

EPA/U.S. Fish and Wildlife Service IAG  
Annual Report of Biological Resource Monitoring for 2004  
Biological Monitoring at the Coeur d'Alene Basin Operable Unit 3 (OU-3).

## **1.0 Background and Objectives**

This report summarizes the U.S. Fish and Wildlife Service (USFWS) Upper Columbia Fish and Wildlife Office (UCFWO) biological resource monitoring activities conducted at the Bunker Hill Mining and Metallurgical Complex Operable Unit 3 (OU-3) in 2004, supported through an Interagency Agreement with the U.S. Environmental Protection Agency (EPA). As identified in the Basin Environmental Monitoring Plan (BEMP) (USEPA, 2004) USFWS is responsible for conducting biological resource monitoring to assist EPA in evaluating the progress of remedial actions in terms of improving ecosystem conditions.

The biological resources monitoring program was designed to evaluate two BEMP monitoring hypotheses:

- There is an improvement in biotic benchmarks from the recent historic trend or pre-remediation condition.
- There has been progress toward achieving benchmarks of selected remedy.

Biotic benchmarks were established in the OU-3 Record of Decision (ROD) (USEPA, 2002) and focus on indicators such as fish, songbirds, and waterfowl. Biological benchmark monitoring under the BEMP is intended to evaluate improvements in biological resources on a habitat basis through the monitoring of habitat-specific indicators. The specific habitat indicators include:

- Riverine habitat – aquatic macroinvertebrates, fish, aquatic habitat assessment
- Lacustrine/palustrine habitat – waterfowl
- Riparian habitat – songbirds, terrestrial macroinvertebrates, riparian vegetation

Monitoring of biological resource parameters were conducted in accordance with UCFWO Standard Operating Procedures (SOP), designed for data continuity and comparability with existing studies. Biological resource monitoring studies conducted by USFWS in 2004 and as identified in the BEMP (EPA, 2004) include:

- Songbird Population Surveys (i.e., Monitoring Avian Productivity and Survivorship)
- Aquatic Invertebrate Diversity and Abundance

## **2.0 Songbird Population Surveys (MAPS)**

A paucity of data existed on songbird populations within OU-3 (BEMP, 2004). The first round of monitoring results from this study is intended to serve as a baseline for comparison with subsequent rounds. Local songbird populations can fluctuate considerably between years. The implementation of a long-term (5-years) sampling strategy was therefore necessary in order to provide reliable data for baseline conditions. Methodologies established in the nationwide Monitoring Avian Productivity and Survivorship (MAPS) protocols allow for the implementation of a multi-year, standardized constant-effort mist netting and banding procedure. MAPS

protocols were therefore adopted to evaluate changes in avian populations in OU-3 (UCFWO SOP #1020.1012).

In general, MAPS mark-recapture data allows for estimates of adult survivorship, adult population size, proportion of resident individuals in the adult population and recruitment (DeSante et al., 2004). Data collected during the MAPS program will allow for comparisons of changes in avian productivity and survivorship over time (between 5-year studies), and because the protocol is standardized across the nation, will allow for comparisons to non-contaminated sites with similar habitat characteristics and to regional averages.

## **2.0.1 Methods**

The selection of study areas within OU-3 was based on areas identified in the BEMP (USEPA, 2004) and MAPS station site criteria (UCFWO SOP #1020.1012). Study areas included:

- Approximately 30 acres in the riparian corridor of Pine Creek (Upper Basin)
- Approximately 35 acres in the riparian corridor of the Coeur d'Alene River at Springston (Lower Basin)

MAPS station registration, location codes, station codes, specific station locations, and station manager contact information were submitted to The Institute for Bird Populations, P.O. Box 1346, Point Reyes Station, CA 94956-1346.

Station registration information is as follows:

Location Code: CDAB (Coeur d'Alene Basin)

Station Code: SPST

Name of Station: Springston

Nearest Town: Harrison ID

County: Shoshone

State: Idaho

Latitude: 47-28-929; Longitude: 116-43-416 (degrees, minutes, seconds; to nearest second)

Elevation: 2138 ft.

Station Code: PNCK

Name of Station: Pine Creek

Nearest Town: Pinehurst ID

County: Shoshone

State: Idaho

Latitude: 47-28-929; Longitude: 116-14-426 (degrees, minutes, seconds; to nearest second)

Elevation: 2445 ft.

Songbird survey methods followed those outlined in UCFWO SOP #1020.1012. In brief, nine mist nets were placed in optimum locations within each of the stations parameters. Mist nets were opened (i.e., set out) at sunrise during each banding session.

A banding session was conducted once every ten days from June 7-August 4, 2004. Nets were checked every 45 minutes for approximately six hours. Data collected on all songbirds captured included species, age, sex, breeding status, fat content, body molt, flight feather molt, flight feather wear, juvenile plumage, wing length, and weight. A numbered leg band was attached to

the right leg of each individual and birds released at the capture net. All data collected was entered into the nationwide database through MAPSPROG ([www.birdpop.org](http://www.birdpop.org)) at the end of the sampling season.

## **2.0.2 Results**

As this protocol is intended to provide long-term data on population and demographic parameters of songbirds inhabiting the OU-3, surveys are scheduled to be conducted for five consecutive years. Therefore, 2004 results are limited (first of 5 years) and will be integrated into the final report. Table 1 presents a species list banded or observed at each station. An inclusive raw data set is available at the UCFWO and should be available on the internet late summer 2005 at: [www.birdpop.org](http://www.birdpop.org).

## **3.0 Aquatic Macroinvertebrate Diversity and Abundance**

As part of the BEMP (EPA, 2004), aquatic macroinvertebrates were collected from various sites within the Coeur d'Alene Basin and identified to determine community trends as they pertain to those areas. Information collected on aquatic macroinvertebrate communities will be used to determine first order effects on the ecological communities utilizing aquatic resources within the Basin under current and future OU-3 contaminants of concern management.

The objectives of aquatic macroinvertebrate community data collection activities include: continued development of data on present conditions, development of macroinvertebrate community trends as they pertain to changes in community and population structures, and continued development of correlations between aquatic macroinvertebrate community structures and metal concentrations in areas along the Coeur d'Alene River (USFWS, 2005).

### **3.0.1 Methods**

The collection of macroinvertebrates followed methods described in UCFWO SOP # 1020.1005. Areas of collection are identified in the BEMP, Section 4.0, Table 4-3 (USEPA, 2004). Collection sites included: Elizabeth Park (above the Bunker Hill Box), South Fork Coeur d'Alene River at Pinehurst (below the Bunker Hill Box) and the Coeur d'Alene River at Cataldo.

Sampling was conducted in July, 2004. A Hess sampler was used to collect six macroinvertebrates samples from riffle zones within each reach. Sampling was conducted downstream to upstream, at downstream, midstream, and upstream areas of the riffle zone. Samples were placed in 250 mL polypropylene containers and fixed in a 95% ethanol solution for sample integrity. All collection locations were recorded with a hand held GPS unit. All samples were sorted to family at the Upper Columbia Fish and Wildlife Office and again fixed in a 95% ethanol solution.

### **3.0.2 Results**

Table 2 presents collection date, site, GPS coordinate, and identification of samples collected in 2004. All samples are currently stored at the Upper Columbia Fish and Wildlife Office. Aquatic macroinvertebrate taxonomic identification is scheduled to be conducted by an independent laboratory through CH2M Hill. Identification results and community analysis will be presented in future annual reports.

#### **4.0 References**

- DeSante, D.F., K. M. Burton, P. Velez and Dan Froehlich. 2004. MAPS Manual, 2004 Protocol. The Institute for Bird Populations. P.O. Box 1346, Point Reyes Station CA 94956-1346. [www.birdpop.org](http://www.birdpop.org).
- USEPA. 2002. Record of Decision, Bunker Hill Mining and Metallurgical Complex Operable Unit 3. U.S. Environmental Protection Agency Report.
- USEPA. 2004. Basin Environmental Monitoring Plan. Bunker Hill Mining and Metallurgical Complex Operable Unit 3. U.S. Environmental Protection Agency Report.
- USFWS, 2005. Scope of Work for Aquatic Macroinvertebrate Monitoring in the Coeur d'Alene Basin by the U.S. Fish and Wildlife Service. U.S. Fish and Wildlife Service Report.

**Table 1: Location and species of birds captured and observed during 2004 MAPS surveys. BEMP 2004, USFWS Biological Resource Monitoring.**

| <b>Pine Creek Station</b> | <b>Springston Station</b> |
|---------------------------|---------------------------|
| <b>Species</b>            | <b>Species</b>            |
| American crow             | American crow             |
| American robin            | American robin            |
| Audubon's warbler         | Bewick's wren             |
| Belted kingfisher         | Black-billed magpie       |
| Black-capped chickadee    | Black-capped chickadee    |
| Black-headed grosbeak     | Black-capped chickadee    |
| Calliope hummingbird      | Black-chinned hummingbird |
| Cedar waxwing             | Black-headed grosbeak     |
| Chestnut-backed chickadee | Bullock's oriole          |
| Chipping sparrow          | Calliope hummingbird      |
| Dusky flycatcher          | Cedar waxwing             |
| Hammon's flycatcher       | Downy woodpecker          |
| Lazuli Bunting            | Dusky flycatcher          |
| MacGillivray's warbler    | Gray catbird              |
| Nashville warbler         | House wren                |
| Orange crowned warbler    | MacGillivray's warbler    |
| Oregon junco              | Mourning dove             |
| Red-breasted nuthatch     | Northern flicker          |
| Ruby-crowned kinglet      | Northern pygmy-owl        |
| Song sparrow              | Orange crowned warbler    |
| Spotted sandpiper         | Oregon junco              |
| Spotted towhee            | Osprey                    |
| Swainson's thrush         | Red-breasted nuthatch     |
| Townsend's solitaire      | Red-eyed vireo            |
| Townsend's warbler        | Song sparrow              |
| Tree swallow              | Spotted towhee            |
| Warbling vireo            | Springston                |
| Western flycatcher        | Steller's jay             |
| Western tanager           | Swainson's thrush         |
| Yellow warbler            | Townsend's warbler        |
|                           | Trail's flycatcher        |
|                           | Warbling vireo            |
|                           | Western flycatcher        |
|                           | Western tanager           |
|                           | Western wood-peewee       |
|                           | Willow flycatcher         |
|                           | Wilson's snipe            |
|                           | Yellow warbler            |

**Table 2: Collection date, site, GPS coordinate and identification of samples collected for aquatic invertebrate diversity and abundance, 2004.**

| <b>Collection Date</b> | <b>Site</b>    | <b>GPS coordinate</b> | <b>Sample #</b> |
|------------------------|----------------|-----------------------|-----------------|
| 07/20/2004             | Pinehurst      | 557503 / 5266445      | BE04AI01        |
|                        |                | 557449 / 5266453      | BE04AI02        |
|                        |                | 557285 / 5266479      | BE04AI03        |
|                        |                | 557285 / 5266419      | BE04AI04        |
|                        |                | 557281 / 5266393      | BE04AI05        |
|                        |                | 557291 / 5266425      | BE04AI06        |
| 07/21/2004             | Elizabeth Park | 568586 / 5264565      | BE04AI07        |
|                        |                | 568596 / 5264261      | BE04AI08        |
|                        |                | 568646 / 5264231      | BE04AI09        |
|                        |                | 568971 / 5264228      | BE04AI10        |
|                        |                | 568949 / 5264227      | BE04AI11        |
|                        |                | 568965 / 5264211      | BE04AI12        |
| 07/21/2004             | Cataldo        | 550532 / 5266873      | BE04AI13        |
|                        |                | 550518 / 5266883      | BE04AI14        |
|                        |                | 550515 / 5266892      | BE04AI15        |
|                        |                | 550485 / 5266883      | BE04AI16        |
|                        |                | 550100 / 5265825      | BE04AI17        |
|                        |                | 550044 / 5265845      | BE04AI18        |