness. Data quality objectives are achieved by following the BURP schedule, procedures and protocols contained in the current Annual Work Plan (Clark 2002) and Field Manual (DEQ 2002), and verifying the protocols are followed.

Mandatory field form tracking procedures for monitoring the status of the forms are included in Appendix B. Mandatory field form debatching procedures are found in Appendix C. Debatching is used if it is necessary to send field forms back to the Regional Office for correction.

Field Form Page 1

Stream Name †

- Required.
- Spelling must be EXACTLY consistent with the Geographic Names Index System (GNIS) (U.S. Geological Survey 2000). No abbreviations are allowed. The database will accept the first 50 characters for this field.
- Be aware of similar spellings such as “Tenmile Creek” and “Ten Mile Creek” which are both different and should not be written as “10 mile Creek.” Also note how a stream name is organized. “Middle Fork Boise River” is not the same as “Boise River, Middle Fork.”

Site ID

- Required (for data handling purposes, make sure it is on every page).
- Must be 12 digits. Table 2 illustrates the site ID numbering convention.

Table 2. Structure of BURP site identification numbers

Present year	4 digits	2001
Waterbody type	1 digit	S-stream R-river
Regional Office Abbreviation	3 digits	IDF-Idaho Falls POC-Pocatello TWF-Twin Falls BOI-Boise LEW-Lewiston CDA-Coeur d’Alene
Crew	1 digit	A, B, C, D for Regional Offices

† Fields indicated with this symbol are to be populated with GIS information at the end of the season. These fields may not necessarily have the same info as the BURP data base.

Present year	4 digits	2001
		E,F for contract crews W-wilderness V-variability
Site Number	3 digits	Example: 001, 045, 165

Example of Site ID for Boise "A" crew, site 34: 2001SBOIA034

Date

- Required.
- The format is Year/Month/Day (YYYY/MM/DD).
- The date is eight digits long. "02/6/3" is not correct. The correct format is "2002/06/03."

Hydrologic Unit Code (HUC) †

- Optional
- Must be eight digits.
- Also called "fourth field HUC" or "fourth field cataloging unit."

WBID Number (Assessment Unit) †

- Optional.
- Idaho's unique waterbody identification number. Historically this number was composed of the eight-character HUC and a three-character georeferenced sequential number (001, 002, 003, ...999). The number is a numerical identification used in the standards. For example, 17060207009 references a waterbody in the Middle Salmon River/Chamberlain Creek subbasin
- The new/current Idaho unique waterbody identifier is a twenty-character field comprised of:
 - 2 alpha, state code (example: "ID" for Idaho)
 - 8 numeric, fourth field HUC
 - 2 alpha, Basin code (example: "SK" for Snake River Basin, see Table 3)

Table 3. Basin and Basin Abbreviations

Basin	Abbreviation
Bear Basin	BR
Clearwater Basin	CL
Panhandle Basin	PN
Salmon Basin	SL
Southwest Basin	SW
Upper Snake Basin	SK

- 3 numeric, 1 alpha (optional), Water Body ID
- "_", 1 underscore as a place holder
- 2 numeric, 1 alpha (optional), Stream Order Code

- An example of the definition is “ID17050102SW009_06”
- When the shape file associated with the BURP site has been corrected at State Office the Assessment Unit will be updated.

Public Land Survey †

- Required to 1/16th section. 1/64th section is optional.
- To describe 1/16th of a section, the correct method is:
Township, Range, Section, (blank), 1/16th section, 1/4 section
For example:
Twtnshp 04N, Range 03W, Section 23, ___ 1/4 of the , SE1/4 of the, NE1/4
- To describe 1/64th of a section, the correct method is:
Township, Range, Section, 1/64th section, 1/16th section, 1/4 section
For example:
Twtnshp 04N, Range 03W, Section. 23, SW 1/4 of the , SE1/4 of the, NE1/4
- To assist in verifying location when using 1:24,000 USGS topographic maps use the locator template shown in Figure 2.

Longitude/Latitude, Datum, and Lat/Long Confidence †

- Required.
- Degrees and minutes should be integers only (no decimal or other text).
- Seconds should be decimal numbers to the one thousands place.
- Longitude should be reported as a negative integer (quality assurance personnel may add the negative sign).
- Check the datum to make sure that it is NAD 27.
- Make sure the lat/long confidence has been selected.
 - If the crew reported corrected GPS data, 2-5 meters should be checked.
 - If the crew reported uncorrected GPS data, 100 meters should be checked.
 - If the crew reported via map, 500 meters (estimate) should be checked.

GPS Filename

- Optional.
- Should include extension; “.ssf” for uncorrected or “.cor” for corrected.

County †

- Required.
- If “Out of Idaho” has been reported by the field crew make sure an explanation is supplied on page 2 of the Comments section specifying what “Out of Idaho” means.
- When the shape file associated with the BURP site has been corrected at State Office the County will be updated.

Ecoregion †

- Required.

- The full ecoregion name must be used: “Snake River Basin/High Desert,” not “Snake River.”
- The eight Ecoregions (Omernik, 1986) available for the Idaho DEQ data are:
 - Blue Mountains
 - Columbia Basin
 - Middle Rockies
 - Northern Basin And Range
 - Northern Rockies
 - Snake River Basin/High Desert
 - Wasatch And Uinta Mountains
 - Wyoming Basin

Map Elevation

- Required.
- Standard reporting format for DEQ data is Meters
- Units should be circled.
- Make sure units are reasonable for location of measurement. Examples of errors might be 400 feet elevation and 4,500 meters, which are too low and too high for Idaho, respectively.

Location Relative to Landmark

- Required.
- Ask yourself, “Could a person new to the area find this site without any trouble?”
- Description must be relative to a permanent structure or point on the ground.
- Do not use information that is only found on a map such as section lines, contour lines, or county lines. Do not use vague information like “bend in road.”
- Good locations are mountain peaks with names, road intersections, road mile markers, stream confluences, power lines, small towns, waterfalls, islands, campgrounds, etc.
- Include all Forest Service or other road numbers.

GPS Elevation

- Optional
- Standard reporting format for DEQ data is Meters.
- GPS elevation should be reported from the GPS Unit display.
- Units should be circled.
- Make sure units are reasonable for location of measurement. Examples of errors might be 400 feet elevation and 4,500 meters, which are too low and too high for Idaho, respectively.

Weather Conditions

- Optional.
- Four categories of weather may be considered: temperature, cloud cover, intensity of rain, and amount of wind.
- Weather may be described with suggested adjectives shown in Table 4.

Table 4. Suggested format of weather descriptions

Temperature	Cloud Cover	Intensity of Rain	Amount of Wind
Hot	Foggy	Misty	Thunderstorms
Cold	Partly cloudy	Light Rain	Breezy
Warm	Mostly cloudy	Raining	Light wind
Cool	Cloudy	Hard Rain/Downpour	Windy
	Clear		Very Windy
	Sunny		

Crew Members

- Required.
- Format is “First Initial, Last Name.” For example, J Smith. Note - no period after first initial.

General Bankfull Width

- Required.
- This is a preliminary estimate (in meters) to give the crews an idea of how long their sample site is going to be.
- If the crew has mistakenly used either the < or > symbol, calculate and replace value with the average of all three transects’ wetted width measurements, which are given on the fifth page of the BURP field forms.

Total Reach Length

- Required
- Must be at least 100 meters if the bank full width is less than or equal to 3.3 meters wide.
- Must be 30 times the bank full width if the stream is more than 3.3 meters wide.
- This number will not always match the Longitudinal Habitat Distribution (LHD) total on page 6. Though the numbers are a description of the length of the stream, the measurement methods for both are different. It is not incorrect if the crew lists the LHD total here, but the Quality Control (QC) person does not need to correct it if an estimate is given.

Stream Order †

- Required
- See Figure 2 for an example of stream order classification.
- One of the numbers should be circled.

Stream Gradient

- Required.
- Make sure the gradient is recorded as a percentage. Conversion is necessary if the gradient is recorded in degrees. The equation for calculating Stream Gradient percentage from 0.0 – 10.0 degrees follows:

$$SGp = 1.763 * SGd - 0.0667$$

Where SGp is Stream Gradient percentage, and SGd is Stream Gradient degrees

- Determined in the field with the aid of a clinometer, but can also be derived and double-checked in the office by dividing the known elevation change between two points on a stream by the stream (or thalweg) distance between those two points.
- Number is usually less than three percent.
- The BURP program trips a warning for all gradients greater than 10%. It would help data entry evaluate data quality if the notes contained a note that the site occurs in an area of high relief.

Rosgen Stream Type

- Required.
- Reference Rosgen 1996 methods.
- Entry should consist of one capital alphabetical character.
- Acceptable entries: A, B, C, D, E, F, G.
- Unacceptable entries: a, AA, A+, "A", <A, A-B, or any alphabetical characters greater than G.
- QC individual may change from lower case to upper case.
- Classify to Level I only.

Water Temperature

- Required.
- Units are necessary.
- Temperature must be in degrees Celsius ($^{\circ}C$); QC staff should convert to $^{\circ}C$ if in $^{\circ}F$.

Stream Order Concepts

1. Using a 1:100K USGS map, start at the headwaters and count the tributaries that make up the stream/river at hand. Do this until you have reached the BURP site. Only count perennial streams (no ephemeral or intermittent streams; marked by a broken blue line on the map).
2. When a first order (headwater) stream joins with another, it becomes a second order stream. Two second order streams together become a third order stream, and so forth. However, when a first order stream joins a second order stream, the combination remains a second order stream. If a lower numbered stream joins with a higher numbered stream, the higher number remains at the original higher order. Theoretically, this is because the amount of flow entering the third order stream from the second order will not increase the volume of the third order stream significantly. On-site, though, the crew may see that the tributary is as big as the main stem. This call can only be made in the field, so check with the crew when in doubt.

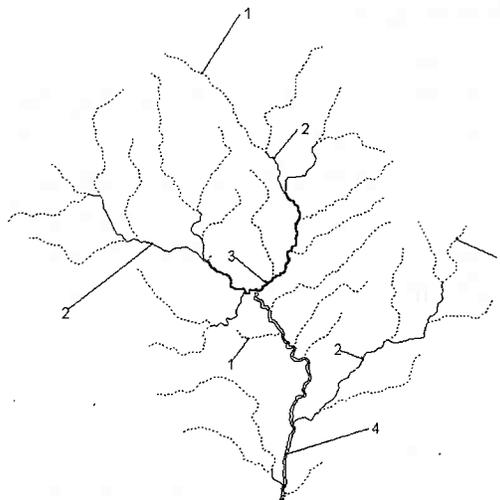


Figure 4. Example Stream Order

$$T_c = (T_f - 32) * 5/9$$

Where T_c is temperature in degrees Celsius, and T_f is temperature in degrees Fahrenheit

Air Temperature

- Optional.
- Temperature must be in degrees Celsius (°C); QC staff may convert to °C if in °F.

Time

- Required.
- 24-hour time must be used. For example, 3:30pm will be entered as 1530 hours.
- There is no colon in 24-hour time.

Amphibians and Fish Observed

- Optional.
- Check electrofishing field sheets to ensure agreement. It is critical to the assessment process that if amphibians or fish were collected that this is noted in the "Amphibian and Fish Observed" fields on the field form.
- Check spelling.
- Unacceptable items for entry in Amphibians and Fish observed are Snakes of any kind or Crawdads.

Conductivity

- Optional.
- Should be recorded as a number with one or two decimal places.

Valley Type

- Required.
- Only one should be circled.

Sinuosity

- Required.
- Only one should be circled.

Activities Affecting Reach

- Required.
- Circle all that apply.
- Briefly scan "Additional Comments" to see if there is mention of more activities that were not marked.

Collected

- Required.
- Mark the check boxes for data types collected for DEQ sites (examples are Macroinvertebrate, fish, periphyton, bacteria, amphibians or fish)
- If Non DEQ fish data exists for the site marked the check box and supply an explanation of the source in the field provided.

Field Form Page 2

- Required.
- This page is for comments from the crew about anything unusual they might have found or seen. Page 2 should have a description of the site: vegetation types, animal tracks, human activity, and other notable aspects. Drawings are encouraged.
- Be sure to include the explanations for fields outside the normal data format examples are: County, Out of Idaho; Activities Affecting Reach, Other.

Field Form Page 3

Discharge Measurement

- Required.
- The DEQ has formulated a spreadsheet entitled FlowCalc2.0, which is derived from discharge calculations found in Harrelson et al, 1994. The final value should be entered onto the form and rounded to the nearest tenth of a decimal.
- Regional Office are responsible for calculating discharge using FlowCalc2.0

Macroinvertebrate Samples

- Required.
- Were samples taken during low/stable flow between July 1st and October 15th? Either “Yes” or “No” must be circled.
- Each of the following are required for all three transects:
 - Label should have both Site ID and T-1, T-2, and T-3 (may have T-3a and T-3b).
 - Sampler Used: Grab, Hess, Surber or Kick must be circled.
 - Habitat Sampled: Riffle, Run, Glide, or Pool must be circled.
 - Time: 24-hour time must be used. No colons.
 - Split: Should be blank when no split is taken. If the sample is split, the form should say yes followed by the number of splits (“yes 2”, “yes 3”).
 - By: Must have first initial and last name of person who collected the sample.
- If time is not reported in 24 hour time it will be converted for entry into the DEQ BURP database.

Field Form Page 4

Wolman Pebble Count

- Required.
- A minimum of 50 counts should have been taken at each transect, for a total of 150.
- Each box should have a LEGIBLE total and hash marks to indicate the total. Double-check the tallies for each box.
- Comments such as “all silt” and “all sand” are unacceptable.
- It is also unacceptable if the crew writes in numbers without any tally marks.
- All fields without tallies and totals will be defaulted to “0”.

Large Organic Debris

- Required.
- A zero should be entered if no large organic debris was present in the stream.
- Blanks in this field will be returned to the region.

Canopy Closure

- Required.
- All boxes must have a number entered.
- No number should be larger than 17.

Field Form Page 5

Width/Depth Ratio

- Required.
- All boxes must have numbers entered in them.
- "Bankfull Width" must be larger than or equal to "Wetted Width."
- Based on what the wetted width is, there should be 3, 5, or 7 wetted depth measurements (see the legend supplied on page 5 of the field form).
- "Average Wetted Depth" field is recalculated from wetted depth measurements.
- Make sure only one habitat type is circled for each transect. Examples are: Riffle, Run, Glide or Pool.

Photo Information

- Optional.
- Roll name can be anything, usually something like "STWF01."
- Individual photo number must be recorded and one direction type (upstream, downstream, panorama) must be circled for general layout photos.
- Detailed photos (like photos of amphibians, unique situations, unknowns) need to be recorded in the "Other" area.
- Azimuth is optional.
- Duplicate photos need to be recorded separately.

Horizontal Distance of Undercut Banks

- Required for streams with transects with undercut banks.
- Blank means undercut bank not observed and will be defaulted to "0"..
- Values should be positive.
- Comments are to be related to the description of undercut banks.

Field Form Page 6

Longitudinal Habitat Distribution

- Required.
- All stream habitat types must have a total in the "total" space provided. If one or more of the habitats did not exist within the reach, a "0" should be in the "total" space.

- This total may be different from "Total Reach Length".

Stream Bank Condition

- Required.
- The sum of the percentages for the left bank and right bank should each equal 100 percent independently.

Habitat Assessment Summary Sheet

- Required.
- The prevailing habitat must be circled (either riffle/run or glide/pool).
- The prevalence should match the dominant habitat type from the "Longitudinal Habitat Distribution" section. If it does not, reconcile with the Regional Office.
- Numbers must be entered only in the shaded boxes under the prevalence selected.
- Do not total the numbers at the bottom of the table.

Pool Quality Index

- Required.
- There should be no blanks on the pool quality index form unless a Stream Condition (such as "Dry" apply) or no pools were observed.
- "Max Pool Depth" must be equal to or greater than "Tailed Depth".
- All measurements entered into the table must be actual numbers. Words such as "silt", "boulder", or "all sand" are not acceptable. It is also unacceptable to enter ranges such as "20-25", "<1mm" or ">254mm", percent symbols "%", tildas "~".
- Double check to see that the proper code was assigned. Data entry only inputs the raw data; however, if the code the crew wrote does not match the raw data, it must be corrected.
- All numbers must be legible.
- Codes, Totals and Averages reported by the field crew that do not match the results from the DEQ BURP program will be updated on the hard copies.

Map Page

- Required.
- The map requires five pieces of information:
 - Stream Name as reported using the current version of the US GNIS.
 - Site ID
 - Map Name
 - Scale
 - Site clearly labeled on the map with an arrow, X, etc.

Bacteria Data

Bacteria samples have gone to a laboratory for analysis. The quality control verification process requires the following:

- A screening sheet submitted for every BURP site.
- A grab sample sheet.
- Five additional sample sheets if the grab sample is positive.

- All the samples collected within a 30-day period, or else the data will be rejected.

Periphyton Data

Periphyton samples have gone to a laboratory for analysis. Periphyton data will not be entered into the BURP database and will therefore have no data control verification procedures in place this year.

Macroinvertebrate Data

Data resulting from macroinvertebrate samples undergoes quality control procedures by the contracting laboratory, EcoAnalysts, Inc. Verification occurs at the steps for sorting and sub-sampling, as well as identification and enumeration. During sorting and sub-sampling, a random 10 percent of the samples is selected and examined by a different technician. At least 95 percent of all the invertebrates in the sample must be removed for identification. If fewer than 95 percent are removed, then the entire sample will be redistributed for a new random sample.

Identification is also verified on at least 10 percent of all samples. Once a taxonomist completes identification and enumeration, the sample is identified and enumerated by a separate taxonomist. A percent similarity index is calculated on the two samples and must be at least 95 percent similar. All discrepancies are investigated and reconciled before any more samples are processed. In addition, the synoptic collections from each DEQ Regional Office are regularly reviewed to ensure taxonomic resolution and consistency are being maintained.

Fish Forms

The BURP crews or other authorized personnel capture fish at selected BURP sites. The species, length, weight, voucher tag number, and voucher group are recorded on each individual fish. Vouchers should be secured for each species, all fish with anomalies and fish injured during collection. The voucher specimens are sent to a professional taxonomist for positive identification and these results are sent to the State Office. The BURP crews send fish field forms to the State Office.

Water Body Name

- Required
- Spelling must be EXACTLY consistent with the Geographic Names Index System (GNIS) (U.S. Geological Survey 2000). No abbreviations are allowed. The database will accept up to 50 characters for this field.
- Be aware of similar spellings such as “Tenmile Creek” and “Ten Mile Creek” which are both different and should not be written as “10 mile Creek.” Also note how a stream name is organized. “Middle Fork Boise River” is not the same as “Boise River, Middle Fork.”

BURP Site ID

- Required
- Must be 12 digits. Table 1 illustrates the site ID numbering convention.
- Use 2002 BURP sites. If going to a previous years site, collect new BURP site, Complete first page of field forms.

Location Description

- Required
- Include in description relationship to BURP reach
- If not adjacent to BURP reach create new BURP site. Complete first page of field forms.

Pass _____ of _____

- Required
- Pass _____ of _____ refers to passes completed during that day and not multiple events.
- Usually Pass 1 of 1.

Collectors

- Required
- Format is “First Initial, Last Name.” For example, J Smith. Note - no period after first initial.
- Usually includes Field Taxonomist if he/she was involved in collection (fishing/netting/bucketing)

Field Taxonomist

- Required
- Format is “First Initial, Last Name.” For example, J Smith. Note - no period after first initial.
- This is the individual that has made the species call, or has supervised the species call, for each fish sampled.

Date

- Required
- The format is Year/Month/Day (YYYY/MM/DD).
- The date is eight digits long. “02/6/3” is not correct. The correct format is “2002/06/03.”

Clarity

- Optional
- This field is to contain information that helps determine e-fishing effectiveness.
- Examples, Clear, Turbid, Stained, Colloidal, Milky

E-fish Length

- Optional
- This field is to contain information regarding the length of stream electrofished.
- Handy field for reporting to Idaho Fish and Game

- meters

Avg Width (Average Width)

- Optional
- This field is to contain information regarding the average width of stream electrofished.
- Handy field for reporting to Idaho Fish and Game
- meters

Temperature

- Required
- Temperature of stream during electrofishing event
- Celsius

Conductivity

- Optional
- Conductivity of stream during electrofishing event
- $\mu\text{S}/\text{cm}$

Electrofisher Model

- Required
- Brand and Model of Electrofisher
- Examples: “Smith Root LR-24”, or “Coffelt Mark 10”

Setting (Electrofisher Setting)

- Required
- Electrofisher setting at the end of the reach
- Examples: “CPS”, or “J11”

Effort (seconds)

- Optional
- Very important information, Optional because we need real numbers rather than estimates.
- The time accumulated electrofishing during this pass

Voltage

- Required
- Electrofisher voltage setting

Type

- Optional
- Short-cut name for field taxonomist
- Examples are: RBT-rainbow trout, CT-cutthroat trout, SUC-sucker...

Leng (Lenth)

- Required for salmonids
- Lengths in millimeters

Weigh (Weight)

- Optional
- Weight in grams

Tag

- Required
- All vouchered fish require unique tag id
- Exact text string as printed on tag

Group

- Optional
- Field reconciliation field
- Recorder records alpha entities to group like fish and vouchers

DEQ code

- Required
- All fish require DEQ code

Flag

- Optional

Data Entry

Data Entry Rejection Process

The purpose of data entry review is to both expedite and increase the accuracy of data in the BURP database. When a form has been submitted that has incompatible information with the BURP database, data entry follows these guidelines in order to resolve and track the data.

- The erroneous field is noted.
- The remaining form is scanned for additional errors, if any, these are noted as well.
- An e-mail is prepared that lists the site ids and errors.
- The e-mail is sent to the appropriate regional coordinator and to the Chain of Custody tracking individual(Brenda)
- The field form is discarded.

Data Entry Verification

Once new site data are entered, data entry personnel generate a site data verification report from the BURP database. Each entry of the data is verified on screen by a separate member of the data entry staff. After data verification, a final printed copy of the site data verification report is attached to the field sheets before the sheets are returned to quality assurance personnel.

Database Error Tracking

A tracking process has been developed in order to record errors on the database that have been identified and corrected. A cumulative database correction logsheet tracks corrections that have been made to the paper file and the electronic database. An example of the logsheet is shown in Figure 4. The following information is necessary to track errors once erroneous information has already been entered into the database:

- A hard copy of the error is submitted to quality assurance personnel. The error identification format may be an E-mail or printed note. The hard copy shall identify the error and the name of the person who identified the error.
- Quality assurance personnel shall enter the date and the person who identified the error into the cumulative database correction log.
- The BURP file containing the error is pulled, a copy of the error identification communication is attached, the database correction logsheet is attached, and the packet is forwarded to data entry.
- When data entry corrects the error in the database, the database correction logsheet is dated and initialed, and the packet is returned to quality assurance personnel.
- Once quality assurance personnel receive the packet after the electronic database has been corrected, the paper file is corrected, dated and initialed and the database correction logsheet is dated and initialed.
- When the correction has been finalized in the paper file and the electronic database, the original person reporting the error is notified of the change.

Figure 5. Example of the database error tracking logsheet.

**BENEFICIAL USE RECONNAISSANCE PROJECT
Field Form Errors Corrected on Database**

	Date Error Identified	Person That Identified the Error	Date Error Corrected in Database (Initial)	Date Error Corrected in Paper File (Initial)	Date Person Reporting Error was Notified of the Change
①	12/22/2000	Sean Woodhead-TWF	BV 2-2-01	SA 2/5/2001	SA 2/5/2001
②	3/6/2001	Sean Woodhead-TWF	BV 3-9-01	SA 3/9/2001	SA 3/9/2001
③	9/17/2001	Brenda Valverde	- AA -	SA 9/17/2001	SA 9/18/2001

Acknowledgments

The Beneficial Use Reconnaissance Program Quality Assurance Plan has evolved since 1995 into its present form. Many people have contributed to the effort since the first draft.

- 1995 version prepared by Robert Steed, Carrie Syme, and Bryce England (DEQ Monitoring and Technical Support Bureau)
- 1996 version updated by Michael Edmondson, Carrie Syme (DEQ Watershed Monitoring and Analysis Bureau)
- 1998 version updated by Richard Lee (DEQ Watershed Monitoring and Analysis Bureau)
- 1999 version updated by William Clark, Morgan Cole, Bryce England (DEQ Watershed Monitoring and Analysis Bureau) Clyde Lay and Sean Woodhead DEQ (Twin Falls Regional Office)
- 2001 version updated by Darcy Sharp and Robert Steed (DEQ Technical Services Bureau)
- 2002 version updated by Robert Steed, Jim Szpara, Brenda Valverde, and Michael Edmondson

This manual was updated with feedback from the 2002 Beneficial Use Reconnaissance Project Technical Advisory Committee (William Clark, Cyndi Grafe, Dave Hull, Angie Petersen, Glen Pettit, Steve Robinson, Daniel Stewart, and Sean Woodhead).

Other contributors include: Barry Burnell, Will Wall, Brad Larson, and Don Zaroban.

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- Clark, W.H. 2002. Beneficial Use Reconnaissance Program 2002 Annual Work Plan for Wadeable (Small) Streams. William H. Clark, State Office of Technical Services. Idaho Department of Environmental Quality. 2002. Boise
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Appendix A-2002 Field Forms

Field forms should be printed from the Beneficial Use Reconnaissance Program data management program. The following forms were from version 3.0.12a. (June 7, 2002)

2002 Beneficial Use Reconnaissance Program Field Forms

Idaho Department of Environmental Quality

Site Identification

Stream Name: _____ Site ID: _____ Date (YYYY/MM/DD): _____

HUC: _____ WBID No.: _____

Public Land Survey: Twnshp _____ Range _____ Section _____ 1/4 of the _____ 1/4 of the _____ 1/4

Latitude: _____ Degrees _____ Minutes :: _____ Seconds Longitude: _____ Degrees _____ Minutes :: _____ Seconds GPS Filename: _____

Datum: NAD83 _____ NAD27 _____ Other _____ Lat/Long Confidence: 2-5 meters _____ 100 meters (raw) _____ 500 meters (estimate) _____

County: _____ Ecoregion: _____ Map Elevation (ft or m) _____

Location Relative to Landmark _____ GPS Elevation (m) _____

Weather Conditions _____ Crew Members: _____

Data Collection

General Wetted Width: _____ meters Total Reach Length: _____ (30 X bankfull width or 100m minimum)

Stream Order: 1 2 3 4 5 6 7 8 (circle one) Stream Gradient: _____ % Rosgen Stream Type: _____

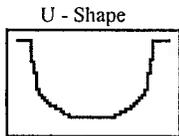
Water Temperature: _____ Time: _____ Amphibians Observed: _____

Air Temperature (C): _____ Fish Observed: _____

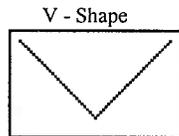
Conductivity (µs/cm) _____

Valley Type:

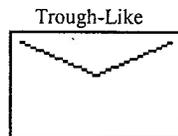
circle one



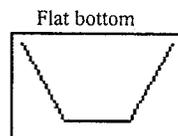
Low



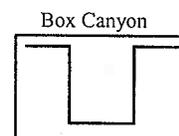
Moderate



High

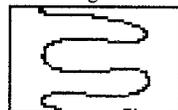


Braided



Sinuosity:

circle one



Activities Observed in Watershed*

Circle all That Apply:

- | | |
|----------------|---------|
| Forestry | Mining |
| Agriculture | Roads |
| Recreation | Urban |
| Diversion | Grazing |
| Wilderness | |
| Beaver Complex | |
| Other: | _____ |

Collected:

- Macroinvertebrate
 Fish
 Periphyton
 Bacteria
 Amphibian

Non DEQ Fish Data Exists Source: _____

2002 Beneficial Use Reconnaissance Program Field Forms

Stream Name: _____ Site ID: _____ Date (YYYY/MM/DD): _____

Additional Information (continued):

[Empty rectangular box for additional information]

2002 Beneficial Use Reconnaissance Program Field Forms

Stream Name: _____

Site ID: _____

Date (YYYY/MM/DD): _____

Discharge Measurement							
Tape:	Width	Depth	Area	Velocity	Velocity	Discharge	
ft	ft	ft	sq ft	ft/sec	ft/sec	cfs	
LWE							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
RWE							
Total Flow							

MacroInvertebrate Samples

Were samples taken during low/stable flow period

(July 1 through October 15)? Yes No

Sample No. 1

Label: _____

Sampler Used: Hess Surber Kick

Habitat Sampled: Riffle Run Glide Pool

Time: _____ Split: _____

By: _____

Sample No. 2

Label: _____

Sampler Used: Hess Surber Kick

Habitat Sampled: Riffle Run Glide Pool

Time: _____ Split: _____

By: _____

Sample No. 3a

Label: _____

Sampler Used: Hess Surber Kick

Habitat Sampled: Riffle Run Glide Pool

Time: _____ Split: _____

By: _____

Sample No. 3b

Label: _____

Sampler Used: Hess Surber Kick

Habitat Sampled: Riffle Run Glide Pool

Time: _____ Split: _____

By: _____

Stream Name: _____ Site ID: _____ Date (YYYY/MM/DD): _____

Wolman Pebble Count (Modified)

Particle Size	Riffle 1		Riffle 2		Riffle 3	
	Within	Outside	Within	Outside	Within	Outside
	Wetted	Wetted	Wetted	Wetted	Wetted	Wetted
silt/clay 0-1 mm						
sand 1.1-2.5 mm						
Subtotal						
very fine pebble 2.51-6 mm						
pebble 6.1-15 mm						
coarse pebble 15.1 - 31 mm						
very coarse pebble 31.1-64 mm						
small cobble 64.1 -128 mm						
large cobble 128.1-256 mm						
small boulder 256.1-512 mm						
medium boulder 512.1-1024 mm						
large boulder 1024.1 mm & larger						
Total						

Large Organic Debris

Total number of pieces larger than 10cm diameter and 1m length: (Within Bankfull)

Canopy Closure

	Riffle 1	Riffle 2	Riffle 3
Left Bank*			
Center Up			
Center Down			
Right Bank*			

* Facing Upstream

2002 Beneficial Use Reconnaissance Program Field Forms

Stream Name: _____ Site ID: _____ Date (YYYY/MM/DD): _____

Width/Depth Ratio

Bankfull Width(m)	Wetted Width(m)	Bankfull Height(m)	Avg Wetted Depth(m)

Habitat Type: Riffle Run Glide Pool

Transect 1

--	--	--	--

Habitat Type: Riffle Run Glide Pool

Transect 2

--	--	--	--

Habitat Type: Riffle Run Glide Pool

Transect 3

Wetted Depth Measurements (m)**

--	--	--	--	--	--	--

--	--	--	--	--	--	--

--	--	--	--	--	--	--

Photo Information

Roll Name (Number): _____

Photo #: _____ Azimuth _____ Direction (circle one): Upstream Downstream Panorama

Photo #: _____ Azimuth _____ Direction (circle one): Upstream Downstream Panorama

Photo #: _____ Azimuth _____ Direction (circle one): Upstream Downstream Panorama

Other:

Photo #: _____ Caption: _____

Photo #: _____ Caption: _____

Photo #: _____ Caption: _____

** Wetted Width # Measurements

< 1 m	3
1 m to 4 m	5
> 4 m	7

Horizontal Distance of Undercut Banks

	Left Bank	Right Bank
Transect 1		
Transect 2		
Transect 3		

Comments:

2002 BENEFICIAL USE RECONNAISSANCE PROGRAM FIELD FORMS

Stream Name: _____ Site ID: _____ Date (YYYY/MM/DD): _____

Longitudinal Habitat Distribution (meters)

Riffle	Run	Glide	Pool
Total	Total	Total	Total

Streambank Condition (percent)

Left Bank Facing Upstream				Right Bank Facing Upstream			
Covered	Covered	Uncvred	Uncvred	Covered	Covered	Uncvred	Uncvred
Stable	Unstable	Stable	Unstable	Stable	Unstable	Stable	Unstable

Habitat Assessment Summary Sheet

Prevalance (circle one)			
Riffle/Run		Glide/Pool	
1. Bottom Substrate - % fines		1. Pool Substrate Char.	
2. Instream Cover		2. Instream Cover (fish)	
3. Embeddedness (riffles)		3. Pool Variability	
4. Velocity/Depth		4. Canopy Cover	
5. Channel Shape		5. Channel Shape	
6. Pool/Riffle Ratio		6. Channel Sinuosity	
7. Width/Depth Ratio (wetted)		7. Width/Depth Ratio	
8. Bank Vegetation Protection		8. Bank Vegetation Protection	
9. Bank Stability		9. Bank Stability	
10. Disruptive Pressures		10. Disruptive Pressures	
11. Zone of Influence		11. Zone of Influence	
Total Score			

Pool Quality Index

Pool Quality Parameter	Pool Number				Code Explanation
	1	2	3	4	
Max Pool Depth (m)					<0.15m = 0 0.15m to 0.45m = 1 >0.45m = 2
Tail Out Depth (m)					
Pool Length (m)					
Max Pool Width (m)					
Residual Depth (m)					<10% = 0 10% to 25% = 1 >25% = 2
code					
Avg Substrate (mm)					<63.5mm = 0 63.5 to 254mm = 1 >254mm = 2
code					
Overhead Cover (%)					<25% = 0 25% to 50% = 1 >50% = 2
code					
Undercut Banks (%)					<10% = 0 10% to 25% = 1 >25% = 2
code					
Total Score					Avg Score

Idaho Department of Environmental Quality Fish Data Sheet

Location Information

Water Body Name _____ BURP Site Id _____

Location Description _____

Pass Information

Pass ___ of ___

Collectors _____

Field Taxonomist _____

Date _____ Clarity _____

E-Fish Length _____

Avg Width _____ Water Temp (°C) _____

Conductivity _____

Electrofisher Model _____

Setting _____

Effort (seconds) _____ Voltage _____

Fish Collected

	Type	Length	Weight	Tag	Group	DEQ Code	Flag		Type	Length	Weight	Tag	Group	DEQ Code	Flag
1								22							
2								23							
3								24							
4								25							
5								26							
6								27							
7								28							
8								29							
9								30							
10								31							
11								32							
12								33							
13								34							
14								35							
15								36							
16								37							
17								38							
18								39							
19								40							
20								41							
21								42							
F1								F2							
F3								F4							
F5								F6							
F7								F8							

Idaho Department of Environmental Quality Fish Data Sheet

#	Type	Length	Weight	Tag	Group	DEQ Code	Flag	#	Type	Length	Weight	Tag	Group	DEQ Code	Flag
43								75							
44								76							
45								77							
46								78							
47								79							
48								80							
49								81							
50								82							
51								83							
52								84							
53								85							
54								86							
55								87							
56								88							
57								89							
58								90							
59								91							
60								92							
61								93							
62								94							
63								95							
64								96							
65								97							
66								98							
67								99							
68								100							
69								101							
70								102							
71								103							
72								104							
73								105							
74								106							
F9								F10							
F11								F12							
F13								F14							
F15								F16							

Appendix B-Fish Taxa Codes

FISH TAXA CODE	COMMON NAME	SCIENTIFIC NAME	FAMILY
1	PACIFIC LAMPREY	<i>Lampetra tridentata</i>	PETROMYZONTIDAE
2	WHITE STURGEON	<i>Acipenser transmontanus</i>	ACIPENSERIDAE
3	AMERICAN SHAD	<i>Alosa sapidissima</i>	CLUPEIDAE
4	LAKE WHITEFISH	<i>Coregonus clupeaformis</i>	SALMONIDAE
5	CHUM SALMON	<i>Oncorhynchus keta</i>	SALMONIDAE
6	COHO SALMON	<i>Oncorhynchus kisutch</i>	SALMONIDAE
7	SOCKEYE SALMON	<i>Oncorhynchus nerka</i>	SALMONIDAE
8	KOKANEE	<i>Oncorhynchus nerka</i>	SALMONIDAE
9	CHINOOK SALMON	<i>Oncorhynchus tshawytscha</i>	SALMONIDAE
10	RAINBOW TROUT	<i>Oncorhynchus mykiss</i>	SALMONIDAE
11	CUTTHROAT TROUT	<i>Oncorhynchus clarki</i>	SALMONIDAE
12	BEAR LAKE WHITEFISH	<i>Prosopium abyssicola</i>	SALMONIDAE
13	PYGMY WHITEFISH	<i>Prosopium coulteri</i>	SALMONIDAE
14	BONNEVILLE CISCO	<i>Prosopium gemmiferum</i>	SALMONIDAE
15	BONNEVILLE WHITEFISH	<i>Prosopium spilonotus</i>	SALMONIDAE
16	MOUNTAIN WHITEFISH	<i>Prosopium williamsoni</i>	SALMONIDAE
17	GOLDEN TROUT	<i>Oncorhynchus aguabonita</i>	SALMONIDAE
18	ATLANTIC SALMON	<i>Salmo salar</i>	SALMONIDAE
19	BROWN TROUT	<i>Salmo trutta</i>	SALMONIDAE
20	ARCTIC CHAR	<i>Salvelinus alpinus</i>	SALMONIDAE
21	BROOK TROUT	<i>Salvelinus fontinalis</i>	SALMONIDAE
22	BULL TROUT	<i>Salvelinus confluentus</i>	SALMONIDAE
23	LAKE TROUT	<i>Salvelinus namaycush</i>	SALMONIDAE
24	ARCTIC GRAYLING	<i>Thymallus arcticus</i>	SALMONIDAE
25	RAINBOW SMELT	<i>Osmerus mordax</i>	OSMERIDAE
26	NORTHERN PIKE	<i>Esox lucius</i>	ESOCIDAE
27	CHISELMOUTH	<i>Acrocheilus alutaceus</i>	CYPRINIDAE
28	GOLDFISH	<i>Carassius auratus</i>	CYPRINIDAE
29	LAKE CHUB	<i>Couesius plumbeus</i>	CYPRINIDAE
30	COMMON CARP	<i>Cyprinus carpio</i>	CYPRINIDAE
31	UTAH CHUB	<i>Gila atraria</i>	CYPRINIDAE
32	TUI CHUB	<i>Gila bicolor</i>	CYPRINIDAE
33	LEATHERSIDE CHUB	<i>Gila copei</i>	CYPRINIDAE
34	PEAMOUTH	<i>Mylocheilus caurinus</i>	CYPRINIDAE
35	FATHEAD MINNOW	<i>Pimephales promelas</i>	CYPRINIDAE
36	NORTHERN SQUAWFISH	<i>Ptychocheilus oregonensis</i>	CYPRINIDAE
37	LONGNOSE DACE	<i>Rhinichthys cataractae</i>	CYPRINIDAE
38	LEOPARD DACE	<i>Rhinichthys falcatus</i>	CYPRINIDAE
39	SPECKLED DACE	<i>Rhinichthys osculus</i>	CYPRINIDAE
40	REDSIDE SHINER	<i>Richardsonius balteatus</i>	CYPRINIDAE
41	TENCH	<i>Tinca tinca</i>	CYPRINIDAE
42	UTAH SUCKER	<i>Catostomus ardens</i>	CATOSTOMIDAE
43	LONGNOSE SUCKER	<i>Catostomus catostomus</i>	CATOSTOMIDAE
44	BRIDGELIP SUCKER	<i>Catostomus columbianus</i>	CATOSTOMIDAE
45	BLUEHEAD SUCKER	<i>Catostomus discobolus</i>	CATOSTOMIDAE
46	LARGESCALE SUCKER	<i>Catostomus macrocheilus</i>	CATOSTOMIDAE
47	MOUNTAIN SUCKER	<i>Catostomus platyrhynchus</i>	CATOSTOMIDAE
48	BLACK BULLHEAD	<i>Ameiurus melas</i>	ICTALURIDAE
49	BROWN BULLHEAD	<i>Ameiurus nebulosus</i>	ICTALURIDAE
50	CHANNEL CATFISH	<i>Ictalurus punctatus</i>	ICTALURIDAE
51	TADPOLE MADTOM	<i>Noturus gyrinus</i>	ICTALURIDAE
52	FLATHEAD CATFISH	<i>Pylodictis olivaris</i>	ICTALURIDAE
53	SAND ROLLER	<i>Percopsis transmontana</i>	PERCOPSIDAE
54	BURBOT	<i>Lota lota</i>	GADIDAE
55	WESTERN MOSQUITOFISH	<i>Gambusia affinis</i>	POECILIIDAE
56	GUPPY	<i>Poecilia reticulata</i>	POECILIIDAE
57	GREEN SUNFISH	<i>Lepomis cyanellus</i>	CENTRARCHIDAE
58	PUMPKINSEED	<i>Lepomis gibbosus</i>	CENTRARCHIDAE
59	WARMOUTH	<i>Lepomis gulosus</i>	CENTRARCHIDAE

FISH TAXA CODE	COMMON NAME	SCIENTIFIC NAME	FAMILY
60	BLUEGILL	<i>Lepomis macrochirus</i>	CENTRARCHIDAE
61	SMALLMOUTH BASS	<i>Micropterus dolomieu</i>	CENTRARCHIDAE
62	LARGEMOUTH BASS	<i>Micropterus salmoides</i>	CENTRARCHIDAE
63	WHITE CRAPPIE	<i>Pomoxis annularis</i>	CENTRARCHIDAE
64	BLACK CRAPPIE	<i>Pomoxis nigromaculatus</i>	CENTRARCHIDAE
65	YELLOW PERCH	<i>Perca flavescens</i>	PERCIDAE
66	WALLEYE	<i>Stizostedion vitreum</i>	PERCIDAE
67	MOTTLED SCULPIN	<i>Cottus bairdi</i>	COTTIDAE
68	PAIUTE SCULPIN	<i>Cottus beldingi</i>	COTTIDAE
69	SLIMY SCULPIN	<i>Cottus cognatus</i>	COTTIDAE
70	SHORTHEAD SCULPIN	<i>Cottus confusus</i>	COTTIDAE
71	BEAR LAKE SCULPIN	<i>Cottus extensus</i>	COTTIDAE
72	SHOSHONE SCULPIN	<i>Cottus greenei</i>	COTTIDAE
73	WOOD RIVER SCULPIN	<i>Cottus leiopomus</i>	COTTIDAE
74	TORRENT SCULPIN	<i>Cottus rhotheus</i>	COTTIDAE
75	LAMPREY	<i>Lampetra sp.</i>	PETROMYZONTIDAE
76	STURGEON	<i>Acipenseridae sp.</i>	ACIPENSERIDAE
77	WHITEFISH	<i>Coregonus sp.</i>	SALMONIDAE
78	SALMON	<i>Oncorhynchus sp.</i>	SALMONIDAE
79	WHITEFISH	<i>Prosopium sp.</i>	SALMONIDAE
80	TROUT	<i>Salmo sp.</i>	SALMONIDAE
81	CHAR	<i>Salvelinus sp.</i>	SALMONIDAE
82	GRAYLING	<i>Thymallus sp.</i>	SALMONIDAE
83	PIKE	<i>Esox sp.</i>	ESOCIDAE
84	CHUB	<i>Couesius sp.</i>	CYPRINIDAE
85	CHUB	<i>Gila sp.</i>	CYPRINIDAE
86	NORTHERN PIKE MINNOW	<i>Ptychocheilus sp.</i>	CYPRINIDAE
87	DACE	<i>Rhinichthys sp.</i>	CYPRINIDAE
88	SHINER	<i>Richardsonius sp.</i>	CYPRINIDAE
89	SUCKER	<i>Catostomus sp.</i>	CATOSTOMIDAE
90	CATFISH	<i>Ictalurus sp.</i>	ICTALURIDAE
91	TROUT-PERCH	<i>Percopsis sp.</i>	PERCOPSIDAE
92	SUNFISH	<i>Lepomis sp.</i>	CENTRARCHIDAE
93	BASS	<i>Micropterus sp.</i>	CENTRARCHIDAE
94	CRAPPIE	<i>Pomoxis sp.</i>	CENTRARCHIDAE
95	PERCH	<i>Perca sp.</i>	PERCIDAE
96	SCULPIN	<i>Cottus sp.</i>	COTTIDAE
97	HERRINGS	<i>Clupeidae</i>	CLYPEIDAE
98	TROUT	<i>Salmonidae</i>	SALMONIDAE
99	MINNOWS	<i>Cyprinidae</i>	CYPRINIDAE
100	CATFISH	<i>Ictaluridae</i>	ICTALURIDAE
101	GUPPY	<i>Poeciliidae</i>	POECILIIDAE
102	SUNFISH	<i>Centrarchidae</i>	CENTRARCHIDAE
103	PERCH	<i>Percidae</i>	PERCIDAE
104	BULLHEAD	<i>Ameiurus sp.</i>	ICTALURIDAE
105	COD	<i>Lota sp.</i>	GADIDAE
106	SMELT	<i>Osmerus sp.</i>	OSMERIDAE
107	ORIENTAL WEATHERFISH	<i>Misgurnus anguillicaudatus</i>	COBITIDAE
108	WEATHERFISH	<i>Misgurnus sp.</i>	COBITIDAE
109	LOACH (COBITIDAE)	<i>Cobitidae</i>	COBITIDAE
110	CONVICT CICHLID	<i>Cichlasoma nigrofasciatum</i>	CICHLIDAE
111	BLUE TILAPIA	<i>Tilapia aurea</i>	CICHLIDAE
112	MOZAMBIQUE TILAPIA	<i>Tilapia mossambica</i>	CICHLIDAE
113	REDBELLY TILAPIA	<i>Tilapia zilli</i>	CICHLIDAE
114	SHORTFIN MOLLY	<i>Poecilia mexicana</i>	POECILIIDAE
115	GREEN SWORDTAIL	<i>Xiphophorus helleri</i>	POECILIIDAE
116	YELLOW BULLHEAD	<i>Ameiurus natalis</i>	ICTALURIDAE
117	STEELHEAD	<i>Onchorhynchus mykiss</i>	SALMONIDAE
118	GRASS CARP	<i>Ctenopharyngodon idella</i>	CYPRINIDAE
119	SPOTTAIL SHINER	<i>Notropis hudsonius</i>	CYPRINIDAE
120	BLUE CATFISH	<i>Ictalurus furcatus</i>	ICTALURIDAE
121	PLATY	<i>Xiphophorus SP.</i>	POECILIIDAE
122	SAUGER	<i>Stizostedion canadense</i>	PERCIDAE

FISH TAXA CODE	COMMON NAME	SCIENTIFIC NAME	FAMILY
123	AMERICAN SHAD	<i>Alosa sapidissima</i>	CLUPEIDAE
124	UMPQUA DACE	<i>Rhinichthys evermanni</i>	CYPRINIDAE
501	CUTTHROAT TROUT (all stocks) X RAINBOW TROUT	<i>Oncorhynchus clarki</i> X <i>O. mykiss</i>	SALMONIDAE
502	BROOK TROUT X BULL TROUT	<i>Salvelinus fontinalis</i> X <i>S. confluentus</i>	SALMONIDAE
503	BROOK TROUT X LAKE TROUT (SPLAKE)	<i>Salvelinus fontinalis</i> X <i>S. namaycush</i>	SALMONIDAE
504	BROOK TROUT X BROWN TROUT (TIGER TROUT)	<i>Salvelinus fontinalis</i> X <i>Salmo trutta</i>	SALMONIDAE
505	TIGER MUSKELLUNGE	<i>Esox luciuc</i> x <i>E. masquinongy</i>	ESOCIDAE
9999	Fish	<i>Unidentified</i>	

Appendix C – Bacteria Screening Sheet

Idaho Division of Environmental Quality Bacteria Check Sheet

Stream Name:	<input type="text"/>	Site ID:	<input type="text"/>
HUC #:	<input type="text"/>	Collection Date:	<input type="text"/>

1	Is Primary Contact Recreation a Designated or Existing Use	Yes	No	If Yes collect 1 sample *****
2	Are upstream land uses affecting recreation use **	Yes	No	If Yes collect 1 sample *****
3	Other reasons ***	Yes	No	If Yes collect 1 sample *****

explain other reasons

collected 1	<input type="text"/>	** include agriculture, grazing, recreation, urban, cabins, septic
collected 5	<input type="text"/>	*** on 300d list for bacteria, etc.
	<input type="text"/>	***** if e-coli exceeds 408/100ml, collected 5 samples over 30 days
	<input type="text"/>	***** if e-coli exceeds 578/100ml collected 5 samples over 30 days

Sample Results

sample #	date	time	location	E-coli results
sample #1				
sample #2				
sample #3				
sample #4				
sample #5				
sample #6				
geometric mean				

other notes: