

Appendix C

Total Dissolved Gas Exposure Estimates at Ives Island, Spawning Years 2002–2004

Appendix C

Total Dissolved Gas Exposure Estimates at Ives Island, Spawning Years 2002–2004

During 2002, 764 chum salmon redds were constructed on the north side of Ives Bar, as well as on the southwest side of the bar, at riverbed elevations ranging from 5.29 ft to 17.97 ft (Figure C.1). Approximately 80% of the redds were constructed at elevations that were easily depth-compensated that year. At the elevation at which 50% of the redds were lower, there were no significant exposures to TDG above 100% (Figure C.2). Above the 80th percentile elevation, redds were exposed to TDG higher than 100% for 103 hours and to 103% TDG for 1 hour. Redds above the 80th elevation percentile became dewatered frequently, and exposure estimates to these high-elevation redds are thus very low.

During 2003, 195 chum salmon redds were constructed on the north and southwest side of Ives Bar, at riverbed elevations ranging from 5.61 ft to 13.28 ft (Figure C.3). Relative to most other years, 2004 was a low water year during emergence (Figure 1.33). At the elevation at which 50% of the redds were lower, the redds were exposed to depth-compensated TDG above 100% for 211 hours (Figure C.4). Redds above this elevation were exposed to depth-compensated TDG higher than 103% for 31 hours and above 105% for 6 hours. Above the 80th percentile elevation, redds were exposed to depth-compensated TDG greater than 100% for 655 hours, TDG above 103% for 175 hours, and TDG above 105% for 47 hours (Figure C.4).

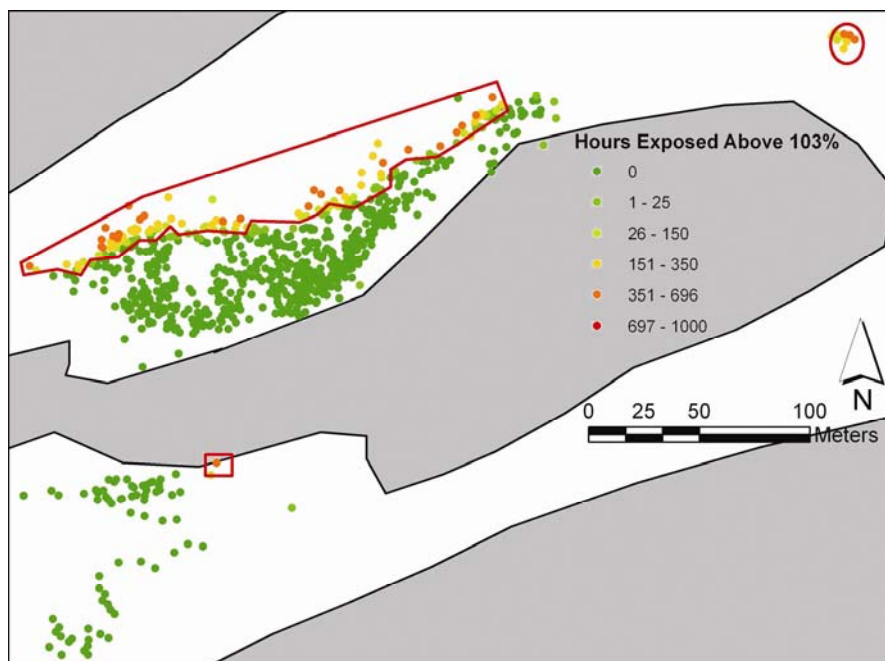


Figure C.1. Estimated TDG exposure to chum salmon sac fry using incubation year 2003 surface water results and the redd distribution for spawning year 2002. Red lines outline areas where redds were dewatered for more than 103 hours.

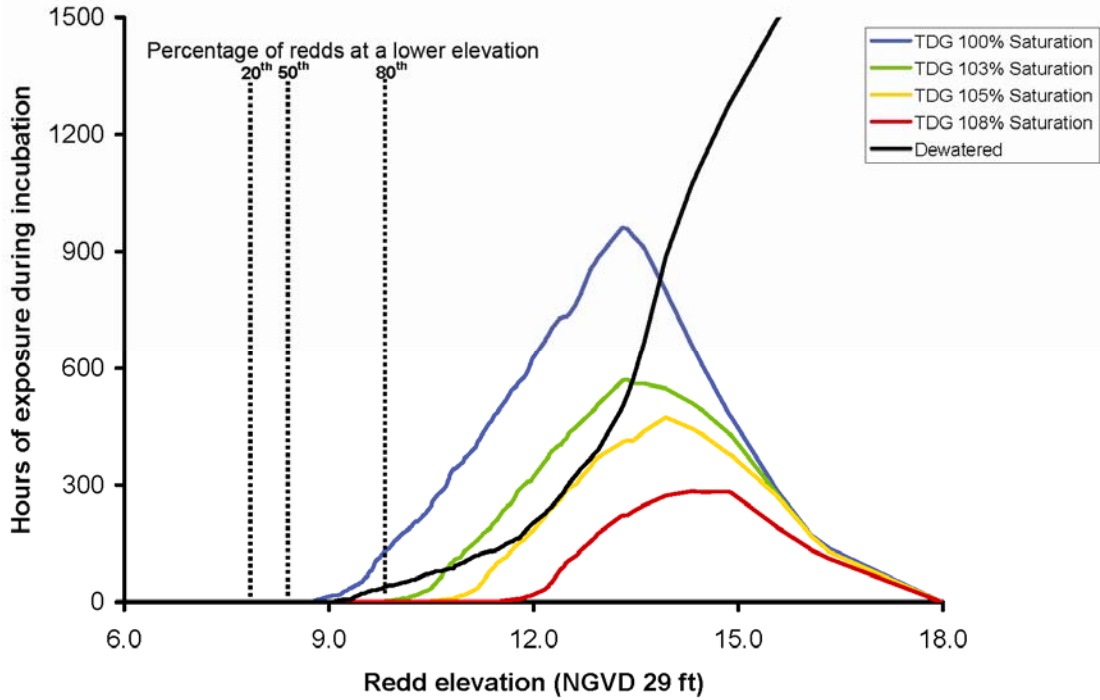


Figure C.2. Estimated hours of TDG exposure and dewatering to chum salmon sac fry based on surface water results from incubation year 2003. Dashed lines show the 2002 redd elevation distribution percentiles.

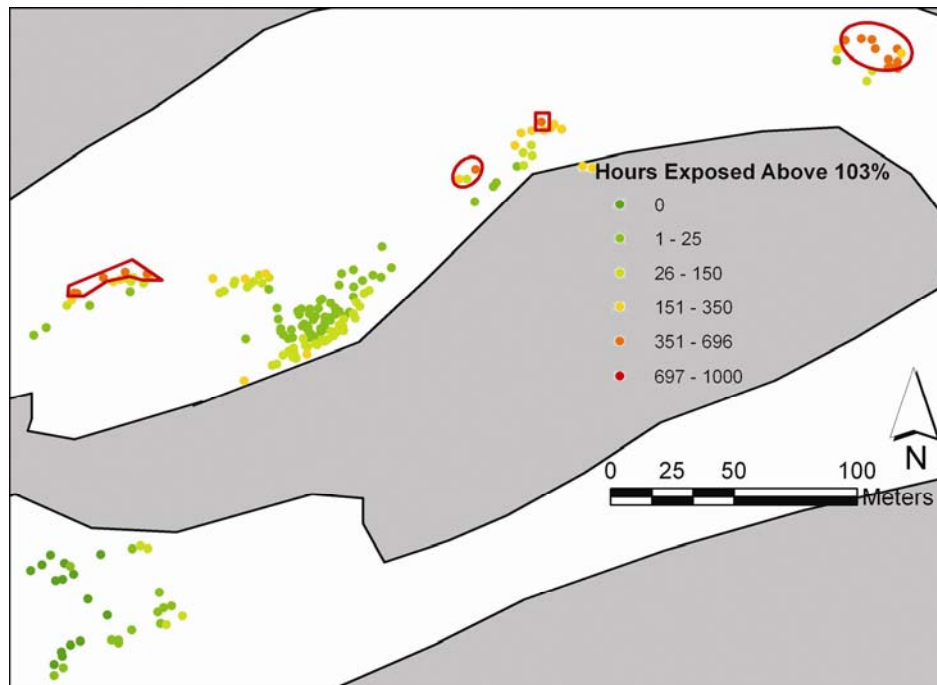


Figure C.3. Estimated TDG exposure to chum salmon sac fry using incubation year 2004 surface water results and the 2003 redd distribution. Red lines outline areas where redds were dewatered for more than 103 hours.

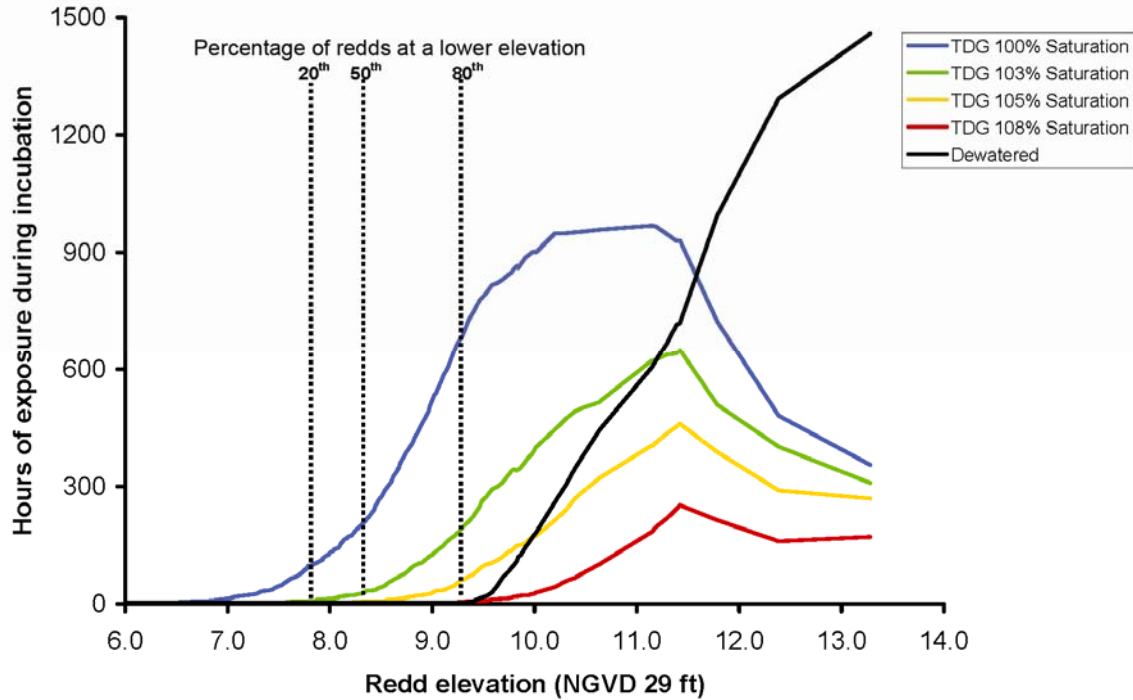


Figure C.4. Estimated hours of TDG exposure and dewatering to chum salmon sac based on surface water results from incubation year 2004. Dashed lines show the 2003 redd elevation distribution percentiles.

During 2004, 181 chum salmon redds were constructed, primarily on the north side of Ives Bar, at riverbed elevations ranging from 6.99 to 9.73 ft (Figure C.5). Relative to most other years, 2005 was a low water year during emergence (Figure 1.33). At the elevation at which 50% of the redds were lower, the redds were exposed to depth-compensated TDG above 100% for 733 hours (Figure C.6). Redds above this elevation were exposed to depth-compensated TDG higher than 103% for 267 hours and above 105% for 67 hours. Above the 80th percentile elevation, redds were exposed to depth-compensated TDG higher than 100% for 922 hours, TDG above 103% for 434 hours, and TDG above 105% for 188 hours (Figure C.6).

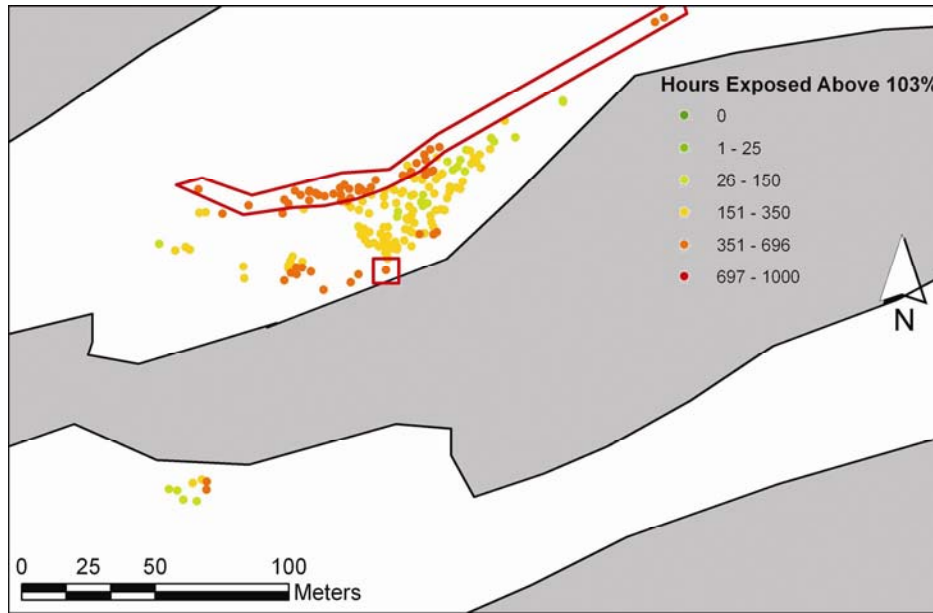


Figure C.5. Estimated TDG exposure to chum salmon sac fry using incubation year 2005 surface water results and the 2004 redd distribution. Red lines outline areas where redds were dewatered for more than 103 hours.

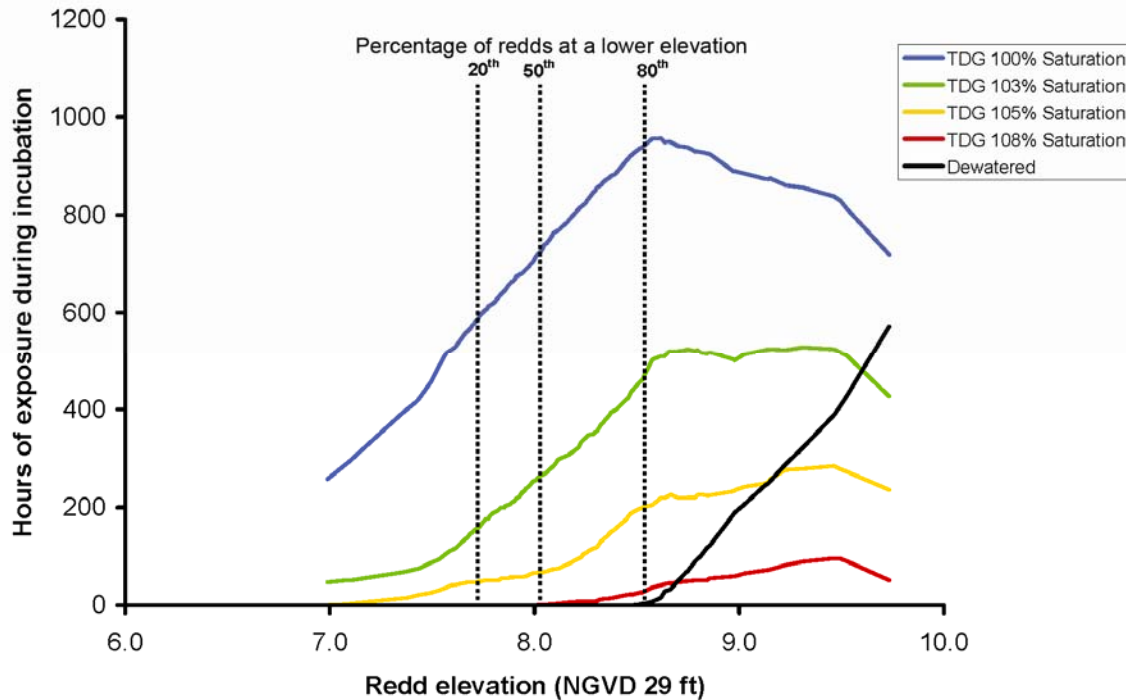


Figure C.6. Estimated hours of TDG exposure and dewatering to chum salmon sac fry based on surface water results from incubation year 2005. Dashed lines show the 2004 redd elevation distribution percentiles.