Northwest Power and Conservation Council

October 4, 2007

MEMORANDUM

TO: Council Members

FROM: Kerry Berg

SUBJECT: Presentation by Dr. Jack Stanford

Below please find information about Dr. Jack Stanford from the Flathead Lake Biological Station's website. For more information go to http://www.umt.edu/flbs/.

About Professor Stanford

Jack has conducted research at FLBS since 1971 and became Director in 1980. His research and education activities have taken him all over the world but his heart is in the Crown of the Continent Ecosystem where he has worked on everything from microbes to grizzly bears. When not fully engaged in ecology he is steep and deep in the backcountry, fly fishing the flats, or climbing some ridge or another just to see what's on the other side.

Professional Experience and Education -

- Jessie M. Bierman Professor of Ecology, The University of Montana, 1986-present.
- Director, Flathead Lake Biological Station, 1980-present.
- Associate Professor of Biology, University of North Texas 1974-80.
- Ph.D. (Limnology): University of Utah -1975
- M.S. (Limnology): Colorado State University – 1971
- B.S. (Fisheries Science): Colorado State University - 1969

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Research Interests

I am an ecosystem scientist mainly working in limnology. I study the many interacting natural and cultural factors and disturbances that determine the distribution of species and productivity within large river-lake ecosystems.

I work mainly in the Crown of the Continent Ecosystem encompassing the headwaters of the Columbia, Saskatchewan and Missouri-Mississippi Rivers in western Montana and southern British Columbia and Alberta. The crown jewel of this area is 480 km^2 Flathead Lake and its 22,000 km^2 drainage basin.

Flathead Lake is perhaps the most pristine large lake in the temperate region of the world. For over 30 years I have directed research at the Flathead Lake Biological Station demonstrating trends in basic limnological measures, such as annual nutrient loading, water clarity, primary productivity, phyto- and zooplankton species composition and biomass dynamics. Lake productivity is determined by natural (floods, droughts and wildfires) and human (accelerated nutrient and sediment inputs, flow regulation and introductions of non-native species) disturbances. This work has expanded to other glacial lakes in the Flathead Basin to study the influences of invading non-native species on food webs and nutrient cycling.

My concurrent studies of mountain rivers in the USA (Flathead, Columbia, Missouri and Colorado) focus on groundwater and floodplain ecology. Penetration of river water into alluvial flood plains forms shallow aquifers that are inhabited by a wide variety of hypogean animals, many of which are new to science. Upwelling of ground water from these aquifers back to the surface creates wetland or riparian mosaics on the flood plains that are hot spots of biodiversity and bioproductivity. Since 1999 this work has expanded to extremely remote and notably pristine rivers in British Columbia, Canada, and Kamchatka, Russia, where processes and biodiversity are influenced dramatically by marine nutrient subsidies from salmon runs. I use these studies to mediate conservation of pristine rivers and to determine restoration strategies for rivers that have been functionally altered by dams, water diversions, pollution and other activities.

I also currently direct a long-term study of the effects digging by grizzly bears on plant distributions and phenologies in alpine meadows in Glacier National Park. The bears dig for nutritious corms of glacier lilies. Mineral nitrogen is much higher in the digs than in undisturbed meadow and bear foraging is variable in time and space. Hence, the meadows are a mosaic of successional stages; plant diversity and productivity is substantially higher than it would be if the bears were not farming lilies. This work compliments other studies of animal disturbances on riparian nutrient cycling being conducted as parts of the river studies described above.

Professional Memberships

- Editorial Board Member (1986-present): River Research and Applications
- Editorial Board Member (1996-1999): Ecological Applications
- Past President: Organization of Biological Field Stations
- Past President: North American Benthological Society
- Fellow: American Association for Advancement of Science
- Panelist: National Research Council, U. S. National Academy of Sciences
- Panelist: U. S. National Science Foundation, Division of Environmental Biology

- Science Advisor: Wild Salmon Center, Portland, Oregon
- Science Advisor: Ecotrust, Portland, Oregon
- Gratis Ecological Consultant: The Nature Conservancy