BONNEVILLE POWER ADMINISTRATION

Umatilla River Subbasin Fish Habitat Improvement Program

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Bonneville Power Administration
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Portland, OR 97208

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Umatilla River Subbasin Fish Habitat Improvement Program

2004 ANNUAL REPORT
Project Completion/Summary Report
January through December 2004

***Prepared by*:**

Danny R. St.Hilaire, Fish Habitat Biologist

Oregon Department of Fish and Wildlife
John Day Watershed District Office
73471 Mytinger Lane
Pendleton, OR 97801

***Prepared for / Funded by*:**

U.S. Department of Energy
Bonneville Power Administration
Division of Fish and Wildlife

Mr. Jonathan McCloud, C.O.T.R.

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ODFW STAFF LISTING

Bruce Eddy	**Northeast Regional Manager, LaGrande**
Kevin Blakely	**John Day Watershed District Manager, Pendleton**
Tim Bailey	**District Fish Biologist, Pendleton**
Mark Kirsch	**District Wildlife Biologist, Pendleton**
Shannon Jewett	**Outmigration and Survival Research Biologist, Hermiston**
Josh Hanson	**Outmigration and Survival Research Biologist, Hermiston**
Cameron Sponseller	**Wildlife Habitat Technician, Pendleton**
Rich Scheele	**Wildlife Habitat Technician, Pendleton**
Russ Powell	**John Day Fish Habitat Biologist, John Day**
Vance McGowan	**Grande Ronde Fish Habitat Biologist, LaGrande**
Danny St.Hilaire	**Umatilla Fish Habitat Biologist, Pendleton**
Mike Montgomery	**Umatilla Fish Habitat Technician, Pendleton**
John Evans	**Seasonal EBA, Pendleton**
Heath Edwards	**Temporary Laborer, Pendleton**
Travis Malin	**Temporary Laborer, Pendleton**

EXECUTIVE SUMMARY

This annual report is in fulfillment of contractual obligations with Bonneville Power Administration (BPA), which is the funding source for the Oregon Department of Fish and Wildlife's (ODFW), Umatilla River Subbasin Fish Habitat Improvement Program (Program).

The Program works cooperatively with private landowners to develop long-term restoration, under which, passive and active Habitat Improvement Projects are conducted. Historically, projects have included livestock exclusion fencing (passive restoration) to protect riparian habitats, along with the installation of instream structures (active restoration) to address erosion and improve fish habitat. In recent years, the focus of active restoration has shifted to bioengineering treatments and, more recently, to channel re-design and re-construction aimed at improving fish habitat, by restoring stable channel function.

This report provides a summary of Program activities for the 2004 calendar year (January 1 through December 31, 2004), within each of the four main project phases, including: 1) Implementation - Pre-Work, 2) Implementation - On Site Development, 3) Operation and Maintenance, and 4) Monitoring and Evaluation. This report also summarizes Program Administrative, Interagency Coordination, and Public Education activities.

Program accomplishments for 2004 included:

Implementation: Adjustments to instream structures (project "betterment"), was planned for the summer of 2004 but was postponed until 2005 following discussions with the US Army Corps of Engineers (USACE). Willow trenches (which utilized 22,400 individual willow cuttings) were installed on the Brogoitti property, East Birch Creek. A new section of board fence was also constructed on the Brogoitti property, to create a livestock corridor and prevent cattle from accessing the riparian area under easement.

Operation and Maintenance: Maintenance of instream grade control structures (rock weirs) was completed on the Baker property, Westgate Creek. Planning was completed for instream maintenance on the Houser property, East Birch Creek: work was postponed until the 2005 field season, following a delay in obtaining federal authorizations. Approximately 1000 supplemental rooted stock seedlings were planted on the Houser and Brogoitti properties, East Birch Creek, as part of riparian revegetation efforts associated with Stable Channel Design projects. Fence inspection and maintenance (including water gaps and stream crossing fences) was carried out on all active projects lease areas, involving 16.22 fence miles on 298 acres. Weed control treatments were put out to contract, for the Brogoitti and Houser properties (73.6 acres). Program staff applied follow-up herbicide treatments on the Brogoitti and Houser properties and conducted necessary spot spraying on all other active leases. Program staff irrigated and maintained riparian planting projects, on the Brogoitti and Houser properties.

Monitoring and Evaluation: Long profile and cross-sectional surveys of the Brogoitti and Houser Stable Channel Design projects were completed for Joint Fill/Removal Applications and post maintenance monitoring. Pre- and Post-maintenance long profile and cross-sectional surveys of the Westgate Creek O&M site were conducted to provided a basis for effectiveness monitoring. Thermograph data was collected from 11 permanent, temperature monitoring sites within the Birch Creek and upper Meacham Creek watersheds. Project sites photos were taken from previously established photopoints, and new photopoints were established on the Houser and Brogoitti properties.

Since its inception, the Program has been involved with a total of 319.8 acres under lease/easement, including the construction and maintenance of 16.48 miles of riparian fencing, 55 stream crossings, 23 water gaps, 15 off channel water developments and 350 instream structures within 12.56 miles of stream. 16 of the Program's lease agreements, encompassing 120 acres and 3.83 stream miles, expired in 2004. As of December 31, 2004, the Program held 8 active riparian lease agreements and 1 riparian easement, encompassing 177.2 acres and 7.82 stream miles. Of these, 5 lease agreements will expire by mid-2005.

1.0 INTRODUCTION

1.1 PROGRAM BACKGROUND

Initiated in 1987, the BPA funded, ODFW sponsored Umatilla River Subbasin Fish Habitat Improvement Program (Program) is aimed at protecting (where possible) and enhancing/rehabilitating (where required) degraded fish habitat on private lands, using both passive and active restoration techniques. The Program was developed following a directive by the Northwest Power Planning Council's Fish and Wildlife Program (NPPC 1987), which calls for the rehabilitation of Umatilla River salmon and steelhead populations (Section 703) (c) (1), to partially mitigate for losses attributable to the implementation of the Federal Columbia River Power System. ODFW is implementing fish Habitat Improvement projects as part of its mission statement: "To protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations".

In 1987-88, representatives of ODFW, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Umatilla National Forest developed a plan for the implementation of fish Habitat Improvement projects within the Umatilla Subbasin (Reeve et al. 1988). A prioritized list of streams in need of restoration was established based on habitat condition (level of degradation and potential for recovery), fish species presence, fish use and logistical constraints (accessibility, technical feasibility, etc.). Geographic areas identified for treatment within the Subbasin, were then divided amongst the agencies; ODFW was assigned responsibility for the Birch Creek and upper Meacham Creek watersheds.

Through cooperative restoration agreements the Program provides technical and financial assistance to landowners and attempts to identify, design, implement, maintain, monitor and evaluate projects beneficial to Umatilla River salmonid fish populations. Historically, projects have included livestock exclusion fencing (passive restoration) to protect riparian habitats and their function, along with the installation of instream structures (active restoration) to halt/prevent erosion and create fish habitat. In recent years, projects have continued to involve riparian exclusion fencing, however, the focus of active restoration has shifted to bio-engineering treatments and, more recently, to channel re-design and re-construction aimed at restoring stable stream channel function, thereby improving fish habitat.

Broad based, long-term Program goals include the rehabilitation and improvement of anadromous fish spawning and rearing habitat and tributary passage to increase smolt production and contribute to the Northwest Power Planning Council's (Council) interim goal of five million anadromous fish returning to the Columbia River Basin. Project and site-specific objectives for Habitat Improvement treatments, vary according to limiting habitat features and channel instability issues being addressed. Most recent Active Restoration projects, have attempted to contribute to the Program's goal of increased smolt production, by addressing the underlying factors adversely affecting fish habitat quality. These projects have attempted to restore a level of channel stability that promotes stable channel, floodplain and riparian function.

1.2 PROGRAM HISTORY

Between 1987 and April 1, 1993 the Program's main emphasis was on implementation of new fish Habitat Improvement projects and continuing interagency coordination and education regarding riparian and watershed-related projects in the Umatilla River Subbasin. In 1993, Program emphasis was redirected towards Operation and Maintenance (O&M) and Monitoring and Evaluation (M&E) of

existing projects. This occurred for two reasons: direction from the funding agency (BPA) and a lack of potential projects at the time. Program emphasis on O&M and M&E continued until 2000, when implementation of new projects once again became priority. Project implementation in recent years has been limited to passive restoration treatments, pending completion of the Subbasin Planning process.

Fish Habitat Improvement Projects have focused on two watersheds within the Subbasin, including Birch and Upper Meacham creeks. Different streams have shown different rates of recovery based on a variety of factors such as stream order, land use constraints, flood plain interventions, location of the stream, climate, elevation, geology, topography, soil profile, hydrograph, condition of the upper watershed, and past management practices.

Early Program efforts suffered failures, due to a number of flood events which occurred in 1991, 93, 94, 96 and 97. These failures helped Program staff identify and correct shortfalls of the early projects. Many of the treated stream channels had been artificially straightened or otherwise manipulated leading to an unstable condition. Unsuccessful treatments failed to address this instability. Lessons learned from early failures helped to ensure that future projects were broader in scope, and addressed the root problems at a given site, rather than simply addressing the symptoms of an underlying problem.

The Program resumed new project implementation in Fiscal Year 2000, using newly acquired habitat restoration techniques (stable channel design and bioengineering applications) and applying adequate buffer widths to encompass flood prone areas and make allowances for proper stream function. Accomplishments of these projects include the elimination channelized stream reaches by recreating sinuous/stable channel configurations, planting native vegetation to rehabilitate riparian habitat, and relocating projects fences further out on the floodplain to prevent livestock from damaging the newly created buffer.

The Program has benefited the primary target species (summer steelhead - *Oncorhynchus mykiss*) in addition to other resident fish and wildlife in this basin, by re-establishing key riparian habitat features inside corridors that have been leased from private landowners. Program efforts have also helped stabilize eroding streambanks, improve floodplain function, and have begun to provide overhead shading within treated stream reaches.

2.0 PROJECT AREA DESCRIPTION

The Umatilla River, located in northeast Oregon, originates on the western slopes of the Blue Mountains (Figure 1). It flows approximately 115 miles northwest to the Columbia River and drains an area of roughly 2,290 square miles. The confluence of the Umatilla with the Columbia River is located at River Mile (RM) 289 near the town of Umatilla, Oregon. The Subbasin consists of the high relief of the Blue Mountains region with elevations ranging from 3,000 to 6,000 feet, and the Deschutes-Umatilla Plateau, a broad upland plain that slopes northward from the Blue Mountains to the Columbia River. Most of the Subbasin is situated within Umatilla County and Morrow County (Butter Creek Watershed), with some small, headwater tributaries originating in Union County.

Approximately 51 percent of the Subbasin is privately owned; 37 percent is managed by federal agencies (principally the U. S. Forest Service), 1 percent is owned by the state of Oregon, and approximately 11 percent lies within the boundaries of the Umatilla Indian Reservation. Forestlands within the basin are managed for timber harvest, grazing and recreation. Much of the mid-Subbasin is used for dry-land

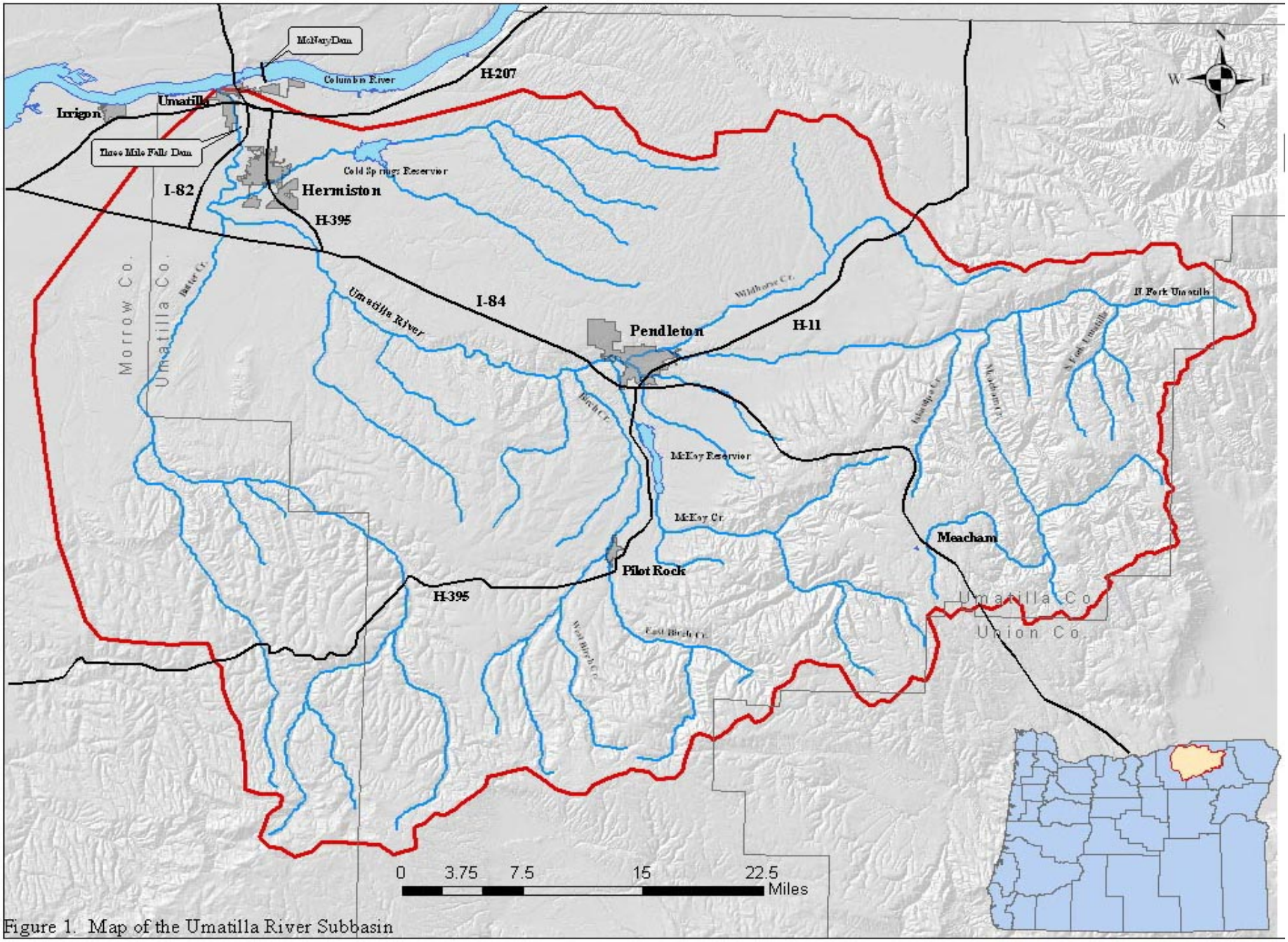


Figure 1. Map of the Umatilla River Subbasin

farming and irrigated agriculture. Irrigation is the largest use of surface and groundwater in the Subbasin, and many streams are over appropriated.

3.0 DESCRIPTION OF AQUATIC AND FISHERIES RESOURCES

Main tributary systems in the Umatilla River Subbasin include (upstream to downstream) Meacham, Iskuulpa, Wildhorse, McKay, Birch and Butter creeks. Indigenous anadromous fish species in the Subbasin include summer steelhead, spring and fall chinook salmon (*O. tshawytscha* - extirpated and reintroduced), coho salmon (*O. kisutch* - extirpated and reintroduced), and pacific lamprey (*Entosphenus tridentatus*).

Historically, the Subbasin supported large runs of spring and fall chinook and coho salmon. Native salmon populations had become extinct by the mid 1900's (OGC 1963, Thompson and Haas 1960), while populations of native steelhead, redband trout and bull trout (*Salvelinus confluentus*) continue to persist, albeit at depressed levels. The actual historic run size of steelhead in the basin is not known, but based on the amount of habitat lost to steelhead production (both the McKay and Butter Creek drainages are no longer accessible to anadromous fish) and the degradation of the existing habitat, current runs are thought to be a fraction of their historical size (CTUIR and ODFW 1990). In recent years, runs have ranged from a low of 768 during the 1981-82 run year, to a high of 5518 in 2001-02 (Figure 2).

Factors contributing to the decline of anadromous salmonids in the Subbasin include extensive water use, overfishing, habitat degradation and Columbia River hydroelectric projects (Boyce 1986). Current Monitoring and Evaluation efforts all identify the need for substantial Habitat Improvement to meet natural production goals. Monitoring and Evaluation biologists stress the need for substantial improvements in water quality, spawning, instream, and riparian habitats (Umatilla Basin Research and Management Review 1998). Approximately forty streams/segments in the Umatilla basin are on the Oregon Department of Environmental Quality's list of water quality impaired water bodies (303 (d) list). Of these streams/segments, 18 are listed for temperature, 17 for sedimentation and 21 for habitat modification (DEQ 2000).

4.0 METHODS AND MATERIALS

This section describes methods and materials employed during the 2004 field season, as well as generic tasks required to complete individual phases of Habitat Improvement Projects. Projects are typically carried out in four phases:

1. Implementation - Pre-Work
2. Implementation - On Site Development
3. Operation and Maintenance
4. Monitoring and Evaluation

4.1 IMPLEMENTATION - PREWORK

During this phase, Habitat Improvement Projects are identified, communication/coordination with landowners is initiated, and the specific goals and objectives of a project (relative to known or perceived limiting habitat conditions) are established. The Implementation - Prework phase may involve various activities including; project development, development of long-term agreements, project preparation, and field inventories.

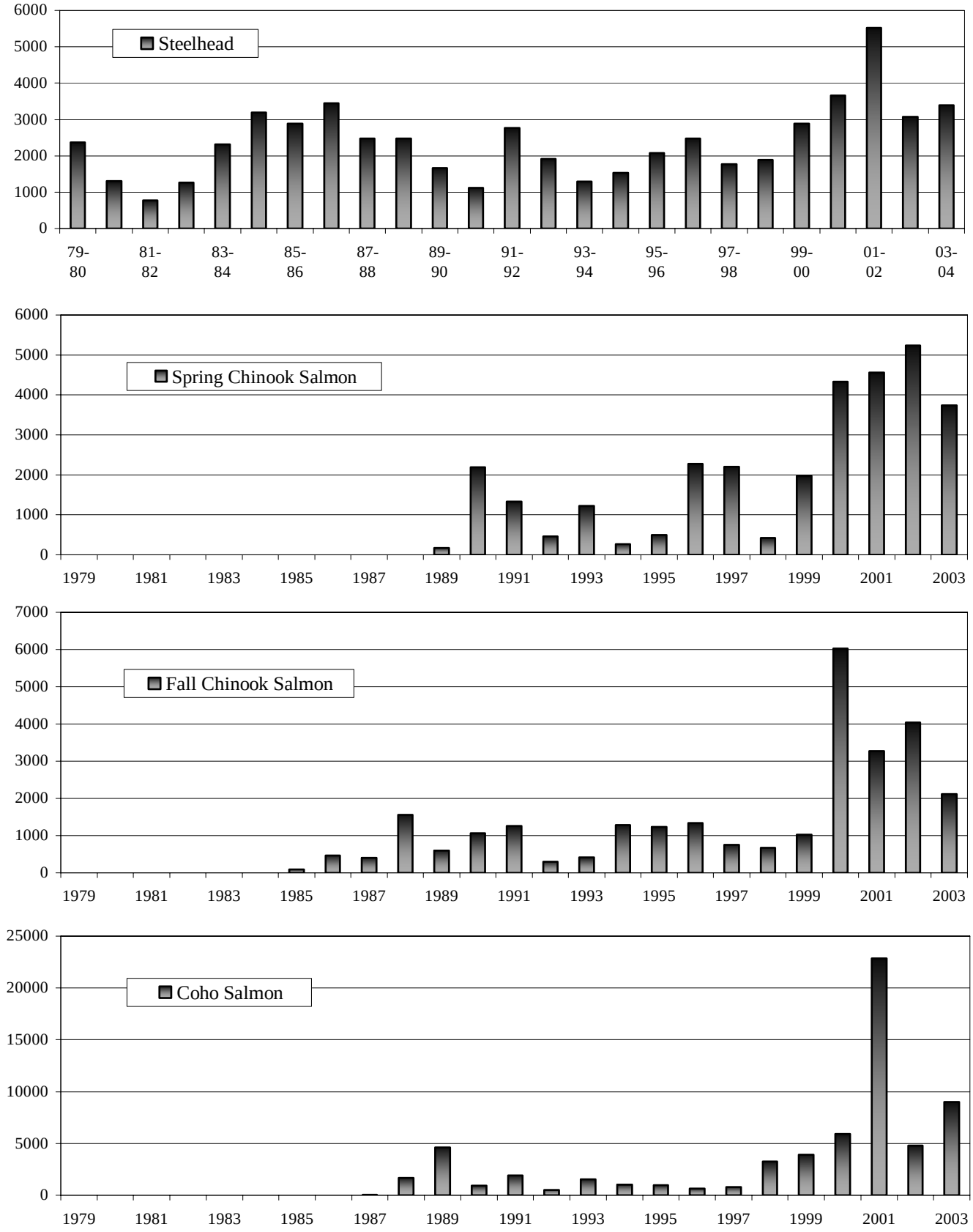


Figure 2. Umatilla River Annual Steelhead and Salmon Returns - Total Returns to Three Miles Falls Dam (1979-2004).

4.1.1 Project Development

Development activities include the identification and initiation of Habitat Improvement Projects, through contact and dialogue with landowners. The development of good working relationships with willing landowners is essential to the implementation of successful projects. Program staff work cooperatively with landowners to draft long-term riparian protection agreements, aimed at balancing landowner needs and Habitat Improvement objectives. Projects are not pursued with landowners who were not amenable to long-term agreements.

For most projects, site-specific work plans are developed which included a description of existing conditions, proposed methods for treating affected riparian and/or habitat conditions, desired post-treatment conditions, and measurable parameters for evaluating the effectiveness of selected treatments. Beginning in 2005, the newly prepared Umatilla/Willow Subbasin Plan will steer the development of future Habitat Improvement projects.

4.1.2 Development of Long-Term Agreements

Prior to implementing work on private property, the Program enters into written agreements with the landowners. Agreements are normally in the form of long-term (15-25 year) riparian lease or easement documents. The agreements specify the exact geographic location(s) under lease/easement, and describe the roles and responsibilities of each of the parties, including what types of activities may and may not occur within the specified area during the term of the agreement. Agreements are developed in cooperation with the landowner to ensure that the final, legal document is acceptable and meets the requirements of both the landowner and the Program. All project agreements are signed, notarized, and filed at the county courthouse.

4.1.3 Project Preparation

Prior to signing long-term agreements, project area boundaries and specific work areas (agreeable to the landowner and Program staff), are field located (staked) and mapped. Work sites may include easements or right-of-ways, fences, livestock watering gaps, instream structures, offsite water developments, planting sites, and other project related areas.

Project preparation also involves all field groundwork required for project implementation, operation and maintenance activities, planned on active lease areas. These may range from staking or flagging access routes for heavy machinery, to developing detailed designs for instream structure placement or channel realignments.

4.1.4 Field Inventories and Permit Acquisition

Inventories include pre-work stream surveys (plotting longitudinal profiles and channel cross sections, mapping floodplain areas, documenting existing habitat conditions, etc.) fish habitat or fish population surveys to provide baseline, pre-treatment data, and photo documentation to provide baseline information on habitat condition and potential for improvement. Field surveys are also conducted to collect the necessary data required to complete environmental permitting applications. All necessary authorizations are obtained during this phase of the project, including joint Fill-Removal Applications obtained from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE).

4.2 IMPLEMENTATION - ON SITE DEVELOPMENT

This phase involves the field implementation of passive and active Habitat Improvement projects. Tasks completed during this phase of a project, vary according to the type of project being implemented. In 2004, on site implementation was limited to riparian planting (willow trenching) and fence construction projects.

4.2.1 Instream Habitat

Instream Habitat Improvement projects are implemented during late summer and early fall (within the designated in-water work window for a given stream) when stream flows are expected to be at their lowest. Instream projects are implemented at locations pre-determined by fishery biologists and/or hydrologists, based on careful assessment of site conditions, limiting habitat features and expected response to prescribed treatments.

Instream Projects can include the placement of individual structures intended to address specific factors limiting fish production within a given reach (increase pool frequency/complexity, large woody debris, available spawning and rearing habitat, etc.), or may involve stable channel design projects aimed at re-establishing channel function. Stable channel design projects are based on principals and techniques described by Rosgen (1994, 1996, 1998 and 2001). Major instream Habitat Improvement Projects (active restoration) implemented by the Program, have included the use of "J-Hook" and "Cross-Vane" structures (Appendix A) and root wad revetments. Instream Habitat Improvements may also combine bioengineering treatments for bank stabilization with stable channel reconstruction techniques.

The Brogoitti Stable Channel Design on East Birch Creek, originally implemented in 2001 as a USACE/Program cost share project, remains under the primary direction of the USACE. This project will not shift to the Operation and Maintenance phase until its adequate completion and hand-off to ODFW/BPA. Therefore, adjustments to instream structures and channel segments scheduled for summer 2004 (but postponed until 2005) were considered project "betterment", and are discussed within the context of *Implementation - On Site Development* activities in this report.

4.2.2 Riparian Plantings

Revegetation is often carried out as part of the implementation phase of instream restoration and stable channel design projects, where mechanical soil disturbance has occurred. Sites are also re-vegetated in conjunction with passive restoration treatments, such as livestock exclusion fencing, to accelerate riparian recovery in heavily grazed areas. Revegetation projects may involve seeding native grasses, willow cutting (whip) plantings, and/or rooted stock plantings.

In 2004, Willow "whips" (cuttings) were installed, using a modified brush layering technique, within mechanically excavated trenches. Trenches were oriented perpendicular to the stream channel, and were dug 2-5' in depth by the width of the excavator bucket (~3' wide). Trenches were started next to the channel, at bankfull elevation, and excavated away from the stream. Individual coyote willow (*Salix exigua*) stems (cuttings) were then laid into the trench in rows running parallel to the stream channel. Cuttings are approximately 25 to a row, and rows are set roughly 18" apart at an angle of roughly 45°. The length of, and spacing between, the trenches varies according to site conditions (Appendix B).

Cuttings were harvested from the McKay National Wildlife Refuge, south of Pendleton, OR. Willows were cut using chain saws, sorted to remove under-sized and dead stems, counted and tied into bundles of approximately 25 stems. ATVs were used to transport bundles to the refuge parking lot and the Program's utility trailer was used to deliver bundles to the Brogoitti project site. Bundles were stockpiled (but end submerged in the water) in East Birch Creek, adjacent to the proposed trench locations.

The installation of willow trenches on the Brogoitti property, was considered implementation (betterment) while rooted stock plantings (supplemental revegetation within previously planted areas) are discussed in the context of O&M for the purposes of this report.

4.2.3 Riparian Fencing

Typically, six-strand high tensile, or three- or four-strand barbed wire fencing is installed along the perimeter of riparian lease areas (Appendix C). Fences are designed to exclude livestock and halt grazing related impacts on riparian vegetation, stream banks, steam channels and water quality. Fences must be installed far enough away from the active stream channel and flood prone areas to ensure that fences are not washed out or undermined, during high flow events. Stream crossings and/or water gaps are often incorporated into the riparian fence construction, in order to meet livestock watering requirements, as identified by the property owner. In 2004, fence construction was limited to a 250-foot long section of board fence, near the residence on the Brogoitti property.

4.2.4 Offsite Water Developments

Where feasible, off site water developments are used to eliminate the need for water gaps in riparian fences. Offsite water developments allow livestock access to drinking water while reducing the significant maintenance requirements normally associated with water gaps.

Water troughs are installed outside the perimeter fence of leased riparian areas. Troughs are supplied from a variety of sources including existing water lines, wells and springs. Troughs range in volume from 125 to 525 gallons; the capacity of the trough is selected based on the capabilities of the water supply, and the number of livestock using the development. Troughs fed by water lines or wells are simply plumbed into the existing water supply, and may require an electrical pump system to fill the trough. In certain cases, an electrical supply is also required to power heated troughs, that keep livestock drinking water ice-free, year round. Spring improvements involve excavating at the source of a ground water supply and installing a receptacle to collect and deliver water via gravity feed to a nearby trough (Appendix D). No new off-site water developments were implemented in 2004

4.3 OPERATION AND MAINTENANCE

Operation and Maintenance (O&M) activities normally begin the first year following project implementation. O&M activities are aimed at identifying and addressing concerns associated with existing projects, to ensure their continued success. Program staff also seek opportunities to improve on existing treatments, as appropriate, in order to maximize benefits to fish habitat.

Once long-term agreements have expired, landowners assume responsibility for the general maintenance of Habitat Improvement Projects implemented on their properties. The Program may offer landowners advice, technical support, and possibly additional funds to support larger scale maintenance activities

within expired project areas, if the work is deemed crucial to the continued success of a project. Permission must be obtained from the landowner, in writing, before the Program can initiate maintenance activities on lands no longer under agreements.

4.3.1 Instream Habitat

Inspections of instream habitat structures and stable channel design projects are conducted annually, in the spring and following major flood events. An assessment and evaluation of project effectiveness is made relative to site-specific objectives, based on visual observation, repeated surveys (channel cross-section and long profile), etc. Requirements for maintenance are identified based on the function of each structure/site, relative to its desired objective. Once maintenance needs have been identified, pre-work surveys are conducted and all necessary permits are obtained. A maintenance plan is prepared which outlines the type of maintenance activities required, along with a rationale for maintenance works.

As with Instream Habitat implementation, projects are implemented during late summer and early fall (within the designated in-water work window for a given stream) when stream flows are expected to be at their lowest.

In 2004, instream maintenance requirements were identified on the Houser property on East Birch Creek. Instream maintenance requirements for the Baker property, on Westgate Creek, were identified in 2003 and completed in 2004.

4.3.2 Riparian Plantings

For the duration of the lease agreement, planting sites are inspected annually and following major flood events. Maintenance requirements are identified based on plant survival, plant vigor, rate of growth, intensity of wildlife browse and the presence of noxious weeds.

Project lease areas are inspected for the presence of noxious weed species. Program staff identify areas in need of treatment, as well as the type and intensity of treatment required. Treatment may include manual removal, mechanical removal, and/or herbicide applications. Herbicide application methods include backpack and ATV-mounted spot spraying, and/or ATV-mounted boom spraying for small to moderate sized treatment areas. Larger treatment areas, normally associated with newer projects having relatively large sections of exposed soil (which are more susceptible to invasion by weeds), are contracted out. Treatments normally consist of two separate applications (in the spring and fall), to effectively control sub-annual species. Herbicide products and application methods follow state and federal regulatory standards. The herbicide most frequently employed by the Program is *Transline* (active ingredient: Clopyralid 40.9%).

In 2004, maintenance treatments included, removal of invasive weeds (through herbicide applications), removal of competitive grass species, irrigation, and supplemental rooted stock planting to achieve desired density. Rooted-stock species were planted individually, in holes excavated using a hand-held, gas-powered auger. Planting strategies for rooted-stock included the installation of plastic mesh tubes for protection against wildlife browse, and/or sod mats to reduce competition from established plants (tall, annual grasses), and maximize plant survival. Only native species were selected for site revegetation (Appendix E). Re-vegetation (grass seeding) was also required following instream maintenance activities on Westgate Creek, where soil was exposed during excavator work.

4.3.3 Riparian Fencing

Fencing projects are inspected twice during the field season: as early as possible in the spring, prior to arrival of livestock on a property, and again in the fall. The entire perimeter of a riparian fence boundary is inspected to identify failures or gaps created by snow pack, falling trees, livestock, wildlife, etc. Instances of damage, and intrusion of livestock into riparian areas, are also reported to Program staff by the landowners. Fences (including water gaps and stream cross fences) are repaired, as required, to ensure the protection of riparian habitat and Program investments.

Inspections of fencing projects may also include an evaluation of fence location, following major flood events. Fences that are deemed too close to the active stream channel or normal flood prone area may need to be relocated. Relocation of fence lines requires consultation with the landowner, and major deviations from the original fence location may require an amendment to the lease agreement.

In 2004, fence inspection and maintenance was carried out on all active projects lease areas, involving 16.22 fence miles on 298 riparian acres.

4.3.4 Off Site Water Developments

Off site water developments are inspected annually (often in conjunction with riparian fence inspections) to ensure proper function. Spring water receptacles are inspected for sediment blockages and troughs are inspected for damaged pipes, fittings and pumps.

4.4 MONITORING AND EVALUATION

Project-specific Monitoring and Evaluation (M&E) Plans are normally developed at the design stage of each project. The M&E plan should describe existing and desired conditions for a given project site, as well as outline measurable parameters by which project effectiveness can be evaluated. The effectiveness of individual projects can then be measured against the pre-determined, site-specific objectives.

4.4.1 Instream Habitat

The effectiveness of instream Habitat Improvement projects is evaluated visually, as well as through the comparison of follow up survey (cross-section and long profile) data. Historically, Channel/Habitat Transect Surveys have also been completed, however, transects were not surveyed in 2004. Instream habitat monitoring is conducted to help refine O&M strategies, to identify potential improvements for existing and future instream treatments, and to ensure that project objective are being achieved.

4.4.2 Photo Documentation

Permanent photopoint sites have been established at select Habitat Improvement Project sites throughout the Program's operating areas. Photopoints are identified in the field using a permanent reference point (often an old fence post or rebar pin) and numbered metal tag. Site photographs are taken to document site conditions prior to, during, and subsequent to, implementation of passive and active Habitat Improvement Projects. Photopoints enable Program staff to obtain a visual documentation of a specific treatment site, over time, from the same vantage point. Photo documentation allows a visual assessment

of site recovery, and is particularly useful for documenting vegetation recovery within fenced riparian corridors. Site photos are typically taken every year for the first 2-3 years following project implementation, and subsequently, once every 4-5 years. When site conditions become such that changes are no longer discernable (due to re-growth of vegetation), photopoints are discontinued.

Historically, project photos were taken using 35 mm slide film. Slides were catalogued in photopoint notebooks, which were arranged by area and also contained maps depicting photopoint locations and a standardized methodology for taking photographs. In 2004, site photos were taken using an *Olympus Camedia C-2500L* digital camera. Digital photos were downloaded to the Program's main PC, and a backup CD Rom was created.

4.4.3 Thermograph Data Collection

Thermograph data were collected at 11, pre-established, stream temperature monitoring sites within the Program's operating areas (Figure 3), including the Birch Creek and upper Meacham Creek watersheds. Thermograph recording sites (selected by Program staff beginning in 1988) were chosen based on their location relative to (upstream and downstream of) existing Habitat Improvement Projects, and/or at locations that would allow the collection of control or pre-treatment data for future projects.

Temperature data were collected during the summer months (May through October) using *Onset* brand, HOBO and STOWAWAY, model thermographs units. The Habitat Biologist developed and maintained a Temperature Monitoring log, to track thermograph models/serial numbers, deployment/retrieval timing, monitoring locations (sites were GPS-located for future reference), and data download information (Appendix F).

Thermographs were downloaded upon retrieval using *Boxcar Pro 4.0* for Windows 95 (backup files of all raw data were created). Raw data were graphed using *Boxcar Pro 4.0*, and graphs were reviewed for anomalies (i.e., evidence of battery die-off, unit malfunctions, etc.). Data from sites that indicated unusable data were not analyzed further. Acceptable raw data were converted to text (.txt) format and imported into *Microsoft Excel 2000*, for data analysis. Once in *Excel*, pre-deployment and post-retrieval data spikes were omitted. Daily minimum, maximum and mean temperatures were calculated, along with the 7-Day Moving Average (SDMA) for maximum daily temperatures (DEQ 2000 and 2004). Minimum, maximum and mean graphs were created for each site, for each month of deployment (mid-May through end of October). The maximum daily SDMA was graphed for the entire deployment season. All temperatures are presented in Degrees Celsius (°C). SDMA Results were used to determine and compare peak summer temperatures at various sites within the Program's operating areas, as well as determine the number of days within the summer deployment period that maximum temperatures exceeded the DEQ Temperature Standard of 17.8°C (DEQ 1997 and 2000).

4.4.4 Spawning Ground Surveys

Steelhead spawning ground surveys are conducted in the spring of the year to provide an indication of spawning habitat use within the Program's area areas of operation. Attempts are made to conduct surveys near the end of peak spawning activity, to obtain a more accurate count. Surveys are conducted within areas under long-term agreements (East Birch Creek), as well as in areas targeted for future projects. Two counts are normally conducted within each survey area, roughly 10 days apart. The number and approximate location of observed redds is recorded, along with the presence of adult steelhead. Flagging ribbon is used to indicate redd locations in the field and eliminate duplicate counts

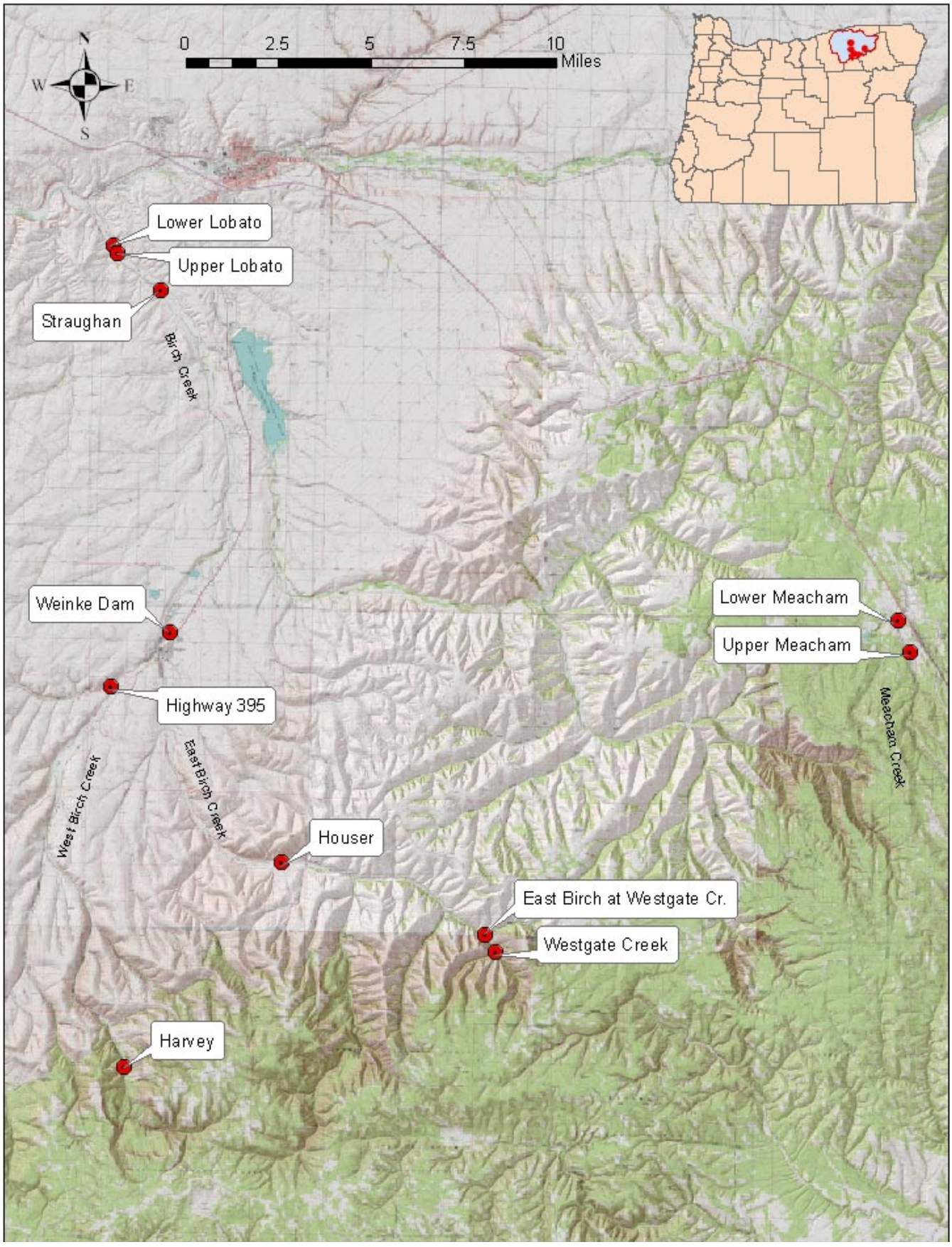


Figure 3. Permanent Stream Temperature Monitoring Sites within the Umatilla Subbasin.

of redds during follow-up surveys. Completion of redd count surveys is dependant on stream flow conditions.

In 2004, spawning ground surveys (single counts) were conducted on the Brogoitti and Houser properties, East Birch Creek.

5.0 RESULTS AND DISCUSSION

Major projects carried out by the Umatilla Subbasin Fish Habitat Improvement Program during the 2004 calendar year included: Instream structure maintenance on Westgate Creek (Baker property), preparation and planning of instream betterment on the Brogoitti property (East Birch Creek), preparation and planning for instream maintenance activities on the Houser property (East Birch Creek), development of agreements and initiation of a stream flow gauge installation project on East and West Birch creeks, collection of stream temperature data, and photo documentation of project sites. Specific activities are described, by project Phase, in the following sections. This report also summarizes Program duties related to Administration, and Interagency Coordination and Education.

Table 1 provides a listing of the Program's long-term agreements and a summary of Program accomplishments since its inception in 1987.

Table 1. Summary of the Umatilla Subbasin Fish Habitat Improvement Program Accomplishments.

Property	Lease Term	Impl. Year	Fence Miles	Acres Leased	Steam Crossings	Water Gaps	Stream Miles	Instream Structures	Water Developments
Mainstem Birch Creek									
F. Straughan	1989-2004	89	0.69	5.8	4	2	0.31	21	1
J. Straughan	1990-2005	90	0.84	17.2	2		1.00	3	
McDaniel	1989-2004	89	1.75	20.3	2	2	0.90	42	
Rhinhart	1989-2004	89		22.1			0.63	40	
B. Weinke	1990-2005	90	0.5	5.8	3		0.50	4	1
Hoeft	1990-2005	90	0.5	21.0	2		1.00	1	2
Hemphill	1989-2004	89	0.38	10.0	1		0.25		
Gambill	1990-2005	90&98	1.25	12.9	2	2	0.70	21	
W. Weinke	1989-2004	89&98	0.65	17.9	4	2	0.44	14	
Lobato	1996-2011	95	0.40	13.0			0.30	11	1
Birch Creek Sub-Total			**6.96**	**146.0**	**20**	**8**	**6.03**	**157**	**5**
East Birch Creek									
Magic Mile[1]	1989-2004	89	1.75	21.2	12	6	0.70	27	
Rugg	1988-2003	89&96	0.45	10.4	1		0.31	8	1
Houser	1999-2014	88&01	2.51	42.6	1		1.53	46	2
Brogoitti	2001-2026	01	2.06	31.0	3		1.20	58	4
Baker (Westgate)	1988-2003	89-98		11.4	6	2	0.70	22	
East Birch Creek Sub-Total			**6.77**	**116.6**	**23**	**8**	**4.44**	**161**	**7**
Meacham Creek									
L. Pacific	1990-2005	89	0.90	15.4	4	1	0.65		1
L. Pacific	1989-2004	91	0.50	23.5	4	1	0.60	32	
Forest Recovery	1992-2007	92	1.70	18.3	4	3	0.94		2
Meacham Creek Sub-Total			**3.10**	**57.2**	**12**	**7**	**2.19**	**32**	**3**
PROGRAM TOTAL			**16.48**	**319.8**	**57**	**23**	**12.56**	**350**	**15**

[1] The Magic Mile is a section of lower East Birch Creek that includes 10 different land ownerships.

A number of long-term agreements expired during the 2004 calendar year. The Program is currently seeking opportunities to develop new projects (both active and passive), and sign new long-term agreements with willing landowners. The newly developed, Final Umatilla/Willow Subbasin Plan will provide direction and steer Habitat Improvement efforts beginning in 2005. A summary of project accomplishments within the Program's 16, recently expired lease areas is provided below.

> **Straughan Property:**

Work completed on the Straughan property included both active and passive Habitat Improvement treatments. Active treatments (instream structures) installed in 1989, included rock jetties and toe-rock to protect and stabilize eroding banks. Instream structures and riparian fences required maintenance in 1991 following the 1990 flood event. Livestock exclusion fencing helped to restore and protect riparian vegetation along the 0.31 miles of stream under lease (Photos 1 and 2). One off site water development was also installed on the property.

> **McDaniel Property:**

Also implemented in 1989, work on the McDaniel property involved active and passive Habitat Improvement treatments, including livestock exclusion fencing and the installation of rock structures (jetties and toe-rock) to protect and stabilize banks. The 1990 flood caused damage to fences and instream structures and maintenance work was required in 1991. Riparian conditions within the 20.3 acre lease area, have improved significantly since the implementation of Habitat Improvement projects (Photos 3 and 4).

> **Rhinhart Property:**

A limited grazing agreement was reached between Program staff and the landowner, eliminating the need for livestock exclusion fencing on the Rhinhart property. Bank stabilization structures (jetties and toe-rock) installed in 1989 required maintenance in 1991, following the 1990 flood event (Photos 5 and 6).

> **Hemphill Property:**

Habitat Improvement work on the Hemphill property was limited to passive treatments, namely the installation of 0.38 miles of livestock exclusion fence in 1998. Riparian habitat conditions within the 10.0 acre project area, showed significant improvement during the period of the lease agreement (Photos 7 and 8). This favorable, and relatively rapid response, was likely attributable to intact stream channel/floodplain connectivity within the treated reach. Flood events prompted major fence maintenance in 1991.

> **Weinke Property:**

Habitat Improvements on the Weinke property consisted primarily of livestock exclusion fencing, installed along the property's 0.44 mile section of stream (Photos 9 and 10). In addition, bank stabilization treatments were implemented along a section of channel that encompasses the lower portion of the Weinke property and the upper portion of the adjacent Gambill property. Instream and fence maintenance was required in 1991, following the 1990 flood. The Habitat Biologist has been in contact with Mr. Weinke and is currently trying to develop a new lease agreement to extend protection of project investments on the property.

Photo 1:	Straughan property, 1994. Following 5 years of passive treatment.

Photo 2:	Straughan property, 2000. Following 11 years of passive treatment.

Photo 3:	McDaniel property, 1991. Pre-treatment photo.

Photo 4:	McDaniel property, 2000. Riparian recovery following livestock exclusion fencing.

Photo 5:	Rhinhart property, 1990. Following implementation of bank stabilization treatment.

Photo 6:	Rhinhart property, 2000. Following 10 years of recovery at bank stabilization treatment site.

Photo 7:	Hemphill property, 1989. Pre-treatment photo.

Photo 8:	Hemphill property, 2000. Riparian recovery following livestock exclusion fencing.

Photo 9:	Weinke property, 1990. One year following fence installation.

Photo 10:	Weinke property, 1999. Following 8 years of riparian recovery within fenced area.

> **Magic Mile (includes 10 property leases):**

Riparian fencing and instream Habitat Improvement treatments (boulder placement) were implemented within the 'Magic Mile', which encompasses 10 adjacent lease properties along the lower section of East Birch Creek near the City of Pilot Rock. The involvement of numerous landowners within a relatively short project area made coordination of Magic Mile projects difficult: landowners were rarely in agreement regarding project development and implementation. Habitat Improvement projects helped to improve riparian conditions within the leased areas (Photos 11 and 12), however, aggradation (directly attributable to upstream channel disturbances) remains a source of concern. The development of a project aimed at addressing upstream channel concerns, has never been economically or logistically feasible.

> **Louisiana Pacific (Boise Cascade) Property:**

Habitat Improvement work on the Boise Cascade property involved primarily livestock exclusion fencing, along with the placement of whole trees (as bank revetment structures and to create instream habitat), to protect and enhance the 0.6 mile section of stream under lease (Photos 13 and 14).

5.1 IMPLEMENTATION - PREWORK

5.1.1 Project Development

Program Staff made written contact with officials from the City of Pilot Rock (Steve Draper, Public Works Director) to discuss the possibility of installing stream flow gauging stations on East and West Birch creeks. The Habitat Biologist then began coordinating with the US Bureau of Reclamation (BOR) and the Oregon Water Resources Department (OWRD), in order to formulate a plan for the operation, calibration and maintenance of these proposed stations. On site visits were held at the OWRD's gauging station on Wildhorse Creek to inspect the gauge house and equipment installations.

The Program Biologist made contact with Mr. Steven Corey of Cunning Sheep Farm Company to discuss the possibility of implementing passive restoration treatments (livestock exclusion fencing) on a portion to the company's property located in the upper Meacham Creek watershed. The targeted riparian area borders the lowermost portion of Beaver Creek, at its confluence with Meacham Creek. Discussions with Mr. Corey revolved around potential impacts the project might have on grazing operations, and the loss of eligibility of the land for federal program funding (i.e., CREP) should fencing occur. Mr. Corey granted permission for Program staff to access the property, for the purposes of conducting preliminary surveys and estimating the area that would require fencing. Discussions regarding a possible lease agreement are ongoing.

The Habitat Technician contacted Mr. Steve McClellan of Boise Cascade to discuss additional fencing projects along upper Meacham Creek. The possibility of conducting this or any other project within the Program's upper Meacham Creek operating area is on hold following the sale of Boise-Cascade timber holdings to *Forest Capitol*, and the re-evaluation of the new owner's priorities regarding all activities on the land.

Photo 11:	Magic Mile (Cumiskey property), 1990. Pre-treatment photo.

Photo 12:	Magic Mile (Cumiskey property), 2000. Riparian recovery following livestock exclusion fencing.

Photo 13:	LP (Boise Cascade) property, 1990. Pre-treatment photo.

Photo 14:	LP (Boise Cascade) property, 1999. Riparian recovery, promoting channel stability following livestock exclusion fencing.

The District Fish Biologist and Habitat Biologist have communicated with Mike Pelissier of the Umatilla Basin Watershed Council (UBWC), to develop plans for the implementation of Conservation Reserve Enhancement Program (CREP) projects in the Umatilla Subbasin. The proposed plan would use funds from the BPA funded Fish Habitat Improvement Program to perform maintenance of CREP projects within priority areas of the Program's operating areas. Meetings with numerous agencies (CTUIR, NRCS, FSA and SWCD) are scheduled for early 2005 to review potential strategies for CREP implementation/maintenance cost share projects.

5.1.1.1 Landowner Coordination

Program Staff was contacted by Ms. Sharon Fleenor, new owner of the Cook property, East Birch Creek, regarding the status of the active lease agreement in place for the property. The Habitat biologist contacted Ms. Fleenor and informed her of the expiry date of the lease agreement (March 2004).

The Habitat Biologist and Habitat Technician addressed a landowner inquiry by Mr. Tom Rugg, regarding the contribution of fencing materials for the completion of a livestock exclosure project on East Birch Creek. Program Staff agreed to contribute 100 fence stays to Mr. Rugg's project. The Habitat Biologist also discussed with Mr. Rugg the possibility of contributing grass seed for a fall seeding project being developed in conjunction with the riparian fencing project. A verbal agreement was made with Mr. Rugg to provide seed for a 5-6 acre section of riparian land. The project was not implemented in 2004.

The Habitat Biologist initiated phone and written contact with the landowner of the Westgate Canyon Property (Mr. Curtis Baker), as well as the property manager (Mr. Pete Irwin). A request was made to gain access to the property to conduct instream habitat maintenance (project lease agreement expired in 2003). Proposed maintenance work was required to lower the elevation of existing instream structures ('vortex weirs' installed in 1998), thereby preventing channel degradation and eliminating potential fish passage barriers. Written permission was received from the landowner, and arrangements were made with the property manager, regarding access to the property through a locked gate. With permission from Mr. Irwin, Program staff installed a combination lock (linked to the landowners lock system) at the Westgate Creek Property. The Habitat Biologist met several times with Mr. Irwin to discuss plans for instream maintenance. As authorizations were received and the contract bidding process progressed, the Habitat Biologist kept Mr. Irwin updated regarding possible start/end dates for instream activities. Landowner concerns regarding the timing of the proposed work were addressed. The Habitat Biologist confirmed in writing that work would be conducted prior to both deer and elk hunting seasons, to avoid conflicting with recreational land use. Following completion of maintenance activities on Westgate Creek, the Habitat Biologist sent a letter to Mr. Baker thanking him for his cooperation and explaining the work that had been carried out. A copy of the letter was also sent to Mr. Irwin.

The Habitat Technician communicated with Mr. Kal Garton regarding the possible implementation of spring development projects as a first phase of treatment within the upper section of West Birch Creek. Water developments will only proceed within if a long-term lease agreement is in place. Communication is ongoing.

The Habitat Biologist contacted Fay Newton (daughter of Grace Harvey, landowner) to request access to the sections of West Birch Creek on the Harvey property, for the purposes of conducting spawning ground surveys.

The Habitat Biologist contacted Tom Straughan to request access to his property in order to deploy and retrieve a thermograph, as part of ongoing temperature monitoring activities. The lease agreement between Mr. Straughan and ODFW expired in March of 2004.

The Habitat Biologist was contacted by Mr. Richard Matteson, caretaker at the Birch Creek Country Club, regarding bank erosion which occurred during high flows in late May of 2004. A site visit was conducted June 9 to view and assess a bank erosion site, which threatens to undermine a cart crossing bridge, also in attendance was Mike Pelissier of the UBWC. Mr. Matteson was informed that the type of project associated with the remediation of erosion problems does not fall within the mandate of the Fish Habitat Program, but that Program staff would be willing to contribute technical advise and design review during the planning stage of the project. A second site visit was held June 22 to view the entire length of Birch Creek on Country Club property and discuss possible revegetation strategies under CREP funding.

Upon request by the landowner, Mr. John Brogoitti, a replacement copy of the easement agreement was faxed to the landowner.

The Habitat Biologist contacted Mr. Pete Irwin to report the presence of cattle on the baker Property at Westgate Creek. Mr. Irwin indicated that both he and Mr. Baker were aware of the presence of livestock, and were attempting to remove the animals and contact the owners to report and remedy the situation.

The Habitat Technician fielded a call from Mr. Brogoitti regarding the improper function of the pump system installed at the bridge site on his property. Mr. Brogoitti and the Habitat Technician agreed that the pump intake, installed within a corrugated metal pipe and affixed to the north piling of the bridge, would need to be lowered (requiring additional excavation) to allow year-round withdrawal from the stream. The Habitat Technician, Habitat Biologist and Mr. Brogoitti have continued to explore options for addressing the situation.

Following the observation of cattle within the riparian exclosure fence on the Brogoitti property, East Birch Creek, the Habitat Technician placed calls to both the Hoeft and Ellis residences to inquire as to whom owned the animals. The Habitat Biologist placed a call to Mr. Brogoitti to report the situation and remind him of his obligations to exclude livestock from the riparian currently area under easement.

The Habitat Biologist, Habitat Technician and District Fish Biologist attended an on site meeting on lower East Birch Creek near Pilot Rock, August 4, 2004. The meeting was requested by Mr. Mark Mascall, a local landowner whose property and residence experienced flooding during the May 2004 high flow event. The meeting was held to discuss options for dealing with excessive aggradation, which has caused water from East Birch Creek to leave its channel and flow through the floodplain. Also present were Mr. Kevin Herkamp of the Oregon Department of State Lands (DSL) in Bend, OR, and several interested landowners who reside in the lower mile of east Birch Creek (Magic Mile). A representative from the US Army Corps of Engineers (USACE) was unable to attend. The scenarios discussed for addressing the situation were not in keeping with the objectives of BPA-funded, Fish Habitat Improvement Programs, and were focused on removing instream gravels and performing annual channel maintenance. Therefore, the Habitat Biologist offered to provide limited technical support (technical project design review and recommendations), but could not commit funds or materials for that type of project.

The Habitat Biologist customized and sent five letters to individual landowners with lease agreements that have recently expired, or are about to expire. The letters thank the landowners for their participation and support for the Program and encourages them to continue operation and maintenance of projects implemented on their respective properties. The remaining letters will be drafted and delivered to landowners as time permits.

In December of 2004, the Habitat Biologist received a call from Mr. Bill Sorenson, who had just recently purchased the Brogoitti property. The Habitat Biologist discussed with Mr. Sorenson past projects undertaken on the portion of the property under easement, as well as the willow trenching project that was underway at the time, and potential activities scheduled for the summer of 2005. Mr. Sorenson and the habitat Biologist agreed to meet on site early in 2005 to visit and discuss the project area.

5.1.2 Development of Long-Term Agreements

The Habitat Biologist contacted landowners Ms. Yvonne Gambill and Mr. Don Weinke, regarding the possibility of extending their respective lease agreements. These landowners have given tacit approval for the extension of their lease agreements, pending a review of the document. The riparian lease agreement for the Weinke property expired in March of 2004, while the Gambill lease expires in January of 2005. Projects were originally implemented on these properties in 1990 and additional work was undertaken in 1998. The Program would like to request an extension of the lease agreements for a period of ten years (i.e., fifteen years from the period of the most recent work completed). The Habitat Biologist completed an updated draft version of a riparian lease document for review by Ms. Gambill and Mr. Weinke. The Habitat Technician has been tasked with the preparation of project lease maps for the project sites, which will differ from the original lease. Extending these agreements will help ensure the prolonged success of Program investments.

An agreement between ODFW and the City of Pilot Rock was signed, granting the Fish Habitat Program permission to install two, stream flow and temperature gauging stations on East and West Birch creeks, in the City of Pilot Rock. The Habitat Biologist worked cooperatively with the Watershed District Manager, the District Fish Biologist and representatives of the OWRD to prepare a draft agreement between ODFW and OWRD for the installation, operation and maintenance of the gauge stations. The draft agreement was sent to ODFW Headquarters in Salem for review and approval, prior to finalization and signature. Stations are scheduled for installation in the summer of 2005.

The Habitat Biologist made contact with Steven Corey of Cunning Sheep Farm Company to discuss the details of a possible livestock exclusion fencing project on a portion of the Company's property, situated on lower Beaver Creek, in the upper Meacham Creek watershed. A letter sent to Mr. Corey, included a rationale for the project as well as a description of projects benefits. An aerial photo overlay map was produced and sent with the letter, which used GPS'd positions to indicate approximate fence locations, potential water-gap sites, and possible livestock crossing points. Mr. Corey is scheduled to present the idea for the project to the company's board of directors for review and comment.

5.1.3 Project Preparation

An optional pre-bid viewing of the Westgate Creek instream maintenance sites was held for the benefit of prospective bidders. The Habitat Biologist and Habitat Technician were present to conduct a walk-

through of the sites, and field any questions regarding the proposed work. Mr. Aaron Hadden of Aaron Hadden Excavating, LLC, was the only contractor to attend.
Prior to conducting instream maintenance work on Westgate Creek, the Habitat Biologist held an on site, pre-work meeting with the excavator operator (Mr. Aaron Hadden), to review specific maintenance activities prescribed for each site, inspect the excavator for lubricant leaks, and discuss and sign the emergency spill response plan. The Habitat Biologist also flagged excavator access routes leading from the access road to the maintenance sites.

The Habitat Biologist, Habitat Technician and District Fish Biologist visited the Brogoitti project site during a high flow event (January 30, 2004). The Stable Channel Design project (designed using Dave Rosgen methodology, implemented jointly by USACE and ODFW), was inspected, informally evaluated, and potential betterment opportunities were identified. A subsequent visit to the sites was made (February 20, 2004) to re-evaluate site conditions at bankfull stage and refine maintenance requirements. In late March of 2004, the USACE was informed of the Program's intent to conduct project betterment on the project. In late May of 2004, the USACE raised concerns regarding the appropriateness of ODFW conducting O&M activities on a project that is still the under the responsibility of the USACE. Proposed betterment of the project was postponed pending discussions with the USACE and a re-evaluation of site conditions. The Habitat Biologist, Habitat Technician and District Fish Biologist visited the Brogoitti project site (June 10, 2004) following the May high flow event. The Stable Channel Design project was again inspected and informally evaluated. The upper ¼ mile the project site suffered significant damage in the form of localized aggradation and bank erosion. Potential maintenance strategies were discussed and findings were reported to the USACE. A meeting was held July 16, 2004, at the Brogoitti, Stable Channel Design project site, which included the Habitat Biologist and Habitat Technician, as well as Wendell Greenwald and Carl Christianson of the USACE. The meeting prompted discussion regarding what action(s) should be taken and how to proceed at the site. It was agreed that, under the circumstances, the best approach might be to have the site and/or project data reviewed by a qualified, neutral third party who could help determine the cause of localized failures and recommend possible solutions.

The Habitat Biologist contacted Mr. Lee Silvey of Colorado. Mr. Silvey had been involved with the very early stages of the Brogoitti project, working with USACE staff during data collection and analysis activities. Mr. Silvey, however, was not involved with the project's design or implementation phases. The Habitat Biologist inquired as to Mr. Silvey's availability with regards to reviewing and re-evaluating project data, and potentially conducting a site inspection. Ultimately, Mr. Silvey's services were not retained, as the USACE was able to obtain the assistance of Mr. Craig Fischenich, Ph.D., P.E., Research Civil Engineer with the US Army Engineer Waterways Experiment Station to perform the same task at no charge to the project. An on site meeting was held and a verbal agreement was reached between Mr. Fischenich, USACE staff and Program staff, regarding what sites should be monitored, what sites required betterment, and general treatment options for the latter. Following the meeting, the District Fish Biologist developed a 6-step approach to advance the project. Per this approach, the Habitat Biologist conducted further assessment of the project site and developed a preliminary action plan for submission and review by the USACE. USACE staff and Mr. Fischenich reviewed the plan and provided comments regarding site-specific treatment prescriptions. The Habitat Biologist is currently discussing options with BPA for the finalization of the implementation portion of the project, financial, technical and administrative responsibility for project, the completion of a project O&M manual for the project (to be drafted jointly by the USACE and ODFW), and the eventual transfer of responsibility for the project from the USACE to ODFW/BPA.

An on site meeting was held at the Houser stable channel design site, East Birch Creek, August 4, 2004. In attendance were, the Habitat Biologist, Habitat Technician, District Fish Biologist and Mr. Kevin Herkamp of the DSL (a representative from the USACE was unable to attend). The meeting held to review and discuss proposed maintenance activities at the site and obtain input from the DSL representative, prior to submission of a *Joint Application Form* for Fill/Removal.

Prior to the installation of willow trenches on the Brogoitti property, the Habitat Biologist and Habitat Technician staked and/or flagged trench locations. Program staff also calculated trench feet and the number of willow cuttings required for the project.

The Habitat Biologist called for field locates for proposed excavation sites associated with the installation of stream flow gauging stations on City of Pilot Rock property. The Habitat Technician and Seasonal EBA completed construction of a gauging house that will hold flow gauging equipment along East Birch Creek. Program staff inspected the City's sewage pumping station building that will house the West Birch Creek gauging equipment.

5.1.4 Field Inventories and Permit Acquisition

The Habitat Biologist prepared and submitted the *Notification Form For Minimal Disturbance General Authorization In Essential Salmonid Habitat,* to the DSL, for proposed instream maintenance work, on the Westgate Canyon Property. The Habitat Biologist discussed the project with USACE staff and provided written notification of the proposed activities, as directed. Written approval was obtained from the DSL to proceed with the activities, as described in the notification. The notification to the USACE prompted a request for additional information, including the completion of a formal Biological Assessment (BA) along with plan view and cross-sectional diagrams (existing and proposed) for each scheduled maintenance site. The Habitat Biologist completed and submitted the BA and all necessary supporting documentation for review by the USACE. Following review of the BA, a response was obtained from the USACE stating that the proposed works were not subject to authorization under their approval process. The letter went on to mention that authorization(s) might be required from other agencies, namely the National Oceanic & Atmospheric Administration (NOAA), the National Marine Fisheries Service (NMFS), and the US Fish and Wildlife Service. The Habitat Biologist proceeded to contact the BPA Environmental Protection Specialist to obtain direction on the matter. Inquiries into the subject revealed that the type of work being proposed was covered, at the programmatic level, under BPA's Habitat Improvement Program Biological Opinion (HIP BiOp). The Habitat Biologist completed and submitted the appropriate paper work and obtained approval under the HIP BiOp process.

The Habitat Biologist completed and submitted the DSL/USACE *Joint Application Form* for Fill/Removal, associated with proposed betterment at the Brogoitti property (scheduled for the of summer of 2004). Included in the application packages were cross-sectional diagrams for each proposed work site, along with a longitudinal profile of the stream channel. Following the May high flow event, Fill/Removal applications for the Brogoitti project were withdrawn from both DSL and the USACE review processes, due to changed site conditions.

The Habitat Biologist completed and submitted the *Joint Application Form* for Fill/Removal, for proposed maintenance activities on the Houser property to both the USACE and DSL. Included in the application packages were cross-sectional diagrams for each proposed work site, along with a longitudinal profile of the stream channel. A request for additional information was received from Mr. Herkamp of the DSL, September 7, 2004, including the completion of a *General Authorization* (GA) *for*

Fish Habitat Enhancement, containing annotated photos of the site and a description of proposed activities. The GA was processed and submitted the same day, and an authorization from the DSL was issued September 29, 2004. Authorization to proceed was also received from the USACE, but not in time to proceed with the project within the designated in water work window (authorization received October 28, 2004, 1 business day before the end of the work window). A request was made to obtain written authorization from the UASCE via facsimile, in order to obtain an extension to the in water work window, but the request was not granted. The project is scheduled for completion in the summer of 2005, with authorizations already in place.

The Habitat Technician and Seasonal EBA conducted field surveys at the Houser maintenance site. Assessments included stream channel pebble counts and gravel bar surveys to determine particle size, along with field measurements of radius of curvature. Data were entered into a *Rivermorph* application, in which various calculations and scenarios were run to help determine the correct adjustments needed at instream maintenance sites.

The Habitat Biologist conducted a field reconnaissance survey at the McKay National Wildlife Refuge (NWR) to locate potential willow collection sites for the Brogoitti willow trenching project. The Habitat Biologist and Habitat Technician also recruited assistance from staff in other ODFW programs to aide in willow collection activities.

After obtaining verbal permission from Mr. Steven Corey, the Habitat Biologist and Habitat Technician conducted preliminary surveys of the lower section of Beaver Creek, at the confluence with Meacham Creek. Staff took photographs within the proposed livestock fencing area and collected GPS data points at various feature locations (potential fence lines, water gaps, off-site water developments and livestock crossing points). GPS data were used in the production of the aerial photo overlay map provided to Mr. Corey for review by the Cunningham Sheep Company board of directors.

5.2 IMPLEMENTATION - ON SITE

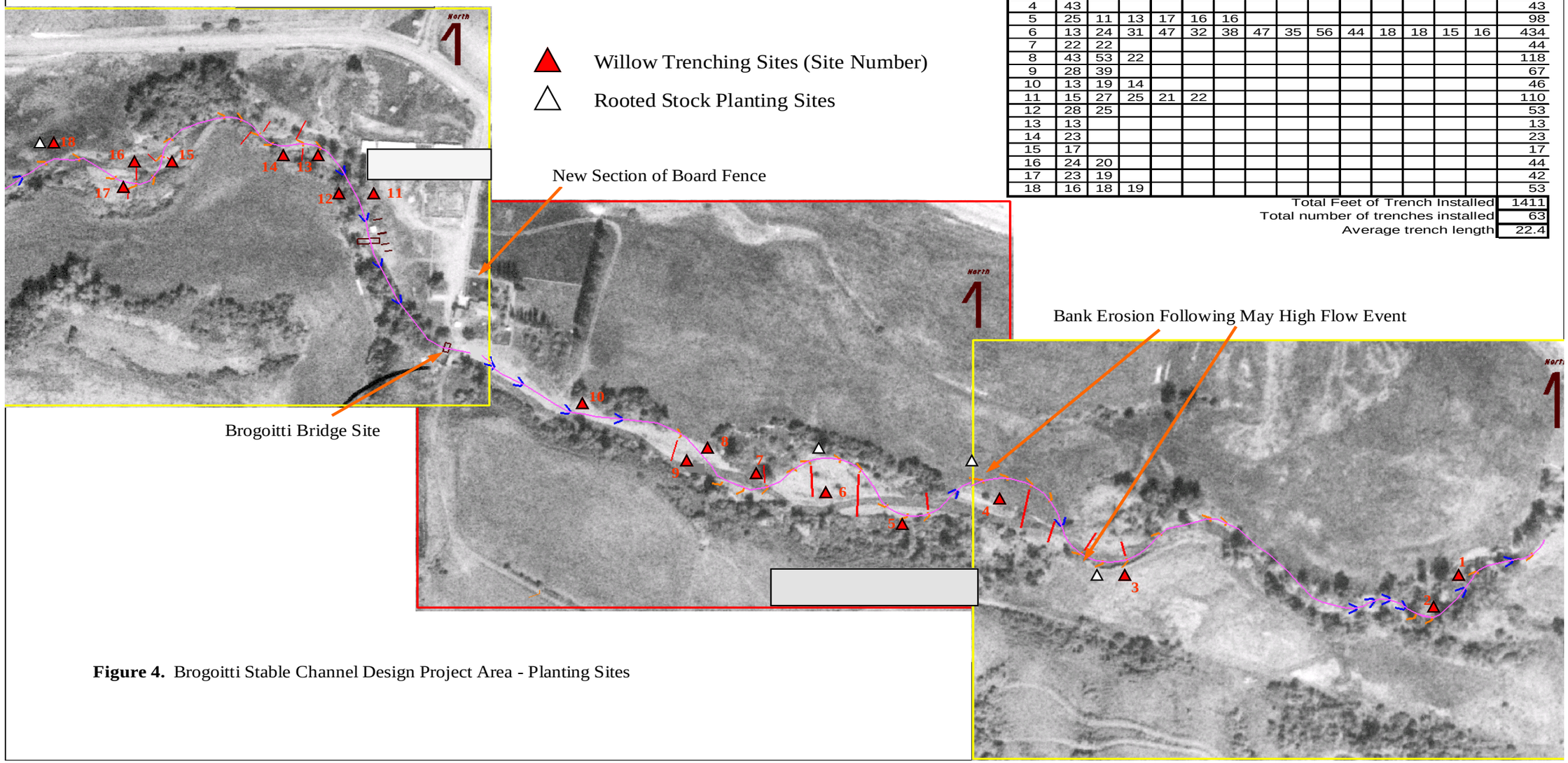
5.2.1 Instream Habitat

Betterment of instream habitat at the Brogoitti Stable Channel Design project was planned for completion in 2004, but was postponed until 2005 following discussions with the USACE.

5.2.2 Riparian Plantings

A willow trenching project, originally scheduled for the spring of the 2004, was postponed due to delays in obtaining an excavator contract review, prior to annual flooding of source willows at the McKay NWR. The project was carried out in December of 2004 (Figure 4). Program staff, with assistance from temporary laborers, Wildlife Habitat Technicians, Research Biologists, the District Fish Biologist and the District Wildlife Biologist, collected 22,400 willow cuttings for use at the Brogoitti project site, as well as an additional 2,300 stems (≈10%) for use by the USFWS. A total of 61 willow trenches were installed (1,312 feet of trench) to protect 15 sites along a 1.2 mile section of stream within the Brogoitti easement (Photos 15 and 16).

Trenches were installed to increase vegetative cover within flood prone areas. Willow trenches will also help to focus high velocity flows in the stream channel at above bankfull flow stages, thereby maintaining sediment transport capabilities and reducing the potential for excessive, localized aggradation. Similar trenches installed in 2002 have also helped promote fine sediment deposition,



Site	No. of Trenches per Site & Length of Trenches (Feet)														Site TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1	10	12	9	14											45
2	20	20													40
3	15	8	16	9	13	15	17	12	16						121
4	43														43
5	25	11	13	17	16	16									98
6	13	24	31	47	32	38	47	35	56	44	18	18	15	16	434
7	22	22													44
8	43	53	22												118
9	28	39													67
10	13	19	14												46
11	15	27	25	21	22										110
12	28	25													53
13	13														13
14	23														23
15	17														17
16	24	20													44
17	23	19													42
18	16	18	19												53
														Total Feet of Trench Installed	1411
														Total number of trenches installed	63
														Average trench length	22.4

Figure 4. Brogoitti Stable Channel Design Project Area - Planting Sites

Photo 15:	Cross-stream (north) view. Three willow trenches installed along East Birch Creek. Rows of individual willow stems visible.

Photo 16:	View of willow cuttings (rows) installed in a trench along East Birch Creek. Installed at a 45 degree angle and trimmed.

thus creating areas for local species (i.e., cottonwood) to germinate. The willow rows are not designed to promote stream shading or large woody debris input per se, however, their installation will hopefully contribute to these habitat features, over time, by allowing the establishment and growth of cottonwoods.

5.2.3 Riparian Fencing

The Habitat Technician and Seasonal EBA, with assistance from the Habitat Biologist, constructed approximately 250 feet of new board fence between a small grazing pasture a the larger pasture near the residence on the Brogoitti property. The fence was constructed to facilitate the herding of livestock towards between pastures, without having to access a section of the riparian area under easement. Construction of the fence was part of a prior agreement between the landowner and the previous Habitat Biologist.

5.3 OPERATION AND MAINTENANCE

5.3.1 Instream Habitat

The Habitat Biologist, Habitat Technician and District Fish Biologist visited the Houser project site during a high flow event (January 30, 2004). The Stable Channel Design project (designed using Dave Rosgen methodology) was inspected and informally evaluated. Potential maintenance opportunities were identified. A subsequent visit to the site was made (February 20, 2004) to re-evaluate conditions at bankfull stage and refine maintenance requirements.

The Habitat Biologist, Habitat Technician and District Fish Biologist visited the Houser project site (June 10, 04) following the May high flow event. The Stable Channel Design project was again inspected and informally evaluated.

Instream maintenance of 8 rock weirs was completed within the lower 0.5 mile section of Westgate Creek on the Baker property, September 8 and 9, 2004. Maintenance activities involved removing and re-positioning the stones forming the uppermost portion of the structures, in order to halt upstream channel aggradation and remedy fish passage concerns at the sites, created by excessive structure height. Following an on site, pre-work meeting to review site access, basic instream precautions and the emergency spill response plan, instream work was completed by Aaron Hadden Excavating, supervised by the Habitat Biologist and Habitat Technician. Excess boulders removed from the structures were loaded into the Program's dump truck and hauled to a temporary stockpile site on the Brogoitti property. The Habitat Biologist took numerous photos before, during and after maintenance work, to document instream activities and site conditions. Following completion of excavator work, the Habitat Biologist seeded areas affected by the tracked backhoe, and removed all ribbons used to delineate access trails for the excavator operator. Ribbons marking photopoint locations and stakes/ribbon used for channel cross-sectional surveys were left in place for future reference.

5.3.2 Riparian Plantings

Site visits were conducted at the Brogoitti and Houser properties to identify and document requirements for additional rooted stock planting. A basic plan was developed outlining site selection rationale, species suitability and percent composition required, planting strategies, maintenance considerations (irrigation and weed control), and M&E requirements and methodologies. The plan will need to be

revised following the May high flow event and the associated loss of planted stems (approximately 200 stems) resulting from bank erosion.

The Habitat Technician and Seasonal EBA obtained 352 potted seedlings from the Pendleton Correctional Facility Tree Nursery. A portion of the plants (180) consisted of local Ponderosa pine (*Pinus ponderosa*) seed stock, which had been given to the nursery by ODFW to grow out for use by the Program. The nursery donated the remaining plants in order to clear out their remaining inventory; the prison will no longer be operating the nursery facility.

Rooted stock planting was conducted at four sites on the Brogoitti property and one site on the Houser property. Approximately 1000 rooted stems were planted, including those obtained from the prison nursery and 650 additional cottonwood (*Populus trichocarpa*) tublings purchased from *Plants of the Wild*, Idaho. Planting was carried out by the Habitat Technician, Seasonal EBA, and two temporary laborers (Travis Malin and Heath Edwards). Planting included the installation of potted plants in holes dug with a gas-powered auger. A variety of species was planted at each site, with more drought tolerant species planted higher along the stream banks and moisture tolerant species planted near the stream channel. In areas where annual grasses could potentially shade out the newly planted trees, sites were cleared using a gas powered weed trimmer and sod mats were used (staked down) to help reduce competition. Plastic mesh cones were also installed over the shrubs to prevent wildlife browse damage (Photos 17 and 18). At each of the sites, a portion of the plants was treated with *DIEHARD^{TM} Transplant*, a mycorrhizal fungi that promotes rapid root growth. An evaluation of the growth of treated versus untreated plants will help determine if the product should be used in future planting projects.

Immediately following the completion of planting activities within a given site, pumps and sprinkler systems were installed and plants were irrigated. The Seasonal EBA preformed routine inspections and maintenance of riparian planting sites on the Houser and Brogoitti properties, throughout the summer. Plantings were irrigated on a regular basis, competitive vegetation was removed from around rooted stock plantings using a gas powered weed trimmer, and additional sod mats and browse cones were installed, as needed.

McLain Spraying L.L.C. conducted herbicide spraying on the Houser and Brogoitti properties between April 22 and May 6, 2004. The Habitat Technician and Seasonal EBA carried out routine spot spraying of invasive weeds on smaller project areas throughout the year, as well as additional treatments on the Houser and Brogoitti properties.

5.3.3 Riparian Fencing

In June of 2004 the Habitat Technician and Seasonal EBA carried out fence inspection and maintenance activities on 3.1 miles of high tensile fence within the upper Meacham Creek watershed (Meacham and Two-Mile creeks). Numerous downed trees were removed the fence and repairs were completed, as required. At one point, several head of cattle were observed within the leased riparian area along Meacham Creek and were herded by Program staff. It was determined that the cattle had entered the riparian area through large gaps in the fence along the Union Pacific Railway right-of-way. The railway maintenance crew, and the owner of the cattle, were notified of the situation. The Habitat Technician and Seasonal EBA carried out additional inspections and maintenance of riparian fences in the upper Meacham Creek area, in September of 2004. A leaning tree, acting as a fence corner post, was straightened and reinforced using an H-Brace support.

Photo 17:	Installation of plastic mesh browse cones to protect rooted stock plantings along East Birch Creek

Photo 18:	View of rooted stock plantings along East Birch Creek, Brogoitti Property.

The Habitat Technician and Seasonal EBA carried out fence inspection activities along the perimeter of the Gambill property lease area, Birch Creek. The Habitat Biologist assisted the Habitat Technician and Seasonal EBA in completing fence maintenance activities. Fairly extensive repairs were required on the Gambill property following the May high flow event. Maintenance work required approximately 20 man-days and included the replacement of 700 feet of electric wire, the reconstruction of 2 barbed-wire stream crossings (200 feet), the reconstruction of 7 H-Braces, and the replacement of several broken fence posts. Materials used included; 15 sharpened posts, 8 blunt posts and 16 fence stays. In addition, two 12V battery/electric fence chargers were installed.

The Habitat Technician and Seasonal EBA repaired (welded) a metal gate along the riparian fence line on the Brogoitti property.

Routine fence inspections and minor repairs were completed along all other riparian fences on active lease properties.

5.3.4 Miscellaneous Operation & Maintenance Activities

Program staff, with assistance from the John Day Watershed District Office staff, hauled, spread and compacted gravel for the interior floor and exterior of the Program's new storage building.

The Habitat Technician prepared truck bed rails with rubber strapping and re-installed truck bed toolboxes with reinforced angle iron supports. The Habitat Technician and EBA inventoried and re-stocked truck bed toolboxes (Vehicle #: E220948).

Seasonal tire changes were performed on Program vehicles E216835 and E220948.

The Program's *Topcon RL-Hb Rotating Laser Level* was sent to an authorized vendor for annual maintenance and calibration. The Level was returned within two weeks and tested by Program Staff. Following a malfunction by the Level during channel surveys, the unit was returned to the dealer for diagnosis and repair. The level's compensator unit was replaced and the level was re-calibrated.

The Program dump truck, backhoe and equipment trailer were retrieved from the Brogoitti project site with the assistance of the District Wildlife Biologist and the Wildlife Habitat Technician.

Program staff participated in an office compound cleanup day at the John Day Watershed District Office, April 15, 2004.

The Seasonal EBA and Habitat Technician moved all of the Program's equipment and materials into the new storage building, following the final inspection. The Seasonal EBA assembled storage shelves and the workbench purchased for the new building.

The May 24 flood resulted in the flooding of numerous pumps (installed for irrigation) at the Houser and Brogoitti planting sites. Crews worked to extract the flooded pumps and the Seasonal EBA worked to clean, service and repair the flooded pumps to restore them to working condition. One pump suffered significant damage and might require additional maintenance. One pump was washed away by the flood and will have to be replaced.

Following discussions with Mr. John Brogoitti, the Seasonal EBA installed a 2-inch gas-powered water pump to provide irrigation water for the property surrounding the house on East Birch Creek.

Vandalism damage to one of the man doors on the new Program storage building was noticed June 14, 2004. The Umatilla Tribal Police were notified and a report was completed. The Habitat Biologist took digital photographs of the damage and the Habitat Technician completed the necessary ODFW administrative paper work.

The Seasonal EBA performed routine maintenance on various Program equipment and vehicles including; installation of a trailer brake controller in vehicle E220948, repairs to Honda gas-powered water pumps, repairs to front mounted truck winch and cable, maintenance of fire tanker trailer, welding dump trailer tailgate hooks, repairing truck (12V) battery charger, and repairing dump truck air lines.

The Seasonal EBA retrieved and winterized all irrigation equipment used for maintaining riparian planting projects. Equipment has been stored in the Program's new storage building.

The Program's Mack dump truck was sent to the ODFW screens shop in John Day for maintenance and repairs. Repairs were completed to the dump bed and fuel tanks, and the vehicle was returned.

The Program's covered trailer was sent to the John Day Screens Shop for design and construction of an interior mobile office/field storage facility. Repairs to the outer covering of the trailer were also performed.

Tow occurrences of vandalism damage to the Program's dump trailer were observed - a total of three tires were slashed. The Umatilla Tribal Police were notified, a report was completed, and the Habitat Technician completed the necessary ODFW administrative paper work. New tires were purchased from Les Schwab Tires in Pendleton.

Regularly scheduled maintenance was performed on both Program vehicles (E216835 and E220948). Vehicle E216835 was also sent to Round-Up City Dodge in Pendleton, OR for repairs to the air conditioning system.

5.4 MONITORING AND EVALUATION

5.4.1 Instream Habitat

The Habitat Biologist conducted field surveys for the development of cross section and longitudinal profile diagrams, at proposed instream maintenance sites on the Brogoitti and Houser properties. Surveys were required for the joint (DSL/USACE) permit applications, but were also intended to serve as the basis for maintenance plans and future site monitoring.

Following the May high flow event, the longitudinal channel profile within the section of East Birch Creek, from the Brogoitti bridge site upstream to the upper limit of the Brogoitti property, was re-surveyed. Data were graphed and compared to pre-flood data to determine where the most significant channel changes occurred and which sites would require channel modifications to ensure project success.

The Habitat Biologist conducted post-maintenance, channel cross-section and longitudinal profile surveys, within the Westgate Creek instream maintenance project area. Data were graphed and compared to pre-maintenance and proposed site conditions at eight work sites. Channel long profile surveys were also completed at select locations to monitor post-maintenance bedload movement. The graphs produced were combined with the photo documentation report/HIP BiOp Form 1 Project Completion/Monitoring document, to produce a complete "as-built" report for the project (Appendix G). Survey data will also provide a basis for Monitoring and Evaluation efforts at the site and allow Program staff to track changes in channel conditions.

5.4.2 Photo Documentation

116 pre-established, permanent photopoint sites were visited in October and November of 2004. Of these, 109 sites were re-photographed, while the remaining 7 were discontinued due to excessive vegetation at the site and a poor view of the project site. 37 new photopoints for the Brogoitti and Houser project sites were established, and site photos were taken. New photopoint locations were temporarily located in the field with fiberglass fence posts, which will be replaced in 2005 with permanent T-posts and numbered metal tags. All photopoints were GPS located for future reference.

5.4.3 Thermograph Data Collection

A preliminary review of raw data graphs revealed data logging anomalies for a number of monitoring sites. The most common anomalies appeared to result from week or dieing batteries, de-watering of the thermograph unit, and, in a very few cases, minor unit malfunctions. Prior to deployment, the HOBO and STOWAWAY units' 3.6 V lithium batteries were tested for voltage. Although all the batteries tested showed ample charge, the batteries were not new, and were not tested under load to determine if they had the voltage required to sustain the entire deployment. Analysis was not conducted on data for 5 of the 11 monitoring sites, due to these observed anomalies. A review of the five sites in question is provided below and annotated raw data graphs are presented in Appendix H.

- The single HOBO unit employed during the 2004 season (at the Lower Meacham site) was replaced in early August with a STOWAWAY model data logger - HOBO thermographs have a limited (90-day) memory capacity. Unfortunately, raw data from both thermographs deployed at the Lower Meacham site, indicated week and/or dieing batteries, resulting in un-usable data.
- Similarly, a STOWAWAY data logger deployed at the Lower Lobato sites, on August 6 (to replace the original STOWAWAY unit that was apparently stolen), recorded only 1 days worth of data prior to batter die off. Therefore, no usable data was obtained for the Lower Lobato site.
- A review of the raw data for the Upper Lobato site did not show indications of battery die, however, the unit ceased to record data on June 13, providing only 1 month of data, and potentially missing the peak summer temperature.
- Data retrieved from the thermograph deployed at the Westgate Creek site (RM 0.75), indicated possible dewatering of the unit between the dates of June 14 and July 28. This period could potentially have encompassed the peak temperature for the season and therefore, the data was not used.
- Data retrieved from the thermograph deployed on East Birch Creek (RM 3.5) on the Straughan property, appeared to indicate battery die off beginning on July 7. The logger unit was also buried in the channel substrate at the time of retrieval, which may account for the irregular pattern of the temperature curve observed in the raw data graph.

Although the thermograph deployed at the East Birch Creek (RM 14.75) site near the confluence with Westgate Creek last logged September 25, the data were graphed and analyzed. The raw data graph did not indicate battery die off or unit malfunction, and the peak summer temperature was thought to have been captured during the data collection period.

2004 temperature data analysis showed maximum temperatures (derived from the SDMA) of between 19.0 and 26.6°C for all seven sites (Figure 5). Not surprisingly, sites located along smaller tributary systems at higher elevations recorded lower maximum temperatures and fewer days over 17.8°C. The Weinke Dam site on Birch Creek (RM 16.0), the Highway 395 site on West Birch Creek (RM 2.0), and the Houser Site on East Birch Creek (RM 8.5), recorded high maximum temperatures and extensive durations (84-96 days) with temperatures over 17.8°C. Daily water temperature graphs, as well as SDMA graphs of daily maximum temperature for each site are presented in Appendix I.

Temperatures at the Weinke Dam and Highway 395 sites may have been influenced by thermograph placement: units are attached to concrete structures which may act as heat sinks. The Houser site may have been influenced by extremly low flow at the site, although the raw data graph did not indicate dewatering of the unit. 2004 data were not compared to previous years' figures to determine if values for these sites represent normal conditions, nor were the compared to ambient air temperatures. Following deployment of thermographs for the 2004 season, the Habitat Biologist researched DEQ temperature standard protocols for temperature monitoring. The document describes methods for site selection, thermograph calibration, quality control, data verification and data analysis (DEQ 2004). Although the Program has not closely followed these standards in the past (including the 2004 season), the DEQ standards will be adopted as a guideline for temperature monitoring activities, beginning in 2005. Adopting the DEQ standards should improve the quality of data collected by and for the Program, as well as allow the Program to share standardized data with other agencies and entities conducting temperature monitoring within the Umatilla Subbasin using similar standards. Standardized data will provide a better tool for the Monitoring and Evaluation of Habitat Improvement projects.

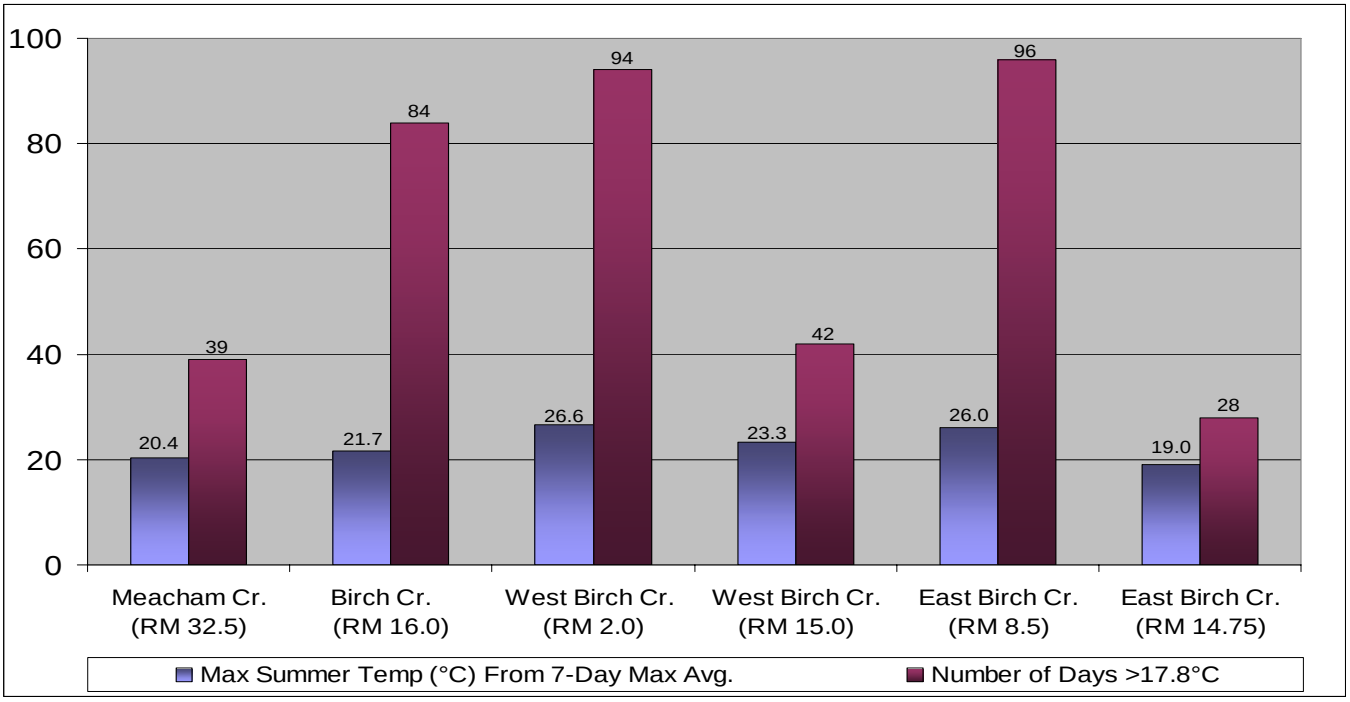


Figure 5. Summary of Maximum Summer Temperature, and Number of Days in Excess of the 17.8°C DEQ Standard, by site.

5.4.4 Spawning Ground Surveys

Steelhead redd counts were conducted along East Birch Creek, on the Houser and Brogoitti properties, April 14, 2004. In addition, redds observed along the section of East Birch Creek on the Brogoitti property, were recorded during the inspection of Stable Channel Design projects, April 23, 2004. Results of both formal and informal surveys are summarized in Table 2.

Table 2. Spring 2004, East Birch Creek Steelhead Spawning Ground Survey Results

Site	Approximate Location	Length Surveyed (River Miles)	No. Redds Counted	Redds per Stream Mile
Houser	RM 8.0 to 9.23	1.23	5	4.06
Brogoitti	RM 9.23 to 10.73	1.5	9	6.00
Total	**RM 8.0 to 10.73**	**2.73**	**14**	**5.13**

Spawning ground survey data, including locations of redds and live steelhead observed, are provided in Appendix J.

A second series of redd counts (follow up surveys), as well as surveys on West Birch Creek, were scheduled for May 2004. These surveys were not conducted due to high flow conditions, and therefore, the results presented in Table 2, should be considered incomplete.

It was interesting to note, however, that several redds tallied were observed immediately upstream or downstream of Habitat Improvement structures (J-Hooks and Cross Vanes) installed as part of the Stable Channel Design projects. The presence of these boulder structures appeared to promote sorting of substrate particles, creating areas of suitable sized gravel for steelhead spawning.

5.4.5 Miscellaneous Monitoring Activities

The Habitat Biologist communicated with the Oregon Department of Environmental Quality (DEQ) in order to obtain Standard Quality Assessment and Quality Control criteria for temperature monitoring. The Habitat Biologist reviewed the DEQ standards, which will be used as a guideline in the modification of the Program's temperature monitoring protocols, beginning in 2005.

The Habitat Biologist researched makes, models and costs for National Institute of Standards and Technology (NIST) traceable thermometers, for use in calibrating stream temperature monitoring sensors. Annual pre-deployment calibration of sensors is required to per DEQ Standards for Quality Assessment and Quality Control.

5.5 PROGRAM ADMINISTRATION

5.5.1 Program Budget

The Habitat Biologist met with the Watershed District Manager to discuss and review the status of the FY 2004 project budget. The Habitat Biologist developed a Budget Tracking Spreadsheet to balance the budget, assist with accrual estimates, and facilitate real time tracking of project expenditures. The Program's Budget Tracking Spreadsheet was updated on a monthly basis, and purchase documents were reconciled with Cost Center Detail and Grant Detail summary reports. The same spreadsheet template was used to create a budget tracking system for the 2005 Fiscal Year budget.

Journal Voucher (JV) requests were completed and submitted by the Habitat Biologist, as needed, to correct improper charges billed to the Fish Habitat Improvement Program.

In June 2004, the Habitat Biologist completed the Program's 2005 Fiscal Year Budget and Statement of Works for delivery to BPA. The documents included a Master Budget spreadsheet, along with a breakdown of Program costs by phase, and an estimate of Program expenditures by task and month.

The Habitat Biologist revised the Program's 2005 Fiscal Year Budget and Statement of Work for delivery to BPA (sent via email September 16, 2004). The revised documents were prepared using BPA's recently adopted Process Improvement (PI) format and included a Statement of Work describing various project "Work Elements" (WE), a Master Budget spreadsheet, a cost-by-WE spreadsheet, and a detailed monthly spending plan.

The Habitat Biologist assisted the ODFW's Fiscal Services Department with budget accrual exercises and fiscal year estimates.

The Habitat Biologist submitted No-Cost Budget Modifications requests to the COTR in order to allow the re-distribution of funds within the Program's FY04 Budget. The budget modifications were requested to enable the purchase of additional project equipment using under-spent Program dollars for the FY04 Fiscal Year. Modifications were approved by the COTR.

Following discussions with the Program's COTR, the Habitat Biologist explored the possibility of modifying the Program's scope of work by completing a "Within-Year Modification Request Form". A successful modification of the Program's scope of work would allow Program staff to begin project planning for barrier remediation and bridge replacement projects within the Birch Creek watershed.

5.5.2 Contract/Agreement Preparation

The Habitat Technician prepared a contract for excavator work to be carried out as part of a willow planting project, scheduled for the Brogoitti and Houser properties during the spring of 2004.

An agreement was reached with Mr. Brian Allen of the USFWS, allowing Program staff to collect 10,000 willow cuttings at McKay Creek National Wildlife Refuge (McKay Reservoir). As part of the agreement, ODFW would collect and donate an additional 1000 willow cuttings (10%), for use by the USFWS. During the month of March, rising water in the reservoir caused flooding of the designated willow collection sites. Flooding occurred prior to completion of the ODFW contract review process and prompted Program Staff to reevaluate planting requirements for the Brogoitti and Houser projects. The decision was made to forego willow planting for the spring of 2004, and the USFWS was notified of the Program's change of agenda. In October of 2004, the Habitat Biologist once again contacted Mr. Allen and discussed the possibility of implementing the same collection/donation agreement for the fall of 2004. A written authorization was received from the USFWS. However, during the field preparation phase of the project, Program staff realized that additional cuttings would be required and verbal authorization was obtained from Mr. Allen to collect the appropriate number of stems. The total number of willow cuttings collected from McKay Reservoir was 25,700, with 2,300 of those cuttings delivered to the USFWS in Irrigon, OR.

The Habitat Technician communicated with Mr. Steve Trask of *Bio-Surveys*, and prepared a contract for the completion of data analysis associated with Fish Species Habitat Utilization and Population Assessments, completed in 2003.

The Habitat Technician developed and prepared a contract for noxious weed spraying at the Brogoitti and Houser properties for the summer of 2004. The contract was issued to McLain Spraying of Wallowa, OR.

The Habitat Biologist completed the review and modification of the Technical Specifications portion of the Invitation to Bid (ITB) for the Westgate Creek instream maintenance project. The ITB was sent to ODFW headquarters for review by the Engineering Department. Following headquarters approval, the ITB was sent out to seven prospective bidders. The Habitat Biologist followed up with phone calls to each contractor to confirm receipt of the bid packages and gauge interest in attending the optional, pre-bid site viewing. Following completion of the competitive bid process, the contract was awarded to the lowest of two bidders; Aaron Hadden Excavating of Pilot Rock, OR.

The Habitat Biologist and Habitat Technician reviewed and modified the Technical Specifications portion of the ITB for the Houser Property, instream maintenance project. The ITB was sent to ODFW Headquarters for review by the Engineering Department, along with a brief list of questions pertaining the specific wording used in the document. The Engineering Department approved the ITB and indicated that the same template could be used to solicit future excavator bids, providing the technical specifications are similar and that all language pertaining to insurance requirements remains unchanged.

5.5.3 Reports and Data Summaries

In April of 2004, the Habitat Biologist completed and submitted a summary table of projected herbicide use, for weed control projects planned for BPA sponsored projects in the summer of 2004. In December of 2004, the Habitat Biologist completed the follow-up report of actual 2004 herbicide use, along with a summary table of projected herbicide use for the summer of 2005. Reports were submitted to the BPA Fish and Wildlife Environmental Team Lead.

The Habitat Biologist prepared a summary of Fish Habitat Program activities, undertaken within the past five years, as part of the requirements for the Umatilla Sub-Basin Plan.

The Habitat Biologist completed BPA, RPA Forms 150 and 153, along with a narrative of project deliverables and accomplishments for FY2003.

The Habitat Biologist developed a spreadsheet of current and past Riparian Lease Agreements and Riparian Easements held by the Program. The spreadsheet includes information on land ownership, property location (map derived Lat. and Long. coordinates), effective agreement dates and a summary of Program outputs (miles of riparian fence, number of instream structures, number of water developments, etc.) associated with each area.

In March of 2004, the Habitat Biologist completed mandatory online reporting of NOAA/ESA Take Permit information, for Fish Species Habitat Utilization and Population Assessments, completed on East and West Birch creeks during the summer of 2003. In October of 2004 the Habitat Biologist completed mandatory online reporting of NOAA/NMFS ESA rule 4d permits, for fish sampling projects scheduled for the summer of 2004. Since fish sampling activities were not conducted in the East Birch or upper

Meacham creek watersheds, as scheduled, the permits were 'withdrawn' per the instructions from the ODFW ESA Specialists. The Habitat Biologist submitted an on-line application for rule 4d permits, for fish sampling activities scheduled for the summer of 2005.

The Habitat Technician completed Quarterly Progress Reports for the periods of July through September and October through December 2003. The Habitat Biologist completed Quarterly Progress Reports for the periods of January through March, April through June, and July through September 2004. Beginning in October and continuing through December of 2004, Progress Reports were completed and submitted, by the Habitat Biologist, on a monthly basis. The change in format from quarterly to monthly reporting coincided with the beginning of the FY05 Fiscal Year, and was intended to standardize progress report deliverables with BPA's new Process Improvement system and PISCES tracking program. Pending completion and availability of the PISCES on-line reporting system, the Habitat Biologist developed a monthly report format (using the FY05 Process Improvement Statement of Work document as template) with a "green-yellow-red" color-coded system to provide an account of project deliverables and milestone completion dates. Progress reports were delivered to the COTR in digital format and copies were provided to the ODFW John Day Watershed District Manager.

The Habitat Biologist met with the District Fish Biologist to discuss deliverable requirements for the 2003 Annual Report. A report outline was developed that described 2003 Program activities and summarized unreported Program activities for the years 1996 to 2002. The Habitat Biologist completed the *2003 ANNUAL REPORT (Project Completion/Summary Report for 2003 Habitat Improvement Projects and Historical Projects: 1996 to 2002*). A draft version of the report was submitted to BPA for review June 24, 2004. In December of 2004, the Habitat Biologist received confirmation from BPA that the report had been approved as final. The Final Report will be uploaded to the BPA website in January of 2005, per the COTR's instructions.

The Habitat Biologist reviewed hard copy deliverables of the Forward Looking Infrared (FLIR) survey flights conducted by Watershed Sciences in 2003. The Habitat Biologist requested permission from CTUIR Habitat Staff to view digital project deliverables (on DVD) using CTUIR's *ArcView* software. The Habitat Biologist also requested a copy of the project deliverables from Watershed Sciences on CD Rom for review.

The Habitat Biologist drafted and submitted a letter to BPA, supporting the proposed inclusion of *Barrier Remediation Projects* in the Birch Creek Watershed within the scope of the Umatilla Subbasin Fish Habitat Improvement Program, on the merits that barrier remediation would afford benefits to anadromous steelhead and resident rainbow trout populations. Following a review by BPA and Council representatives, Barrier Remediation activities were deemed inadmissible for the Program's FY2005 Statement of Work, since the type of work proposed was not explicitly outlined in the Program 2001 proposal (scope of work).

The Habitat Biologist completed a Biological Assessment for the Westgate Canyon (Baker) Property, Westgate Creek, as requested by the USACE following notification by the Program of our intent to conduct maintenance of instream structures.

The Habitat Biologist prepared a template letter for distribution to individual landowners with lease agreements that have recently expired, or are about to expire. The letter thanks the landowners for their participation and support for the Program and encourages them to continue operation and maintenance

of projects implemented on their respective properties. The letter template can be customized to include specific projects undertaken on each property, prior to delivery to the landowners.

The Habitat Biologist summarized spawning ground survey data, collected on the portion of East Birch Creek located on the Houser and Brogoitti properties. The total number of redds surveyed and number of redds-per-mile was calculated, however, data should be considered incomplete due to the inability of Program staff to complete a second round of surveys due to high flow conditions.

Upon request by BPA, the Habitat Biologist completed and delivered a brief summary of activities associated with the Program's new storage building.

The Habitat Biologist compiled a Project Completion report form, for maintenance activities conducted on the Baker property, Westgate Creek. The report included the HIP BiOp Implementation Monitoring Report and associated photographs, as well as cross-sectional area graphs of each work site showing 'pre-maintenance', 'proposed' and 'as-built' site conditions, and selected longitudinal profile graphs to monitor post-maintenance bedload movement. The report was submitted to the COTR and the BPA Environmental Specialist.

In November of 2004, following on site meetings and discussions with the USACE regarding future 'betterment' requirements for the Brogoitti Stable Channel Design Project, the Habitat Biologist developed a Preliminary Action Plan outlining site-specific recommendations for the project area. The plan was sent to the USACE for review.

In November of 2004, the Habitat Biologist downloaded thermograph data, completed data verification, and conducted preliminary temperature data analysis. In December of 2004 the Habitat Biologist graphed stream temperature data using a template program developed by the Grande Ronde Subbasin Habitat Biologist.

5.5.4 Price Quotes and Purchases

In March of 2004, the Habitat Technician completed necessary paper work for the purchase of a monitor, keyboard and mouse for use with the Program's laptop computer. Purchases were necessary to replace an outdated Program PC. A new CPU was purchased for the Habitat Technician's workstation (August of 2004) to eliminate the need to use the Program's laptop computer as a permanent workstation. ArcGIS 9.0 ArcView mapping software was also purchased and will be installed on the new CPU.

The Habitat Technician researched and obtained price quotes for grass seed, from three vendors. Grass seed (167 lbs) was purchased for use at various O&M sites during the summer of 2004.

The Habitat Technician and Habitat Biologist worked to complete the procurement paper work needed to obtain the title, license and registration for the Program's newly acquired dump trailer. The paper work was received from ODFW's Procurement Division and the trailer was licensed through the Department of Motor Vehicles.

The Habitat Technician obtained price quotes, and purchased steel tubing needed to complete repairs to the Program's heavy equipment trailer. Modifications to the trailer are required to ensure safety during equipment transport.

Following discussions with the safety officer concerning requirements for the Program's new storage building, two fire extinguishers were purchased and installed per safety code requirements. Storage shelving units and a steel workbench were also purchased for the new storage building.

The Habitat Technician ordered and purchased rooted stock supplies (plants, protective cones, sod mats, stakes, etc.) for planting projects on the Houser and Brogoitti properties.

The Habitat Technician purchased the necessary chemicals and additives for herbicide spraying, from PGG in Pendleton.

The Habitat Biologist purchased occupational clothing (chest waders and wading boots) for use during field surveys.

Due to a malfunction of Program's laser level, a temporary replacement level was rented, for one day, from United Rentals, in Hermiston.

The Habitat Technician solicited cost estimates for the purchase of fence construction materials (blunt posts and strainers) from two local merchants. Materials were purchased from the merchant with the lowest bid price, Northwest Farm Supplies, of Hermiston, OR.

In September of 2004, the Habitat Biologist purchased a portion of the equipment required for the installation of two stream-flow gauging stations, scheduled for summer of 2005. Equipment included; two *WaterLOG* H-350XL^{TM}/H-355 High Level Data Loggers/Pressure Transducers and Gas Purge Systems, two H-355-DES-2 Desiccating Air Dryers, two H-12V-20A-BG 110V AC to 12V DC Power Converters, and one H-350-FCATA Flash Memory card. Given the total cost of these items, the Habitat Biologist was required to obtain authorization from ODFW Headquarters to sole source the purchase to the vendor (*Design Analysis Associates, Inc.*), recommended by the Oregon Water Resources Department, with whom our Program will be collaborating on this project. The Habitat Biologist also purchased 6-foot, metal staff gauges for installation at the project sites. In December of 2004, the Habitat Biologist solicited bids for the purchase of GOES transmitter equipment, required to uplink and transfer gauge station data to the BOR Hydromet system. The purchase of uplink equipment will not be finalized until 2005.

A *Eutechnics* brand, Model 4600 thermometer with EP642 hard-wired probe was purchased from Alpha Sensors Inc., of Anaheim, CA. The NIST Traceable thermometer will be used in the calibration of thermograph recorders.

5.5.5 Program Development and Training

The Habitat Biologist and Habitat Technician began the year by reviewing the 2004 Fiscal Year Statement of Works. The Habitat Biologist was informed of the status of each phase and activity, and a tentative schedule/timelines for completion of remaining tasks, was developed. The schedule was used to direct the monthly activities of Program staff, and was updated on a regular basis.

Program staff attended monthly safety meetings organized by the John Day Watershed District Safety Officer. Topics discussed included: Shop maintenance and cleanup of the office compound, pesticide application (safety and reporting), general operation and safety procedures for workshop power tools

and heavy machinery, protection from exposure to heat and sun, and vehicle safety. An office-wide compound clean-up day was conducted Thursday, April 15, 2004.

Weekly meetings were held between the Habitat Biologist and Habitat Technician to discuss and prioritize Program activities, and assign individual tasks. Monthly meetings were held between the Habitat Biologist, Habitat Technician and Seasonal EBA to discuss the status of ongoing projects and schedule upcoming tasks. Bi-weekly meetings between the District Fish Biologist and Habitat Staff were initiated, to review and discuss Program related issues.

The Habitat Biologist attended a Department of State Lands training session on the Fill/Removal Permit Application process, in Pendleton OR, April 2004.

The Habitat Biologist attended a Procurement Training session in LaGrande OR, presented by the ODFW Procurement Division. The Habitat Biologist and Habitat Technician attended a Fiscal Training session in LaGrande OR, presented by the ODFW Fiscal Services Division.

The Habitat Technician and Seasonal EBA prepared for, and wrote, the Oregon Department of Agriculture, Public Pesticide Applicator's License exam. Both obtained their respective licenses prior to the commencement of herbicide spraying activities. In November of 2004, both attended a Herbicide Safety/Stewardship Seminar in Pendleton, OR.

The Habitat Biologist attended a presentation of the Draft Umatilla Subbasin Plan to the Independent Scientific Review Panel (ISRP), July 21, 2004, in Mission, OR.

The Habitat Biologist and Habitat Technician attended the ODFW NE Region, Fish Division meetings in LaGrande, OR, August 9 and 10, 2004. A variety of topics were discussed including the development of an updated, standardized riparian lease document for use with BPA Habitat Improvement projects.

The Habitat Biologist attended a one-day workshop presented by BPA to review their new Process Improvement system and newly adopted Program Budget and Statement of Work formats. The workshop was held July 30, 2004 in Portland, OR. The Habitat Biologist transmitted information and materials from the workshop to regional ODFW staff that were unable to attend.

5.5.6 Personnel

The new Fish Habitat Biologist was hired and began work January 15, 2004. The Habitat Biologist familiarized himself with project files as well as the Annual Program Budget and FY04 Statement of Works. The Habitat Biologist communicated with the Habitat Technician, District Fish Biologist and Watershed District Manager, to discuss various aspects of the Program and ensure efficient Program management. Program-level priorities were identified, which included:

- Resuming and maintaining quarterly and annual reporting activities to fulfill contractual obligations.
- Development and maintenance of a system to track Program expenditures.
- Fulfilling current Operation and Maintenance requirements for existing habitat projects.
- Identification and development of future Habitat Improvement projects.
- Development of Project Plans for all new projects, that outline: habitat conditions/limitations, project rationale, implementation strategies, project/site-specific objectives, as well as measurable parameters and methodologies for monitoring and evaluating project effectiveness.
- Assisting with the development of Habitat Related RM&E Objectives and Methodologies.

Request for Hire documents, for both the Seasonal EBA and Temporary Laborers, were prepared and submitted to the Watershed District Manager and Regional Headquarters for approval. Hiring approvals were obtained from the ODFW Regional office.

The Habitat Biologist reviewed applications, prepared a list of qualified candidates and invited five potential candidates to interview for the Program's Seasonal EBA position. The Habitat Biologist, Habitat Technician and Office Coordinator, held interviews on March 8, 2004. Three candidates were interviewed. Program Staff selected Mr. John Evans as the best-suited applicant. Mr. Evans began work on March 22, and terminated his service November 26, 2004.

The Habitat Biologist completed the necessary paper work following an injury sustained by the Seasonal EBA. Paperwork included SAIF claim forms and standard ODFW injury report forms. The injury proved to be minor: a small puncture wound to the hand received during the handling of barbed-wire fencing. The EBA received a tetanus shot and returned to work immediately.

Two ODFW Temporary Laborers (Travis Malin and Heath Edwards) were hired to assist with rooted stock planting activities on the Houser and Brogoitti properties. The laborers began work on April 26 and terminated their service on May 26, 2004. In December of 2004, John Evans and Heath Edwards were re-hired as ODFW Temporary Laborers, for the collection and installation of willow cuttings on the Brogoitti property. The Habitat Biologist completed all necessary paperwork associated with the hiring and termination of the temporary laborers, and assisted the laborers with the completion of monthly time sheets.

Program staff read and signed off on updated ODFW Policy statements pertaining to: "Employee Code of Conduct" [HR_410_02], "Promotion and Maintenance of a Respectful Workplace" [HR_450_01], "Drug- and Alcohol-Free Workplace" [HR_450_02], "Smoke-Free Workplace" [HR_450_03], "Violence-Free Workplace" [HR_450_04], and "Driving Record and Criminal History Record Checks" [HR_450_17].

In November of 2004, the Habitat Biologist completed a Performance Evaluation for the Seasonal EBA, prior to his termination of employment. The Seasonal EBA received an above average review and was offered the option to resume the EBA position in the spring of 2005.

In November of 2004, the Habitat Biologist completed individual, detailed work plans for each member of the Program's staff (Habitat Biologist, Habitat Technician and Seasonal EBA). Work plans were provided to Program staff for review and comments. The Work Plans are intended to help Program staff with the prioritization of personal tasks, while helping to ensure that Deliverables are achieved by the Milestone Dates outlined in the FY2005 Fiscal Year Statement of Works.

5.5.7 Miscellaneous Administrative Activities

The Habitat Technician, Watershed District Manager and Habitat Biologist, worked to schedule inspections and obtain necessary permits/certifications for the newly constructed Fish Habitat Program storage facility at the John Day Watershed District Office. A construction inspection conducted by the ODFW Engineering Department identified minor modifications to the structure, which were subsequently completed by the contractor. A Tribal/State electrical inspection was completed. Following the graveling and compaction of the storage facility floor space and building surroundings, the final flood plain elevation was surveyed (Witness Tree Surveying) and a certificate was obtained. A

final Tribal inspection was completed April 2, 2004, and the building was certified as complete. Program Staff transferred equipment and supplies into the new storage building following the final inspection.

The Habitat Biologist and Habitat Technician worked cooperatively to review and sort project files, and archive historical project information. The Habitat Biologist developed and completed a spreadsheet to track and retrieve archived information as needed. The Habitat Biologist sorted, organized and purged obsolete files from the Program's main computer in order to create space on the hard drive and eliminate slowed operation resulting from lack of memory. Over 900 MB of files, consisting mainly of digital project photographs, were burned onto 2 CD ROMs and archived. Two copies of each CD were made; one set to be kept at the John Day Watershed District Office, and one set to be stored off-site.

The Habitat Biologist fielded correspondence and provided information to BPA regarding the re-scheduling of funds for the Program's new storage building. An updated version to the 2004 Fiscal Year Budget, showing an additional $60,000 line item for Capitol Outlay costs associated with the building, was delivered to BPA upon request.

The Habitat Biologist and Habitat Technician transferred all office supplies and furniture from the Fish Habitat Improvement office, to the Program's storage building, following a water leak at the John Day Watershed District Office, in October of 2004. The Habitat Biologist set up a temporary workspace pending repairs to the office. Repairs were completed and furniture was returned to the office in December of 2004. An inventory of water-damaged equipment was completed for submission under the ODFW insurance claim.

The Habitat Biologist and Habitat Technician completed *Small Purchase Order Transaction System* (S.P.O.T.S.) Visa card paper work, as well as vehicle mileage reports for Program vehicles, on a monthly basis.

The Habitat Biologist requested clarification from ODFW Headquarters in Salem, regarding the status of the final building payments to the contractor, warranty documentation and re-scheduling requests submitted to BPA.

The Habitat Biologist and Habitat Technician completed an inventory of Program equipment, for submission to BPA. An inventory spreadsheet has been developed and maintained by the Habitat Biologist that allows newly purchased equipment to be added to the Program's inventory or a regular basis.

5.6 INTERAGENCY COORDINATION AND PUBLIC EDUCATION

5.6.1 Interagency Coordination

Early in 2004, the Habitat Biologist made telephone contact with the Program COTR, as well as with CTUIR and ODFW counterparts to open lines of communication and help promote a standardized approach to BPA Habitat Improvement projects. The Habitat Biologist and Habitat Technician attended a meeting with the newly appointed CTUIR Fish Habitat Biologist (Bob Lewis) to discuss past projects and areas of operation for each of the Programs, as well as potential future projects and the possibility for ODFW/CTUIR collaboration.

The Habitat Biologist attended a UMMEOC meeting, held to discuss Umatilla Subbasin RM&E Objectives and Methodologies.

The Habitat Biologist obtained the assistance of the ODFW Hermiston Field Research personnel in the preparation of various presentations used for public education. Research staff provided the Habitat Biologist with raw data, graphs, and digital photographs.
The Habitat Biologist communicated with Wendell Greenwald (Engineer) of the USACE, to obtain survey pin elevations needed to accurately graph channel longitudinal profiles and cross section diagrams, required for the Brogoitti Joint Application. The Habitat Biologist has been in regular contact with USACE staff (via phone and email) to discuss issues (technical and administrative) relating to the Brogoitti Stable Channel Design project.

The Habitat Biologist corresponded with DSL and USACE representative in order to keep both agencies informed regarding changes to the Brogoitti project site and implications to the Fill/Removal application process, following the May 2004 high flow event.

The Habitat Biologist reviewed the *Meacham Creek Watershed Analysis and Action Plan* and attended the Meacham Creek Planning Team Meeting, held at the CTUIR offices April 28, 2004.

The Habitat Biologist attended an on site visit to potential barrier locations within the Birch Creek watershed, along with the District Fish Biologist and the CTUIR Habitat Biologist. A preliminary plan for addressing barrier diversion dams within the watershed was discussed, as was the possibility of the CTUIR obtaining funding to carry out barrier remediation work.

The Habitat Biologist provided the ODFW Hermiston Field Research Office staff with a project abstract and summary of Program accomplishments, for inclusion in the RM&E plan.

Following a request by Craig Contor of the CTUIR Natural Production Program, the Habitat Biologist prepared a digital map of ODFW Fish Habitat Improvement Program temperature logger sites within the Umatilla Subbasin. The information was included in a joint ODFW/CTUIR presentation of the Draft Umatilla Subbasin Plan to the ISRP.

The Habitat Biologist communicated with the Grand Ronde Fish Habitat Biologist to obtain copies of current Lease and Cooperative Agreements, for use as a template for the extension of the Gambill and Weinke lease agreements.

The Habitat Biologist and Habitat Technician visited an active Habitat Improvement Project being carried out in the Grande Ronde Subbasin on Wallowa Creek. Program staff discussed project implementation and techniques with the Grande Ronde Habitat Biologist as well as a possible tour of Umatilla Subbasin projects sites by the Grande Ronde and John Day Habitat Improvement staff.

5.6.2 Public Education

The Habitat Biologist prepared display materials and handout information pertaining to the Fish Habitat Improvement Program, for the ODFW booth at the Pendleton Sportsman's Show, held in February of 2004.

The Habitat Biologist also prepared and delivered a presentation at the Pendleton Sportsman's Show on Salmon and Steelhead Angling Opportunities in the Umatilla River. The presentation, which was attended by approximately 45 people, described BPA's contribution to the restoration of fish runs in the Umatilla Subbasin and the derived benefits to anglers. Upon request, the same presentation was given to approximately 35 members of the Oasis of Hope Church Men's Group of Hermiston, in December of 2004.

The Habitat Biologist prepared and delivered a presentation on Anadromous Fish Populations of the Umatilla River to the Hermiston Nazarene Church Men's Group, as part of their Annual Wild Game Dinner, held in March of 2004. The presentation highlighted contributions by BPA and the Fish Habitat Improvement Program to salmon and steelhead recovery within the Umatilla Subbasin. Approximately 65 people were in attendance. Following the presentation, the Habitat Biologist was contacted by a concerned landowner (Mr. Scot Echols). Mr. Echols' property, situated along the lower Umatilla River mainstem, was experiencing stream bank erosion. Mr. Echols was provided reference information on riparian/stream interactions and restoration principals, as well as a list of websites pertaining to Federal and State permitting requirements for instream works. Since the Umatilla River mainstem falls within the area of responsibility of the CTUIR, the Habitat Biologist contacted and referred the project to the CTUIR Fish Habitat Enhancement Biologist.

Following the presentation to the Hermiston Nazarene Men's Group, the Habitat Biologist was also approached by Mr. Tim McCreary (Science Teacher at Hermiston High School) to deliver the same presentation to two General Science classes (52 students), and one Biology class (26 students), in March of 2004.

The Habitat Biologist collaborated with ODFW Hermiston Field Research Office staff, to provide habitat photos for use in a poster presentation by the Juvenile Outmigration and Survival Program, at the 2004 annual meeting of the Oregon Chapter of the American Fisheries Society.

The Habitat Biologist, with collaboration from the ODFW Northeast Regional Manager, District Fish Biologist and Fish Habitat Biologists for the Grande Ronde and John Day Subbasins, compiled and prepared a *MS PowerPoint* presentation, highlighting results of the three BPA-funded, Fish Habitat Improvement Programs operating in ODFW's Northeast Region, for the years 2001 through 2003. The presentation was delivered September 23, 2004 in Richland, Washington, as part of the Columbia Basin Fish and Wildlife Authority's (CBFWA) Anadromous Fish Committee (AFC), BPA Project Implementation Review.

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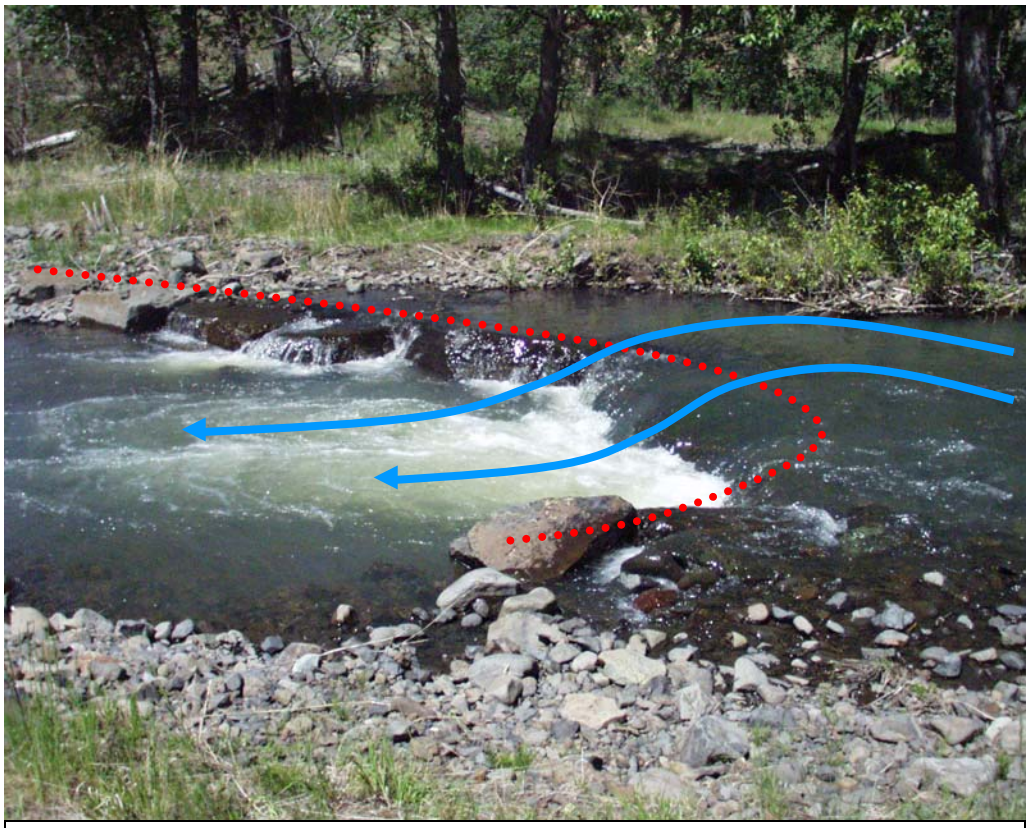
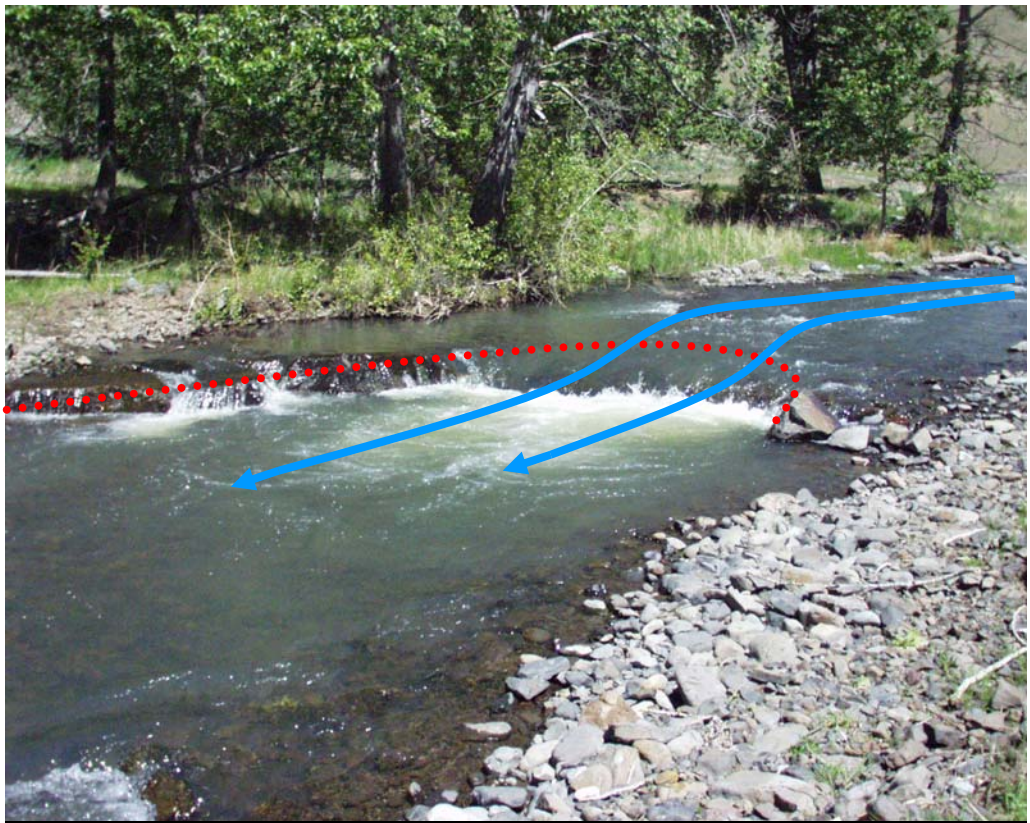
APPENDIX A

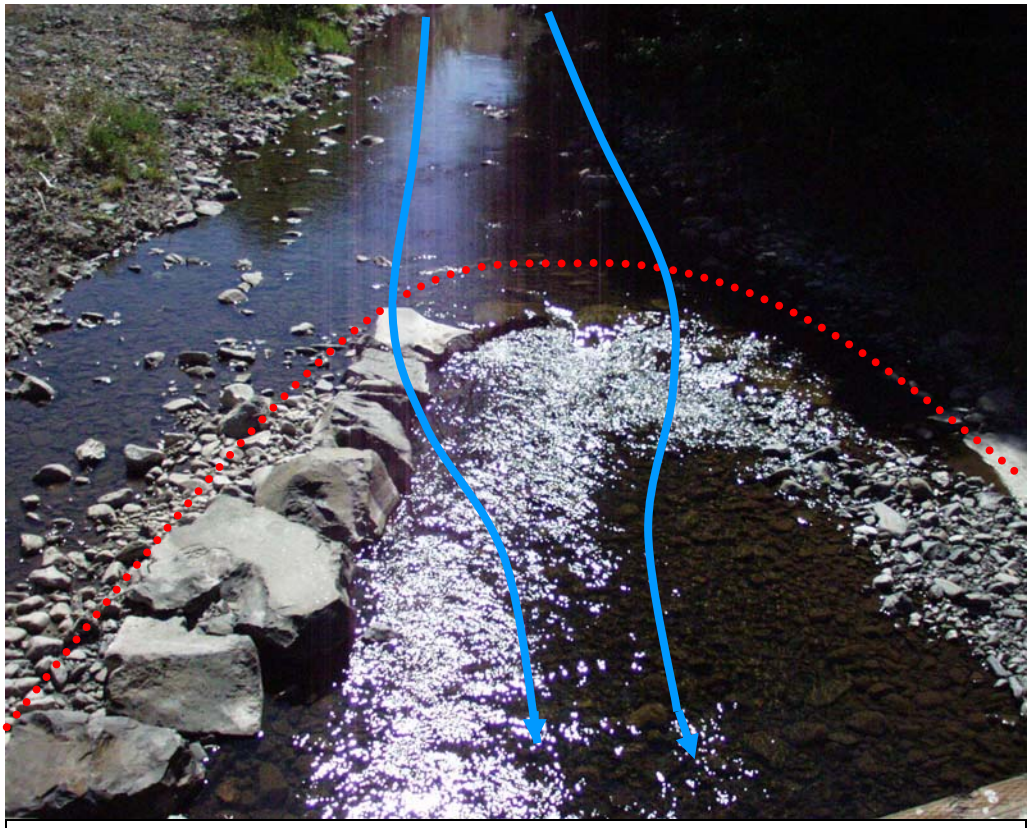
Examples of Typical *J-Hook* and *Cross Vane* Structures
Designed and Installed using Principals and Techniques Developed by Rosgen (2001)



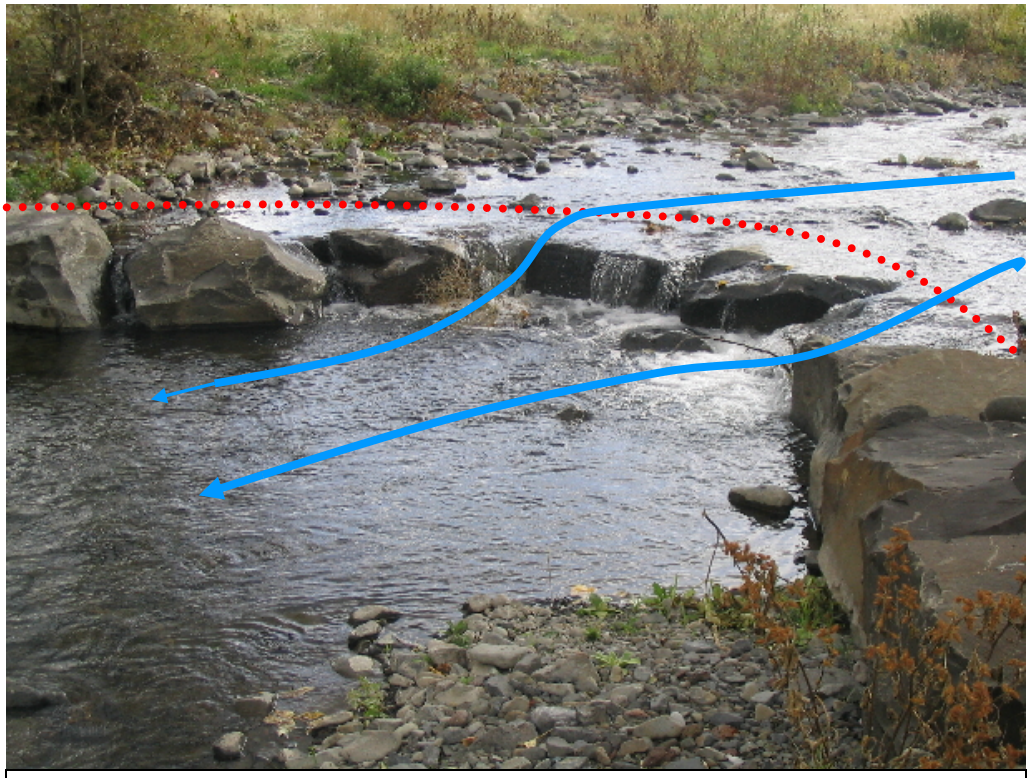
Cross stream view of typical "J-Hook Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.



Upstream view of typical "J-Hook Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.



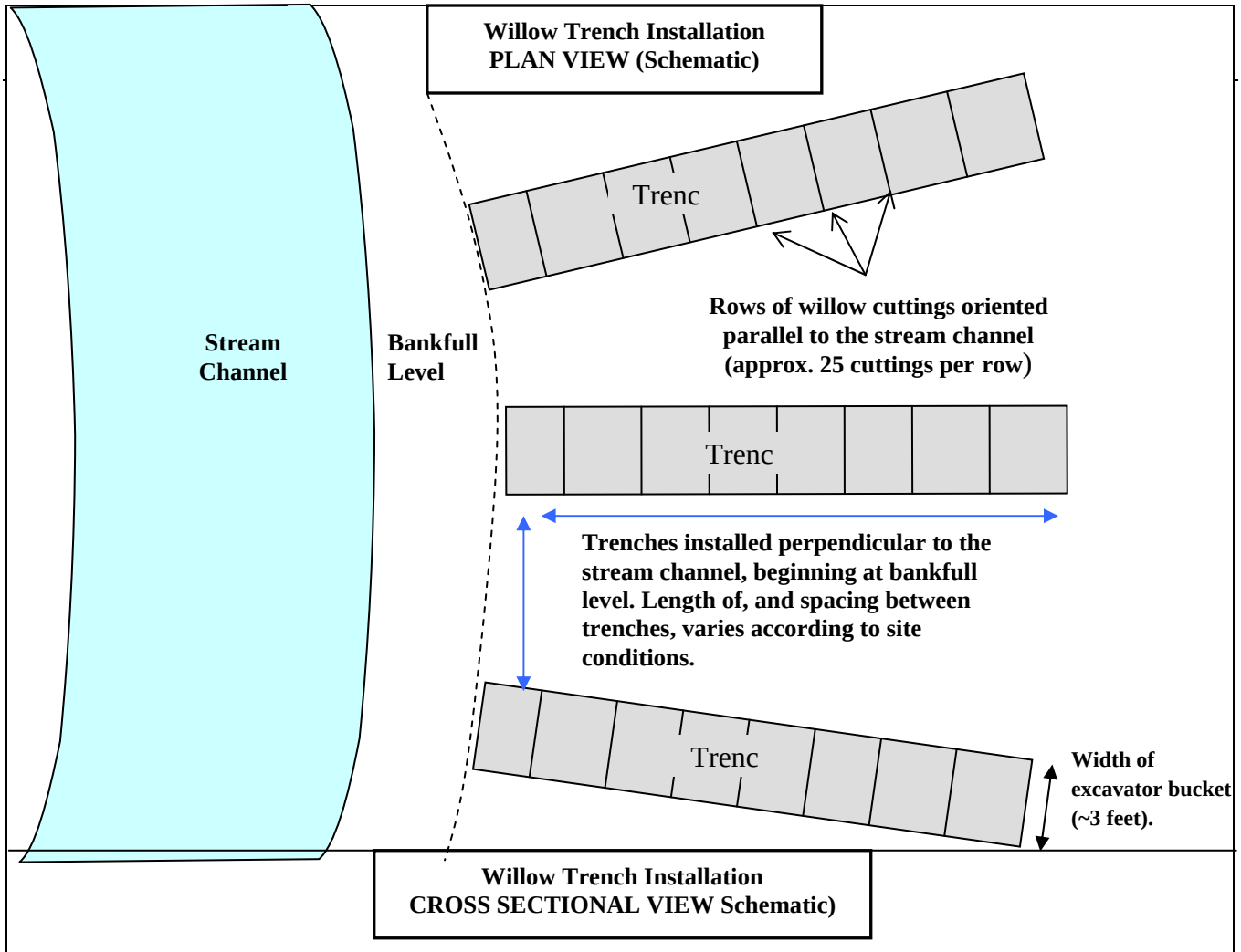
Upstream view of typical "Cross Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.

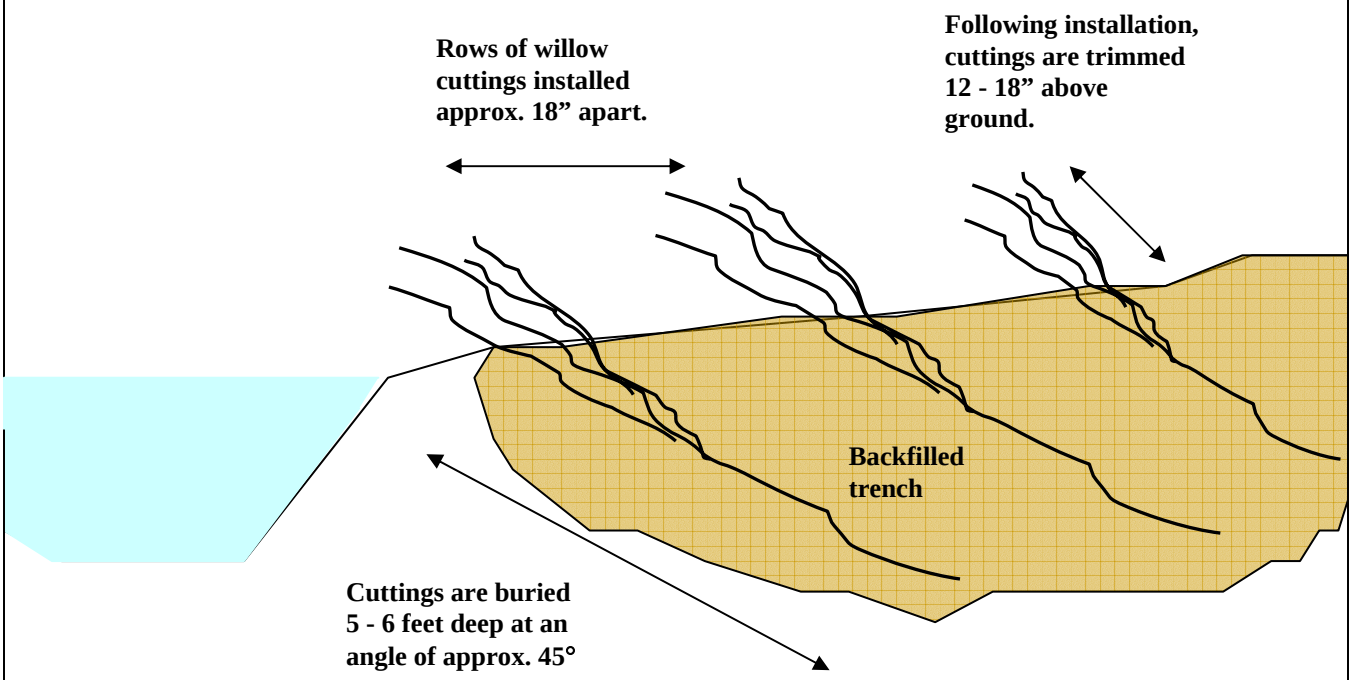


Upstream view of typical "Cross Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.

APPENDIX B

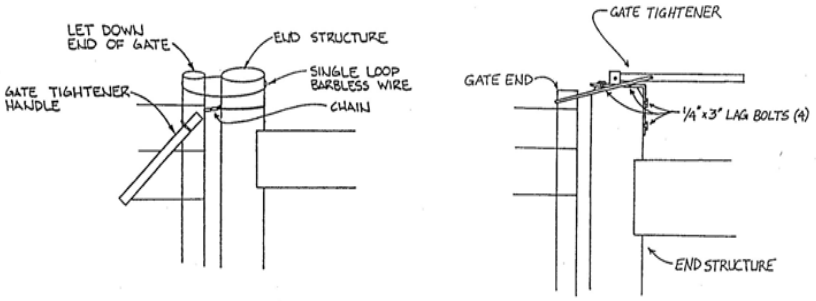
Willow Trench Application
Schematic Diagram


Willow Trench Installation
PLAN VIEW (Schematic)
Trenc
Rows of willow cuttings oriented parallel to the stream channel (approx. 25 cuttings per row)
Stream Channel
Bankfull Level
Trenc
Trenches installed perpendicular to the stream channel, beginning at bankfull level. Length of, and spacing between trenches, varies according to site conditions.
Trenc
Width of excavator bucket (~3 feet).
Willow Trench Installation
CROSS SECTIONAL VIEW Schematic)

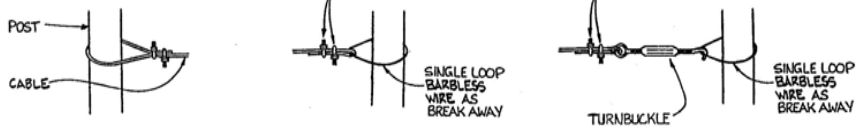

Rows of willow cuttings installed approx. 18” apart.
Following installation, cuttings are trimmed 12 - 18” above ground.
Backfilled trench
Cuttings are buried 5 - 6 feet deep at an angle of approx. 45°

APPENDIX C

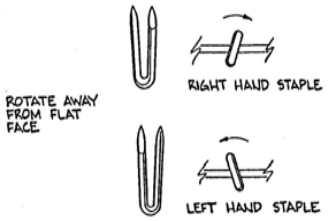
Typical Fence Construction Specifications



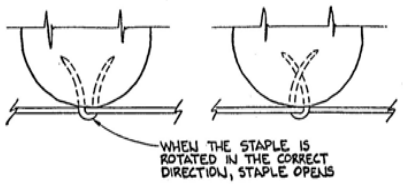
GATE LATCH DETAILS



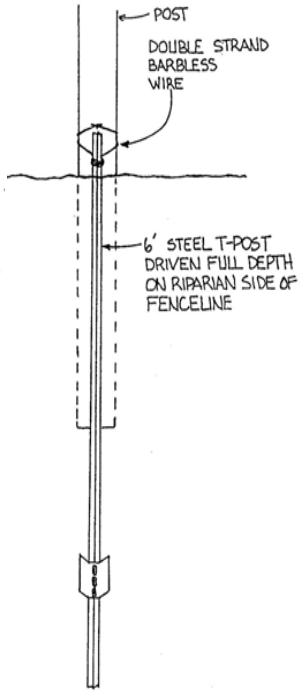
CABLE DETAILS



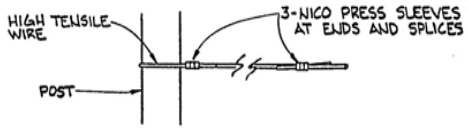
STAPLE ROTATION



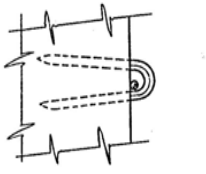
STAPLING



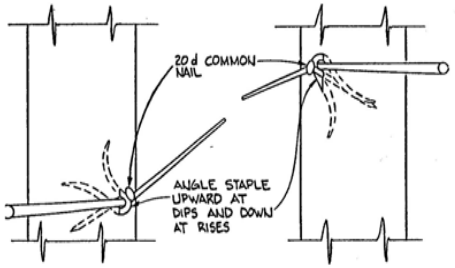
STEEL FOOT



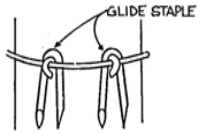
NICO PRESS DETAIL



STAPLE DEPTH



DIPS & RISES

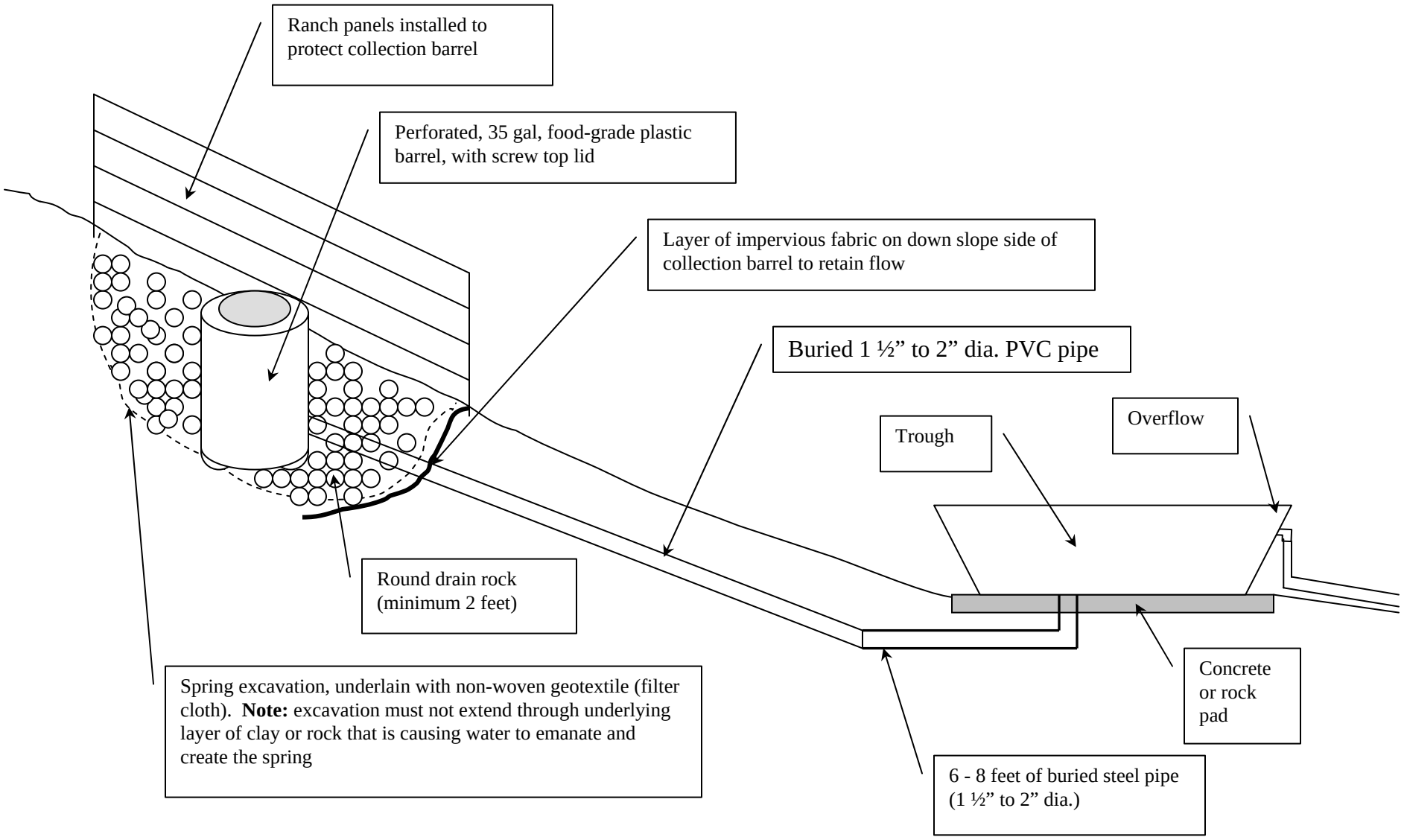


CORNER STAPLING

HIGH TENSILE FENCE DETAILS

APPENDIX D

Typical Spring Development (Schematic Diagram)


Ranch panels installed to protect collection barrel
Perforated, 35 gal, food-grade plastic barrel, with screw top lid
Layer of impervious fabric on down slope side of collection barrel to retain flow
Buried 1 ½" to 2" dia. PVC pipe
Trough
Overflow
Round drain rock (minimum 2 feet)
Spring excavation, underlain with non-woven geotextile (filter cloth). **Note:** excavation must not extend through underlying layer of clay or rock that is causing water to emanate and create the spring
Concrete or rock pad
6 - 8 feet of buried steel pipe (1 ½" to 2" dia.)

APPENDIX E

Summary Table of Typical Plant Species
Employed During Rooted Stock Planting Projects

Summary Table of Plant Species Employed During Rooted Stock Plantings

COMMON NAME	SCIENTIFIC NAME
Black Cottonwood	*Populus trichocarpa*
Blue Elderberry	*Sambucus cerulea*
Cascara	*Rhamnus purshiana*
Chokecherry	*Prunus virginiana*
Coyote willow	*Salix exigua*
Mockorange	*Philadelphus lewisii*
Oceanspray	*Holodiscus discolor*
Red Osier Dogwood	*Cornus stolonifera*
Serviceberry	*Amelanchier alnifolia*
Snowberry	*Symphoricarpos albus*
Water Birch	*Betula occidentalis*
Woods Rose	*Rosa woodsii*
Currant	*Ribies spp.*
Ponderosa Pine	*Pinus ponderosa*

APPENDIX F

Summer 2004 Temperature Monitoring Sites
Deployment-Retrieval-Download Log

Summer 2004 Temperature Monitoring Sites: Deployment/Retrieval/Download Log

Deployed		Retrieved		Location	RM	Property	Logger "Name"	Logger Type	Logger No.	Notes/Comments
Date	Time	Date	Time							
May 11	1030	Aug 11	1200	Lower Meacham	31.5	Boise Cascade	Lower Meacham	HOBO	2928	Will need to be replaced by early August (Hobos only have 90 day capacity). Retrieved and downloaded Aug 11,04 replaced with 251498 File: *Lower Meacham Cr_RM 31_May-Aug* Last logged date = Aug 9. Graph seems to indicate battery die-off beginning ~7/20/04.
Aug 11	1200	Nov 2	0900					Stowaway	251498	Deployed to replace HOBO 2928 Downloaded 11-03-04 File: *Lower Meacham Cr._RM 31_Aug-Nov* Graph seems to indicate week battery and/or unit malfunctions throughout deployment.
May 11	1130	Nov 2	0927	Upper Meacham	32.5	Boise Cascade	Upper Meacham	Stowaway	251499	Downloaded 11-03-04 File: *Meacham Cr._RM32.50_LP_Summer2004*
May 11	1300	N/A	N/A	Lower Lobato	1.5	Lobato	Upper Lobato	Stowaway	91926	Logger named *Upper Lobato*, but logger was in fact deployed at Lower site. Logger lost or stolen? NO DATA
Aug 6	1200?	Nov 2	1135				Lower Lobato	Stowaway	91925	91926 was stolen, replaced August 6 with 91925 Downloaded 11-03-04 File: *Birch Cr._RM1.50_LowerLobato_LSummer2004* Graph indicates immediate battery die-off post-deployment. Only one day of data – DISCARD.
May 11	1315	Nov 2	1150	Upper Lobato	1.75	Lobato	Lower Lobato	Stowaway	76977	Logger named *Lower Lobato*, but logger was in fact deployed at Upper site. Downloaded 11-03-04 File: *Upper Lobato* Prelim review of graph does not indicate battery die-off, but only logged data until June 13/04.
May 11	1400	Nov 2	1232	Birch Cr. Weinke Dam	16.0	Weinke	Birch Cr. Weinke Dam	Stowaway	251504	Downloaded 11-03-04 File: *BirchCr_RM16.0_WeinkeDam*
May 11	1420	Nov 2	1250	West Birch Hwy 395	2.0	N/A	West Birch Hwy 395	Stowaway	3757	Downloaded 11-03-04 File: *W Birch_RM2_Hwy395Br_Summer2004*
May 11	1445	Nov 2	1322	West Birch Harvey's	15.0	Harvey	West Birch Harvey's	Stowaway	3758	Downloaded 11-03-04 File: *W Birch_ RM15_ Harvey_ Summer2004* Note: Logger barely touching the water when retrieved.
May 11	1630	Nov 2	1410	East Birch Houser's	8.5	Houser	East Birch Houser's	Stowaway	251501	Downloaded 11-03-04 File: *E Birch Cr_RM8_Houser*
May 12	1515	Nov 8	~1000	Westgate Creek	0.75	Baker	Westgate Canyon	Stowaway	251500	Downloaded 11-09-04 File: *Westgate_RM 0.75_C.Baker_Summer2004* Graph indicates possible de-watering from 6-13 to 7-27
May 12	1600	Nov 8	~1000	E Birch/Westgate Conf.	8.5	Baker	Westgate Confluence	Stowaway	3755	Downloaded 11-09-04 File: *E.BirchCr._RM15.0_C.Baker_Summer2004* Graph indicates possible battery die-off, last logged 9-25-04
May 19	1500	Nov 22	1025	Birch Cr. Tom Straughan	3.5	Straughan	Birch Cr. T. Straughan	Stowaway	251503	Downloaded 11-22-04 File: *Birch Cr._RM3.50_T* Graph indicates possible battery die-off ~7-22. Logger buried in stream bed when retrieved. Discarded data.

APPENDIX G

Habitat Improvement Program Biological Opinion Implementation Monitoring Report
(Photo Documentation, Channel Cross Sections and Monitoring Long Profiles)

Habitat Improvement Program Biological Opinion Implementation Monitoring Report

Each project sponsor will submit an Implementation Monitoring Report to BPA within 120 days of project completion describing the sponsor's success in meeting the applicable terms and conditions of the Opinion. To meet the requirements for implementation monitoring, please complete the form below and attach additional information as necessary.

Implementation Monitoring Information

Date: **September 22, 2004**
Project Name: **Umatilla Fish Habitat Enhancement ODFW – Weir Maintenance**
BPA Fish and Wildlife Project Number: **1987- 100 - 02**
BPA Contract Manager: **Jonathon McCloud**
Starting and ending dates for the habitat improvement work completed: **Sept 8/04, Sept 9/04**

Project Sponsor:
Name: **Danny St. Hilaire**
Address: **ODFW John Day Watershed District Office, 73471 Mytinger Lane**
City: **Pendleton** State: **Oregon** Zip: **97801**
Telephone: **(541) 276-2344** ext. **N/A**

Project Sponsor Biologist (or person filling out this form):
Name: **Danny St. Hilaire**
Address: Same

Project Location:
Section: **22, 23, 24** Township: **T2S** Range: **R33E**
Latitude: **45 22 28** (e.g. 45 36 43) Longitude: **–118 39 01** (e.g. –121 44 04)
County: **Umatilla** Water body: **Westgate Creek**
Tributary to: **East Birch Creek**
Watershed/Water Resource Inventory Area (WRIA-Washington State only): **N/A**
12 digit 6th Field HUC: **170701030602**

Photo Documentation
Provide photo documentation of habitat conditions at the project site before, during, and after project completion.

- Include general views and close-ups showing pre- and post-construction details of the project and project area. Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project area.
- Label each photo with date, time, project name, photographer's name, and documentation of the subject habitat improvement activity.

Other Data
Please provide the following additional project-specific data, as appropriate, for individual projects

Work cessation: Provide dates work ceased because of high flows, if any. **N/A**

Fish screen: Describe compliance with NOAA Fisheries fish screen criteria.
Note: new criteria are currently being drafted by NOAA Fisheries (2003). **N/A**

Pollution and Erosion Control: Provide a summary of pollution and erosion control inspections, including any erosion control failures, contaminant releases, and correction efforts: **An inspection of the excavator used for the project was conducted on-site, September 8, 2004, per the project implementation plan. The equipment was found to be clean and in good working condition. In addition, the State representative and the excavator operator reviewed, on-site, the project specific Spill Response Plan for the projects and reviewed specific tasks for each work site.**

Site preparation:
Total cleared area – riparian and upland: **0.0 acres**
Total new impervious area (impervious area is defined as that part of the action area that is sufficiently compacted or otherwise covered by constructed, non-filtrating surfaces like concrete, pavement or buildings such that runoff is likely to contribute to the storm runoff response of the downstream channel): **0.0 acres**

Isolation of in-water work area, capture and release: Provide the following information.
Supervisory fish biologist: **N/A**
Address:
City: State: Zip:
Methods of work area isolation and take minimization: **N/A**
Stream conditions before, during, and within one week after completion of work area isolation:
Means of fish capture: **N/A**
Number of fish captured by species:
Location and condition of all fish released:
Any incidence of observed injury or mortality of listed species:

Streambank protection:
Describe type and amount of materials used: **N/A**
Project size – one bank or two, width and linear feet:

Road construction, repairs, and improvements: Provide a justification for permanent road crossings design (*i.e.,* road realignment, full-span bridge, streambed simulation, or no-slope design culvert): **N/A**

2004 Instream Structure Maintenance
Westgate Creek/Baker Property

Project Completion - Photo Documentation Report
Table of Contents

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Site 2 ..... **p.2**
Site 3 ..... **p.5**
Site 4 ..... **p.7**
Site 5 ..... **p.9**
Site 6 ..... **p.10**
Site 7 ..... **p.11**
Site 8 ..... **p.13**
Site 9 ..... **p.14**

Photo Legend

Upstream View	=	Looking upstream, facing southeast
Downstream View	=	Looking downstream, facing northwest
Cross-stream View (RB)	=	Looking across the channel towards the right bank, facing northeast
Cross-stream View (LB)	=	Looking across the channel towards the left bank, facing southwest
→	=	Direction of Flow

Site #:	1	**Date/Time:**	September 1, 2004 - 10:55
Description:	Cross-stream view (RB). Suspected fish passage impediment. At low flow, no passage concerns noted, no action taken at this site.		

Site #:	1	**Date/Time:**	September 1, 2004 - 10:55
Description:	Cross-stream view (RB). At low flow, no passage concerns noted. Dropped from the work plan, no action taken at this site.		

p.1

Site #:	2	**Date/Time:**	September 8, 2004 - 08:10
Description:	Upstream view. Prior to maintenance.		

Site #:	2	**Date/Time:**	September 9, 2004 - 11:00
Description:	Upstream view. Post-maintenance.		

p.2

Site #:	2	**Date/Time:**	September 8, 2004 - 08:40
Description:	Cross-stream view (RB). Beginning of maintenance work. Stones slated for removal/manipulation marked with orange paint.		

Site #:	2	**Date/Time:**	September 8, 2004 - 08:45
Description:	Cross-stream view (RB). Maintenance work in progress.		

p.3

Site #:	2	**Date/Time:**	September 9, 2004 - 11:00
Description:	Cross-stream view (RB). Post-maintenance.		

Site #:	2	**Date/Time:**	September 9, 2004 - 11:00
Description:	Upstream view. Post-maintenance.		

p.4

Site #:	3	**Date/Time:**	September 8, 2004 - 09:40
Description:	Cross-stream view (RB). Prior to maintenance (1st stone being removed).		

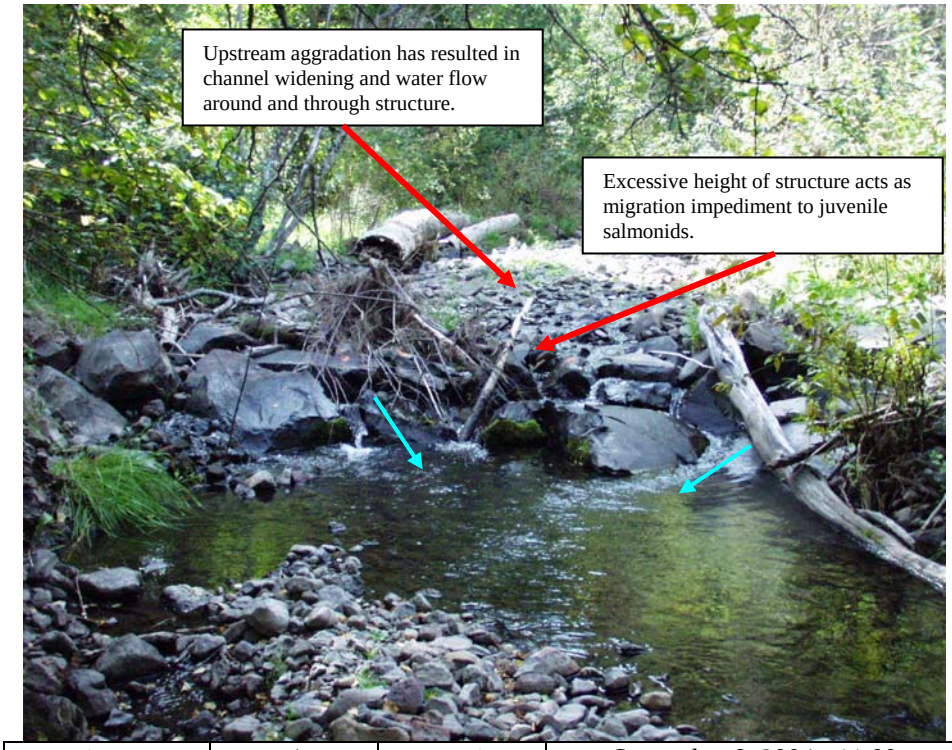
Site #:	3	**Date/Time:**	September 9, 2004 - 10:50
Description:	Cross-stream view (RB). Post maintenance.		

p.5

Site #:	3	**Date/Time:**	September 9, 2004 - 10:50
Description:	Cross-stream view (LB). Post maintenance.		

Site #:	3	**Date/Time:**	September 9, 2004 - 10:50
Description:	Upstream view. Post maintenance.		

p.6



Site #:	4	**Date/Time:**	September 8, 2004 - 11:00
Description:	Upstream view. Prior to maintenance.		

Site #:	4	**Date/Time:**	September 9, 2004 - 10:50
Description:	Upstream view. Post-maintenance.		

p.7

Site #:	4	**Date/Time:**	September 1, 2004 - 10:35
Description:	Cross-stream view (LB). Prior to maintenance.		

Site #:	4	**Date/Time:**	September 9, 2004 - 10:45
Description:	Cross-stream view (LB). Post-maintenance.		

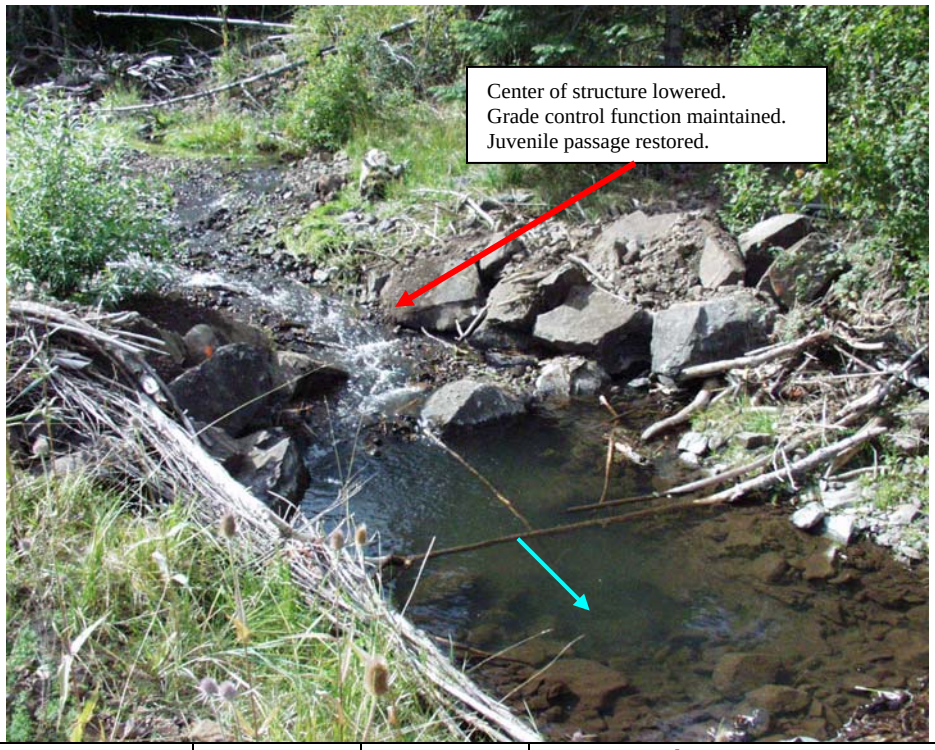
p.8

Site #:	5	**Date/Time:**	September 8, 2004 - 11:42
Description:	Upstream view. Prior to maintenance.		

Site #:	5	**Date/Time:**	September 1, 2004 - 12:40
Description:	Upstream view. Post-maintenance.		

p.9

Site #:	6	**Date/Time:**	September 1, 2004 - 10:15
Description:	Upstream view. Prior to maintenance.		



Site #:	6	**Date/Time:**	September 9, 2004 - 10:40
Description:	Upstream view. Post-maintenance.		

p.10

Site #:	7	**Date/Time:**	September 1, 2004 - 10:10
Description:	Upstream view. Prior to maintenance.		

Site #:	7	**Date/Time:**	September 9, 2004 - 10:30
Description:	Upstream view. Post-maintenance.		

p.11

Site #:	7	**Date/Time:**	September 8, 2004 - 14:20
Description:	Downstream view. Maintenance work in progress.		

Site #:	7	**Date/Time:**	September 9, 2004 - 10:30
Description:	Downstream view. Post-maintenance.		

p.12

Site #:	8	**Date/Time:**	September 8, 2004 - 15:00
Description:	Upstream view. Prior to maintenance.		

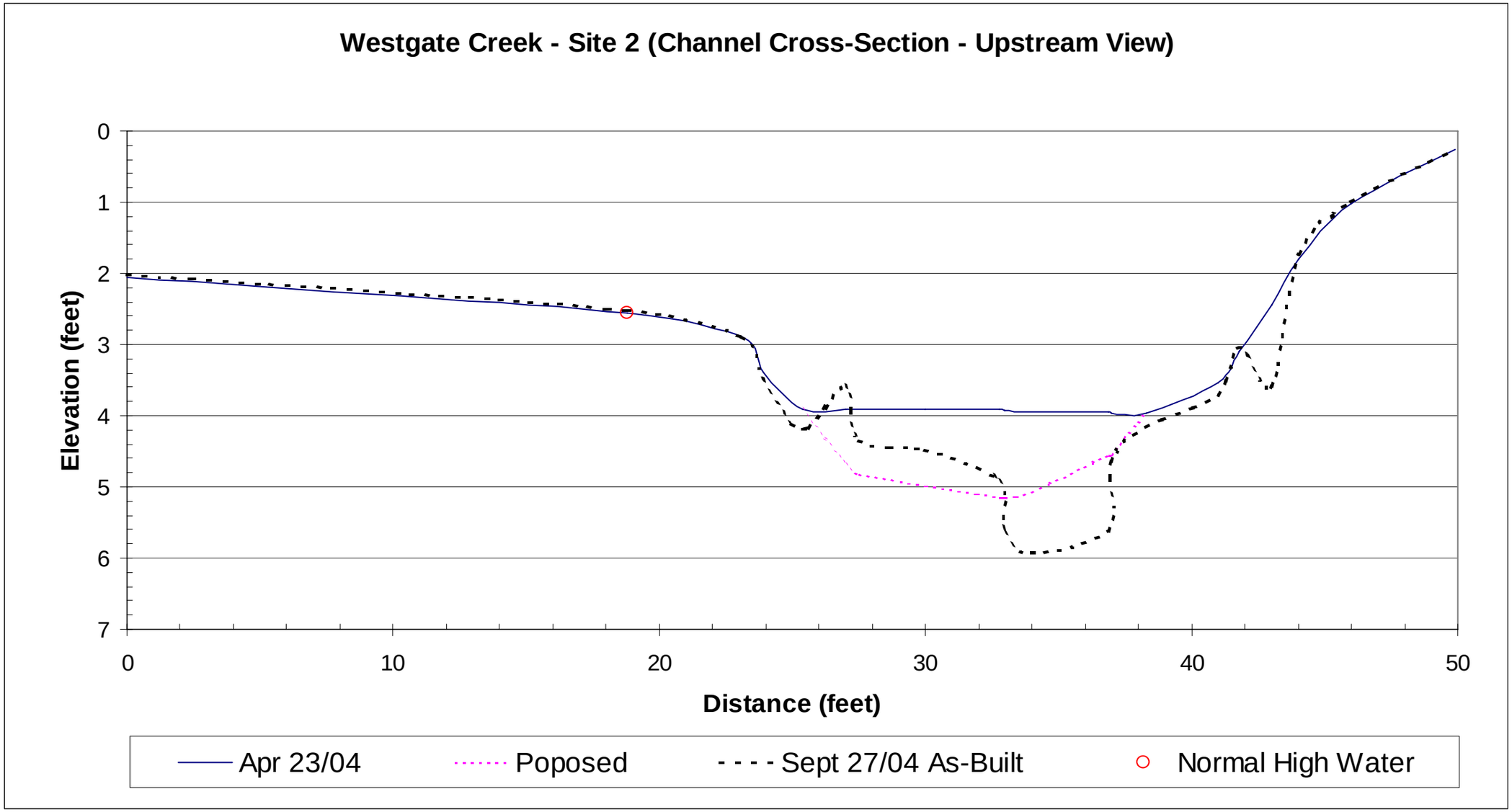
Site #:	8	**Date/Time:**	September 9, 2004 - 10:20
Description:	Upstream view. Post-maintenance.		

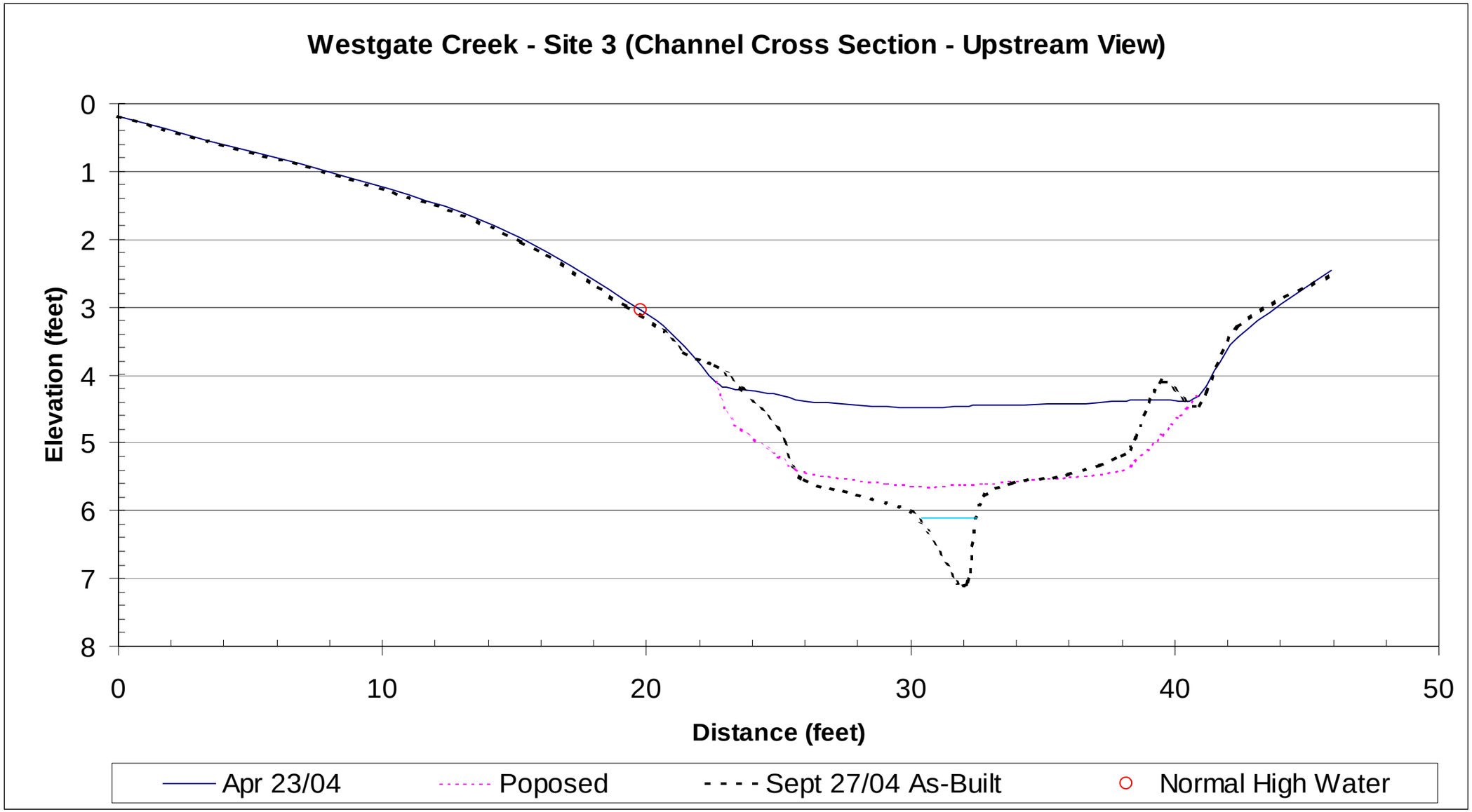
p.13

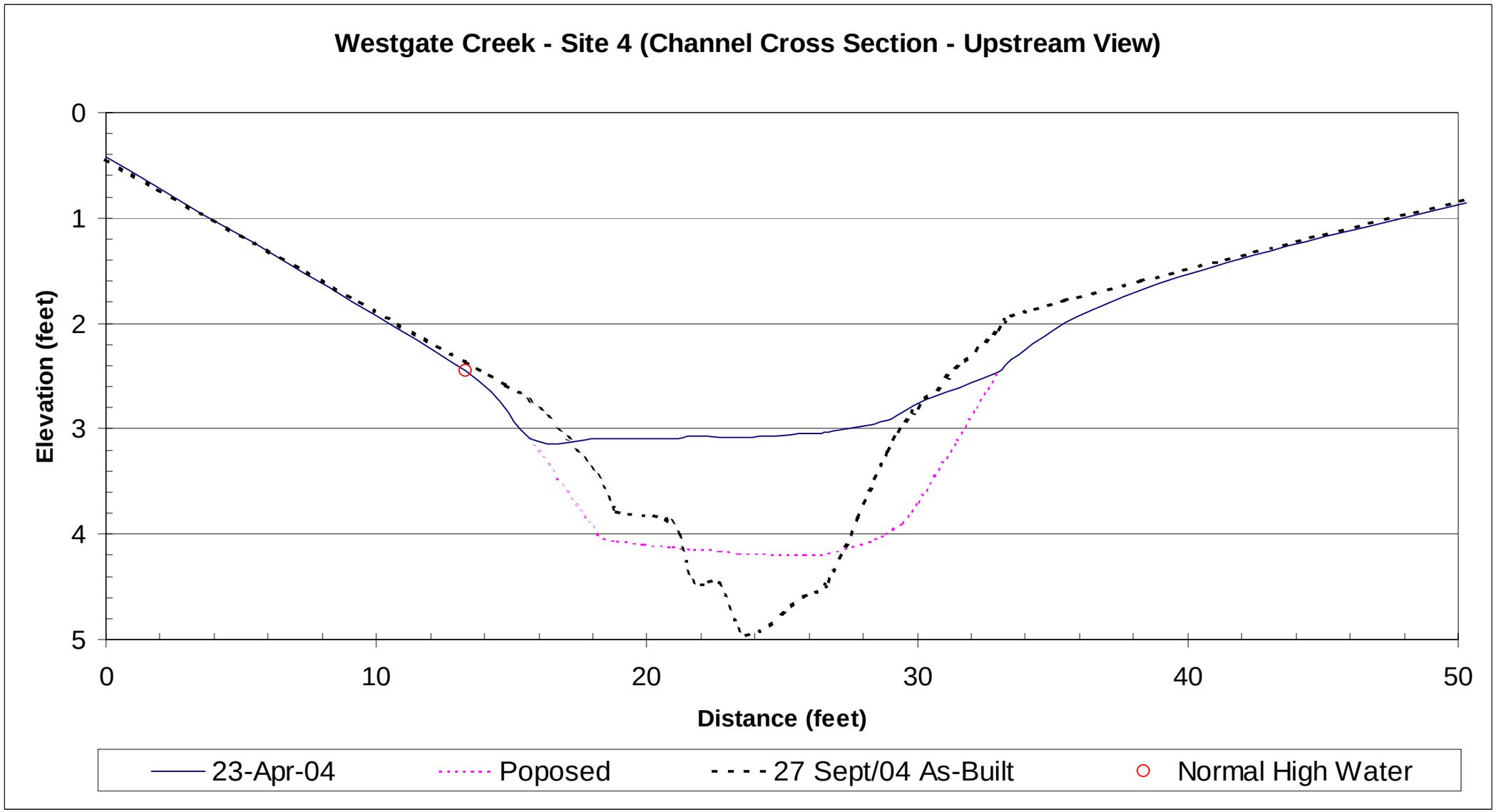
Site #:	9	**Date/Time:**	September 8, 2004 - 15:30
Description:	Upstream view. Prior to maintenance.		

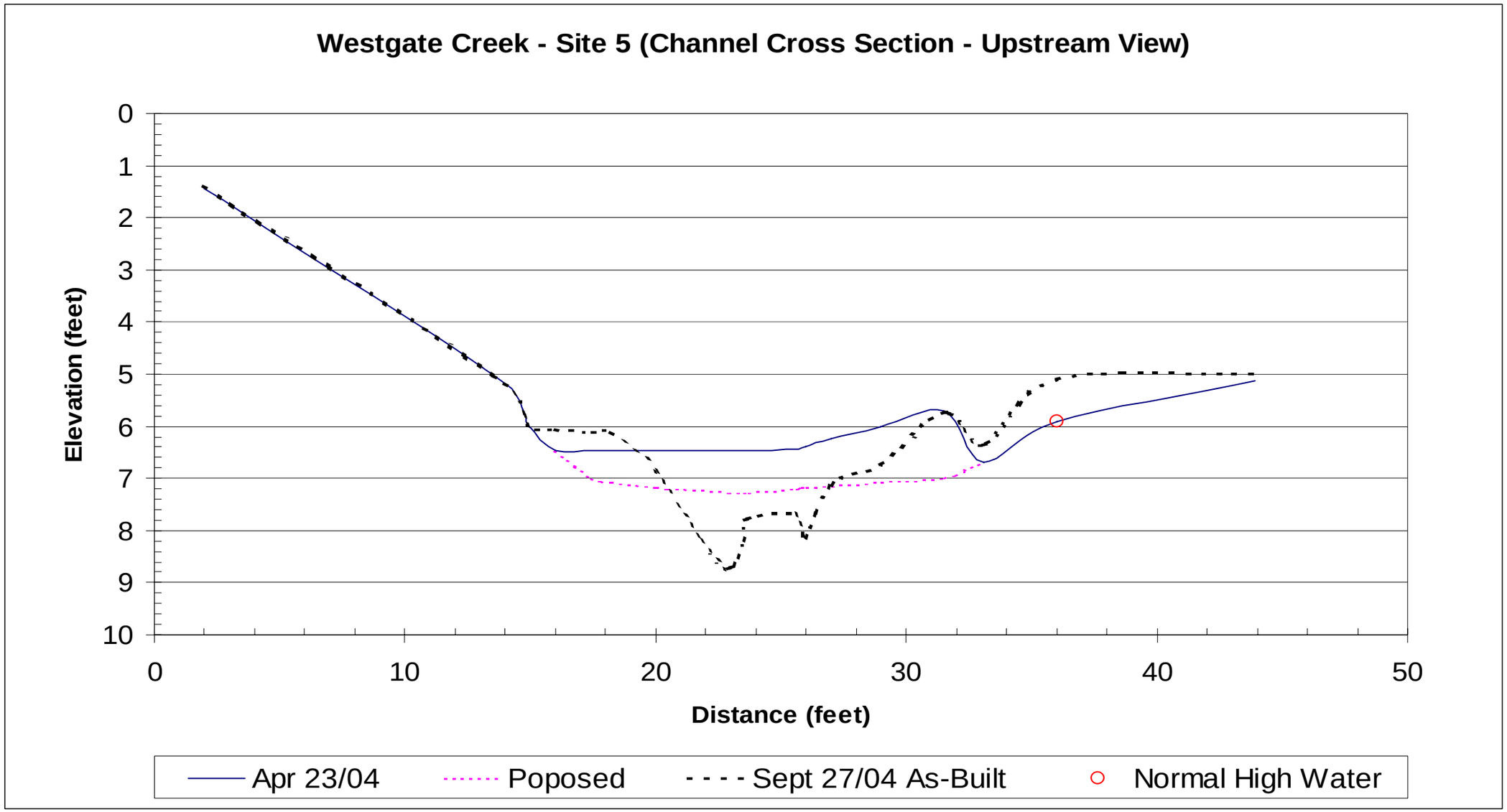
Site #:	9	**Date/Time:**	September 9, 2004 - 09:20
Description:	Upstream view. Post-maintenance.		

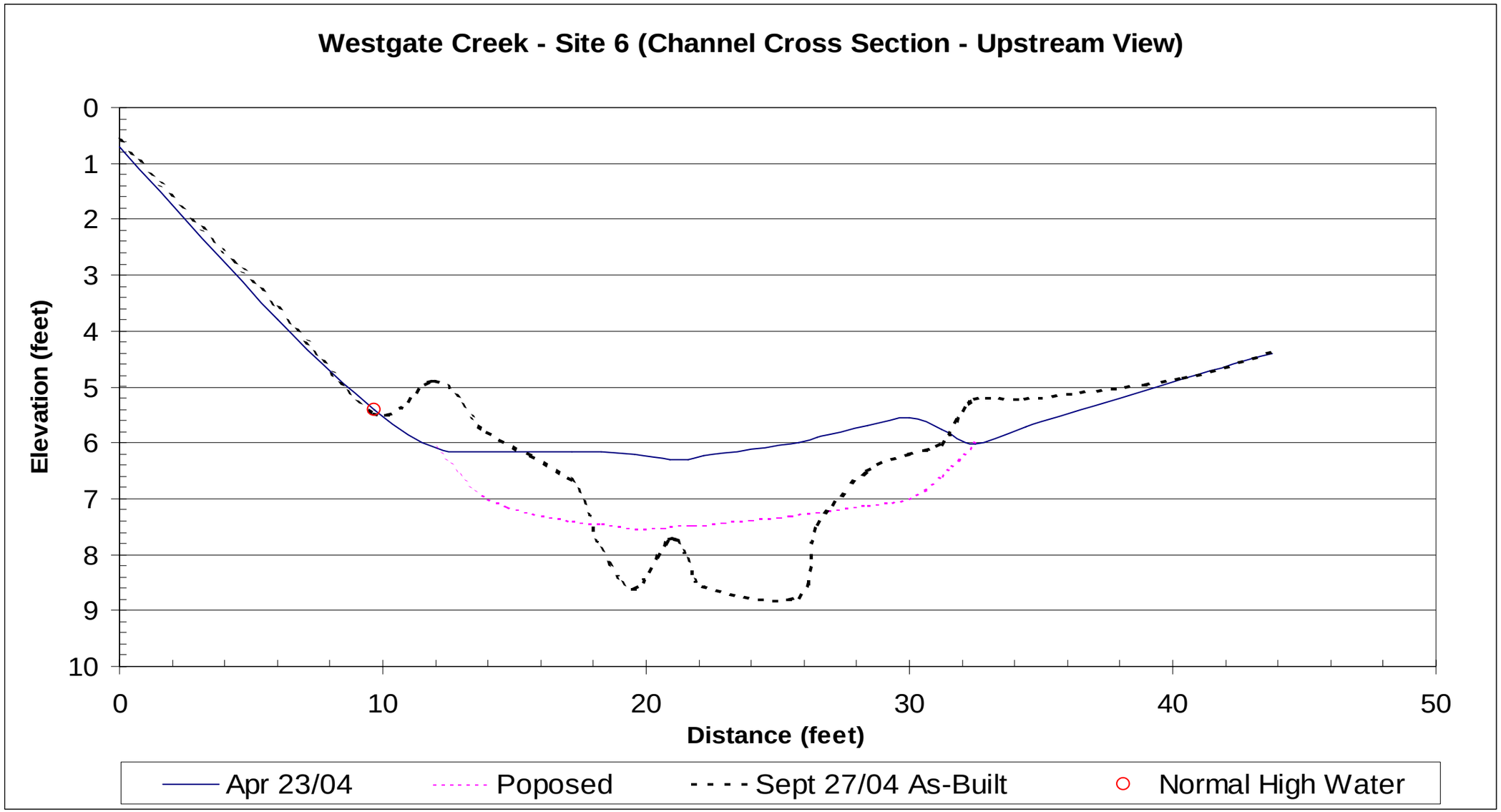
p.14

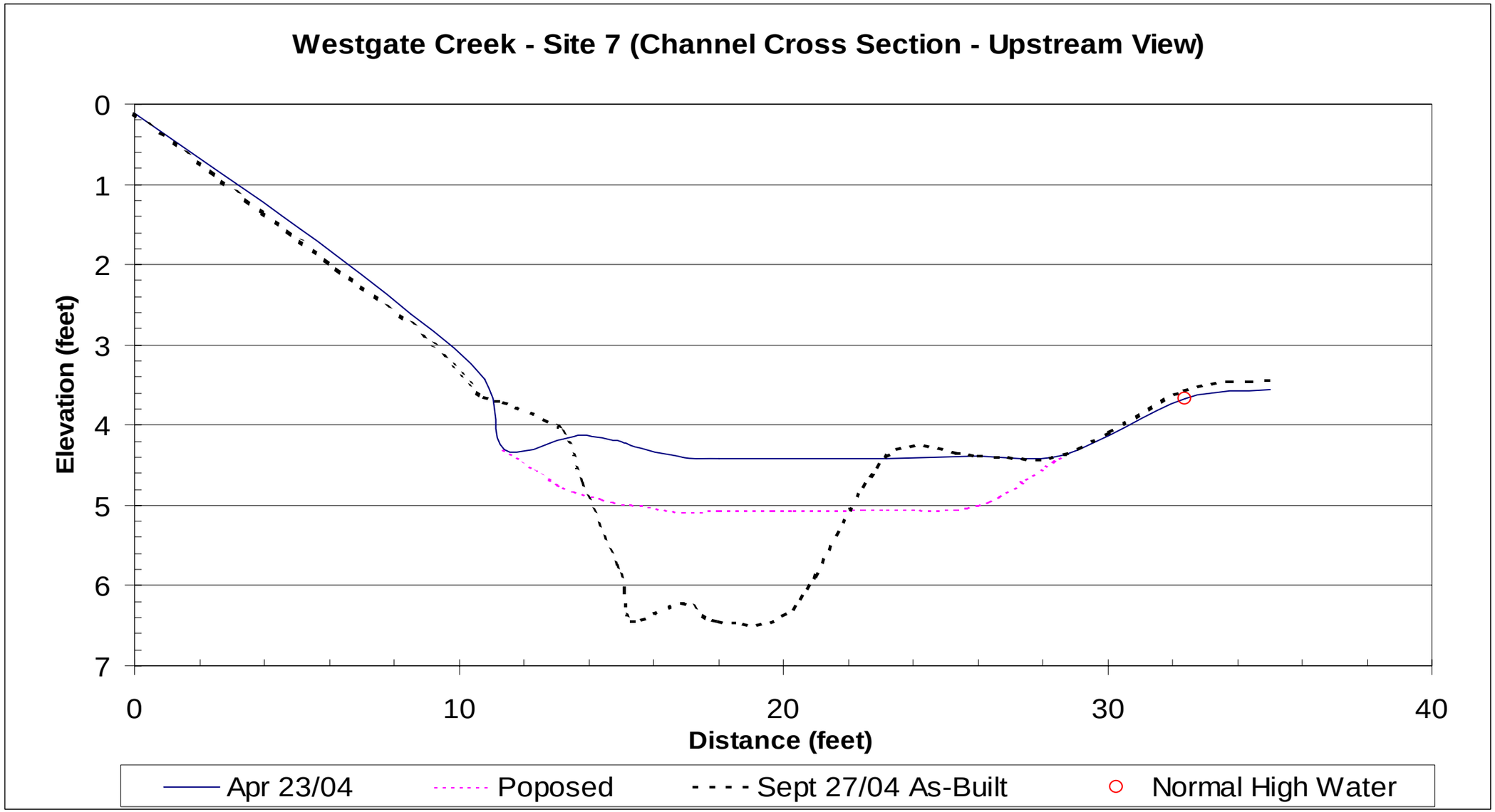

Westgate Creek - Site 2 (Channel Cross-Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
0
10
20
30
40
50
Distance (feet)
Apr 23/04
Poposed
Sept 27/04 As-Built
Normal High Water

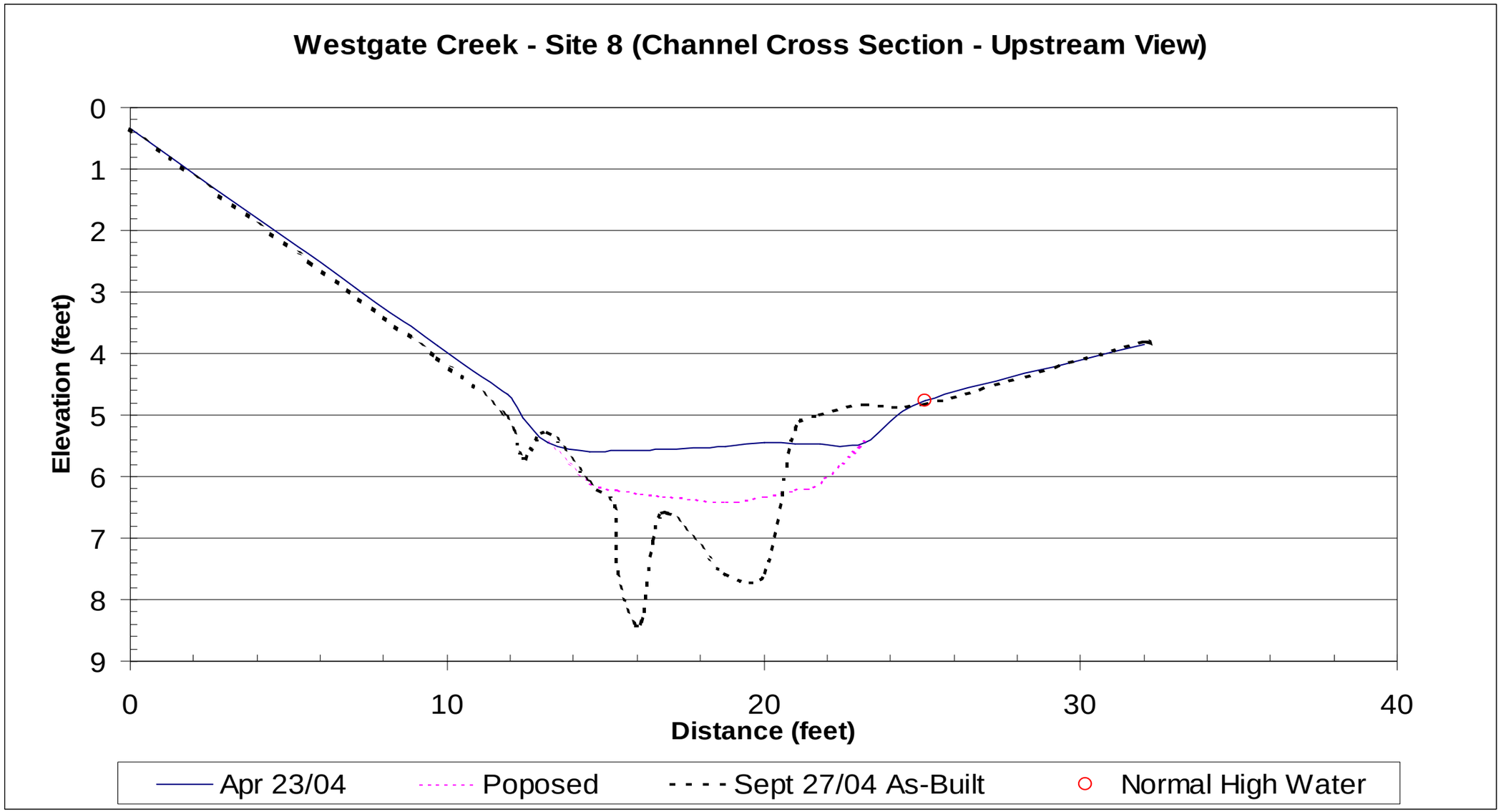

Westgate Creek - Site 3 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
8
0
10
20
30
40
50
Distance (feet)
Apr 23/04
Poposed
Sept 27/04 As-Built
Normal High Water

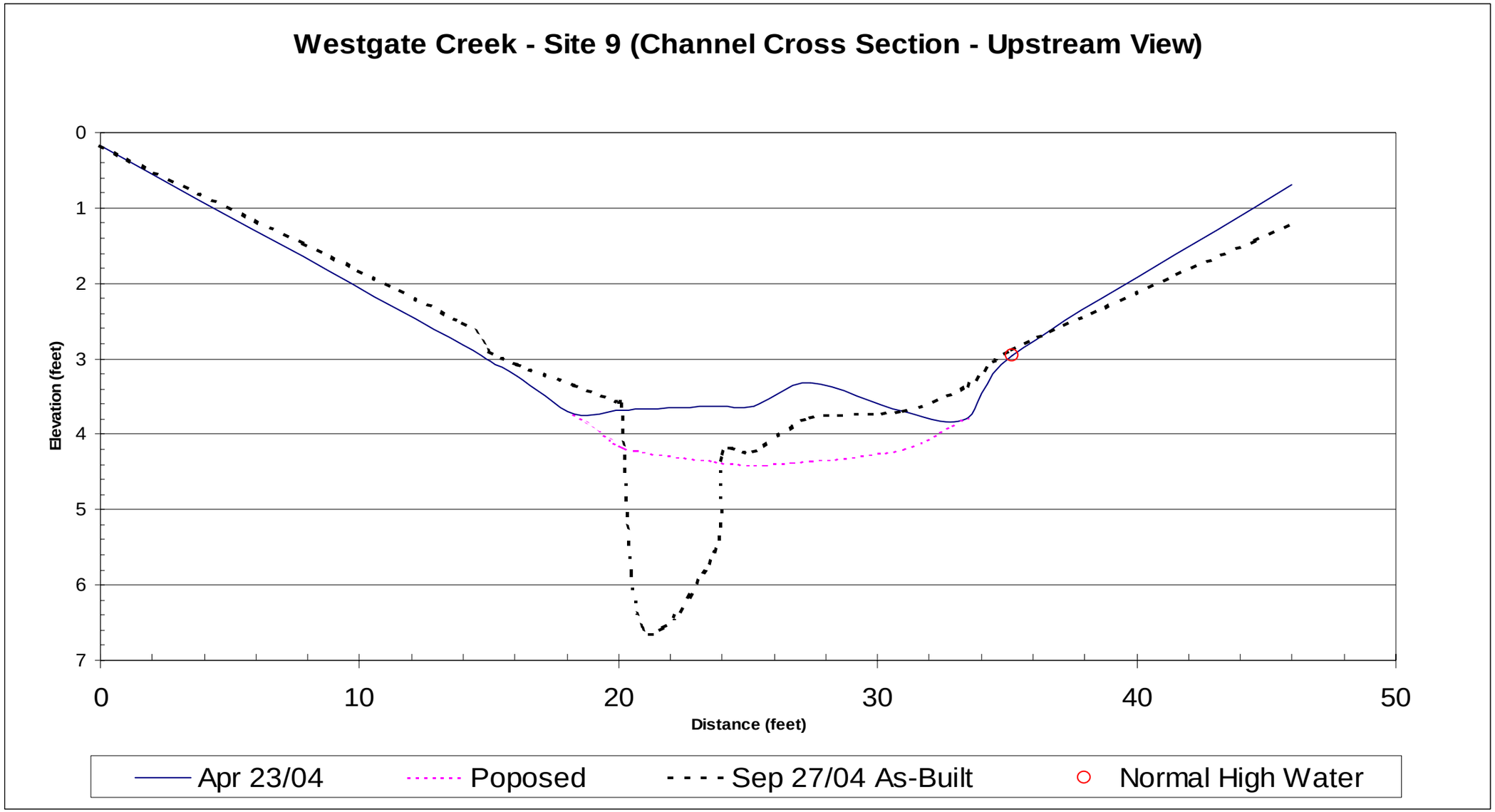

Westgate Creek - Site 4 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
0
10
20
30
40
50
Distance (feet)
23-Apr-04
Poposed
27 Sept/04 As-Built
Normal High Water

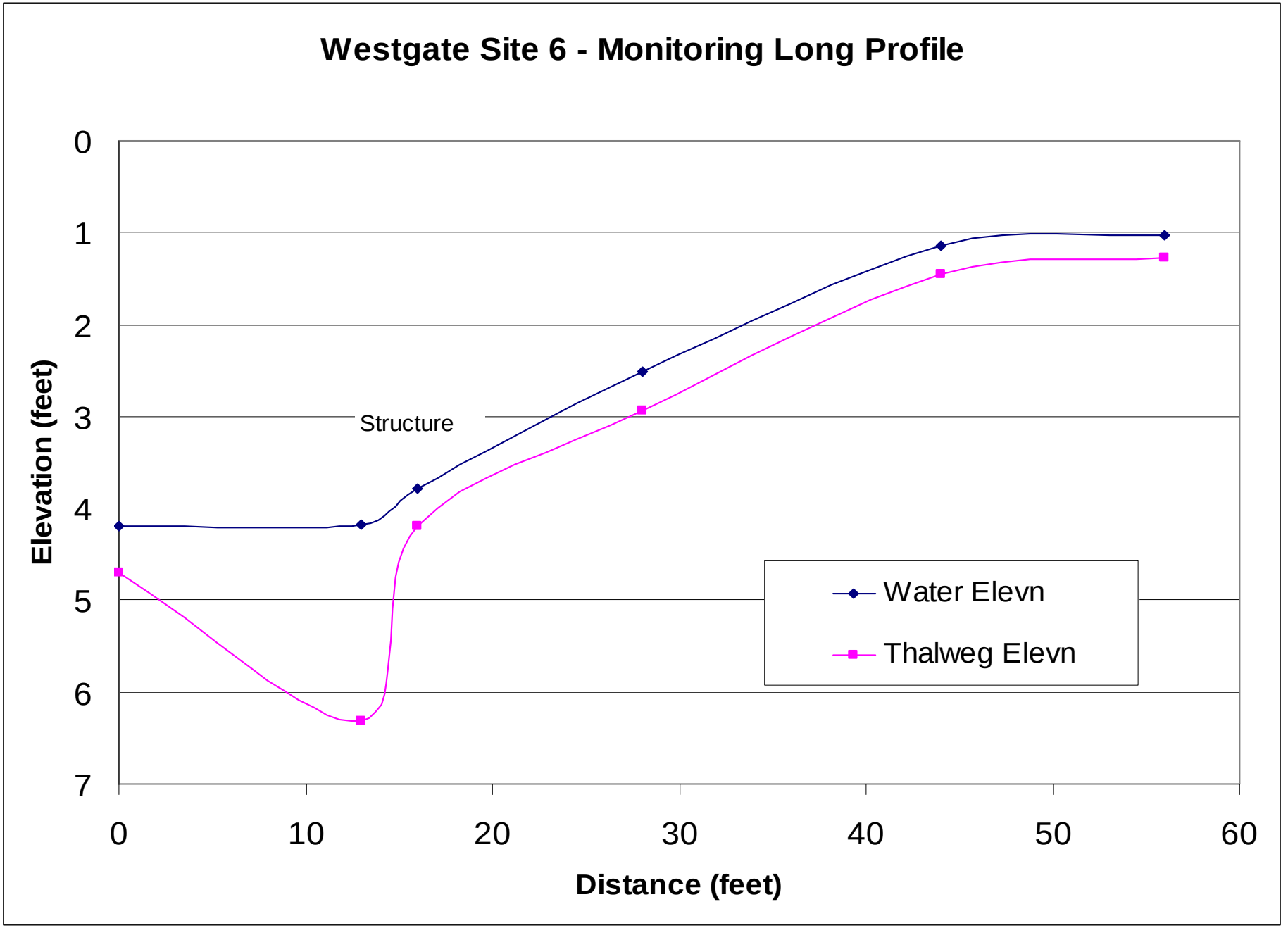

Westgate Creek - Site 5 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
Distance (feet)
Apr 23/04
Poposed
Sept 27/04 As-Built
Normal High Water

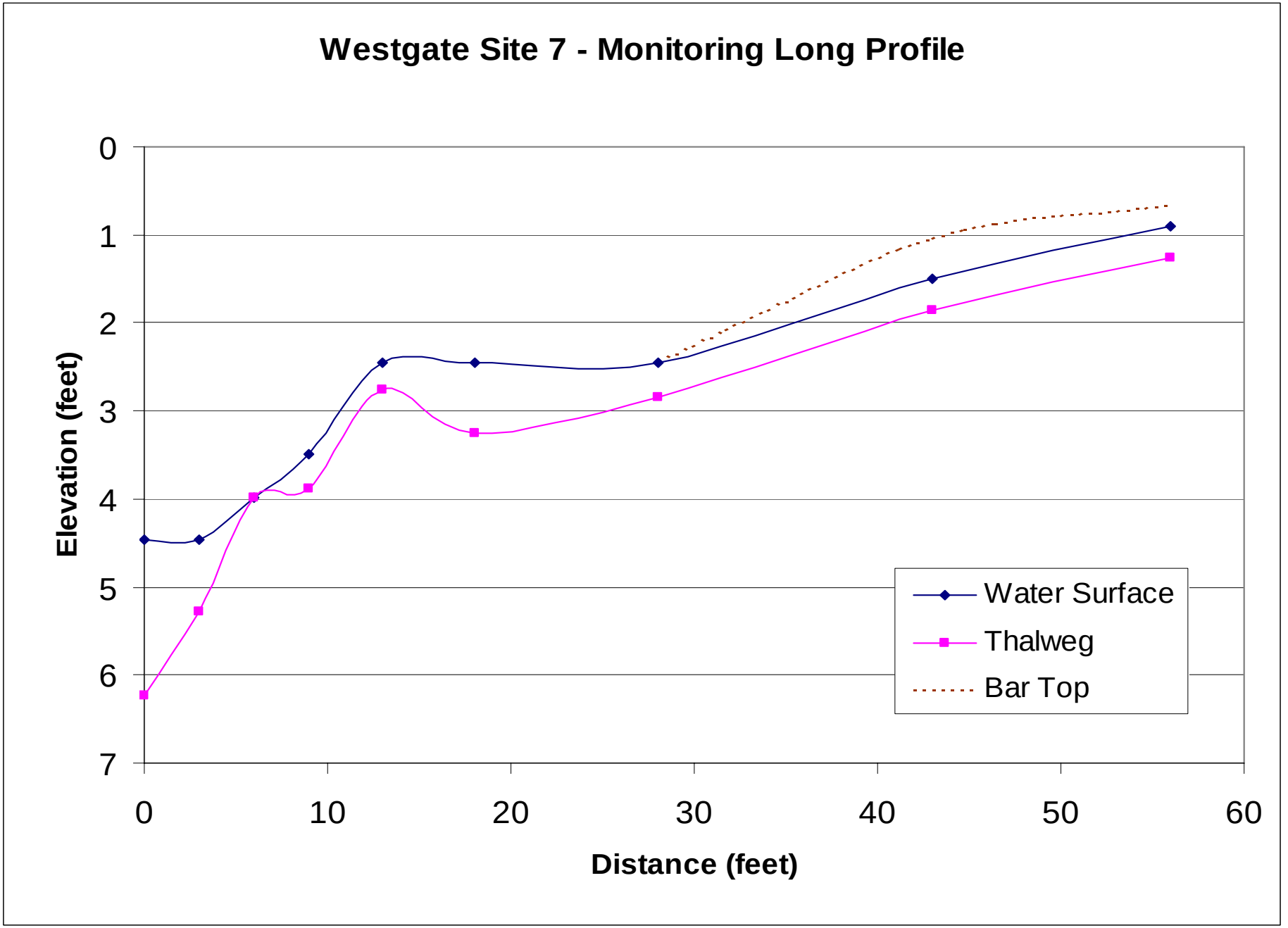

Westgate Creek - Site 6 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
Distance (feet)
Apr 23/04
Poposed
Sept 27/04 As-Built
Normal High Water


Westgate Creek - Site 7 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
0
10
20
30
40
Distance (feet)
Apr 23/04
Poposed
Sept 27/04 As-Built
Normal High Water


Westgate Creek - Site 8 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
Distance (feet)
Apr 23/04
Poposed
Sept 27/04 As-Built
Normal High Water

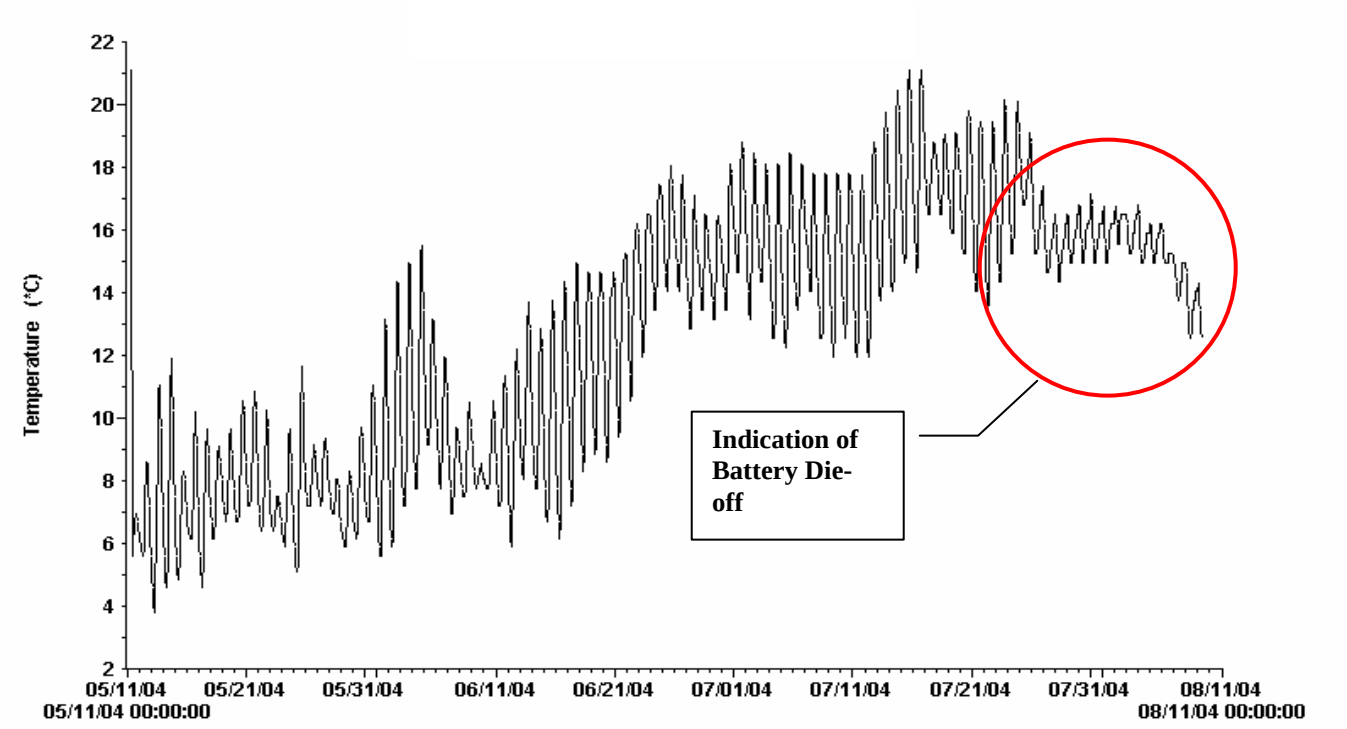

Westgate Creek - Site 9 (Channel Cross Section - Upstream View)
Elevation (feet)
0
1
2
3
4
5
6
7
0
10
20
30
40
50
Distance (feet)
Apr 23/04
Poposed
Sep 27/04 As-Built
Normal High Water


Westgate Site 6 - Monitoring Long Profile
Elevation (feet)
0
1
2
3
4
5
6
7
Structure
Water Elevn
Thalweg Elevn
0
10
20
30
40
50
60
Distance (feet)

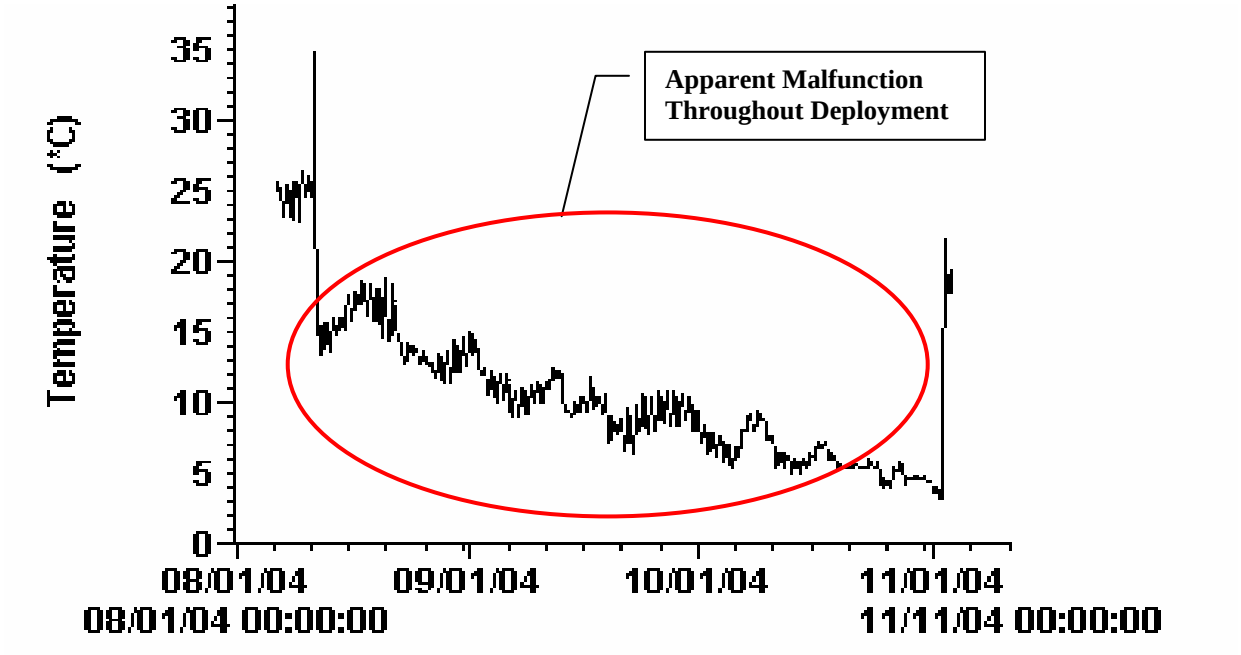

Westgate Site 7 - Monitoring Long Profile
Elevation (feet)
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60
Distance (feet)
Water Surface
Thalweg
Bar Top

APPENDIX H

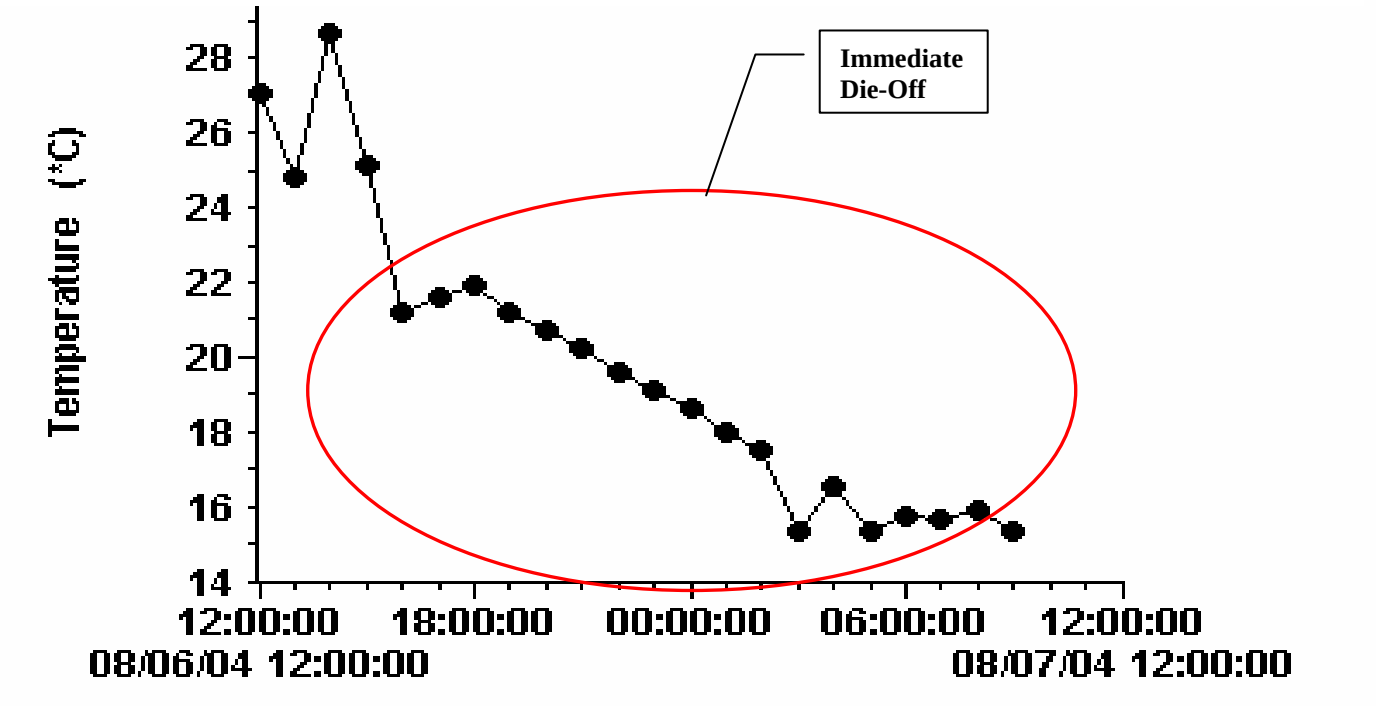
Annotated Raw Thermograph Data Graphs



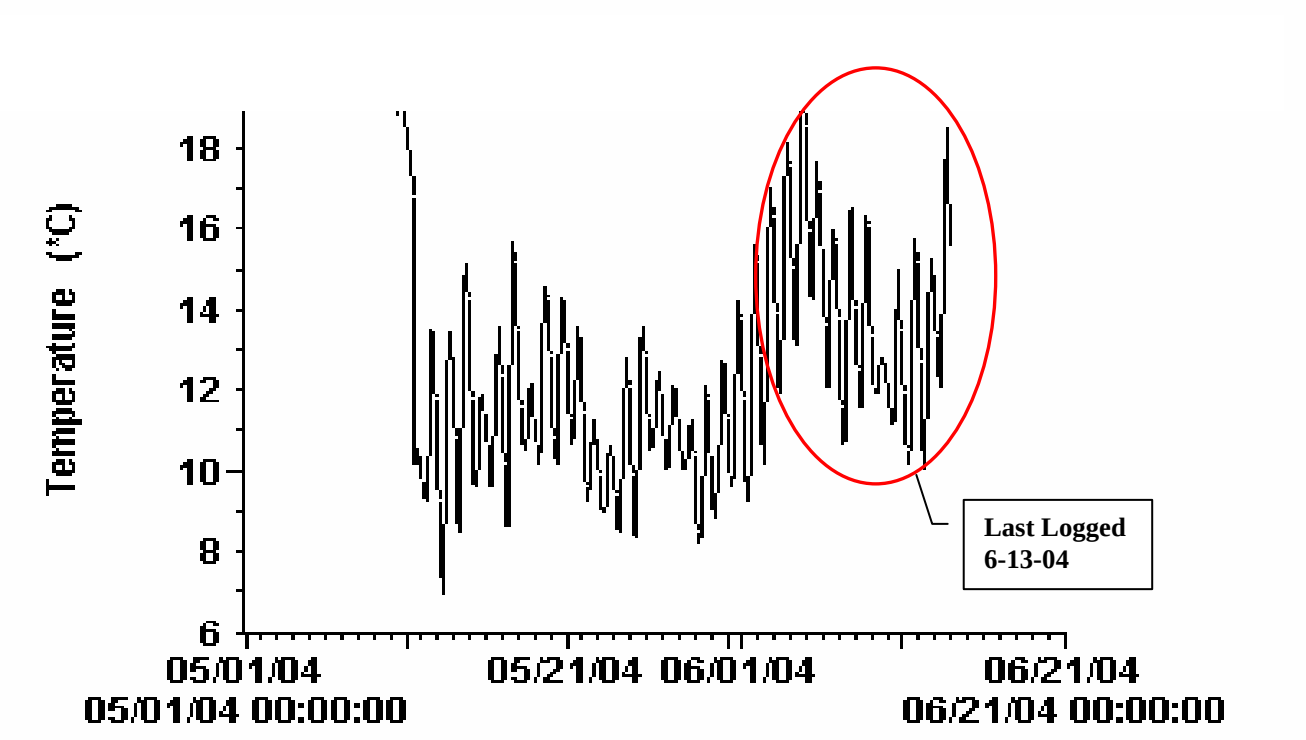
Lower Meacham - First (HOBO) Deployment



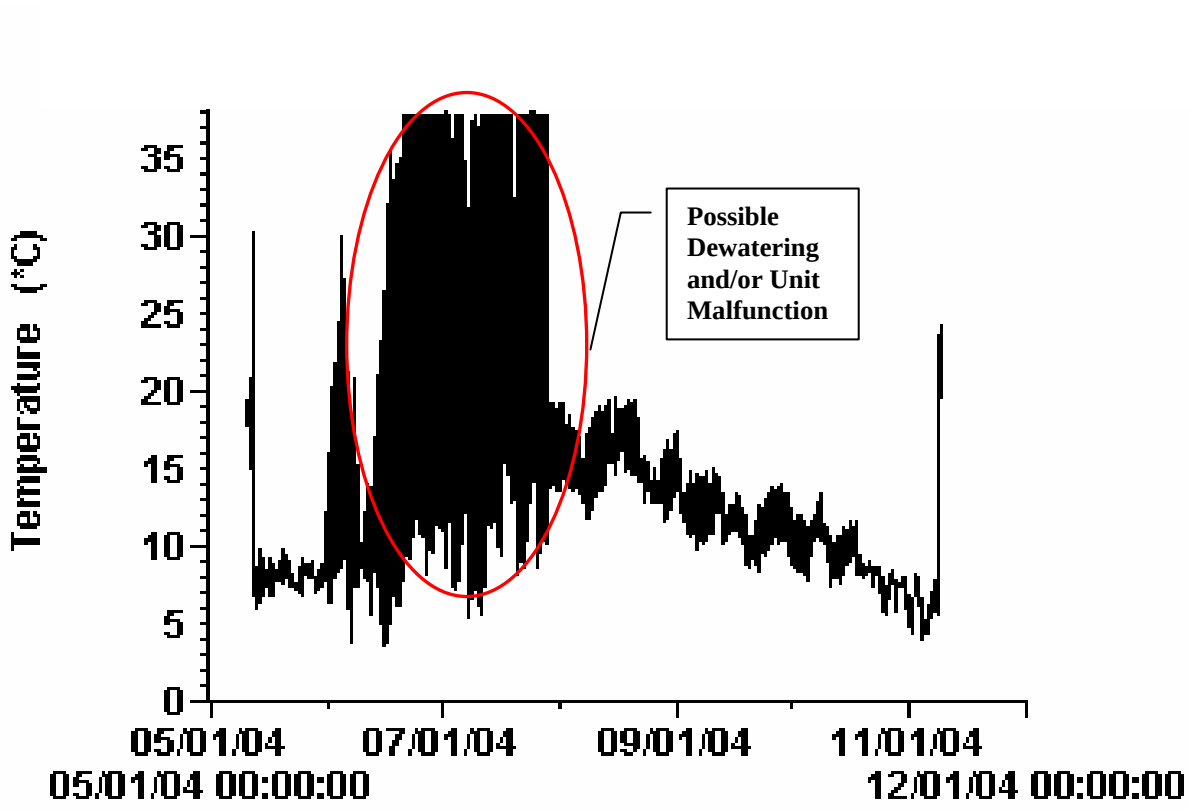
Lower Meacham - Second (STOWAWAY) Deployment



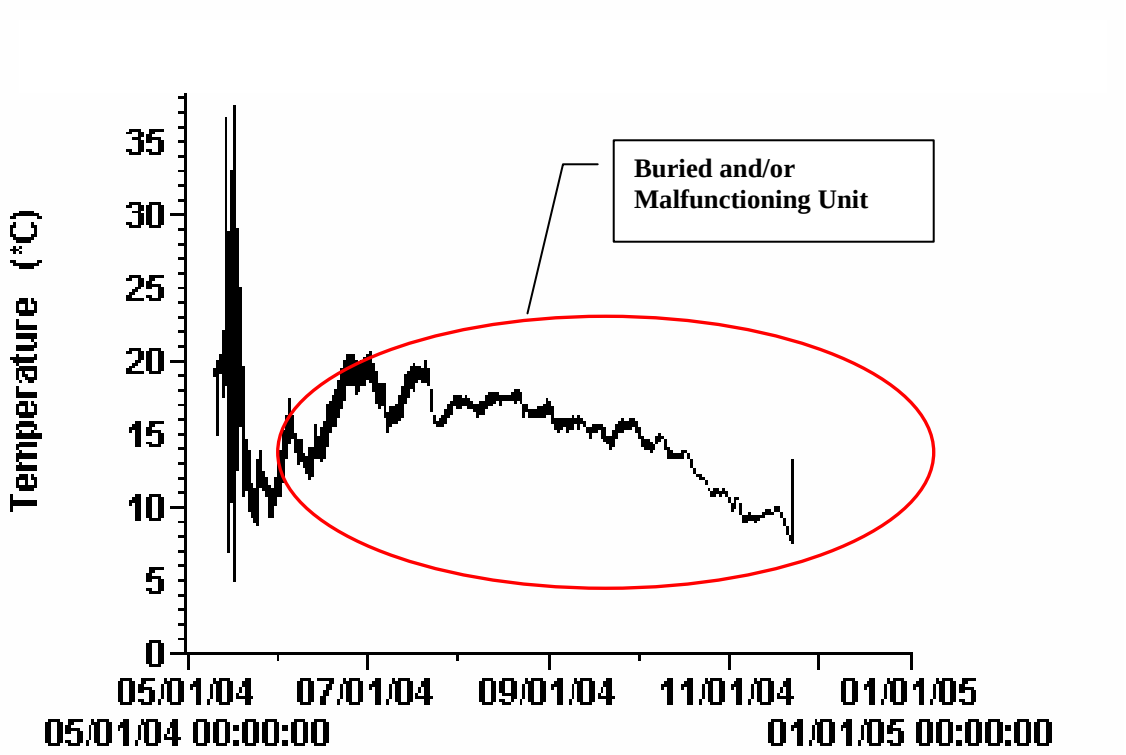
Lower Lobato



Upper Lobato



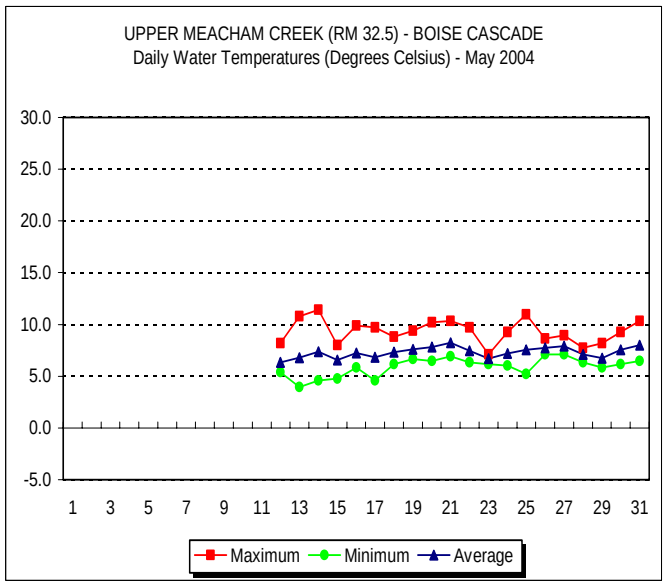
Westgate

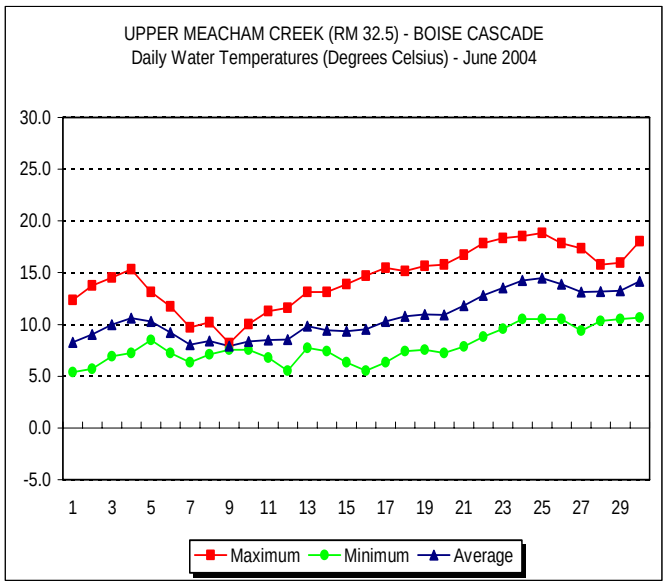


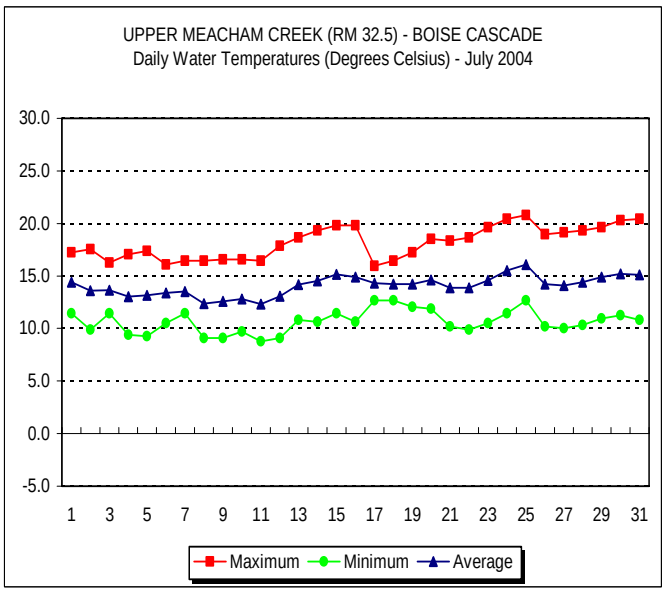
Straughan

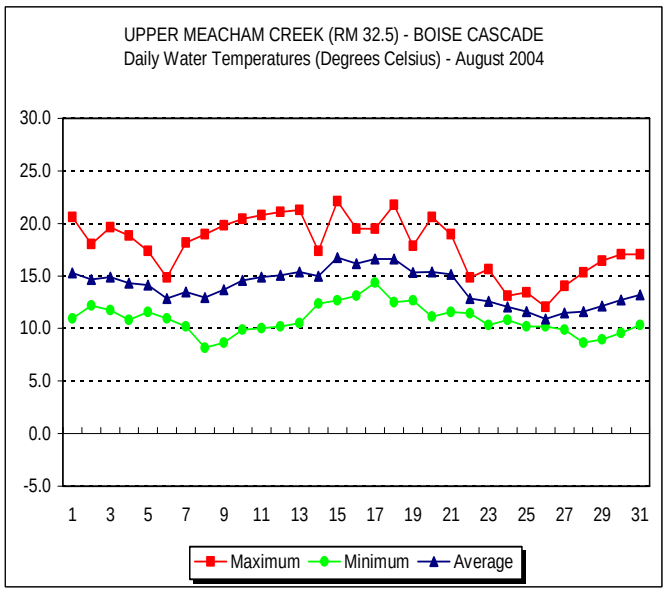
APPENDIX I

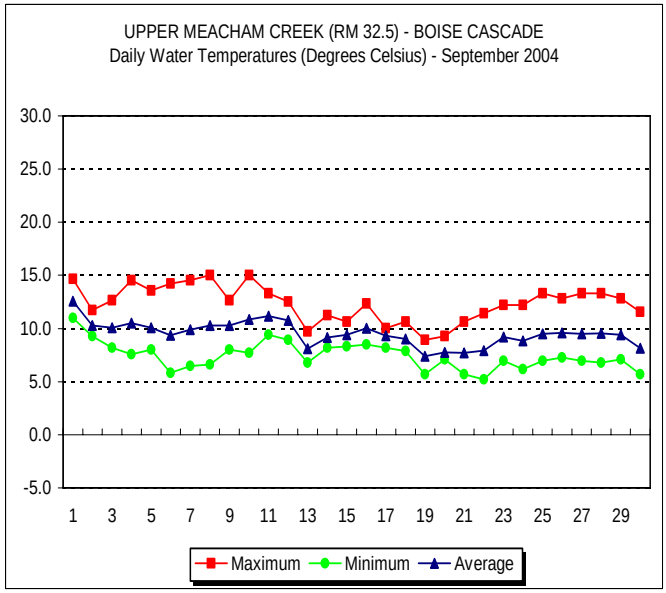
2004 Daily Minimum, Maximum and Average Water Temperatures, and SDMA of Daily Maximum Water Temperatures, by Site

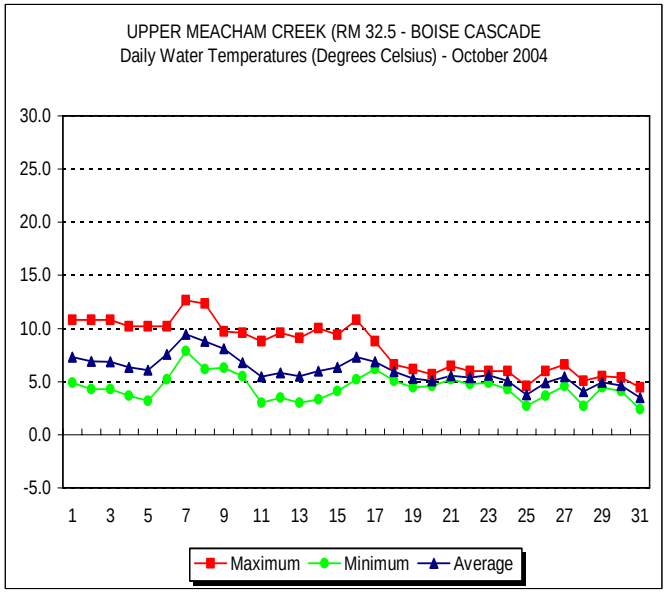

UPPER MEACHAM CREEK (RM 32.5) - BOISE CASCADE
Daily Water Temperatures (Degrees Celsius) - May 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

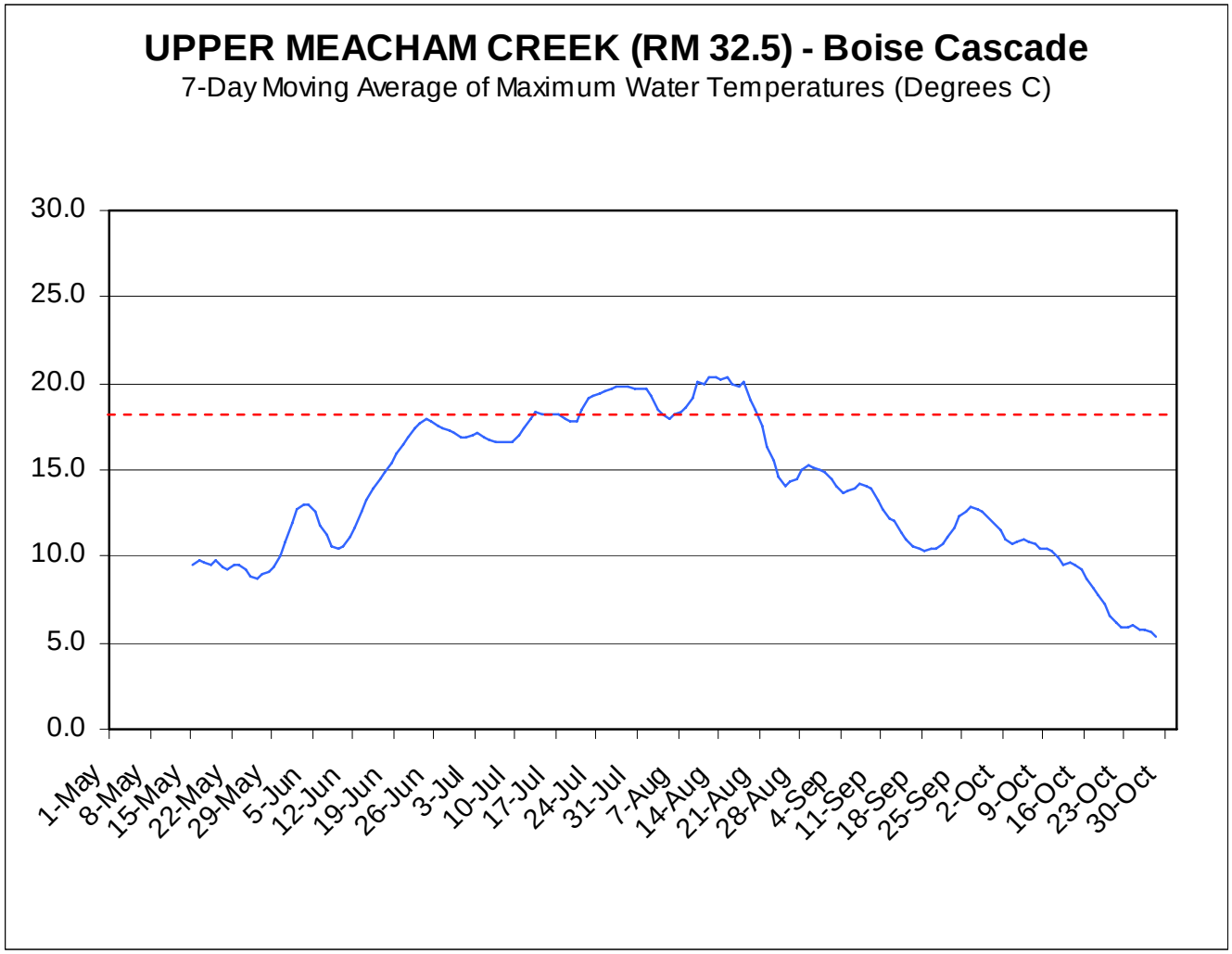

UPPER MEACHAM CREEK (RM 32.5) - BOISE CASCADE
Daily Water Temperatures (Degrees Celsius) - June 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

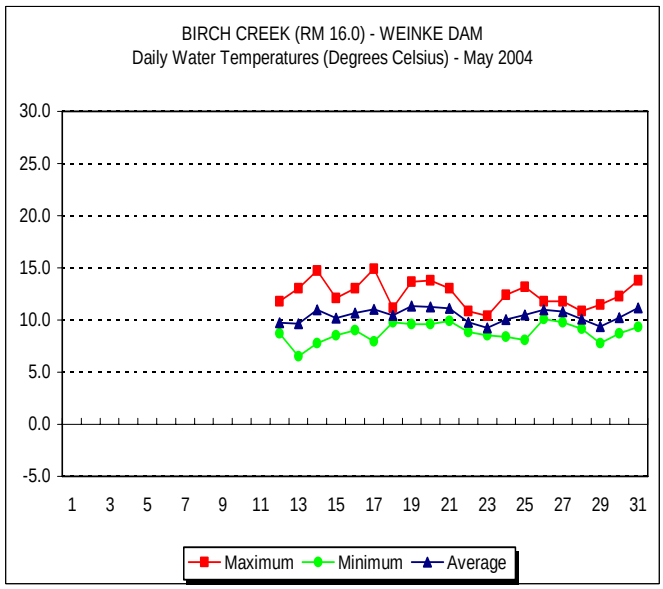

UPPER MEACHAM CREEK (RM 32.5) - BOISE CASCADE
Daily Water Temperatures (Degrees Celsius) - July 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

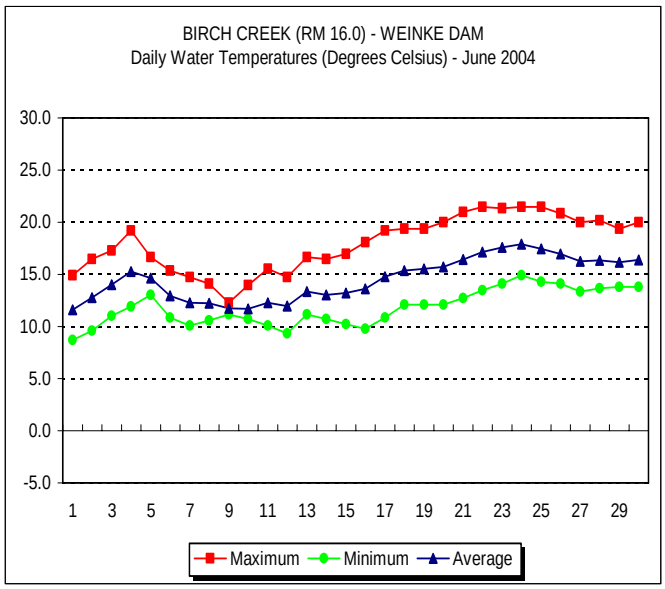

UPPER MEACHAM CREEK (RM 32.5) - BOISE CASCADE
Daily Water Temperatures (Degrees Celsius) - August 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

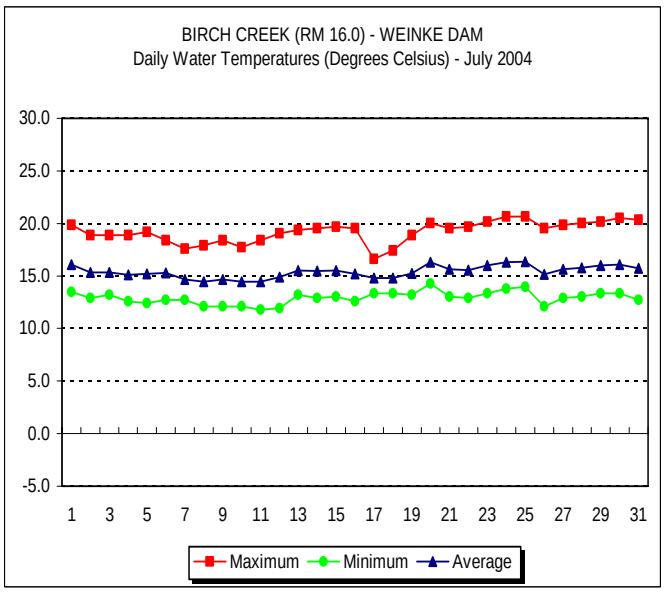

UPPER MEACHAM CREEK (RM 32.5) - BOISE CASCADE
Daily Water Temperatures (Degrees Celsius) - September 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

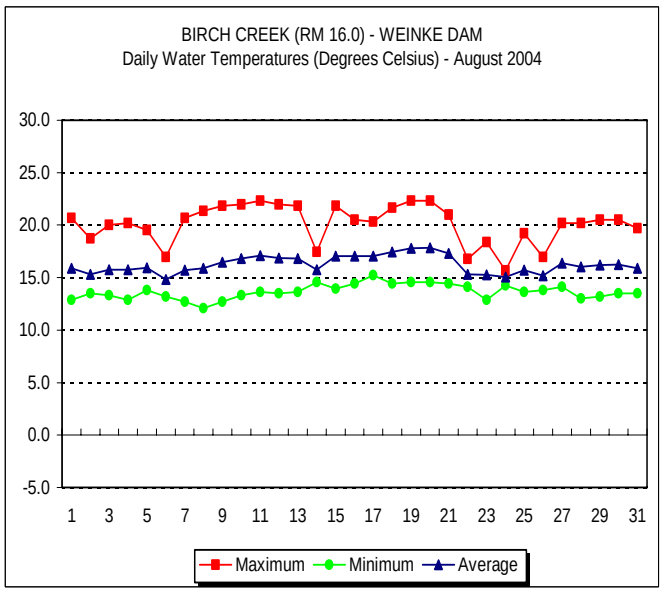

UPPER MEACHAM CREEK (RM 32.5 - BOISE CASCADE
Daily Water Temperatures (Degrees Celsius) - October 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

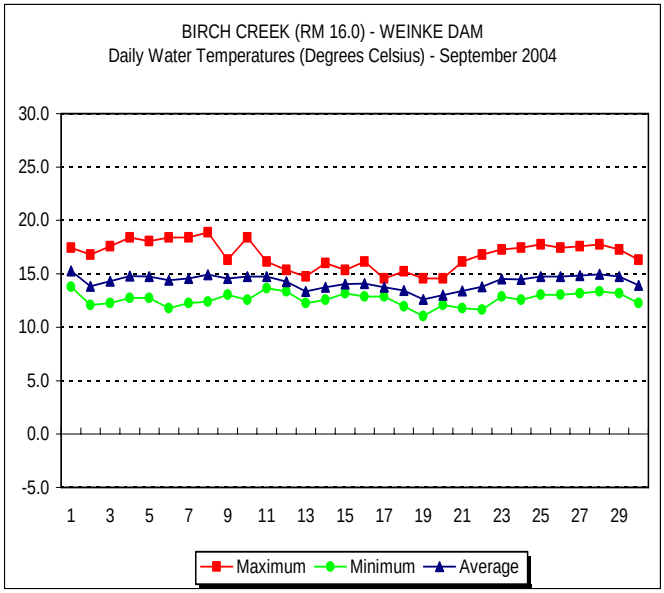

UPPER MEACHAM CREEK (RM 32.5) - Boise Cascade
7-Day Moving Average of Maximum Water Temperatures (Degrees C)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
24-Jul
31-Jul
7-Aug
14-Aug
21-Aug
28-Aug
4-Sep
11-Sep
18-Sep
25-Sep
2-Oct
9-Oct
16-Oct
23-Oct
30-Oct

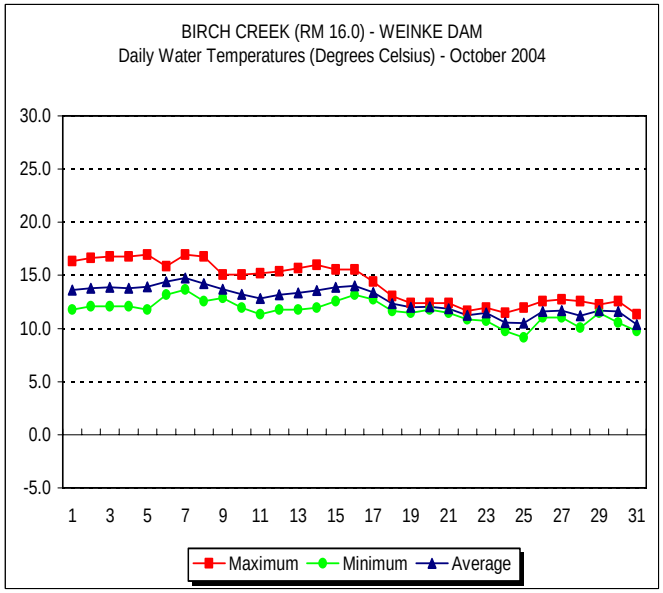

BIRCH CREEK (RM 16.0) - WEINKE DAM
Daily Water Temperatures (Degrees Celsius) - May 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

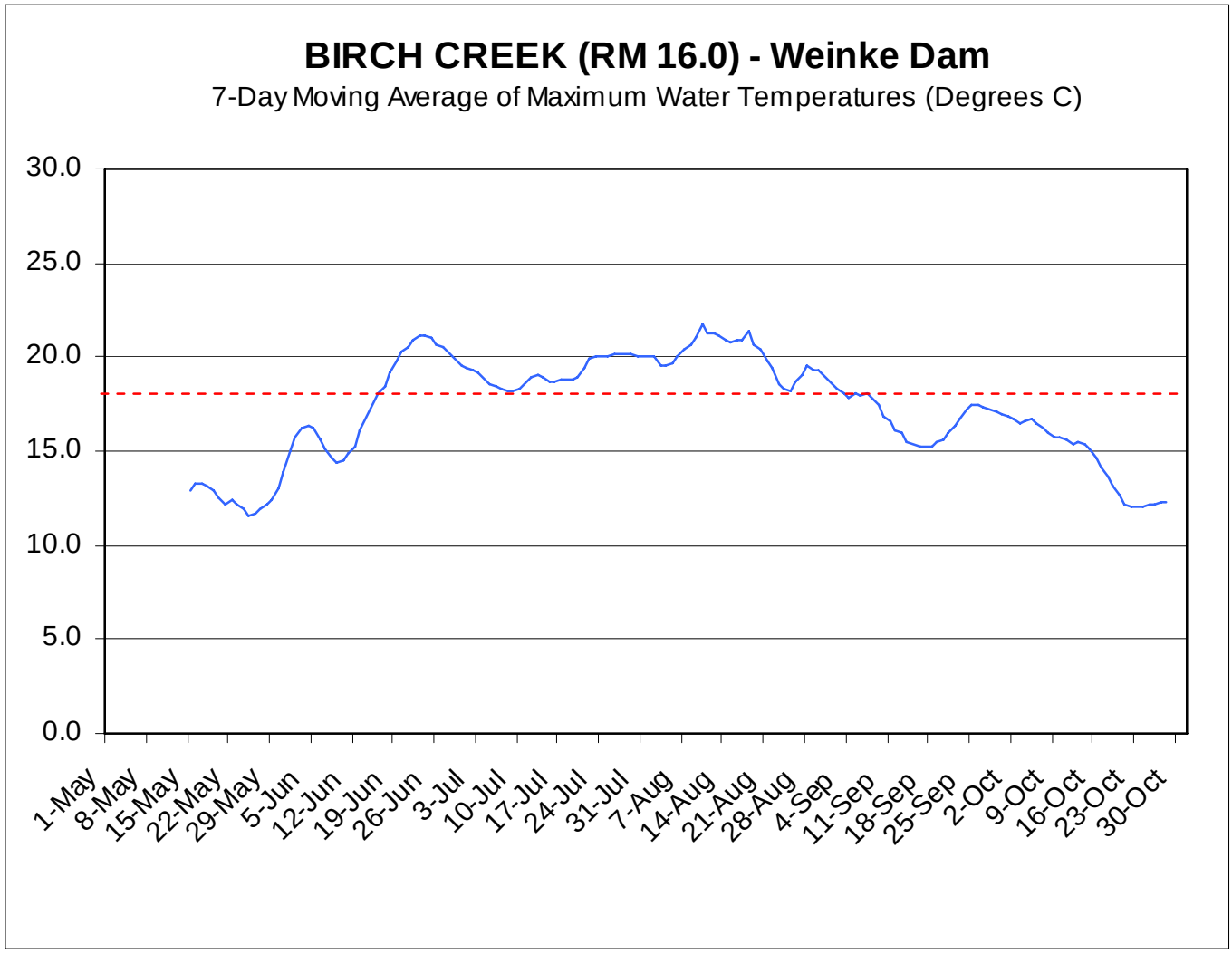

BIRCH CREEK (RM 16.0) - WEINKE DAM
Daily Water Temperatures (Degrees Celsius) - June 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

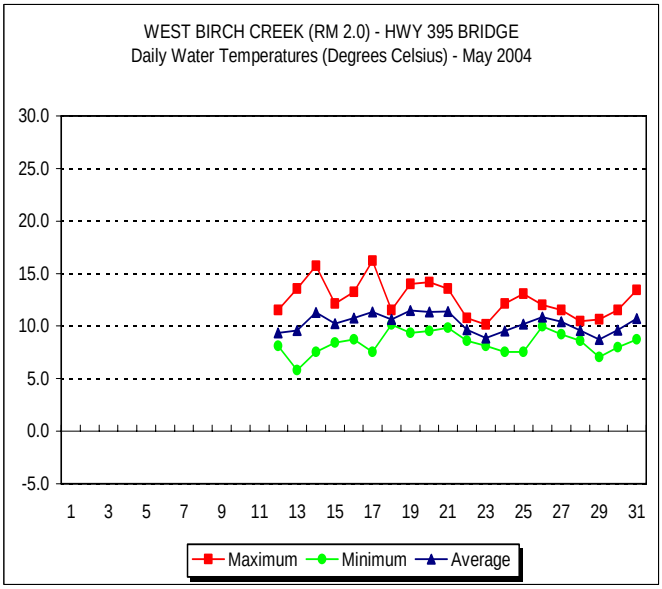

BIRCH CREEK (RM 16.0) - WEINKE DAM
Daily Water Temperatures (Degrees Celsius) - July 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

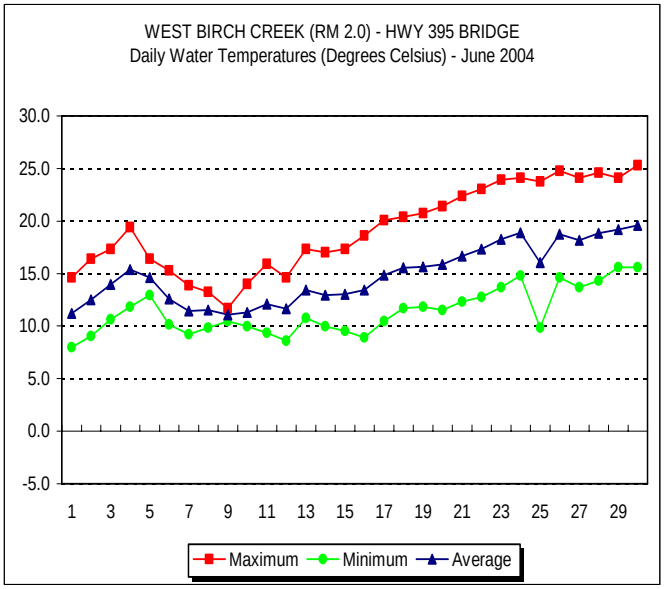

BIRCH CREEK (RM 16.0) - WEINKE DAM
Daily Water Temperatures (Degrees Celsius) - August 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

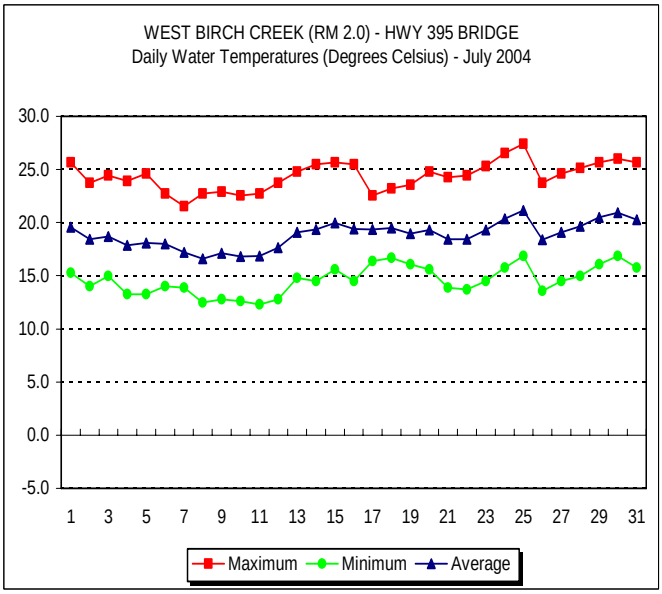

BIRCH CREEK (RM 16.0) - WEINKE DAM
Daily Water Temperatures (Degrees Celsius) - September 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

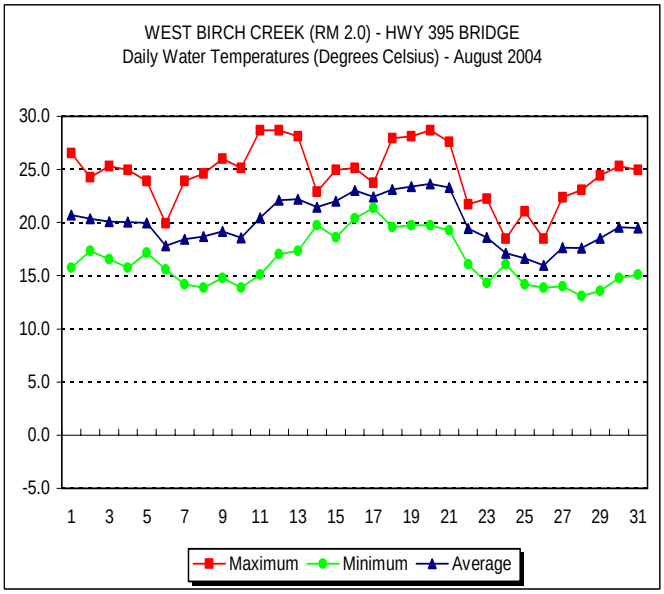

BIRCH CREEK (RM 16.0) - WEINKE DAM
Daily Water Temperatures (Degrees Celsius) - October 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

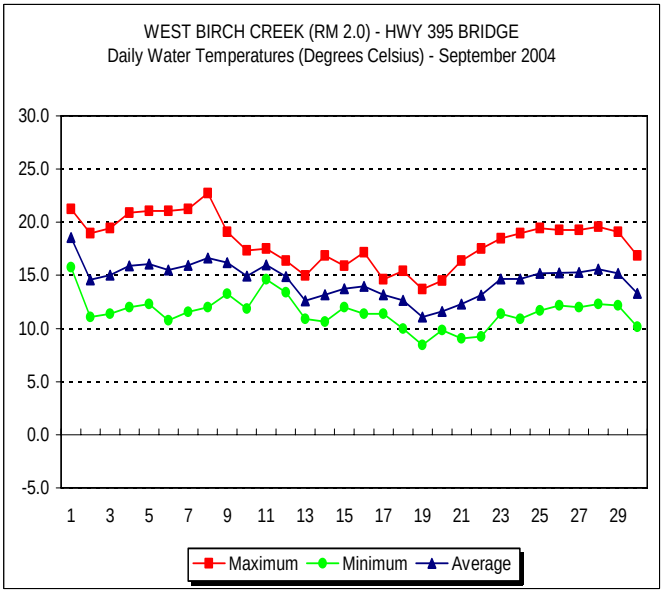

BIRCH CREEK (RM 16.0) - Weinke Dam
7-Day Moving Average of Maximum Water Temperatures (Degrees C)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
24-Jul
31-Jul
7-Aug
14-Aug
21-Aug
28-Aug
4-Sep
11-Sep
18-Sep
25-Sep
2-Oct
9-Oct
16-Oct
23-Oct
30-Oct

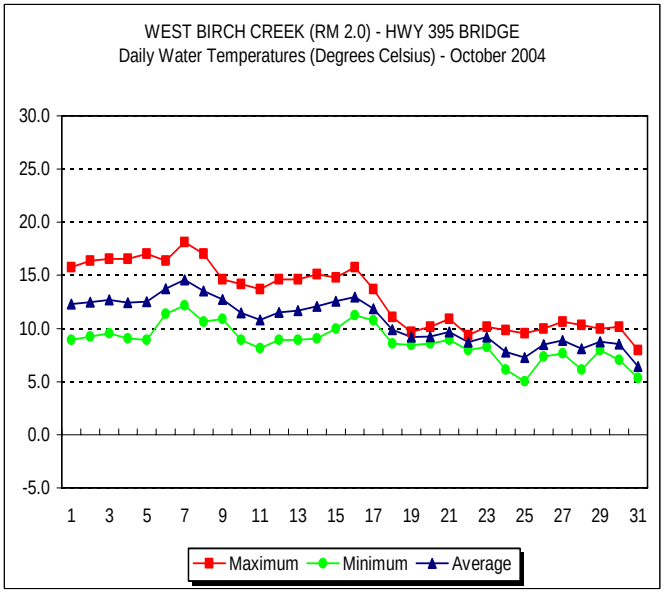

WEST BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
Daily Water Temperatures (Degrees Celsius) - May 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

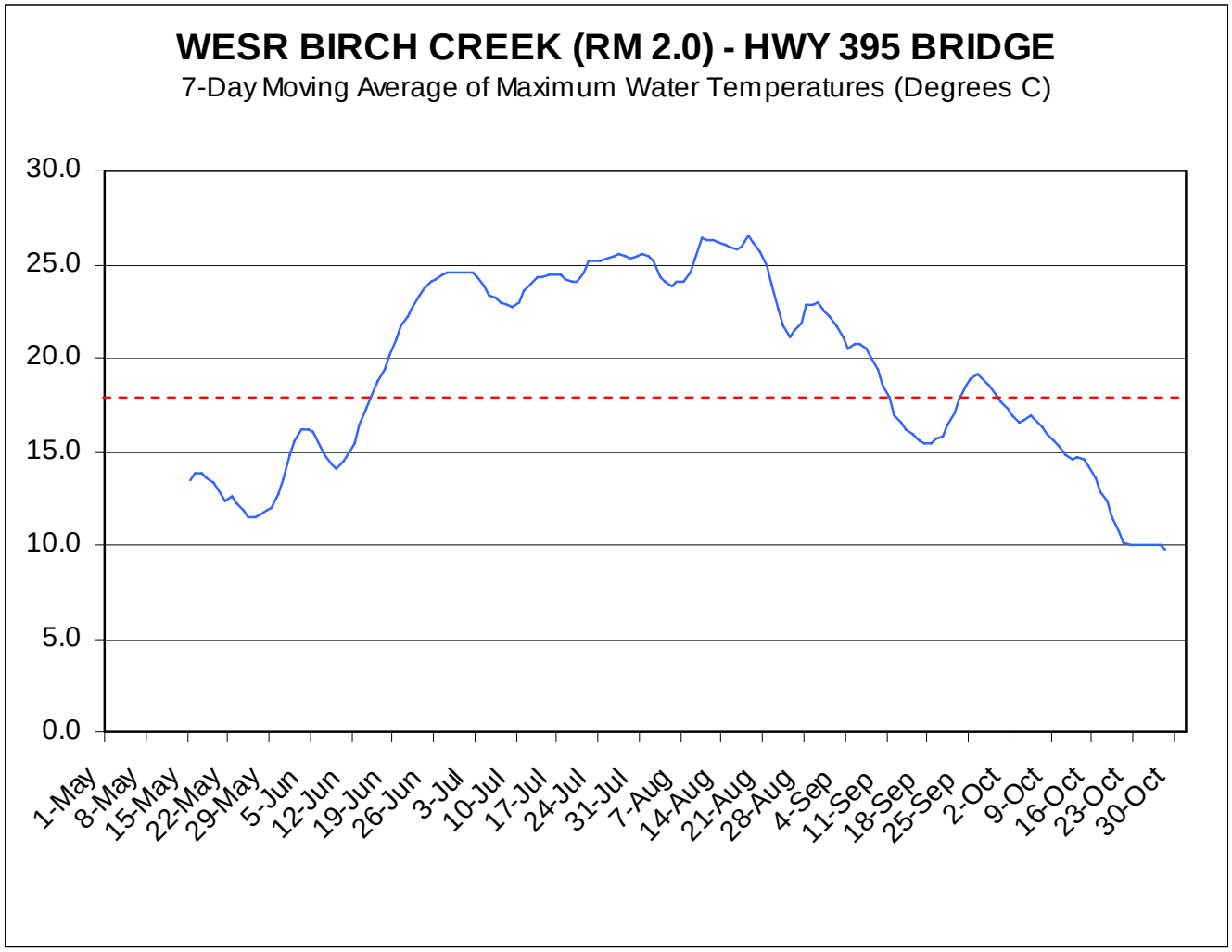

WEST BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
Daily Water Temperatures (Degrees Celsius) - June 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

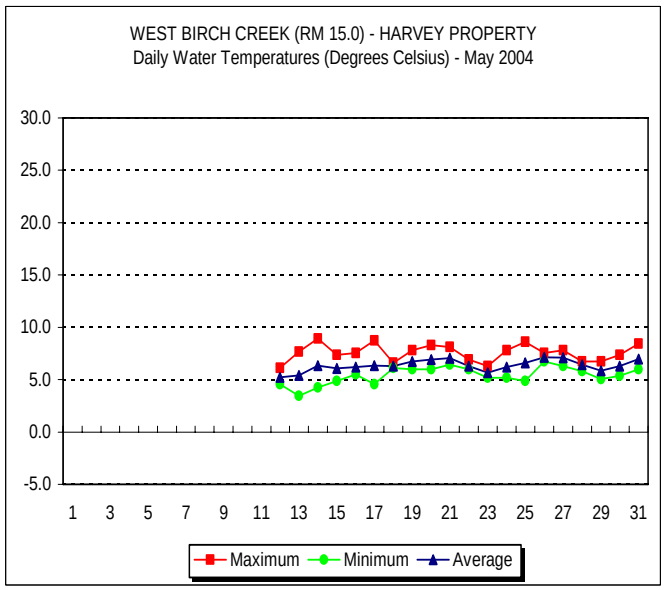

WEST BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
Daily Water Temperatures (Degrees Celsius) - July 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

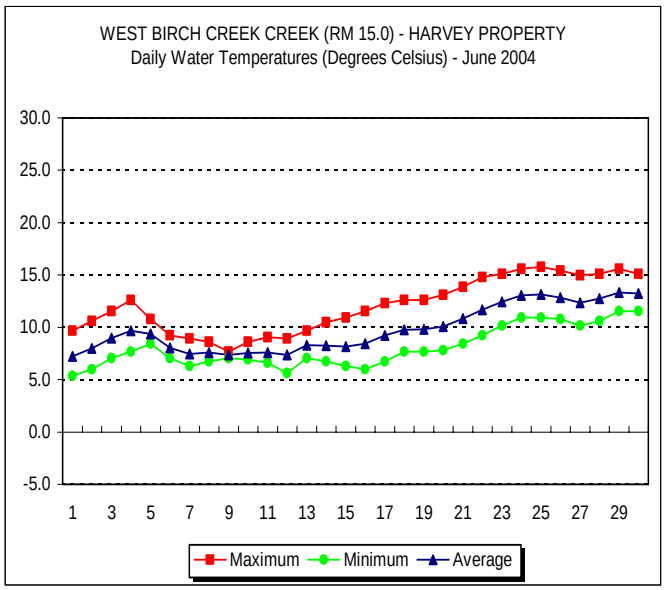

WEST BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
Daily Water Temperatures (Degrees Celsius) - August 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

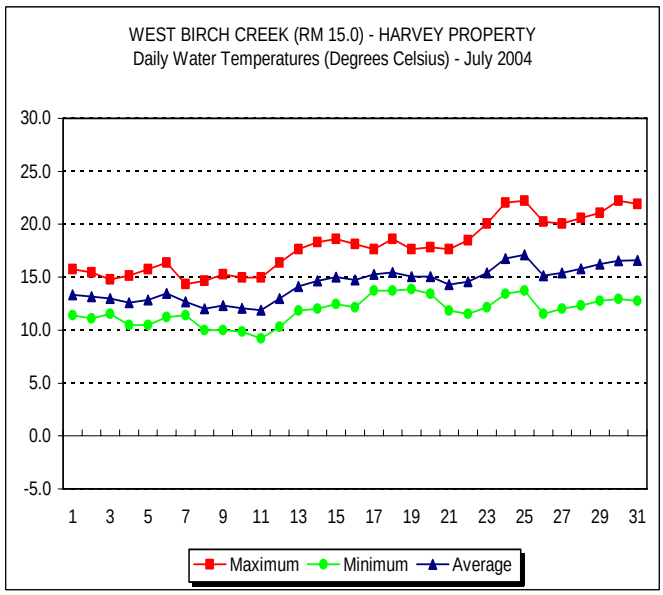

WEST BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
Daily Water Temperatures (Degrees Celsius) - September 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

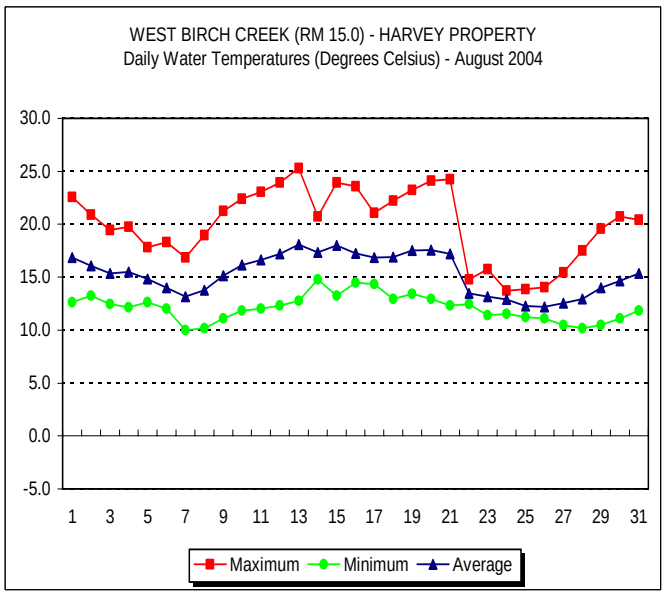

WEST BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
Daily Water Temperatures (Degrees Celsius) - October 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

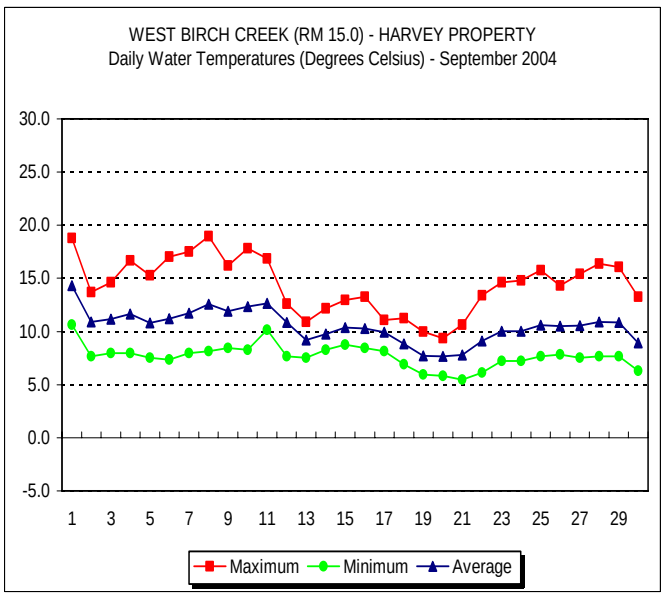

WESR BIRCH CREEK (RM 2.0) - HWY 395 BRIDGE
7-Day Moving Average of Maximum Water Temperatures (Degrees C)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
24-Jul
31-Jul
7-Aug
14-Aug
21-Aug
28-Aug
4-Sep
11-Sep
18-Sep
25-Sep
2-Oct
9-Oct
16-Oct
23-Oct
30-Oct

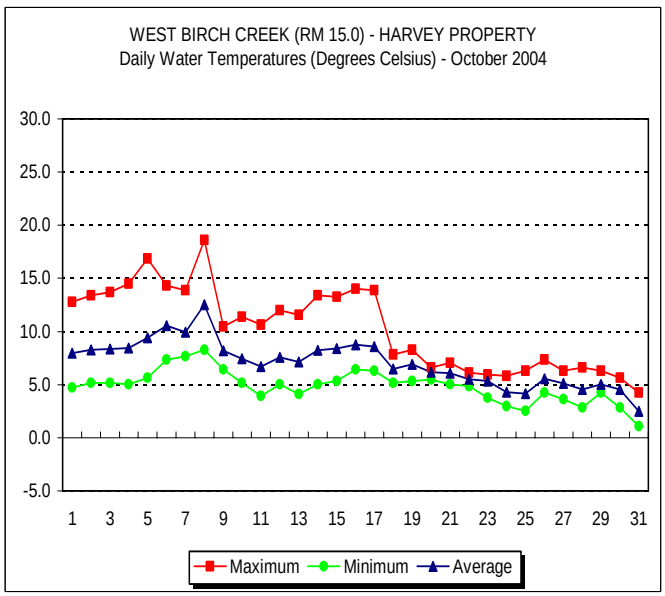

WEST BIRCH CREEK (RM 15.0) - HARVEY PROPERTY
Daily Water Temperatures (Degrees Celsius) - May 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

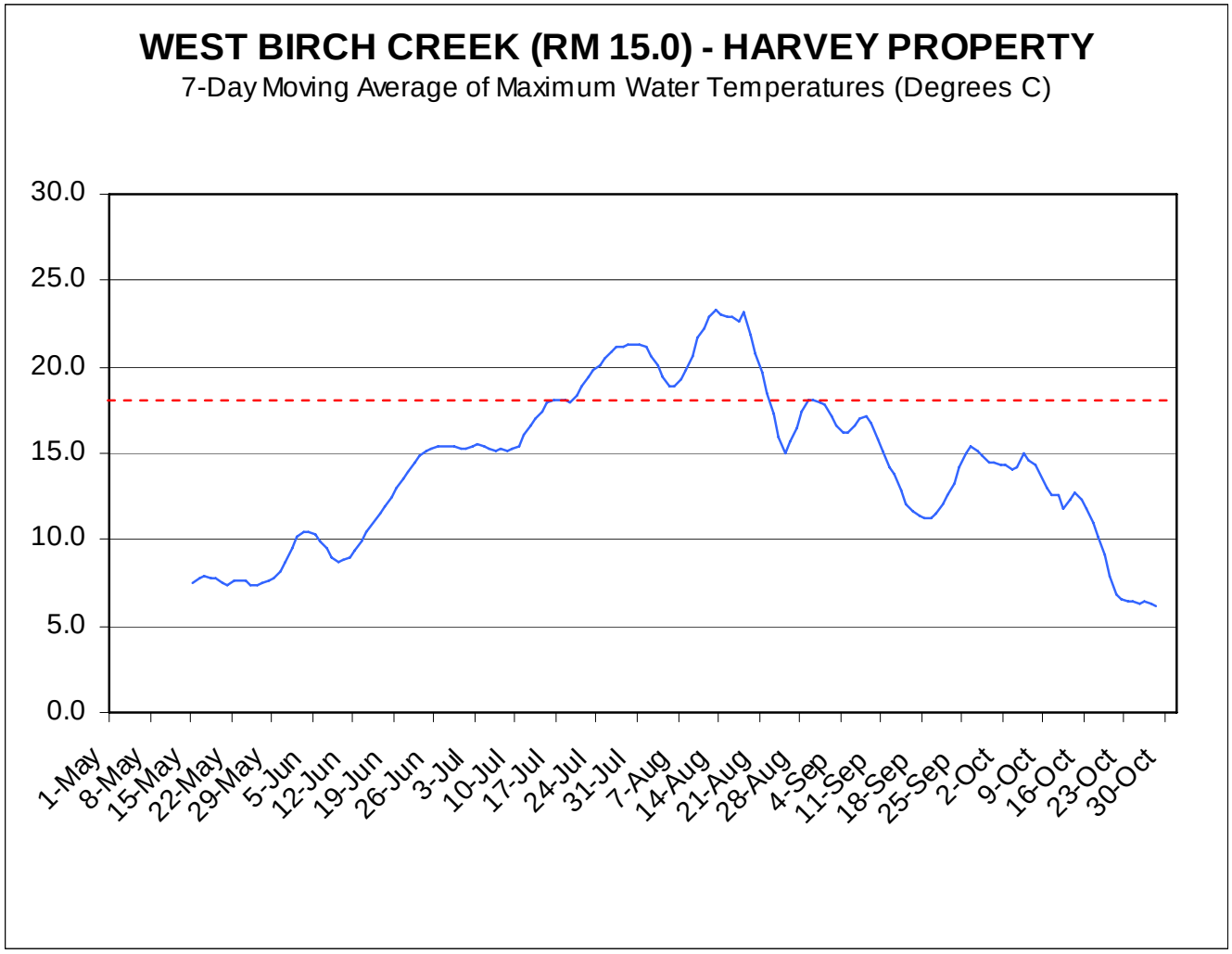

WEST BIRCH CREEK CREEK (RM 15.0) - HARVEY PROPERTY
Daily Water Temperatures (Degrees Celsius) - June 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

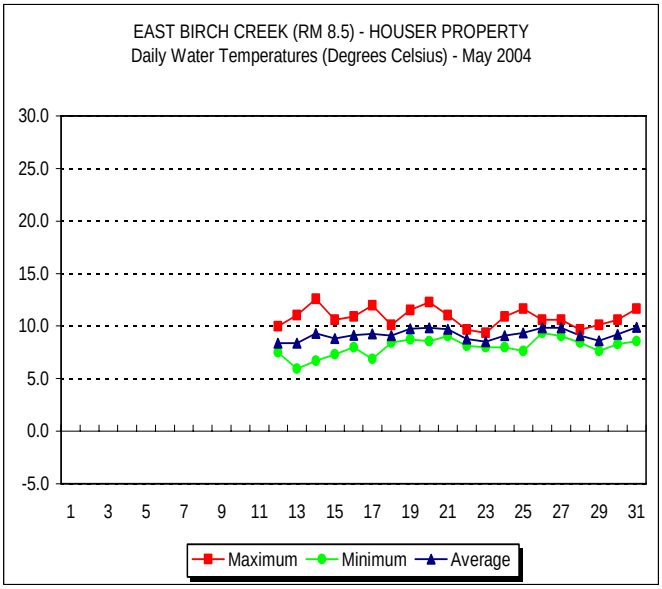

WEST BIRCH CREEK (RM 15.0) - HARVEY PROPERTY
Daily Water Temperatures (Degrees Celsius) - July 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

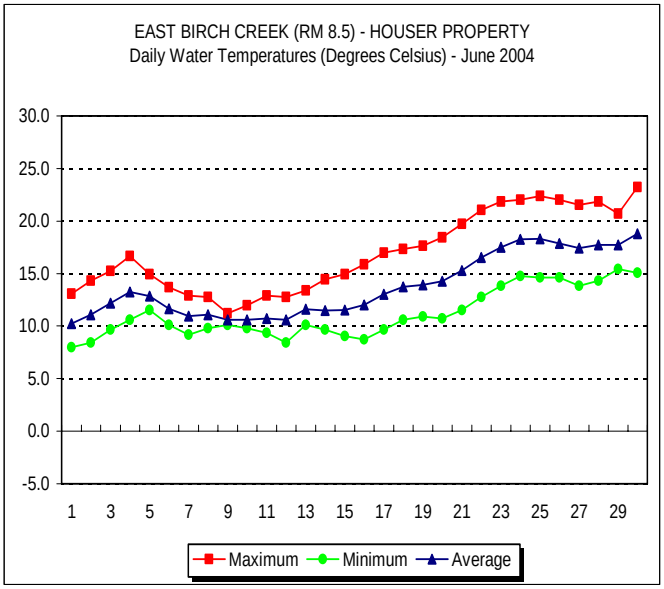

WEST BIRCH CREEK (RM 15.0) - HARVEY PROPERTY
Daily Water Temperatures (Degrees Celsius) - August 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

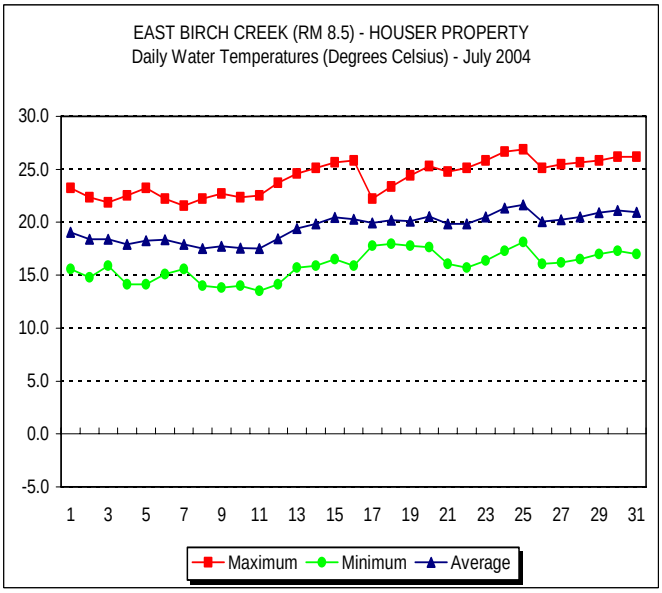

WEST BIRCH CREEK (RM 15.0) - HARVEY PROPERTY
Daily Water Temperatures (Degrees Celsius) - September 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

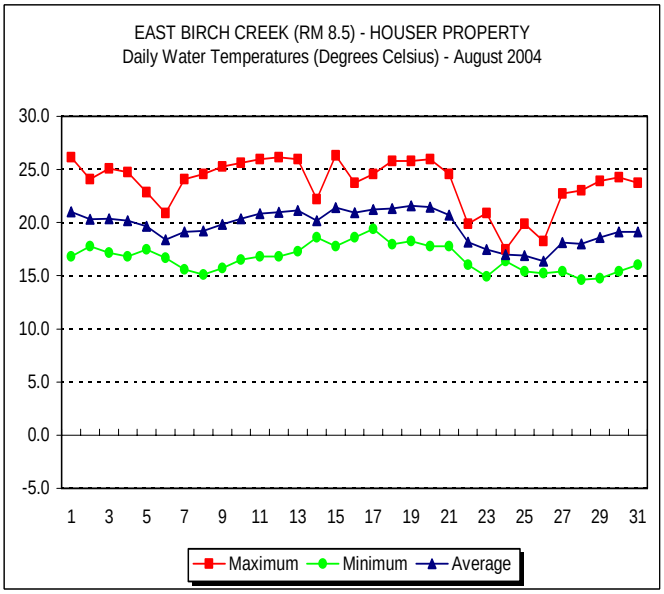

WEST BIRCH CREEK (RM 15.0) - HARVEY PROPERTY
Daily Water Temperatures (Degrees Celsius) - October 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

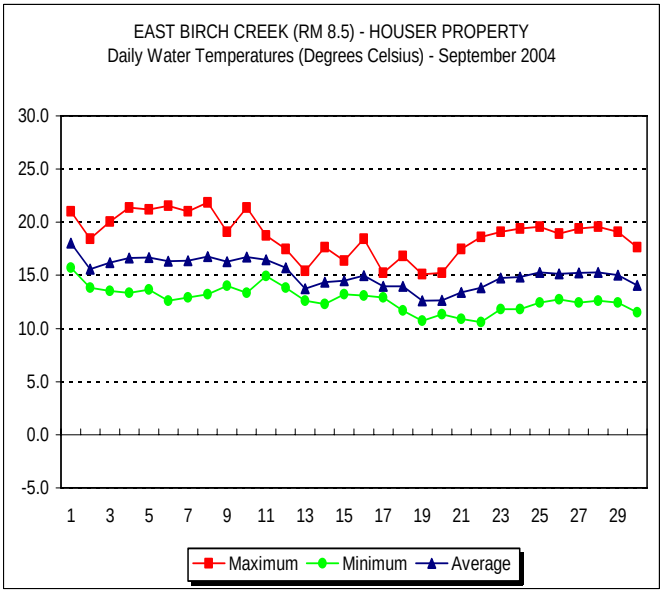

WEST BIRCH CREEK (RM 15.0) - HARVEY PROPERTY
7-Day Moving Average of Maximum Water Temperatures (Degrees C)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
24-Jul
31-Jul
7-Aug
14-Aug
21-Aug
28-Aug
4-Sep
11-Sep
18-Sep
25-Sep
2-Oct
9-Oct
16-Oct
23-Oct
30-Oct

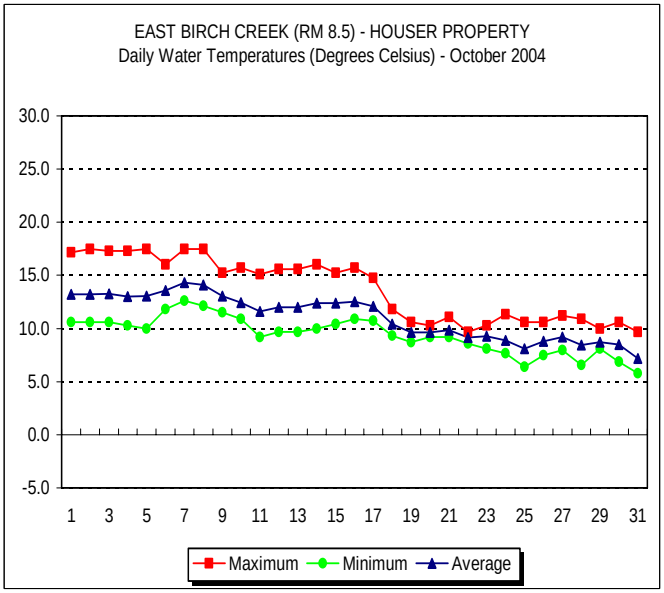

EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
Daily Water Temperatures (Degrees Celsius) - May 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average

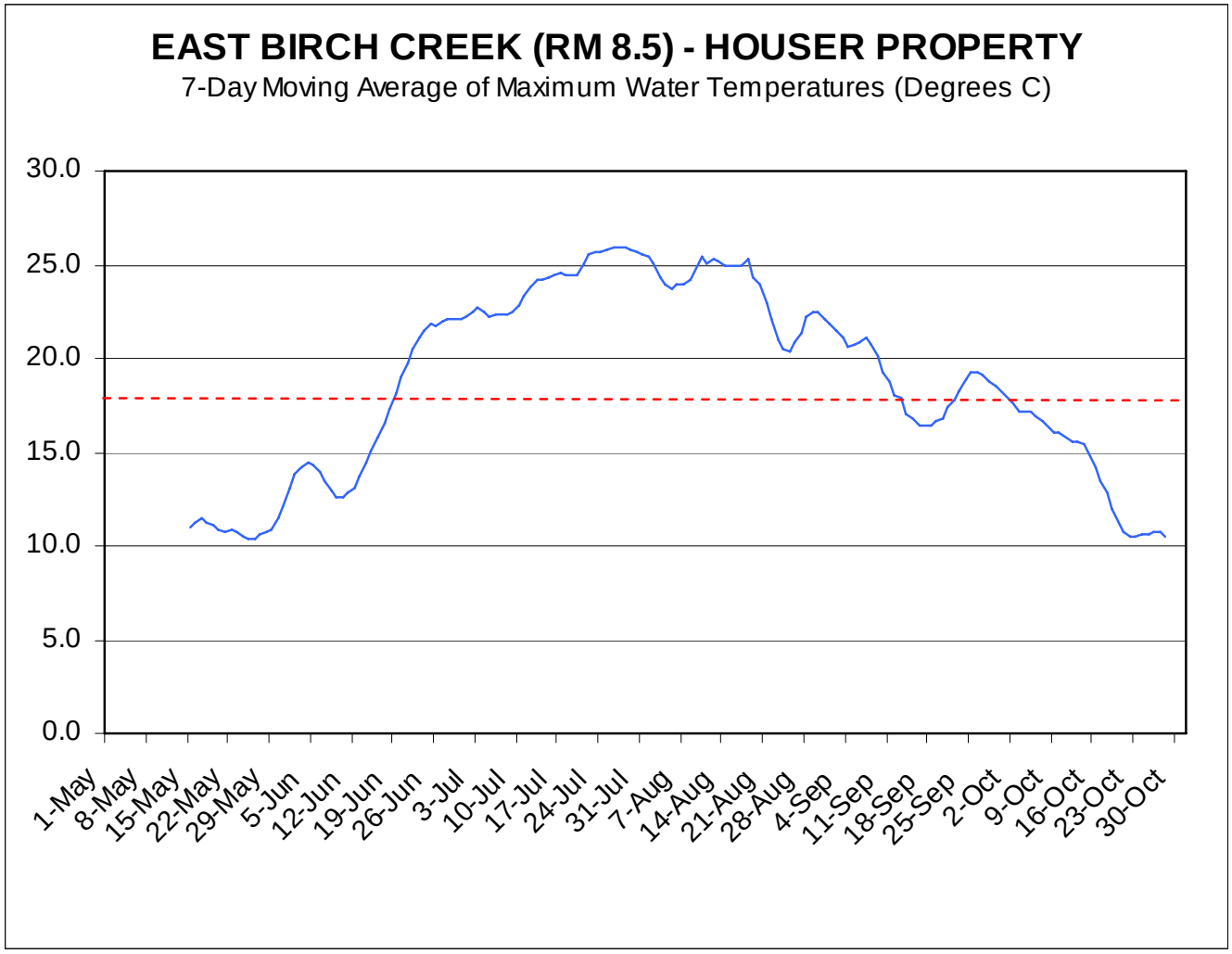

EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
Daily Water Temperatures (Degrees Celsius) - June 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average

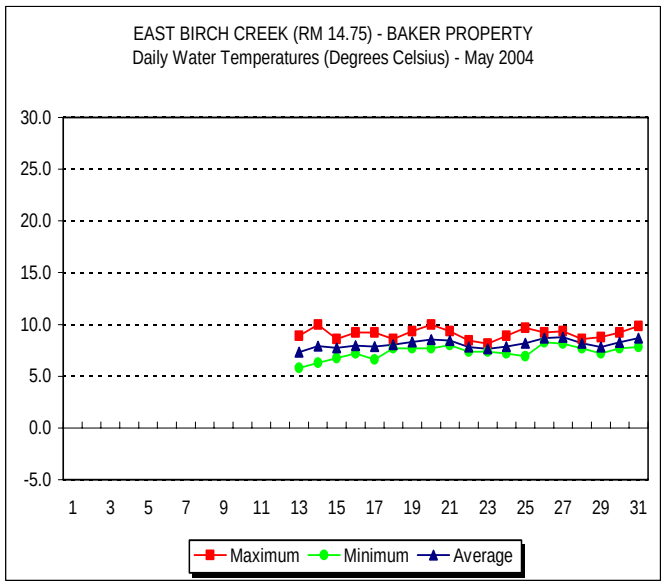

EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
Daily Water Temperatures (Degrees Celsius) - July 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
Daily Water Temperatures (Degrees Celsius) - August 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
Daily Water Temperatures (Degrees Celsius) - September 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
Daily Water Temperatures (Degrees Celsius) - October 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 8.5) - HOUSER PROPERTY
7-Day Moving Average of Maximum Water Temperatures (Degrees C)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
24-Jul
31-Jul
7-Aug
14-Aug
21-Aug
28-Aug
4-Sep
11-Sep
18-Sep
25-Sep
2-Oct
9-Oct
16-Oct
23-Oct
30-Oct


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
Daily Water Temperatures (Degrees Celsius) - May 2004
30.0
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15.0
10.0
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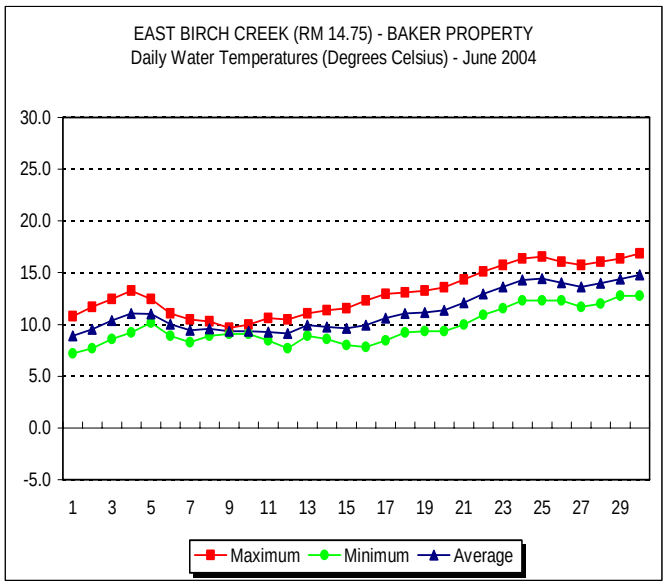
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
Daily Water Temperatures (Degrees Celsius) - June 2004
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10.0
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-5.0
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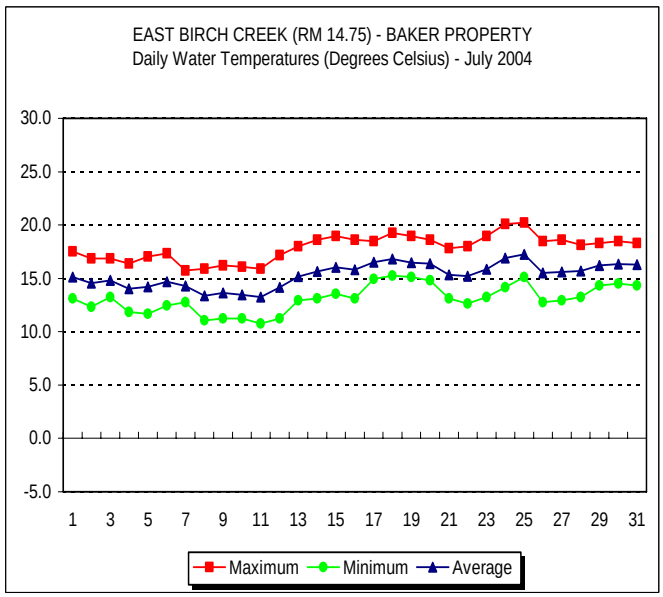
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
Daily Water Temperatures (Degrees Celsius) - July 2004
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10.0
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-5.0
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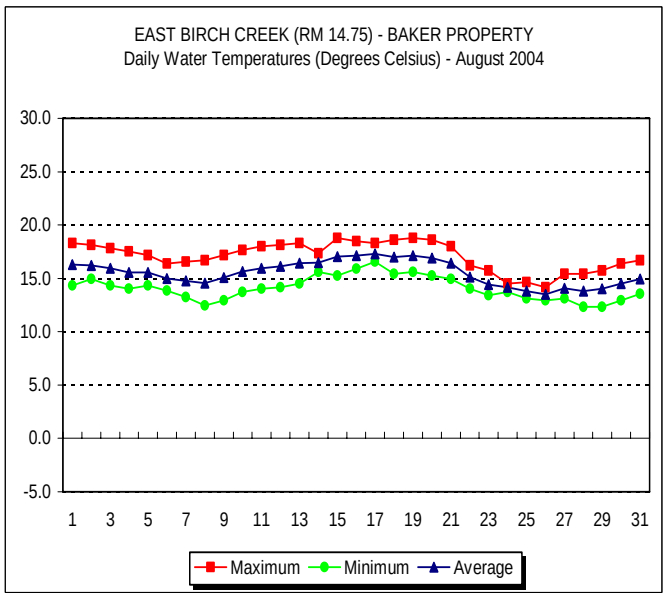
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
Daily Water Temperatures (Degrees Celsius) - August 2004
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10.0
5.0
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-5.0
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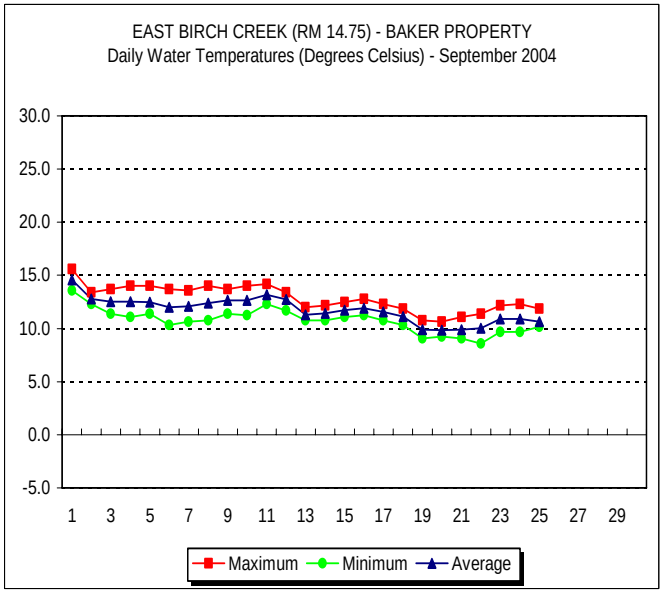
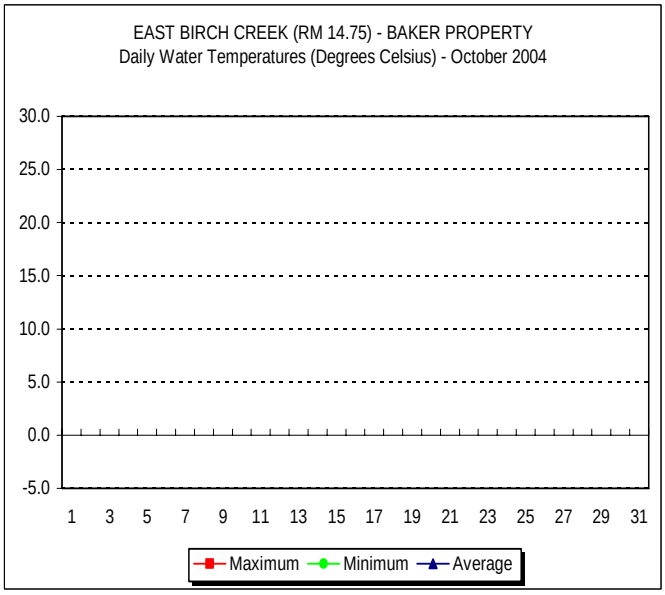
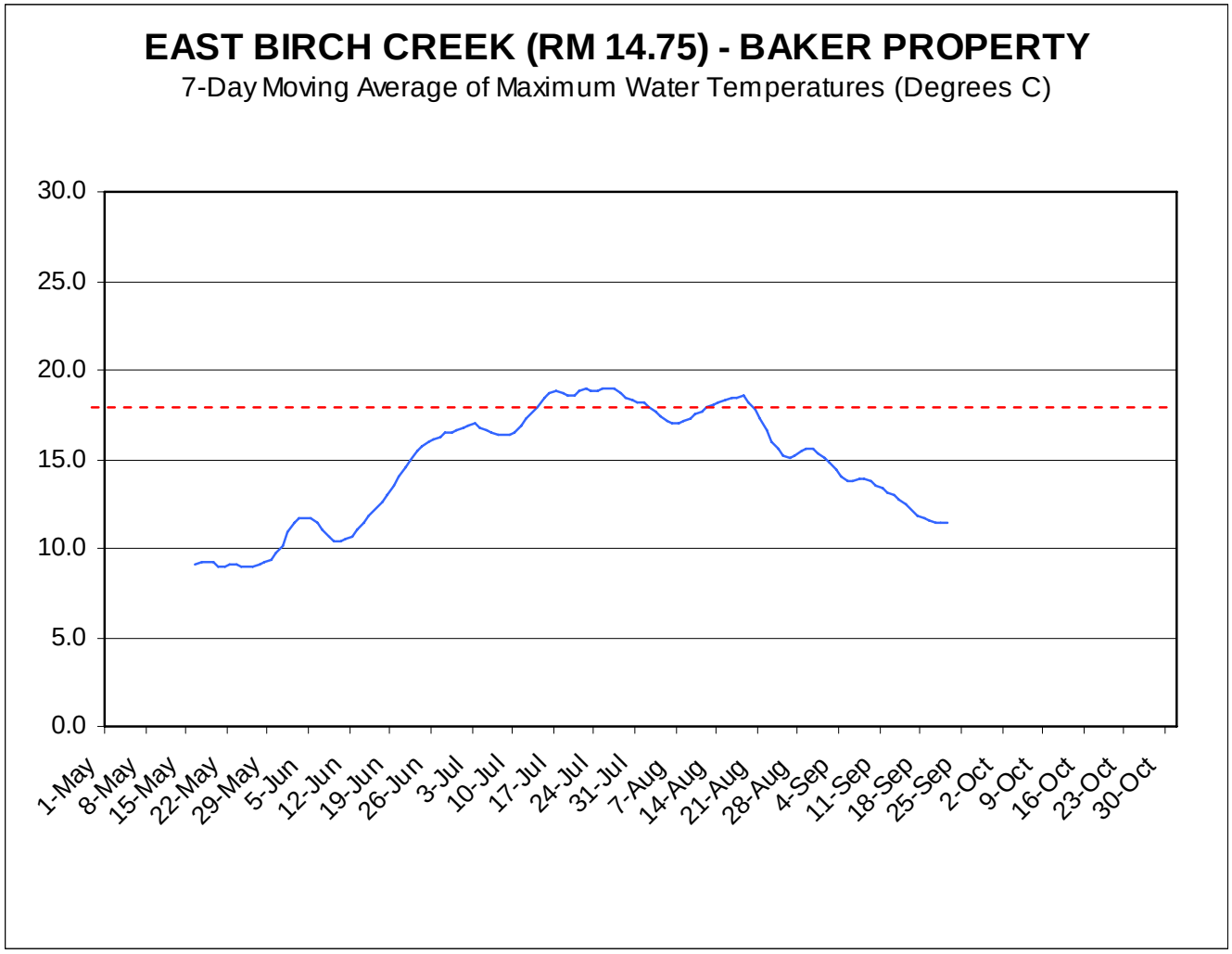
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
Daily Water Temperatures (Degrees Celsius) - September 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
Daily Water Temperatures (Degrees Celsius) - October 2004
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
Maximum
Minimum
Average


EAST BIRCH CREEK (RM 14.75) - BAKER PROPERTY
7-Day Moving Average of Maximum Water Temperatures (Degrees C)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1-May
8-May
15-May
22-May
29-May
5-Jun
12-Jun
19-Jun
26-Jun
3-Jul
10-Jul
17-Jul
24-Jul
31-Jul
7-Aug
14-Aug
21-Aug
28-Aug
4-Sep
11-Sep
18-Sep
25-Sep
2-Oct
9-Oct
16-Oct
23-Oct
30-Oct

APPENDIX J

Spawning Ground Survey Data

East Birch Creek: 2004 Steelhead Redd Counts (Houser & Brogoitti Properties)

Survey Date	Stream Section	Redd Number	Location	Surveyor Initials	Notes
April 14	Houser	--	~100' east of power pole/transformer	DSH	Fish observed (~30' TL)
April 14	Houser	1	~50' DS of "island"	DSH	~10' US of weir near L-bank.
April 14	Houser	2	~100' US from barn	DSH	~6' from L-bank
April 14	Houser	3	~40' US from Redd #2	DSH	~10' from L-bank. Not well defined
April 14	Houser	--	@ cross log, US of large cabled log at steep cut bank (L-bank)	DSH	Wild, male STS, spawned out, in poor condition
April 14	Houser	4	~100 yards from cabled log	DSH	Near center of channel (slightly to the left)
April 14	Houser	5	~25' DS of sharp meander	DSH	~10' from R-bank. Very well defined. 3 distinct 'pockets' visible.
April 14	Brogoitti	1	Bridge at Brogoitti's (House)	MM	Under Bridge
April 14	Brogoitti	2	Immediately US of Bridge	MM	South bank, upstream of X-Vane structure, Spawning pair on redd
April 14	Brogoitti	3	Near man-made wetland	MM	North bank
April 14	Brogoitti	4	--	MM	South Bank
April 14	Brogoitti	5	--	MM	South Bank
April 14	Brogoitti	6	--	MM	North bank
May 3*	Brogoitti	1	~25' US of maintenance site #2	DSH	Near R-bank, well defined
May 3*	Brogoitti	2	Immediately DS of lowermost J-hook in series (Maintenance site #3)	DSH	Near R-bank, at location of X-Section 3A, Fish observed near redd. Wild STS, sex unknown (Female?), spawned out, poor condition
May 3*	Brogoitti	3	Immediately US of Maintenance site #5	DSH	Near R-bank, very Near R-bank, well defined well defined

* May 3 redd counts recorded during the course of channel surveys - only walked section from bridge upstream to upper limit of Brogoitti property.

Follow-up survey on east Birch Creek scheduled for May 14/04 (initial count for West Birch Creek scheduled for same day) cancelled due to high water. Heavy rains (over three days) resulted in bankfull flow event. Determined that redds would likely be difficult to identify following the high water event, no further surveys conducted in 2004.

Approx. Length of Stream Surveyed (Miles):	2.73
Total Number of Redds Counted:	14
Redds-per-mile:	**5.13**