



September 21, 2011

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Subject: Comments on Draft Program Environmental Impact Statement/Environmental Impact Report on San Joaquin River Restoration Program

Dear Ms. Forsythe:

We submit these comments on behalf of the California Water Impact Network (C-WIN), the California Sportfishing Protection Alliance (CSPA), AquAlliance, the Pacific Coast Federation of Fishermen's Associations (PCFFA), the Planning and Conservation League (PCL) and the Institute for Fisheries Resources (IFR) on the Draft Program Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the San Joaquin River Restoration Program. CSPA and PCFFA were plaintiffs in the NRDC v. Patterson litigation that resulted in the San Joaquin River Settlement Act and subsequent San Joaquin River Restoration Program.

Alternatives

We support selection of Alternative A2 as the environmentally preferred alternative because it would provide flows of 4,500 cfs in Reach 4B1 and allow recapture of flows in the Delta rather than upstream. As we understand it, this alternative would allow the maximum amount of water to flow to the Delta for recapture and the maximum potential flows through Reach 4B1. We believe that this alternative would provide the greatest benefits to the fishery by allowing the maximum volume

of clean water released from Friant Dam to be available in-river the longest possible distance from Friant Dam to the state and federal Delta pumps.

Impact Analysis- Selenium

While we support the successful reintroduction of fall run and spring run Chinook salmon in the San Joaquin River, the impact analysis does not adequately describe the risks to salmon due to selenium pollution from irrigation of the western San Joaquin Valley. The Grasslands Bypass Project has been discharging highly contaminated groundwater and agricultural pollution from the northerly area of the San Luis Unit of the CVP since 1995. At the time of the San Joaquin River Settlement Agreement it was assumed that polluted discharges from the Grasslands Bypass Project into Mud Slough North and the San Joaquin River would cease by 2010. However, plans are to continue doing so through 2019. The harmful impacts of these discharges on juvenile salmonids in the San Joaquin River have not been analyzed in this Draft Program EIS/EIR. These impacts should be analyzed, especially in light of the recent U.S. Geological Survey report on the toxicity of selenium in the Bay-Delta¹ and the recent water quality report on the Delta-Mendota Canal which showed violations of the 2 ppb water quality objective in Delta Mendota Canal (Check 21) adjacent to the Mendota Pool for five of the first six months of 2011.²

USGS Selenium Report

Since 2002, under the Clean Water Act, Section 303, and the Endangered Species Act, the United States Environmental Protection Agency (USEPA) has been required to adopt national and California acute and chronic aquatic life criteria for Selenium under what is called "The California Toxics Rule."³ The overdue requirement is to take into account the bioaccumulation of this contaminant as it magnifies throughout the food chain often causing reproductive failure, teratogenic effects and death. The terms and conditions of the California Toxics Rule also included USEPA's reevaluation and revision of selenium criteria for the protection of semi-aquatic wildlife.

The just released peer reviewed United States Geological Survey (USGS) Administrative Report, also part of the terms and conditions of the California Toxic Rule, models the fate and transport of selenium in the San Francisco Bay-Delta Estuary and as agreed, the report will serve as the basis for USEPA's revised

¹ See "Ecosystem-Scale Modeling in support of Fish and Wildlife Criteria Development for the San Francisco Bay-Delta Estuary, California." By Theresa S. Presser and Samuel N. Luoma, U.S. Geological Survey, Menlo Park, CA. Administrative Report, December 10, 2010, available with figures, tables and appendices at <http://www.epa.gov/region9/water/ctr/>, accessed 9/12/11.

² See http://www.c-win.org/webfm_send/186 and http://www.c-win.org/webfm_send/187, accessed 9/12/11.

³ See "Selenium and the California Toxics Rule" on the C-WIN website at <http://www.c-win.org/selenium-and-california-toxics-rule.html>

selenium water quality criteria for the protection of fish and wildlife species for the Bay-Delta estuary. In order to comply with the California Toxics Rule Biological Opinion, another effort and report is still required to revise selenium criteria for the rest of California, which includes the San Joaquin River.

USEPA released the Administrative Report by the US Geological Survey in September 2011 documenting that the existing Bay-Delta selenium water quality standard of 5ppb is inadequate to protect Bay-Delta fish and wildlife. The USGS report provides the scientific basis for changing to a selenium water quality standard of less than 1 ppb, in some cases substantially less than 0.5 ppb. This change is needed to protect economic resources of the Delta Estuary and Bay including salmon, steelhead, sturgeon, and diving birds. While it does not include a selenium analysis of food webs and impacts to salmonids in the San Joaquin River, it raises significant questions about the adequacy of the existing 5 ppb selenium water quality objective for the San Joaquin River, which is identical to the Bay-Delta's 5 ppb selenium water quality objective. The same analysis USGS utilized for the Bay-Delta should also be performed for the San Joaquin River Restoration Program to determine selenium's impacts on efforts to restore spring and fall Chinook salmon to the San Joaquin River.

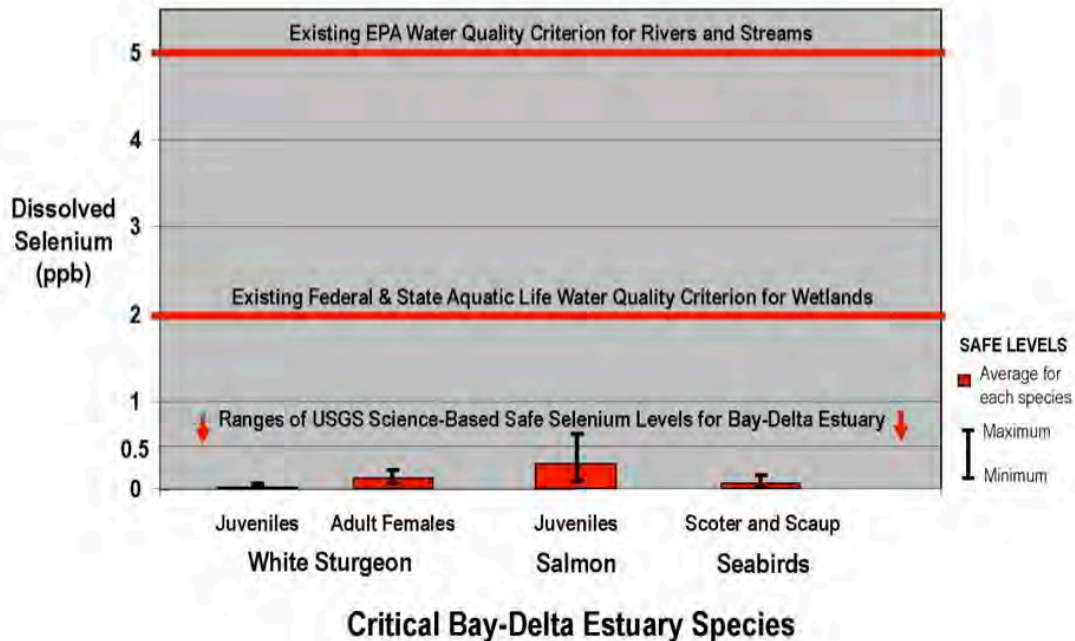
The USGS study evaluated a series of selenium exposure scenarios using a set of specific guidelines and modeling choices from the range of temporal hydrodynamic conditions, geographic locations, food webs, and allowable dissolved, particulate, and prey Se concentrations (which we have referred to as "safe levels"). According to the USGS, "The specificity of these scenarios demonstrates that enough is known about the biotransfer of Se and the interconnectedness of habitats and species to set a range of limits and establish an understanding of the conditions, biological responses, and ecological risks critical to management of the Bay-Delta".

The summary graphic below shows the results for critical Bay-Delta species, aggregated across all combinations of target tissues (e.g. Whole body, eggs, or diets) that have known levels of concerns, as summarized by the U.S. Fish and Wildlife Service. Results are also combined across all hydrologic conditions for each species.

The ranges of "allowable" or safe levels of dissolved selenium clearly show that, although EPA will need to specify exact safety levels, flow conditions, and species, new standards for the Bay-Delta will need to be substantially less than 0.5 parts per billion dissolved selenium in order to be protective. A similar analysis should be conducted for the San Joaquin River Restoration Program by USGS to determine if selenium contamination from the Grasslands Bypass Project and other sources is impacting efforts to restore Chinook salmon. The analysis could then be used to determine who is responsible for the pollution and what remedial action is necessary to ensure restoration success.

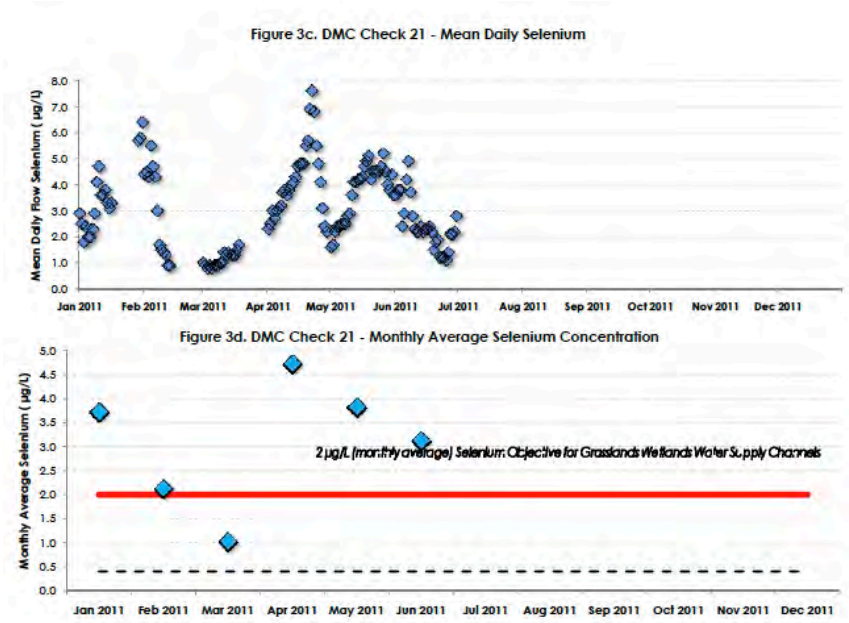
Existing Selenium Water-Quality Standards Do Not Protect Bay-Delta Species:

A new USGS study, which will be used by EPA to revise standards, shows that much lower levels of selenium will be required to protect critical species.



Delta-Mendota Canal Selenium Violations

Recently released Reclamation water quality monitoring reports for the Delta Mendota Canal adjacent to Mendota Pool on the San Joaquin River confirm selenium violations of the existing 5 ppb standard for five months out of the first six months of 2011. The Delta Mendota Canal at this location serves thousands of acres of wildlife refuges, duck clubs, and wetlands in the San Joaquin Valley, is upstream of the Delta, but most importantly is also located on the migration route of potentially restored San Joaquin River Chinook salmon runs. See Figures 3c and 3d below.



Selenium concentrations in the San Joaquin River at Hills Ferry have not only exceeded selenium aquatic life criterion regularly since 1997, they have sometimes exceeded USEPA’s drinking water Maximum Contamination Level (MCL) for drinking water. See Figure 5 below.

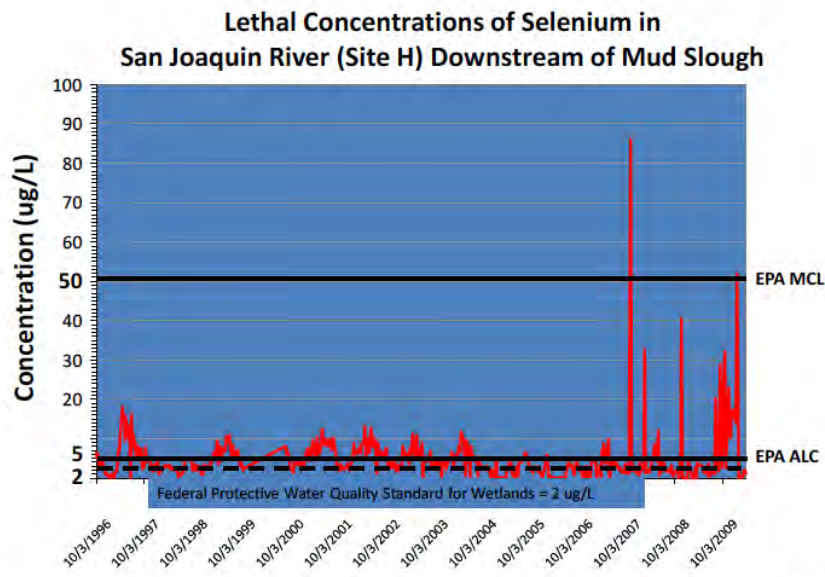
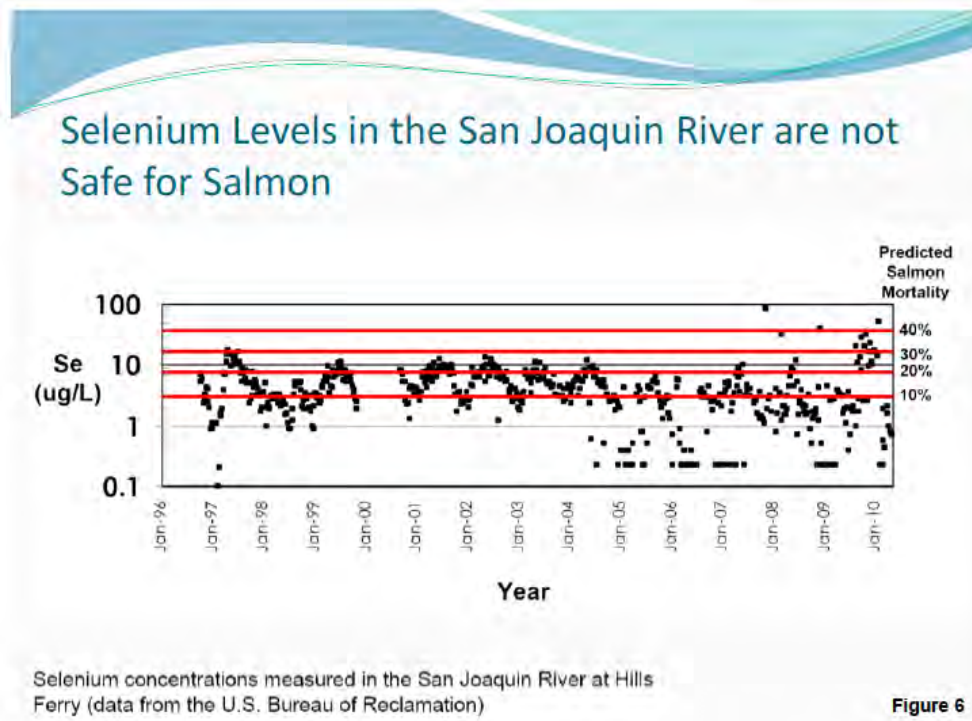


Figure 5

Data from USBR MCL=Maximum Contaminant Level for Drinking Water ALC=Aquatic Life Criterion

The selenium concentrations found in the San Joaquin River at Hills Ferry are clearly toxic to juvenile salmon and steelhead, even if Basin Plan selenium objectives were met, which they are not. See Figure 6 below.



We strongly oppose continued pollution of the Delta Mendota Canal, the San Joaquin River and refuge water supplies with selenium and other harmful contaminants which will impair restoration of Chinook salmon in the San Joaquin River. The parties responsible for this pollution should be held accountable and discharges should cease much sooner than 2020 in order to protect fish, wildlife and public health.

Failure to address this water pollution and determine the sources of selenium contamination in the Delta-Mendota Canal and the San Joaquin River has been ongoing for years. C-WIN, CSPA, AquAlliance, PCFFA, PCL and IFR believe that some of this selenium contamination of the San Joaquin River may be a result of San Joaquin River Exchange Contractor water transfers as well as groundwater pumping for water transfers into various canals and aqueducts, including, but not limited to the Delta-Mendota Canal. The PEIS/EIR should examine where the pollution is coming from.

There is no longer monitoring of selenium and other pollution in the San Joaquin River below Crows Landing, nor is this pollution being monitored as it travels to and through the Bay-Delta. The Department of Fish and Game is currently not monitoring for selenium in the Grasslands area because funding has not been provided by Reclamation. Most of the remaining selenium samples are weekly grab samples, except for Hills Ferry, which is now a monthly grab sample. The sporadic nature of the selenium sampling program masks spikes and understates the level of pollution. Since San Joaquin River salmon must run the gauntlet of contaminant levels from the Delta up through the San Joaquin River, the San Joaquin River

Restoration Program EIS/EIR should identify and implement a comprehensive selenium monitoring program for the Bay-Delta estuary and the San Joaquin River with triggers to be implemented when water quality standards are being violated that would harm salmonids.

We submit to you as further evidence of selenium problems a letter from salmonid selenium biologist Dennis Lemly in which he states that selenium discharges from the Grasslands Bypass Project will result in the mortality of up to half of the juvenile salmonids in the San Joaquin River. The Draft EIS/EIR should fully analyze the impacts of existing selenium discharges into the San Joaquin River from the Grasslands Bypass Project, as well as the impacts of the various alternatives on the fate and distribution of selenium in the San Joaquin River and the Bay-Delta estuary.

For instance, will higher San Joaquin River flows from Friant Dam result in greater mobilization of selenium into the Bay-Delta? What level of dilution will the increased San Joaquin River flows provide in areas where selenium water quality objectives are regularly violated (Mendota Pool to Merced River)? How will these changes in San Joaquin River flow affect mobilization and bioaccumulation of selenium in the various river reaches and affected downstream ecosystems? The potential for increased mobilization of selenium into the Delta could be a negative impact (FSH-32) for some alternatives and was not adequately analyzed in the Draft EIS/EIR.

Cumulative Impacts

Delta Plan and SWRCB Delta Outflow Decision- The Cumulative Impacts chapter omits two extremely significant ongoing programs. One omission is the Delta Plan, which is required to be completed and approved by the Delta Stewardship Council by January 1, 2012 in order to meet the Delta's co-equal goals of water supply reliability and ecosystem restoration. The other program is the State Water Resources Control Board's Delta Outflow Criteria and its potential impact on the amount of water that the San Joaquin River basin will be required to provide for Delta outflows. Both of those programs/plans may ultimately result in San Joaquin River water right holders providing additional water for Delta outflows, including water from the Friant Division. Junior San Joaquin River water rights held by Reclamation in Friant Dam could be required to be released to the Delta and not recirculated in the state and federal pumps located there, but instead allowed to run to the Golden Gate as additional Delta outflow. This scenario should, at a minimum, be considered as a cumulative impact/benefit for the various issue areas being analyzed. How will use of Friant water affect the ability to meet downstream water quality objectives and standards if it made it all the way to the Golden Gate? How would such flows affect various resources and the ability to restore spring and fall Chinook in the San Joaquin River?

Page 26-21 (Grasslands Bypass Project)- The Cumulative Impacts chapter contains an inadequate description of the Grasslands Bypass project in both the

descriptions of the San Joaquin River Salinity Management Plan (SJRSMP) and the San Joaquin River Water Quality Improvement Project (SJRWQIP).

The SJRSMP description completely fails to disclose that highly seleniferous discharges that formerly went into the San Joaquin River via Salt Slough now discharge to the San Joaquin River through Mud Slough North, often exceeding Basin Plan water quality objectives for selenium, salt and boron. The description also fails to disclose that these discharges have been ongoing since 1995 and have been sanctioned by regulators until the end of 2019, nearly a quarter of a century of bureaucratically approved pollution. The impact of this ongoing pollution in violation of state and national water quality objectives for selenium needs to be fully analyzed, as described above under impact analysis.

The SJRWQIP description does not disclose that the toxic contamination the SJRWQIP cannot handle discharges directly into Mud Slough via the Grasslands Bypass Project. The description also fails to mention that a pilot treatment plant is to be constructed by 2014, but that there is inadequate funding and technology for large-scale treatment of this selenium contaminated pollution. As a result there is no solution on the table for this chronic problem and this Draft Program EIS/EIR has failed to identify and analyze the issue and how selenium may affect restoration.

Thank you for the opportunity to comment on this document. Please include C-WIN Water Policy Analyst Tom Stokely (tstokely@att.net) and us on your distribution list for responses to comments and the Final EIS/EIR.

Sincerely,



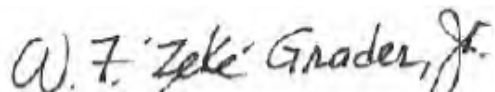
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Attachment:

E-mail -Dennis Lemly to Tom Stokely

Tom Stokely

From: "Dennis Lemly" <dlemly@fs.fed.us>
To: "Tom Stokely" <tstokely@att.net>
Sent: Wednesday, December 09, 2009 6:18 AM
Attach: Lemly-TechnicalQualifications.doc
Subject: Re: Request for Review of Grasslands Bypass Project Selenium Effects on Salmonids

Hello Tom,

I have reviewed the information you sent, specifically, the US Fish and Wildlife Service technical analysis of selenium risks to Chinook salmon and steelhead associated with the Grasslands Bypass Project (GBP) by Beckon and Maurer, the US Fish and Wildlife Service comments to USBR on the Final EIS, and USBR's response to those comments.

After close inspection of these reports, comments, and responses, I can only conclude that the Proposed Action and the Alternative Action pose unacceptable risks to the health and well-being of extant and to-be-established populations of migratory fish.

The report by Beckon and Maurer clearly shows that there are/will be substantial negative effects (perhaps above 50% mortality) based on existing and anticipated waterborne selenium concentrations. This is a technically sound report. Although USBR casts doubt on one key study (Hamilton et al. 1980) due to mortality in controls, the results were identical for both field-source and experimental diets (which did not have those problems).

It is interesting that USBR essentially admits there are substantial risks in its response to USFWS comments (Appendix I, Public Comments and Responses, page I-65) "However, as discussed above, there is considerable uncertainty in this analysis due to lack of data on Se bioaccumulation and toxicity in salmonids as well as limited data on likely exposure periods. Due to this uncertainty, it was assumed in the Draft EIS/EIR that there could be potential negative impacts to Chinook salmon and steelhead under the Proposed Action and Alternative Action, independent of the SJRRP"

Curiously, despite this admission of uncertainty and potential for negative impacts, USBR goes on to conclude that "GBP is unlikely to have a significant impact on the fish reintroduced as part of the SJRRP. Because both projects would be expected to improve conditions for salmonids in the SJR and, therefore, they would not have a cumulatively significant impact".

Clearly, this latter statement is based on hopes and not facts.

USBR wants it both ways.....identify a problem but then say there is no problem.

Acknowledging that substantial uncertainty (and thus ecological risk) exists cannot logically be followed by concluding that there will be no problem.

This is a blatant contradiction and there is no credible scientific basis for USBR to claim there will be no cumulatively significant impact.

The correct conclusion is that available data and a reasonable interpretation of it clearly shows that significant risks of substantial selenium toxicity exist which will not be eliminated or substantially lessened by GBP or SJRRP.

I hope these brief comments adequately express my grave concerns about what USBR is proposing.

Please let me know if I can be of further assistance.

I have attached a statement of my technical qualifications for your information.

Sincerely,

A. Dennis Lemly, Ph.D.

Technical Qualifications Statement
Dr. A. Dennis Lemly

I have spent over 30 years investigating the effects of selenium pollution in aquatic ecosystems. I have extensive experience conducting field and laboratory research on selenium toxicology, primarily involving aquatic cycling, bioaccumulation, and effects on fish. These studies include intensive investigations of the two most substantial cases of selenium pollution that have taken place in the USA; (1) Belews Lake, North Carolina, where 19 species of fish were eliminated, and (2) Kesterson Marsh, California, where thousands of aquatic birds were poisoned. My career began in the late 1970's with studies of the landmark pollution event at Belews Lake, which established the fundamental principles of selenium bioaccumulation and reproductive toxicity in fish. In the 1980's, I was a research project manager for the U.S. Fish and Wildlife Service, directing studies that determined impacts of selenium from agricultural irrigation on aquatic life at Kesterson and in 14 other western states. In the 1990's, the emphasis of my research shifted to the development of methods and guidelines for hazard assessment and water quality criteria for selenium, which led to the publication of a reference book (see item 42 below). This handbook contains the first comprehensive assessment tools for evaluating selenium pollution on an ecosystem scale. I have consulted on selenium contamination issues ranging from landfill leachate in Hong Kong to mountaintop removal coal mining in West Virginia. I provide the methods and technical guidance necessary to identify, evaluate, and correct aquatic selenium problems before they become significant toxic threats to fish and wildlife populations. I have devised and applied techniques for protecting aquatic life in habitats from the Arctic to the tropics, and from high mountain streams to coastal lagoons. I have Masters and Doctorate degrees in biology from Wake Forest University.

PUBLICATIONS ON SELENIUM:

1. Lemly, A.D. 1982. Response of juvenile centrarchids to sublethal concentrations of waterborne selenium: I. Uptake, tissue distribution, and retention. *Aquatic Toxicology* 2: 235-252.
2. Lemly, A.D. 1982. Determination of selenium in fish tissues with differential pulse polarography. *Environmental Technology* 3: 497-502.
3. Lemly, A.D. 1983. A simple activity quotient for detecting pollution-induced stress in fishes. *Environmental Technology* 4: 173-178.
4. Lemly, A.D. 1985. Ecological basis for regulating aquatic emissions from the power industry: The case with selenium. *Regulatory Toxicology and Pharmacology* 5: 465-486.
5. Lemly, A.D. 1985. Toxicology of selenium in a freshwater reservoir: Implications for environmental hazard evaluation and safety. *Ecotoxicology and Environmental Safety* 10: 314-338.
6. Lemly, A.D. 1986. Effects of selenium on fish and other aquatic life. Pages 153-162 in J.B. Anderson and S.S. Anderson, editors. *Toxic Substances in Agricultural Water Supply*

- and Drainage: Defining the Problems.* U.S. Committee on Irrigation Drainage, Denver, CO.
7. Lemly, A.D., and G.J. Smith. 1987. *Aquatic Cycling of Selenium: Implications for Fish and Wildlife.* Fish and Wildlife Leaflet 12. U.S. Fish and Wildlife Service, Washington, DC. 10 pages.
 8. Lemly, A.D. 1989. Cycling of selenium in the environment. Pages 113-123 in A.Q. Howard, editor. *Selenium and Agricultural Drainage: Implications for San Francisco Bay and the California Environment.* The Bay Institute of San Francisco, Tiburon, CA.
 9. Lemly, A.D., and G.J. Smith. 1991. Selenium in aquatic ecosystems: Potential impacts on fish and wildlife. In R.C. Severson, S.E. Fisher, Jr., and L.P. Gough, editors. *Proceedings of the Billings Land Reclamation Symposium on Selenium in Arid and Semiarid Environments, Western United States.* U.S. Geological Survey Circular 1064: 43-53.
 10. Lemly, A.D. 1993. Subsurface agricultural irrigation drainage: The need for regulation. *Regulatory Toxicology and Pharmacology* 17: 157-180.
 11. Lemly, A.D., S.E. Finger, and M.K. Nelson. 1993. Sources and impacts of irrigation drainwater contaminants in arid wetlands. *Environmental Toxicology and Chemistry* 12: 2265-2279.
 12. Lemly, A.D. 1993. Guidelines for evaluating selenium data from aquatic monitoring and assessment studies. *Environmental Monitoring and Assessment* 28: 83-100.
 13. Lemly, A.D. 1993. Teratogenic effects of selenium in natural populations of freshwater fish. *Ecotoxicology and Environmental Safety* 26: 181-204.
 14. Lemly, A.D. 1993. Metabolic stress during winter increases the toxicity of selenium to fish. *Aquatic Toxicology* 27: 133-158.
 15. Lemly, A.D. 1994. Agriculture and wildlife: Ecological implications of subsurface irrigation drainage. *Journal of Arid Environments* 28: 85-94.
 16. Lemly, A.D. 1994. Irrigated agriculture and freshwater wetlands: A struggle for coexistence in the western United States. *Wetlands Ecology and Management* 3: 3-15.
 17. Lemly, A.D. 1995. A protocol for aquatic hazard assessment of selenium. *Ecotoxicology and Environmental Safety* 32: 280-288.
 18. Lemly, A.D. 1996. Selenium in aquatic organisms. Chapter 19 (pages 427-445) in W.N. Beyer, G.H. Heinz, and A.W. Redmon-Norwood, editors. *Environmental Contaminants in Wildlife: Interpreting Tissue Concentrations.* Lewis Publishers, Boca Raton, FL.
 19. Lemly, A.D. 1996. Winter Stress Syndrome: An important consideration for hazard assessment of aquatic pollutants. *Ecotoxicology and Environmental Safety* 34: 223-227.
 20. Lemly, A.D. 1996. Identifying and reducing environmental risks from agricultural irrigation drainage in developing countries. *Proceedings of the World Congress of Toxicology in Developing Countries* 3: 177-190.
 21. Lemly, A.D. 1996. Assessing the toxic threat of selenium to fish and aquatic birds. *Environmental Monitoring and Assessment* 43: 19-35.
 22. Lemly, A.D. 1996. Wastewater discharges may be most hazardous to fish during winter.

- Environmental Pollution* 93: 169-174.
23. Lemly, A.D. 1996. Evaluation of the hazard quotient method for risk assessment of selenium. *Ecotoxicology and Environmental Safety* 35: 156-162.
 24. Lemly, A.D. 1997. Ecosystem recovery following selenium contamination in a freshwater reservoir. *Ecotoxicology and Environmental Safety* 36: 275-281.
 25. Lemly, A.D. 1997. Environmental hazard of selenium in the Animas La Plata Water Development Project. *Ecotoxicology and Environmental Safety* 37: 92-96.
 26. Lemly, A.D. 1997. Role of season in aquatic hazard assessment. *Environmental Monitoring and Assessment* 45: 89-98.
 27. Lemly, A.D. 1997. A teratogenic deformity index for evaluating impacts of selenium on fish populations. *Ecotoxicology and Environmental Safety* 37: 259-266.
 28. Lemly, A.D. 1997. Environmental implications of excessive selenium. *Biomedical and Environmental Sciences* 10: 415-435.
 29. Lemly, A.D. 1998. Pathology of selenium poisoning in fish. Chapter 16 (Pages 281-296) in W.T. Frankenberger and R.A. Engberg, editors. *Environmental Chemistry of Selenium*. Marcel-Dekker Press, New York, NY.
 30. Lemly, A.D. 1998. A position paper on selenium in ecotoxicology: A procedure for deriving site-specific water quality criteria. *Ecotoxicology and Environmental Safety* 39: 1-9.
 31. Lemly, A.D. 1998. Belews Lake: Lessons learned. Pages 3-6 and E15-20 in U.S. EPA Publication EPA-822-R-98-007. *Report on the Peer Consultation Workshop on Selenium Aquatic Toxicity and Bioaccumulation*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.
 32. Lemly, A.D. 1999. Case study: Contaminant impacts on freshwater wetlands at Kesterson National Wildlife Refuge, California. Chapter 6 (pages 191-206) in M.A. Lewis et al., editors. *Ecotoxicology and Risk Assessment for Wetlands*. SETAC Press, Pensacola, FL.
 33. Lemly, A.D. 1999. Selenium transport and bioaccumulation in aquatic ecosystems: A proposal for water quality criteria based on hydrological units. *Ecotoxicology and Environmental Safety* 42: 150-156.
 34. Lemly, A.D. 1999. Irrigation drainage. Pages 304-307 in M.A. Mares, editor. *Encyclopedia of Deserts*. University of Oklahoma Press, Norman, OK.
 35. Hamilton, S.J., and A.D. Lemly. 1999. The water-sediment controversy in setting environmental standards for selenium. *Ecotoxicology and Environmental Safety* 44: 227-235.
 36. Lemly, A.D. 1999. Selenium impacts on fish: An insidious time bomb. *Human and Ecological Risk Assessment* 5: 1139-1151.
 37. Lemly, A.D., R.T. Kingsford, and J.R. Thompson. 2000. Irrigated agriculture and wildlife conservation: Conflict on a global scale. *Environmental Management* 25: 485-512.
 38. Lemly, A.D. 2001. Irrigation-induced demise of wetlands. Pages 399-410 in R.E. Munn and I. Douglas, editors. *Global Environmental Change, Volume 3: Causes and Consequences of Global Environmental Change*. John Wiley & Sons Ltd., Chichester,

United Kingdom.

39. Lemly, A.D. 2002. Symptoms and implications of selenium toxicity in fish: The Belews Lake case example. *Aquatic Toxicology* 57: 39-49.
40. Lemly, A.D., and H.M. Ohlendorf. 2002. Regulatory implications of using constructed wetlands to treat selenium-laden wastewater. *Ecotoxicology and Environmental Safety* 52: 46-56.
41. Lemly, A.D. 2002. A procedure for setting environmentally safe Total Maximum Daily Loads (TMDLs) for selenium. *Ecotoxicology and Environmental Safety* 52: 123-127.
42. Lemly, A.D. 2002. *Selenium Assessment in Aquatic Ecosystems: A Guide for Hazard Evaluation and Water Quality Criteria*. Springer-Verlag Publishers, New York, NY.
43. Lemly, A.D. 2004. Aquatic selenium pollution is a global environmental safety issue. *Ecotoxicology and Environmental Safety* 59: 44-56.
44. Kingsford, R.T., A.D. Lemly, and J.R. Thompson. 2006. Impacts of dams, river management, and diversions on desert rivers. Chapter 8 (pages 203-247) in R.T. Kingsford (editor). *Ecology of Desert Rivers*. Cambridge University Press, UK.
45. Lemly, A.D. 2007. A procedure for NEPA assessment of selenium hazards associated with mining. *Environmental Monitoring and Assessment* 125: 361-375.
46. Lemly, A.D., and J.P. Skorupa. 2007. Technical issues affecting the implementation of US Environmental Protection Agency's proposed fish tissue-based aquatic criterion for selenium. *Integrated Environmental Assessment and Management* 3: 552-558.
47. Lemly, A.D. 2008. Aquatic hazard of selenium pollution from coal mining. Chapter 6 (Pages 167-183) in G.B. Fosdyke (editor). *Coal Mining: Research, Technology, and Safety*. Nova Science Publishers, New York, NY.
48. Palmer, M.A., E.S. Bernhardt, W.N. Schlesinger, K.N. Eshleman, E. Fonfoula-Georgious, M.S. Hendryx, A.D. Lemly, G.E. Likens, O.L. Louck, M.E. Power, P.S. White, and P.R. Wilcock. (In press). Consequences of Mountaintop Mining. Science.