APPENDIX S

TECHNICAL MEMO ON IMPACTS TO AQUATIC RESOURCES (SWCA, 2006)

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TECHNICAL MEMORANDUM

TO: Analytical Environmental Services
FROM: Paul Fishman, M.S., CEP; Senior Consultant
SUBJECT: Cowlitz Indian Tribe Casino Project, Aquatic Resources: Response to USEPA Comments
DATE: December 21, 2006

SWCA has been requested by Analytical Environmental Services (AES) to review and respond to questions and issues from the US Environmental Protection Agency (EPA) concerning the subject project DEIS, specifically impacts to aquatic resources. This technical memorandum addresses the EPA questions and issues indicated by underlined section headings.

Water quality data presented for the unnamed tributary and the East Fork Lewis River are limited to January 2006, and therefore do not adequately characterize baseline conditions for these water bodies.

Additional temperature and flow stream data for the unnamed tributary were collected from spring into autumn at two locations by Olson Engineering (pers. comm. Olson Engineering 2006). A summary of these data is presented in the text box. During 2006 the unnamed stream had no water during the period July through October; this is probably typical of this small drainage. Water temperatures in the unnamed stream ranged from just under 12°C in November to 16.0°C in June.

Water quality data for the East Fork Lewis River are also limited; however, we obtained temperature data for the City of La Center wastewater treatment plant, including river temperature upstream of the La Center WWTP discharge point (personal communication, Sue Lawrence, Wastewater System Supervisor, November 14, 2006). The unnamed stream joins the East Fork Lewis River at river mile (RM) 1.6; the La Center WWTP outfall is at RM 3.2. The data obtained from the City of La Center include summer water temperature data, as maximum

DATA SUMMARY FOR UNNAMED CREEK (OLSON ENGINEERING 2006)

Downstream end of culvert under NW 319th Street

Flow range: 19MAY2006 0.00198 cfs (0.89 gpm)
09NOV2006 0.05 cfs (229.8 gpm)
stream dry 07JUL – 20OCT (sampling dates)

Water temperature range (C):
11.78 (9NOV2006) – 16.0 (22JUN2006)

Upstream end of culvert under Interstate 5

Flow range: 22JUN2006 0.01 cfs (5.88 gpm)
9NOV2006 0.90 cfs (406.18 gpm)
stream dry 26AUG2006 (sampling date)

Water temperature range (C):
11.67 (9NOV2006) – 15.3 (2JUN2006)

daily temperature (ºC), for 2004 and 2005 (Figures 1 and 2). The 2004 data are for the period August 6 through October 4; the 2005 data are for the period June 1 through October 31.

An analysis needs to be presented demonstrating that water quality standards will be met in these water bodies with the discharge of treated waste water effluent and stormwater.

Water temperature in the East Fork Lewis River at RM 3.2 appears to exceed the state water quality criterion of 18ºC during the summer months. During 2005, water temperature first exceeded 18º on June 20, then fluctuated above and below that criterion until July 12. Water temperature was above 18ºC from July 12 until mid-September, and was above 20ºC from July 14 until early September (Figure 2). The 2004 data do not show the onset of temperature exceedance, but do show that the river was above 18ºC from August 6 (the earliest data point for the year) until August 24, then fluctuated above and below that criterion until September 12 (Figure 1). River temperature was at or above 20ºC in 2004 between August 6 and August 23.

Wet season flows in the unnamed stream from stormwater runoff will be at or near ambient air temperature, and will therefore not adversely impact conditions in the stream (Olson Engineering 2006a). Stormwater during summer storm events is expected to infiltrate into soils and evaporate in the stormwater facilities. The result will be either no stormwater discharges to the stream during summer, or very infrequent discharges. The existing condition of the stream at the project site is no water during the summer.

Stormwater effluent characteristics have been estimated for the four proposed stormwater facilities (Olson Engineering 2006a). The ranges of estimated concentrations are:

- Total suspended solids 1.2 – 3.0 mg/l
- Total Kjeldahl nitrate 0.43 – 0.77 mg/l
- Copper 0.0015 – 0.004 mg/l
- Lead 0.0046 – 0.013 mg/l
- Zinc 0.0098 – 0.028 mg/l
- Phosphorous 0.013 – 0.0385 mg/l
- Cadmium 0.00003 – 0.00008 mg/l

The concentrations listed above are in compliance with Washington SEPA limits under Clark County municipal permit conditions for stormwater effluent discharges.

The proposed wastewater treatment facility for the project is designed to meet or exceed effluent water quality requirements (Olson Engineering 2006b). Wastewater effluent from the treatment facility will run through an underground pipe field where heat transfer to the soil will lower the effluent temperature to below 18ºC (the estimated effluent temperature at the discharge point is 16ºC). During the summer months, wastewater effluent will be the only flow in the

unnamed stream, and the temperature of this water will be lower than the water temperature in the East Fork Lewis River at the junction of the two streams (see Figures 1 and 2).

The proposed wastewater treatment facility will be a membrane bioreactor (MBR) system designed for denitrification, with ultra-violet disinfection. Estimated wastewater effluent characteristics for the proposed wastewater treatment facility are shown below (Olson Engineering 2006b).

PARAMETER	AMOUNT
Average daily flow	-36,500 to 304,000 gpd (-0.057 to 0.471 cfs) (a)
Maximum daily flow	-46,623 to 490,000 gpd (0.072 to 0.760 cfs) (a)
Temperature	16ºC
pH	7.0 to 8.0
Fecal coliform colonies	<2/100ml
Biochemical oxygen demand (BOD)	<5 mg/L
Total suspended solids (TSS)	<1 mg/L
Ammonia as nitrogen (NH_3-N)	<1 mg/L
Turbidity	<1 NTU

Note: (a) negative flow indicates reuse of wastewater effluent.

All of the wastewater effluent characteristics shown above meet water quality standards for the receiving waters and will not result in adverse ecological effects to the unnamed stream or the East Fork Lewis River.

The analysis needs to focus on seasons when fecal coliform and temperature are at their maximums.

As discussed in the previous sections, water temperature in the East Fork Lewis River is at the maximum during summer months. Temperature data for the East Fork Lewis River indicate that 18ºC is exceeded from approximately late June through mid-September (Figures 1 and 2). Because the project area unnamed stream tributary to the East Fork is presently dry during the summer, the effluent from the wastewater treatment plant will constitute summer flow in the stream. The effluent is estimated to be approximately 16ºC, which will be cooler than summer temperatures in the East Fork.

Fecal coliform data for the East Fork Lewis River are available for a Washington Department of Ecology long-term water quality monitoring station at Dollar's Corner (WQ Station 27D090). The Dollar's Corner water quality station is at river mile 10.2, which is 8.6 river miles upstream from the junction of the project area unnamed stream and the East Fork Lewis River. Monthly fecal coliform data for the Dollar's Corner station is shown in Figure 3 for the water years (WY) from 1976 through 2005, and in Figure 4 for water years 2000 through 2005. The East Fork Lewis River is a Class A stream, for which the water quality criterion for fecal coliform bacteria is a geometric mean value of 100 colonies/100 ml, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200/100 ml. Fecal coliform bacteria samples at the Dollar's Corner

station occasionally exceeded 200 colonies per 100 ml during the almost 30 years of record (Figure 3). A closer examination of the data, using as an example the six-year period shown in Figure 4, shows that fecal coliform maxima tend to occur during late June (2 of 6 years), late July (2 of 6 years), late September (3 of 6 years), and once each in April and November. Three of the six years shown in Figure 4 had two peak coliform events. Only two samples during this period, however, exceeded 200 colonies per 100 ml.

The estimated fecal coliform level in the proposed wastewater effluent is <2 colonies per 100 ml (Olson Engineering 2006b). If one assumes that during summer months the entire flow of the unnamed stream will be wastewater effluent, the estimated fecal coliform levels will not degrade water quality or exceed water quality criteria in the East Fork Lewis River.

The impacts of existing septic systems on the site, combined with livestock use, on fecal coliform levels in the streams need to be addressed.

Development of the subject property for the proposed uses will eliminate livestock from the site. Use of existing septic systems will also be terminated. The removal of these two potential sources of fecal coliform contamination from the site will reduce the levels of fecal coliform in the unnamed stream from the existing condition.

Baseline nitrogen (total ammonia as nitrogen) data for the affected streams need to be provided, as well as for the proposed wastewater and stormwater discharges, in order to demonstrate that CWA antidegradation provisions will be met for the project.

The NPDES permit for the City of La Center WWTP has a summer (June - October) standard of 4.5 mg/L monthly and 9 mg/L daily for total ammonia as nitrogen. The La Center NPDES Permit fact sheet Appendix C shows calculations to determine the ammonia standard based on WAC 173-201A. Based on those calculations the summer Acute Total Ammonia as Nitrogen Criteria was 4.5 mg/L and the Summer Chronic Total Ammonia as Nitrogen Criteria was 0.73 mg/L. For the winter the Acute Total Ammonia as nitrogen Criteria was 9.5 mg/L and the Chronic Total Ammonia as Nitrogen Criteria was 2.16 mg/L. Using those numbers the proposed project WWTP should not have a problem meeting the ammonia standard, with the possible exception of the Summer Chronic Total Ammonia as Nitrogen criterion. For the proposed plant the ammonia and nitrogen will be taken out in the anoxic basin ahead of the MBR's. The WWTP anoxic basins can be sized to achieve the appropriate level of denitrification and therefore lower the effluent ammonia level to meet the criterion. The <1 mg/L effluent estimate for total ammonia shown in a previous section is based on case studies of similar MBR WWTPs that probably had higher ammonia standards (B. Stepp, Olson Engineering, pers. commun. December 19, 2006). CWA antidegradation provisions for the project area streams will be met through design of the WWTP.

The EIS needs to discuss the pre-project beneficial uses of the unnamed seasonal stream and how these uses will be maintained when the project changes the stream to perennial.

All surface waters of the State of Washington[1] have the following designated uses that are protected: salmon and trout spawning, noncore rearing, and migration; primary contact recreation; domestic, industrial, and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values (WAC 173-201A-600 Use Designations – Fresh Waters).

The unnamed stream does not presently provide primary contact recreation; domestic, industrial and agricultural water supply; stock watering; harvesting; commerce and navigation; or boating. These designated uses are not likely to be realized under the present seasonal condition and size of the stream. The stream presently provides wildlife habitat, although in-stream habitat use is limited to times of year when there is water in the stream (fall through spring). The lower reach of the stream might presently provide limited noncore rearing for salmon and trout during the period fall through spring (see next section).

Under the proposed wastewater effluent discharge scenario to the unnamed stream, additional wildlife habitat designated uses and potentially salmon and trout noncore rearing uses could be provided during summer months.

The EIS needs to analyze and discuss in more detail the impacts to ESA-listed fish species in the project area, and how the proposed mitigation measures will avoid or minimize project impacts to those species.

ESA-listed fish species in the project area include: Lower Columbia River Chinook salmon (Threatened), Lower Columbia River Coho salmon (Threatened), Lower Columbia River Steelhead (Threatened), and Columbia River Chum salmon (Threatened). Detailed life history information for these species (and other sensitive species present in the East Fork Lewis River) is presented in Figures 5 and 6.

The proposed storm- and wastewater discharges to the unnamed stream do not pose potential adverse impacts to ESA-listed fish species in the East Fork Lewis River. Discharge parameters, as discussed above, will meet or exceed water quality compliance criteria and therefore will not result in adverse changes to East Fork Lewis River water quality.

A possible beneficial result of proposed wastewater discharges to the unnamed stream will be perennial flow in the stream through the summer. The discharged water will be cooler than water in the East Fork Lewis River during summer months (see above), potentially providing a cooler water refugium for rearing

[1] With the exception of waters specifically named in Table 602, WAC 173-201A-602; project area streams are not named in Table 602.

Chinook salmon juveniles (see Figure 6) in the lower section of the unnamed stream (below the waterfall).

Figure 1. East Fork Lewis River Upstream of La Center WWTP: 2004

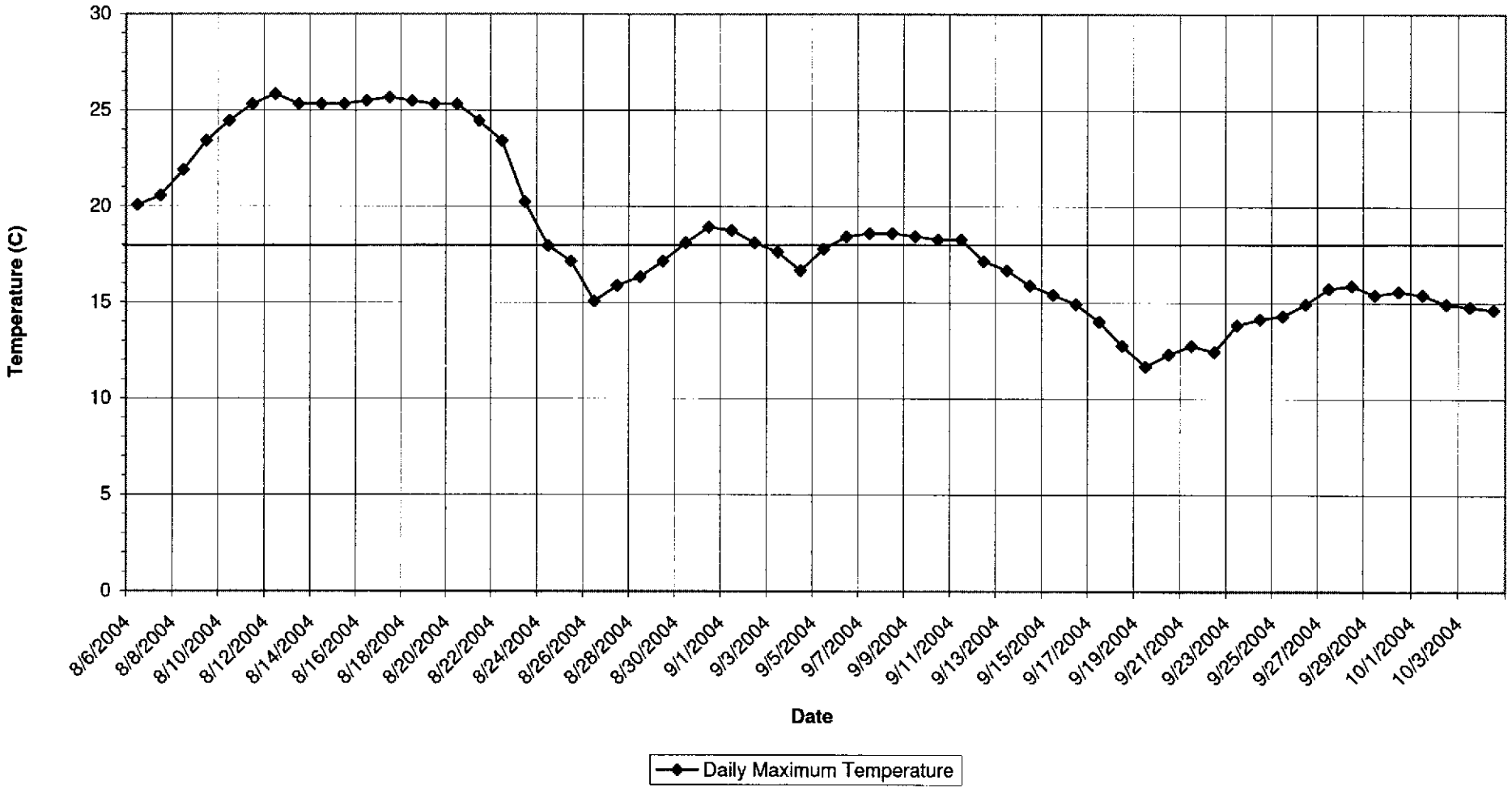


Figure 2. East Fork Lewis River Upstream of La Center WWTP: 2005

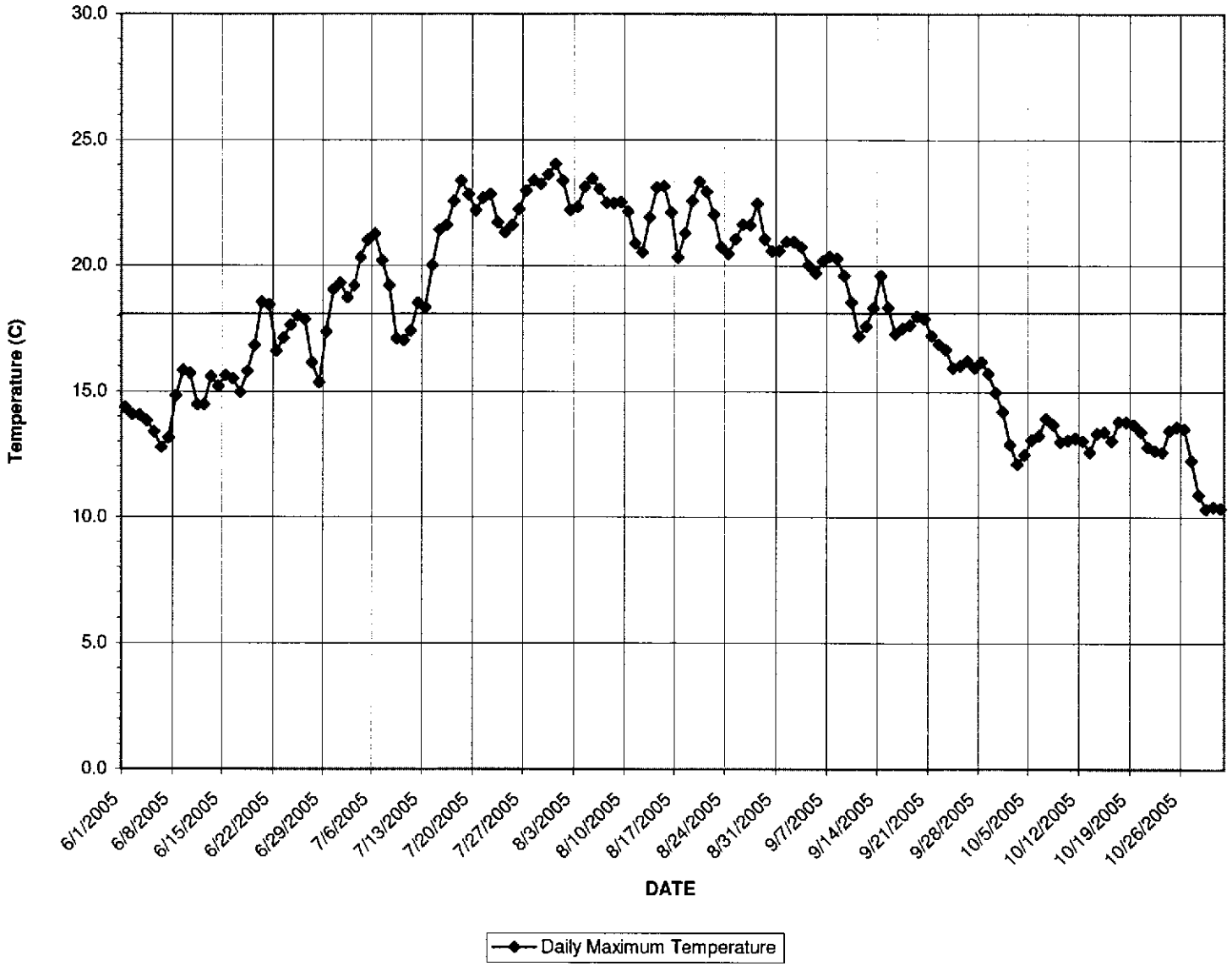


Figure 3. Fecal Coliform Data for East Fork Lewis River, Dollars Corner Station: 1976-2005

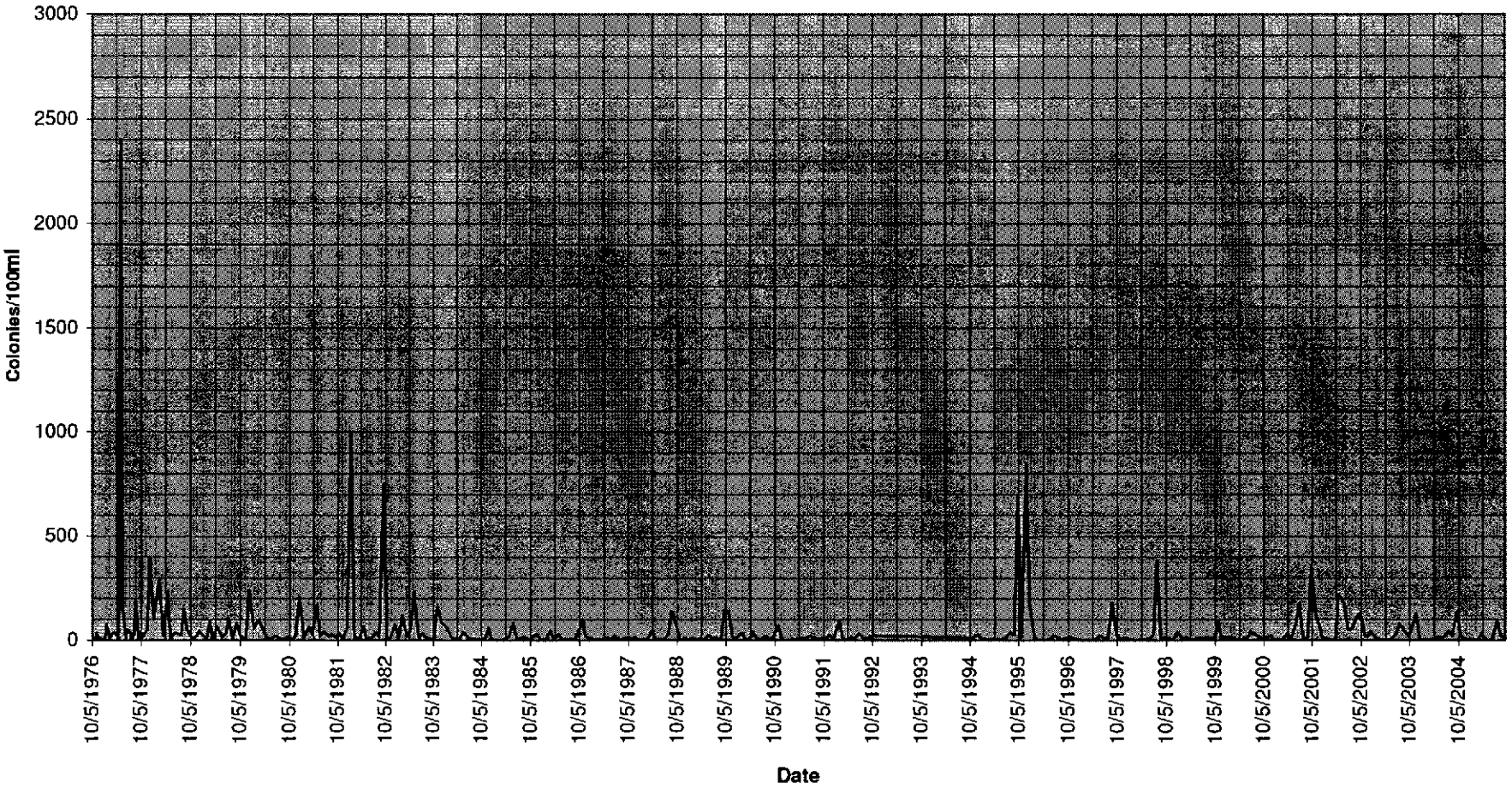


Figure 4. Fecal Coliform Data for East Fork Lewis River, Dollars Corner Station: WY 2000-2005

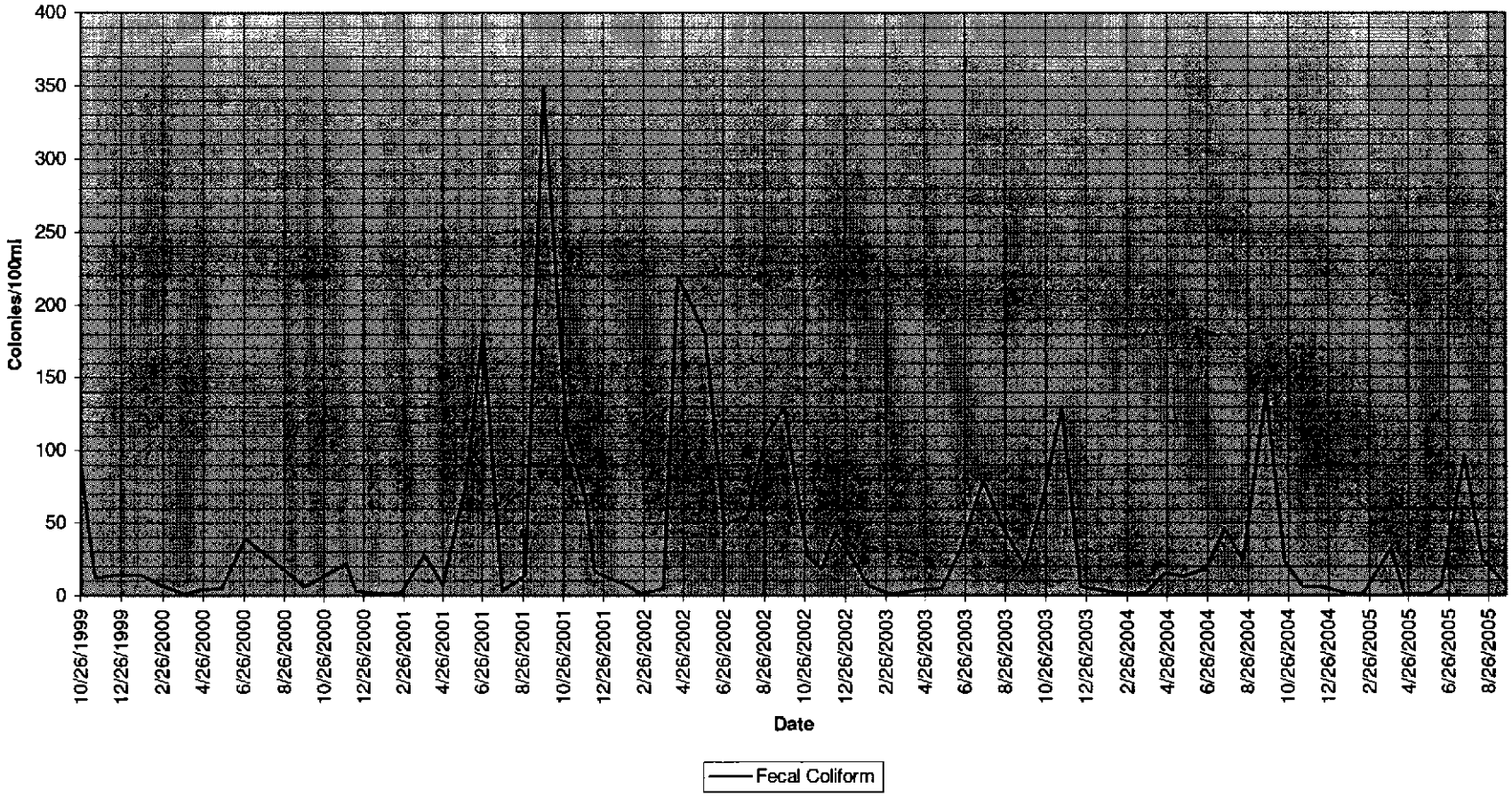


Figure 5. Timing of upstream adult salmonid, trout, and lamprey migrations and spawning in the East Fork Lewis River (adapted from LCFRB 2004, Wydoski & Whitney 2003). Gray bars denote estimated total period of occurrence, black bars denote peak periods, and diagonal bars denote adult over-wintering period prior to spawning.

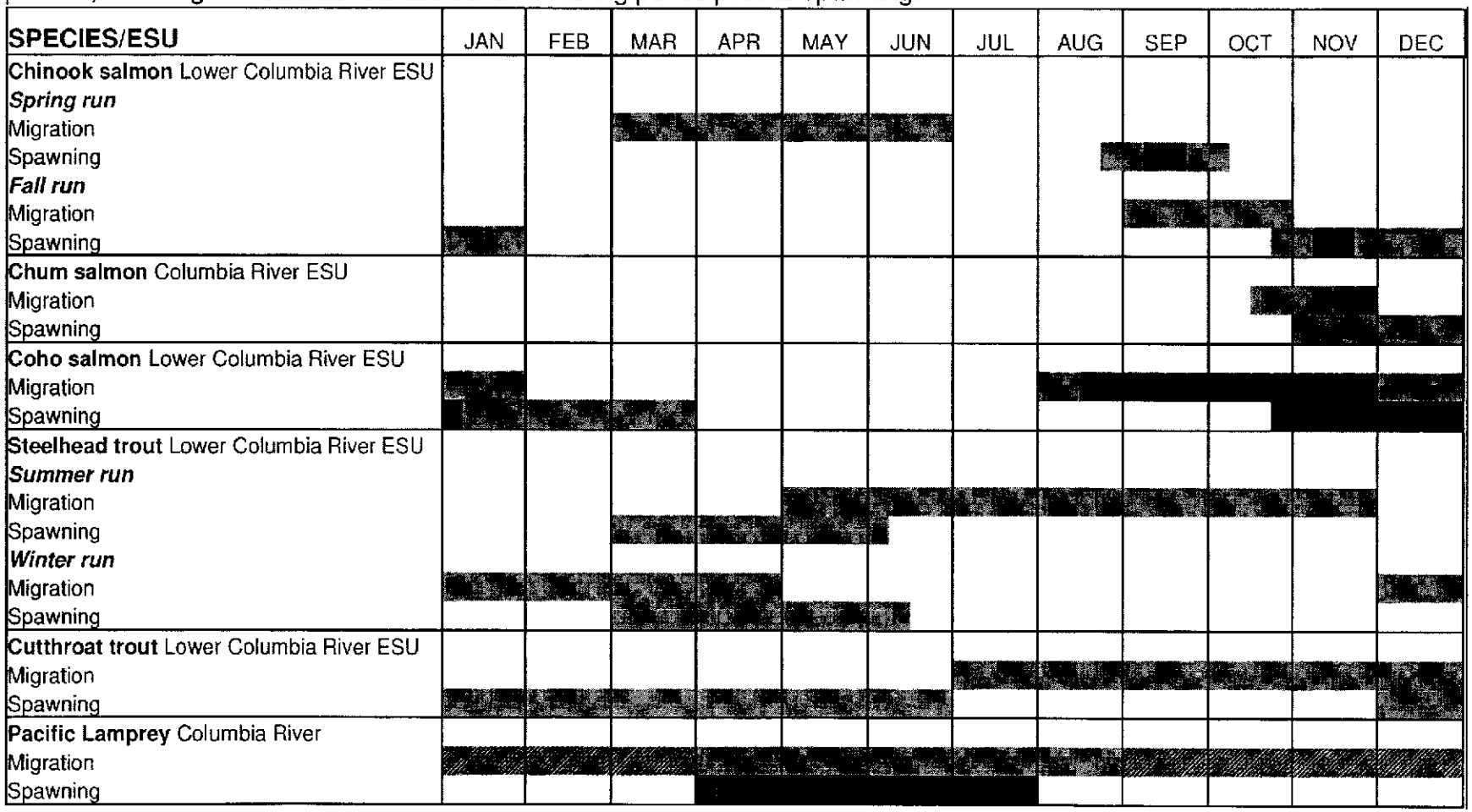
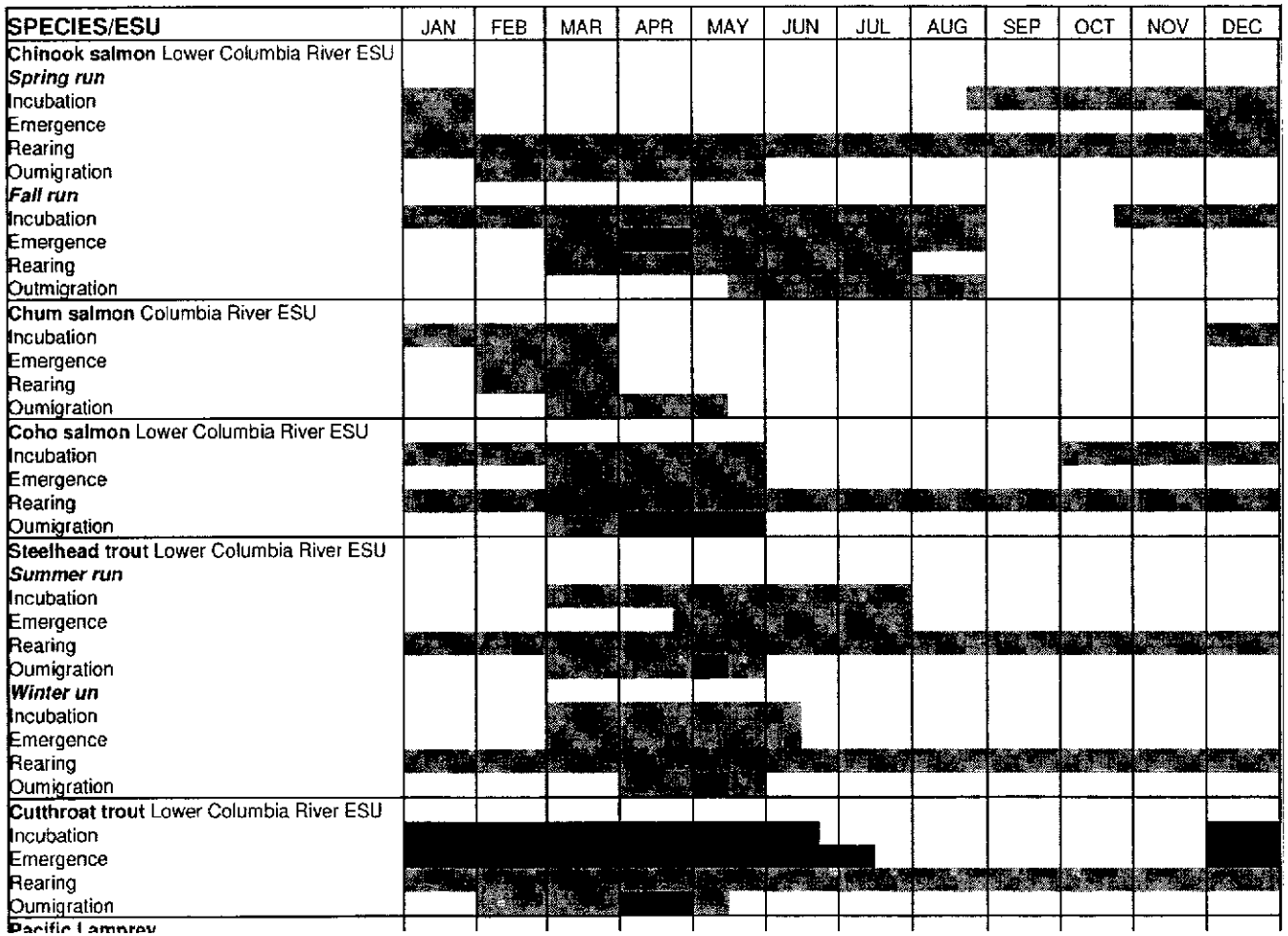


Figure 6. Timing of juvenile salmonid, trout, and lamprey incubation, emergence, rearing, and downstream emigration in the East Fork Lewis River (adapted from LCFRB 2004, Wydoski & Whitney 2003). Gray bars denote estimated total period of occurrence and black bars denote peak periods.



CITATIONS

Lower Columbia Fish Recovery Board. December 15, 2004. Lower Columbia Salmon Recovery And Fish & Wildlife Subbasin Plan. Appendix A – Focal Fish.

Olson Engineering, Inc. 2006a. Cowlitz Indian Tribe Casino Project Stormwater Report Addendum. Prepared for Analytical Environmental Services.

Olson Engineering, Inc. 2006b. Cowlitz Indian Tribe Casino Project Wastewater Report Addendum. Prepared for Analytical Environmental Services.

Wydoski, R. S., and R. R. Whitney. 2003. Inland fishes of Washington, 2nd Edition. American Fisheries Society, Bethesda, Maryland and University of Washington Press, Seattle.