Photo: William E. Simpson II: CAL-FIRE tanker trucks and helicopters drafted thousands of gallons of water from the easily accessed Iron Gate Lake on the Klamath River during the deadly Klamathon Wildfire saving the Cascade-Siskiyou National Monument, an American treasure. Without the lake, this would not be possible.

Proposed Klamath River Dams Removal: The Height Of Obtuse Thinking?

By: William E. Simpson II – Naturalist / Rancher

Considering the recent revelations as published in several California newspapers regarding the Klamath River dams removal proposal, many important questions arise to those who are using logic to examine the *fishy-reasoning* for considering the removal of several perfectly good dams.

The dams on the Klamath River were built by the U.S. Army Corps of Engineers and paid-for and owned by the vast majority of American taxpayers, not Pacific Corp, not Warren Buffet, not any native American tribes, and not Governors Gavin Newsome (CA) or Kate Brown (OR).

**Can a couple of politicians from just two states and a greedy uncaring corporation, supported by a handful of incentivized minority stakeholders, execute a deal to undermine an Act of Congress and the will of American voters by crafting a work-around? And if so, who will be next to execute a similar workaround designed to usurp the power of Congress and the will of the American people?*

**What about the loss of that important water storage, down-river flood control, and clean hydroelectric power?*

**What about the loss of the rare freshwater shoreline ecosystem that is the habitat for numerous threatened and endangered species, as well as numerous waterfowl?*

**Would the removal of the Klamath River dams interrupt the natural mitigation of anthropogenic pollution (nitrates and phosphates) produced by Klamath basin agricultural production?*

The reasons that allegedly support the Klamath River dams removal concept are so flawed in some many ways, it's hard to know where to begin.

Berkshire Hathaway Energy a Warren Buffet company ostensibly decided they could make more money by going into the gas-powered turbine energy generation business. But this would require decommissioning four perfectly good hydroelectric dams on the Klamath River to prevent lowering the price of energy by adding more energy to the existing market supply.

The four dams and the fresh water stores behind them were created in 1957 by the Klamath River Basin Compact, which was essentially a treaty between the states of California and Oregon that was ratified by an Act of Congress.

This Compact, which arguably is still the controlling authority, provided many much-needed benefits to the people of this important area of the Pacific Northwest. Water storage for both domestic and agricultural uses was of paramount import in the considerations of the Compact. But flood control and green low-cost electric power generation were not far behind. And these state-of-the-art dams have been and continue to provide green hydroelectric power to nearly 80,000 households and businesses in Jackson County Oregon and Siskiyou County California.

However, since the dams and the lakes behind them came into existence, they have evolved to provide many unforeseen yet extremely important benefits to the area over the past 60 years.

Extremely rare and valuable among all shoreline ecosystems on the planet, the freshwater shoreline ecosystems formed by the four lakes behind the dams support a myriad of lifeforms that have carved out niches formed by the unique habitats in this rare environment.

The fresh-water shoreline ecosystem supports numerous other interdependent ecosystems, all of which provide habitat for a vibrant array of birds (including migratory species), reptiles, amphibians, mammals and a host of aquatic life including species of fish that have and continue to provide recreational fishing for thousands of people over the past 60-years.

The lakes themselves host numerous recreational activities including boating, camping, and hunting, which in turn bring revenue into the local economy. All of this on a river that has a long pre-dam history of running warm and nearly dry during the late summer and fall months of most years, creating conditions unsuited to any fish on the upper reach of the Klamath basin east of the Interstate 5.

And in contrast to the pre-dam summers, during the pre-dam winter and spring runoff season, rushing waters and catastrophic floods caused death and destruction without the critical water control afforded by the thoughtful placement of the dams.

These dams also sequester the toxic anthropogenic pollution stemming from intense agricultural enterprises at the upper end of the Klamath River basin in southern Oregon.

The ubiquitous use of nitrates and phosphates as soil amendments in agri-production along with dissolved feces from animal production is deposited into the upper Klamath River and dissolved in-solution as runoff during the rains. The plankton (commonly called; ‘green algae’) that uniquely live in the quiet deep waters of the lakes formed behind the dams are able to metabolize these pollutants that are otherwise toxic to most species of fish. The biological action of these blue-green algae *(Microcystis aeruginosa)* generally renders these pollutants harmless to the environment. The proof in this is empirical, and regardless of the current and past agricultural tempo there has never been a genuine fish die-off in the lakes behind the dams or in the Klamath River from these algae.

Nevertheless, concentrations of some of these same pollutants are sequestered into the layers of nearly impervious clay-mud deposits (estimated at 5-million metric yards) on the bottoms of the lakes where anaerobic organisms act upon them, breaking them down further. These combined processes naturally and cost-effectively resolve an otherwise major and costly problem for the agricultural enterprises in Oregon.

Thus, thanks to the existence of the Klamath River dams, we have in-place an important process that mitigates a major portion of the anthropogenic agricultural pollution coming into California from Oregon.

In the end, the lakes behind the dams create cleaner and cooler water, which exits the final dam in the string of dams on the Klamath River; the Iron Gate Dam.

Now a few wrong-headed people blinded by money and ego want to destroy all of these wonderfully valuable assets by removing the dams and in the process devastating the environment and depriving the people of the low-cost green energy they depend upon.

And now, we are witness to a dangerous erosion of the democratic process, where two state governors seem to have decided between themselves to over-rule the U.S. Congress and the will of the American voters who have the only legitimate legal standing in the dam removal controversy.

It seems from recent newspaper reports that governors Gavin Newsome (CA) and Kate Brown (OR), along with PacificCorp, are continuing to thumb their noses at the citizens of Siskiyou County California where three of the four dams and lakes are located, who via a 79% super-majority voted against any dam removal in a 2010 referendum. And the public sentiment in this regard has not changed since then.

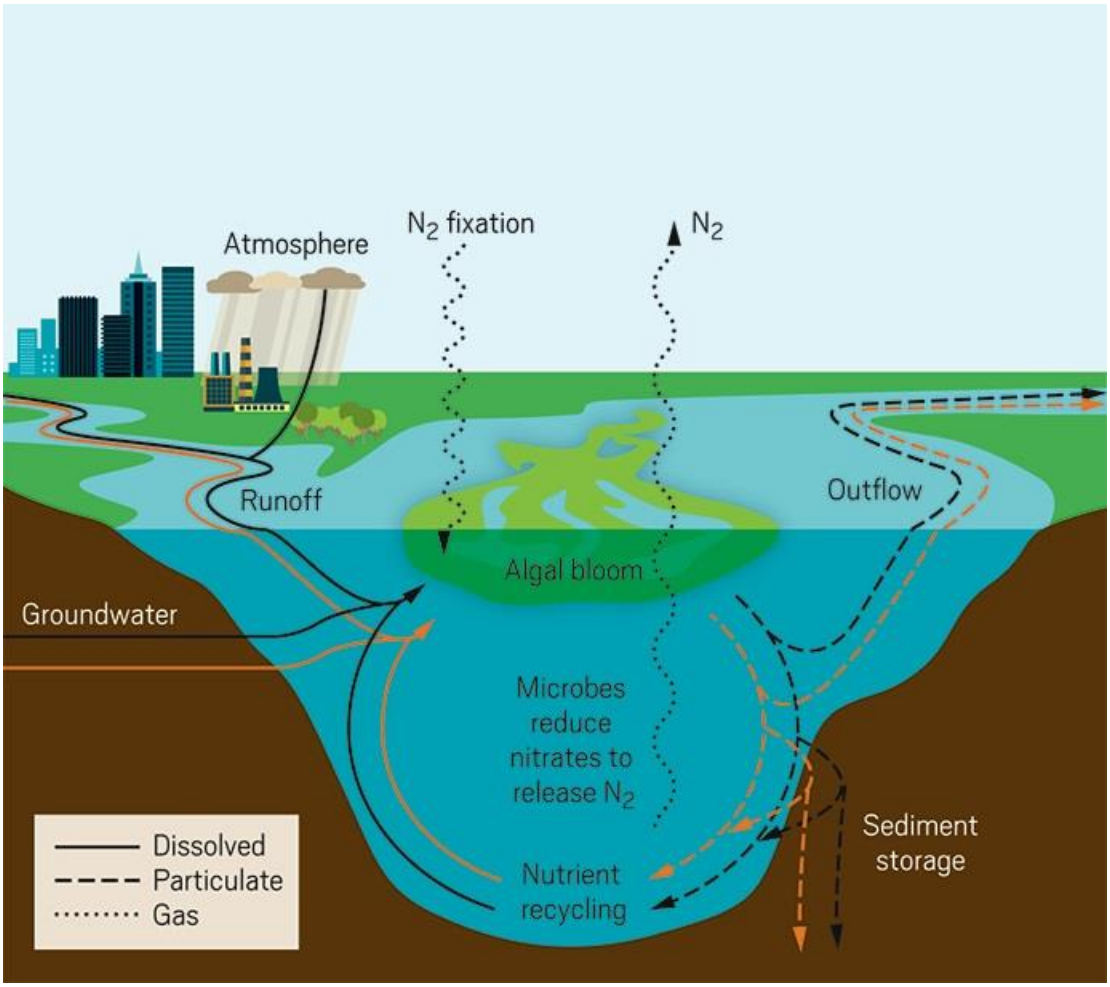
Furthermore, the largest tribe of native Americans in the area historically are the Shasta Indians, who remain against any dam removal according to sources.

Recently several newspaper articles, including the Sacramento Bee, S.F. Chronical and Los Angeles Times, introduced articles into the discussion about the so-called benefits of removing the dams in Siskiyou County California. Of course, such articles seem to carelessly discount the critical importance of the need for more stored water in a state such as California that is desperately suffering a worsening drought and the evolution of annual catastrophic wildfire, among other problems.

California agriculture produces about '*one-third of the country's vegetables and two-thirds of the country's fruits and nuts*' and depends on stored water (in aquafers and behind dams) for crop irrigation and production.

Any suggestion that the removal of any perfectly good dam in a drought and wildfire-stricken state (the Klamath dams are structurally sound) at this time in history is ridiculous.

I am astounded by the 'positioning' that some of the pro-dam-removal lobbyists and activists have posited in order to justify their argument for the removal of the dams; namely, to allegedly allow a species of salmon to hopefully transit the area where the dams now exist. What these activists (including the local smaller tribes of native Americans) fail to realize is that, since the dams were installed approximately 60 years ago, the agricultural and animal production at the headwaters of the Klamath River have gone up exponentially, including the agricultural pollution stemming from that highly intensive production of livestock and crops.



It's a sure bet that;

*If the Klamath River dams are removed along with the critical habitat (deep still-water lakes lost) for the blue-green algae that mitigate the pollution from the upper Klamath Basic agri-production industry (in southern Oregon), most fish and other aquatic life in the upper Klamath River area could no longer exist. If the dams are removed, the resulting polluted-waters from southern Oregon will cause the Klamath River to become *eutrophic *(rich in nutrients and so supporting a dense plant population, the decomposition of which kills animal life by depriving it of oxygen).*

What makes blue-green algae (Microcystis aeruginosa) so special?

First of all, dams and/or warm-water don't cause algae, as has been incorrectly stated by some uneducated people. And the specific algae that is observed in recent history on the lakes is a blue-green algae (Microcystis aeruginosa) that is naturally occurring in

many places around the world and is endemic in the Klamath Basin and the lakes on the Klamath River.

Most of the time under normal circumstances, these naturally occurring algae are unseen because when they are in-balance within a natural system of available nutrients where their growth is limited due to the availability of nutrients (and sunlight), which are also competitively used by many other plants and organisms that utilize many of the same nutrients. Additionally, because these algae have the ability to migrate vertically within a column of still water, they spend much of their time below the surface of the water and out of sight.

These unique algae control their buoyancy using a microscopic gas-filled vesicle. The amount of gas (volume) in this tiny vesicle is what controls the amount of buoyancy and dictates where the algae is located within the vertical water column. According to the science; when there is more nitrogen and sunlight available, there is more gas in the gas-vesicle (the float), and more buoyancy is generated. Therefore, the algae can suspend themselves and range in depth from the bottom of the lake to the surface depending on the amount of sunlight available combined with the amount of nutrients present (nitrogen and phosphorus), where available nitrogen has the greatest effect on positive buoyancy.

This scientific study on these algae, by Justin D. Brookes and George G. Ganf, titled; '*Variations in the buoyancy response of Microcystis aeruginosa to nitrogen, phosphorus and light*', supports the foregoing observations:
http://plankt.oxfordjournals.org/content/23/12/1399.full

The high-levels of nitrogen and phosphate-based compounds (used in agri-production) that are required and which in my estimation stimulates the excessively large blooms of algae floating on the surfaces of the lakes, is *not naturally occurring*.

Based upon another study conducted (2005) by OSU scientist Damion C. Ciotti, titled; *'Water Quality of Runoff from Flood Irrigated Pasture in the Klamath Basin, Oregon'* (https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20575/CiottiDamionC2005.pdf?sequence=1), the excess nitrogen condition is a function of intensified agricultural operations in this geographical region (Klamath Basin) over the past 30-40 years.

Nature's mitigation response to man's activities (agriculture on steroids over the past 60-years) is certainly 'natural and effective':

Another question on the table is; are the dams and/or warm-water the cause of these large algae blooms?

Based upon the unbiased studies that I have cited; the answer is clearly 'no'.

In order for an un-biased scientific study of such a problem to evolve, the financial, and political motivations and/or the incentives to 'lean' towards any particular conclusion (such as dam removal) must be absolutely removed from the process.

In the case of the algae blooms, the loudest voices seem to be motivated by beneficiaries of the money and various concessions and benefits to minority stakeholders (as opposed to the voting super-majority of Americans) that would ostensibly stem from the removal of the dams.

In review: Siskiyou County (the dams are within their jurisdiction) voted on whether it was in the best interests of the entire county (about 40,000 taxpayers) to remove the dams. A vast majority (78%) voted to keep the dams.

Nonetheless, even in light of what a vast majority of people want in a so-called 'democracy', a term thrown-around when convenient by governors Gavin Newsome (CA) and Kate Brown (OR), there are a tiny fraction of people who still want to undermine the will of the majority of American people, and through the utilization of almost any means, including the use of questionable studies and assertions, have the dams removed anyway.

In summary, the message is simple; Is the alleged revival of one species of salmon worth these costs?

If the Klamath River dams were removed, and the lakes lost, here are just some of the costs:

1. About 80,000 homes and businesses in southern Oregon would lose the cheap, clean hydroelectric power that comes from the power generation plants on the Klamath River dams.

2. Removal of the Klamath Dams would interrupt existing natural pollution mitigation in the lakes by the green-algae that require the lakes as habitat. This in turn would require the Klamath basin agricultural industry to significantly reduce their production tempo, resulting in reduced food production in order to roll-back the agricultural runoff (nitrates, phosphates and livestock feces). And ranchers/farmers can bet that the DEQ will see that this is done when they see the eutrophication of the Klamath River if the dams are removed.

3. Numerous threatened and endangered species of flora and fauna would lose critical habitat and would likely vanish. Just a few of such species of fauna include: Yellow legged frog, giant California garter snake, giant California salamander and the short-nosed sucker fish.

4. The flood control and protection provided by the dams to the down-river homes and town of Happy Camp in California would be gone: https://en.wikipedia.org/wiki/Christmas_flood_of_1964

5. Water for irrigation of lands and crops along with *easily accessed water critical for fighting increasing catastrophic wildfires* in the areas around the dams would be gone! The Cascade-Siskiyou National Monument was arguably saved by the water from Iron Gate Lake… Here is video interview with a CAL-FIRE Battalion Chief: https://www.youtube.com/watch?v=XLcfJ1crUH0&app=desktop

6. There will be a change in the ground-water (hydrology) and some homes, ranches and farms on and around the lakes will suffer changes in their well-water; reduced (lost) production, sedimentation changes, etc.

7. Potential for long-term catastrophic damage to the entirety of the Klamath River ecosystems due to the release of approximately ***5-million metric yards of clay sediments that are laden with decades of pollutants*** from industrial agricultural production up-river from the lakes formed by the dams.

Photo: William E. Simpson II: The deadly 2018 Klamathon Wildfire (38,000 acres) was stopped due to the easily-accessed water in Iron Gate Lake, which in turn saved the Cascade-Siskiyou National Monument.

One could make the argument that the proponents of dam-removal just want their concessions and really don't care too much about wildlife or all the agricultural runoff

and the repercussions of that runoff. Maybe they think it will all just disappear down the river into the sea, out of sight, and out of mind? But that merely defers dealing with the same problem, only then it will be a coastal problem at the mouth of the Klamath River, where the river's nitrogen loading will undoubtedly affect the ecosystem down-river in some manner, possibly producing a more serious situation in an area where trout and salmon are still able to spawn.

Additional References:

***CalWatchDog: https://calwatchdog.com/2010/03/04/dam-plan-shrouded-in-mystery/**

***Klamath Basin Animal Production and Feces:** The total nitrogen that is contained in the feces from animal production is not insignificant (http://www.ecochem.com/t_manure_fert.html). Feces is deposited on the Klamath basin grazing lands through high animal density per acre (cattle, sheep, etc.), where feces is highly concentrated on irrigated pasture lands that are already in many cases enhanced with nitrogen-rich fertilizers. And along with the soil additives, the tons of animal feces is an important source of excessive nitrogen runoff into the tributaries of the upper lakes and the Klamath River feeding into the Copco and Iron Gate reservoirs.

When the density of grazing animals over the past 60-years, gets to the levels we now observe in and around the upper lakes (we are even seeing animals being trucked into the area to graze from well outside the local region), the amount of available nitrogen rich organic compounds (feces) exceeds the fixation capacity of the land-based plants and organisms (related to the bio-*stoichiometry)*, and a very significant amount of nitrogen-rich compounds are washed-off the land and into the Klamath basin drainage during irrigation, storms and the heavy spring runoff.

***Industrial Agriculture:** Crop farmers are continually enhancing their lands through the extensive use of fertilizers and soil conditioners. A significant amount of these plant supporting (algae too!) nutrients are transported into the upper lakes and into the upper Klamath River via irrigation run-off, storm water run-off and spring run-off, thereby supporting the uncontrolled growth of algae, resulting in the blooms that are observed in the late summer. This statement is supported by the OSU study titled 'Water Quality of Runoff from Flood Irrigated Pasture in the Klamath Basin, Oregon': https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20575/CiottiDamionC2005.pdf?sequence=1

Historically, looking back about 30-40 years and beyond, there were no algae blooms of the size and scope we are now seeing floating in the Copco and Iron Gate lakes. The algae were present in the past, but the conditions (nutrients) to support incredible growth (and buoyancy) were not present. As we begin to understand, these algae do very well when there is an abundance of nitrogen and phosphorus ('fertilizer') and sunlight; they need both to grow at accelerated rates that results in a visible 'bloom' floating on the surface of the lakes. However, in the absence of added nitrogen to the lakes, even with the naturally occurring phosphorus, it's doubtful that we would *be seeing* the expansive algae blooms that have been occurring in recent history. And the notion that high levels of naturally occurring phosphorus are instrumental in these blooms is inconsistent with the observations of the cited scientific study in the Oxford Journals (The Journal of Plankton Research): http://plankt.oxfordjournals.org/content/23/12/1399.full

As the cited OSU study infers, agricultural activities are culpable when it comes to excess nitrogen in the Klamath basin. The nitrogen-rich runoff from agricultural lands (compounds in solution as well as insoluble particulate matter suspended due to turbidity) is combined with other organic and inorganic matter in the turbid runoff waters that flow into the Klamath basin watershed. As these turbid run-off waters reach the calmer less agitated waters of the lakes that are formed behind the dams, much of the suspended matter, including some of the nitrogen compounds (from a super-saturated solution), will begin to settle-out into the sediment layers of the lakes (potential nitrogen sink). These nutrient and nitrogen-rich deposits into the lake beds could, under the right conditions (I.E. as water temp increases, currents agitate the bottom sediments, etc.), also go into solution (dissolve back into the lake water), while some of the more soluble nitrogen compounds (dissolved solids and gases) may remain in solution.

In the cited OSU study, the 'conclusion' that is found on page 115 of the document and contents within the study, supports the thesis herein regarding nitrogen transport into the watershed: (https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20575/CiottiDamionC2005.pdf?sequence=1). This study also confirms the presence of an abundance of phosphorus, which is another important element (in the right ratio) for the growth of plants as well as the algae in question.

By looking at history (before there was a problem) and then asking a simple question; what 'has changed since the 1960's; it is crystal clear what has happened. Over time, farmers began increasing the amounts of fertilizers being used over larger and larger areas of land. While concurrently cattlemen are grazing more animals per acre than at any time in the past, as a result of enriched (fertilized) pastures.
An example of the same basic phenomenon (nitrates from feces and commercial fertilizer stimulating an algae bloom) was studied by the University of Hawaii (http://www.hawaii.edu/kahekili/algalworkshop.html).