

“Comment Letter – 2016 Bay Delta Plan Amendment & SED”

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am



(It is my understanding that comments are being accepted until noon today.)

Dear Board members:

As the first female apprentice in a CA plumbing union, I was indoctrinated with the idea that plumbers protect the health of the people. I take that role seriously: now as a plumbing contractor and water activist, I lecture all the time about extreme water conservation. With the non-profit Greywater Action **I teach people to re-use their greywater, and to capture their rainwater.** I experience first-hand people's desire to be a part of the water scarcity solution. (Over and over again people tell me about how they carry buckets full of greywater from their tub/showers to their gardens. That's hard work, and reflects true commitment.) So I know that **a great deal more water conservation is possible**, if people are rallied and taught how to do so.

I'm also an eco-artist and in 2012 created a 20 foot long "taxidermied" Sturgeon, to remind folks that they used to be that huge, right here in our Delta. They weighed as much as 2000 lbs and were a thriving fishery until we almost wiped them out. And here we are over a century later still threatening the survival of this 240 million year old (minimum!) species. They live to be well over 100, giving them time to bioaccumulate the many toxins we carelessly allow to pollute our rivers. Those toxins negatively impact their ability to reproduce: high flows will dilute and flush those toxins.

Almost all of the talk about river flows is focused on restoring the salmon fishery. We need to **restore the sturgeon fishery** as well--they are the incredibly delicious to eat and their roe is highly prized caviar. But even more importantly they are a **key species in maintaining the health of the entire delta eco-system**--they eat the invasive overbite clams, and it has been suggested that their "plowing" of the sediment at riverbottom keeps it aerated, preventing anoxic deadzones that plague most estuaries worldwide.

Plus they are simply amazing elders we should be honored to have in our midst. Rivers in both Oregon and Washington support profitable recreational "catch and release" sturgeon fishing, and the ecstatic faces of fisherpeople momentarily embracing their enormous catch testify to the marvel of contact with these ancient beings.

The scientists are telling you that **60% of unimpaired flow February to June** is necessary for the health of the delta ecosystem and of all the various fish: there's your mandate, and your cover. **Stick with the science!**

Sturgeon numbers have plummeted during the last few years of severely reduced flows and research into the cause has shown that they simply do not reproduce when there is not an adequate flow of **cold, oxygen rich water around their eggs.** They are blocked everywhere by dams from migrating upstream to spawn as they normally would, so **they**

require consistent high flows in the rivers from February to June in order to reproduce, period.

We humans can figure out how to get by with less water--we fancy ourselves intelligent innovators, and actually we love a challenge. Though you wouldn't know it given all the whining I've witnessed at the Water Board hearing in Modesto or SFPUC meetings evaluating the supposed dire impact of your flow proposals. I've heard “experts” claim that it's impossible to ask folks to conserve any more because they've already achieved a 30% drop in per capita usage to 60 gallons per day and certainly that is the most that can be asked or achieved. Meanwhile I use 12 to 24 gallons per day for my household and large food producing garden, with no sense of deprivation.

HERE IS MY MOST IMPORTANT POINT:

In fact, **the Water Board creating the necessity for us to change our water behaviors (due to reduced supply) could catalyze the adoption of practices which we desperately need to embrace anyway** --for human survival in the face of climate chaos!

~It is being widely recognized that industrial agriculture is a primary contributor of greenhouse gas emissions and a driver of climate change. The majority of farmers claiming rights to the water that (truly rightfully) needs to flow down our rivers and through our Delta, are engaged in industrial ag, often just to raise crops for export. They can be encouraged to adopt more beneficial ag strategies (and crops) that require less water. For example, **“Carbon farming” practices** are getting a lot of traction at the state level, and will hopefully become highly incentivized or even mandated. These practices have been shown to reduce CO2 emissions and increase water infiltration into the soil and groundwater, so that **less irrigation water is required.**

<https://oaec.org/food-systems/carbon-farming/>

<http://www.carboncycle.org/programs/ag-carbon/>

<https://oaec.org/our-work/projects-and-partnerships/california-climate-agriculture-network/>

~We now know that industrial agricultural's use of plowing and of chemical fertilizers and pesticides kills the biological life in the soil, leaving dead dirt with no organic matter and no capacity to absorb and hold water. (Hence requiring large inputs of irrigation water.) An inspiring example of carbon farming/organic no-till yet highly profitable food production, is Singing Frog Farm in Sonoma county. Applications of compost have increased soil organic matter to 12% and very little irrigation is needed as the **biologically living soil holds moisture like a sponge.** <http://www.singingfrogsfarm.com/our-farming-model.html>

~Dr. Elaine Ingham consults around the world helping farmers revitalize their soil's biology, with the result that virtually no fertilizer or herbicide or pesticide inputs are required to maintain fertility and productivity. This results in greater profitability too, and no pollutants are running off into rivers. AND irrigation requirements decrease substantially. These practices could be implemented on large acreages in the central valley.

<http://sustainablefoodtrust.org/articles/roots-health-elaine-ingham-science-soil/>

http://www.soilfoodweb.com/drlnghams_cv.html

“Comment Letter – 2016 Bay Delta Plan Amendment & SED”

I submit that both water *and soil* are a “public trust” and the broadscale adoption of carbon farming practices would represent a more responsible stewarding of those trusts.

The atmosphere should be considered a public trust as well.

A big dilemma for climate change intervention is that even if we stop burning fossil fuels and emitting greenhouse gases, there is already too much CO₂ in the atmosphere, having a continuing impact on global warming. We must figure out how to extract CO₂ from the atmosphere and the best and most hopeful way is through **carbon sequestration from the atmosphere into the soil**:

The game changing Marin Carbon Project research conclusively demonstrated that the spreading of 1/2” of compost over vast swaths of rangeland stimulates a cascade of effects: the annual and continuing sequestration of high amounts of carbon from the atmosphere into a stable form in the soil; the increased abundance and nutritive quality of forage; and most important here, the **increased absorption of water into the soil**.

<http://www.marincarbonproject.org/about>

The highly respected scientists participating in the study have suggested that spreading even 1/4” of compost on rangelands over large areas of CA could offset a significant amount of our state’s greenhouse gas emissions. And I would add, possibly contribute to the recharging of aquifers through increased stormwater infiltration. Question is what can we use to make all that compost?

What about the elephant in the room: the flush toilet! (the water conservation opportunity staring us in the face that we refuse to look at!)

Okay, time to tackle this one if we want there to be enough water for everyone, especially rivers and fish. Time to intercept the nutrients in our own effluent and put them to good use. And what higher use could there be than “using our poo to save our butts”? Maybe we can collect our precious poo, compost it with yard waste and food scraps, and then spread it on rangelands to pull CO₂ out of the air and increase our chances of survival!

Oops, is your fecal phobia getting triggered? Of course! It would require a massive public education campaign, true. But it would **save a massive amount of water**, (duh), and prevent a massive amount of nutrients from polluting our waterways, contributing to algal blooms.

Many people are doing important work on this front:

~**Thermophilic composting of humanure** has been proven to destroy pathogens (Thermopile Project). Current research at Stanford and Davis is focused on what happens to pharmaceuticals during the hot composting process: are they rendered safe for the environment? Thus far results are promising. <http://www.thermopileproject.com>

~Occidental Arts and Ecology Center has just gotten high level research permits to track the performance of composting toilets they have installed in new housing. This could lead to major regulatory changes. <https://oaec.org/our-work/projects-and-partnerships/compost-toilet-project/>

~Rich Earth Institute, University of Michigan and others have a \$3 million NSF funded project to do further research on **human urine as a fertilizer**. http://richearthinstitute.org/wp-content/uploads/2016/12/Project-SummaryContext_ForSharing.pdf

“Comment Letter – 2016 Bay Delta Plan Amendment & SED”

The flush toilet was a choice. An extremely unwise one at this point in the face of inadequate fresh water supplies. We can un-choose it and **choose to hot compost our feces** instead! We can! We’re supposedly a smart and adaptable species! Maybe even smart enough to save ourselves from extinction.

In summary, **I am proposing that we can give the rivers 60% of unimpaired flow AND thereby be prompted to embrace other beneficial practices:**

~we can *change agricultural practices* to increase the amount of organic matter and biological life in the soil, thereby requiring less irrigation water. Less run-off pollution and less carbon release into the atmosphere would result.

~we can *increase stormwater infiltration and augment groundwater resources* by spreading compost on rangelands, at the same time catalyzing the sequestration of carbon into the soil.

~we can *collect our human poo and hot compost it*, thus capturing those nutrients, and making all the fresh water currently required to convey it available for other uses.

~*challenge the public to conserve even more water* with rebates for low flow fixtures, appropriate landscaping, elimination of lawns, re-use of greywater, and harvesting of rainwater.

The “wasteful” flow that needs to be reduced is not down our rivers, but down our toilets!

Please please give our Sturgeon Elders the water they need to thrive! Give the Delta the water it needs to function as an effective eco-system.

We need living rivers and vibrant fish populations, not lawns and flush toilets!

I submit that even if unconsciously, we humans can “sense” whether the natural environment around us is flourishing or in steep decline, and that has an impact on our mental health. Rampant depression and substance abuse may have something to do with the way we are treating the world around us, and the beings that share it with us.

Let’s release that 60% of unimpaired flows into our rivers, so we can all feel the rebounding exuberance and exhilaration of our Delta eco-system!

Thank you for doing the best you can, on behalf of all beings, and for seizing this opportunity to simultaneously advance many beneficial changes in our human behaviors!

Warm regards,

Christina Berteau

Plumbing contractor, eco-artist, Greywater Action instructor