Habitat 2020 is a coalition that works to protect the lands, waters, wildlife and native plants in the Sacramento region. Members of Habitat 2020 include the Sacramento Audubon Society, California Native Plant Society, Friends of Swainson's Hawk, Save the American River Association, Save Our Sandhill Cranes, Sierra Club Mother Lode chapter – Sacramento group, Friends of Stone Lakes National Wildlife Refuge and the Sacramento Area Creeks Council.

ECOS PO Box 1526 Sacramento CA 95812 916 444 0022

March 21, 2017

Mayor Darrell Steinberg
City Hall
915 I Street
Sacramento, CA 95814

Mayor Christopher Cabaldon
City Hall
1110 West Capitol
West Sacramento, CA 95691

Dear Mayor Steinberg and Mayor Cabaldon:

Habitat 2020, the Habitat Committee of the Environmental Council of Sacramento and allies are contacting you with concerns about city light impacts on declining salmon populations. Studies show that a continuous flow of juvenile salmon out-migrate down the Sacramento River as a result of the four "runs" and their timing. Currently governments at a number of levels are engaged in the prevention of the loss of six state and federally listed species, including our Sacramento River salmon, especially the endangered winter-run Chinook salmon. State and Federal agencies are spending hundreds of millions of dollars to improve habitat and to address water supply to assist recovery.

The US Bureau of Reclamation-CVPIA 2017 Annual Work Plan recognizes the key habitat problem caused by cities:

> "Artificial night-time lighting at structures near water is believed to have adverse impacts on juvenile salmon by altering fish behavior and making the fish more prone to predation. For example, in 1984, the U.S. Fish and Wildlife Service and the California Department of Fish and Game (DFG) requested that the U.S. Bureau of Reclamation turn off large sodium vapor lights on top of the Red Bluff Diversion Dam on the Sacramento River to reduce the opportunities for Sacramento pike minnow predation on juvenile salmon passing the dam (Vogel and Smith 1984), a measure that was ultimately believed to be beneficial for salmon (Vogel et al. 1988). CDFW recently identified a potentially extremely severe problem with lighting on a pedestrian bridge (Sundial Bridge) over the Sacramento River in Redding and efforts to reduce the degree and impacts of light penetrating the water at this site have proven to be effective at reducing migration delays for juvenile salmonids and likely the associated predation risk of those individuals."

The Biological Assessment for the California WaterFix, Figure 5.D.2-2, "Approximate Timing of Various Runs of Chinook Salmon, " graphically illustrates that juvenile Chinook salmon are present in the Sacramento River virtually year round. Fall Run Chinook salmon rearing and migration from January to June, followed by Late Fall Run from April to the next December, followed by the "Endangered" Winter Run rearing and migration from July to the next March and finally Spring Run from November to April.

It should be noted that it is not just the reaction of juvenile salmon to lighting on the river but also the opportunity it provides the predators who operate visually. General or local crepuscular lighting levels can enable predation. Bass and other fish species are abundant in the Sacramento water front and are visual predators. Sea Lions frequent the Sacramento waterfront and no doubt use the back lighting of prey just as the Harbor Seals on the Puntledge River, Cortney BC used the lighting of the 5th Street Bridge and stray light from tennis courts to prey on adult and juvenile salmon.[1]

On the Sacramento River, four cities play a major role: Redding, Red Bluff, Sacramento, and West Sacramento. Redding is an important example. The CDFW required the City of Redding to make changes in the Sundial Bridge lighting. It overlooks important spawning and rearing habitat for the endangered winter-run Chinook Salmon as well as a migration path. In addition, the CDFW and NMFS require that all lights be turned off for an extended period during releases of hatchery fish above the bridge. It is undisputed that the bridge lighting poses a risk of predation and delay in migration.[2]

Specific Concerns
The unique geographic position of Sacramento and West Sacramento requires that all of the natural spawning Sacramento River salmon must migrate through a gauntlet formed by the two cities. The only fish that escape risk of predation in the river are those who are trucked from hatcheries or in very high flow periods like January–February 2017.

West Sacramento
West Sacramento has shown the most promise in that it has developed lighting standards that protect the nighttime environment and has kept impacts of lighting on the river to a minimum. When looking across the river to the West Sacramento, very few lights are visible. On the west side of the river, projects such as Raley's Dock and the Rice Mill Pier are of utmost concern because they pose the most direct new threat to out-migrating juvenile salmon and hold the potential for more lighting on the river. The general increase in ambient lighting created by various new sources in the new Bridge District and elsewhere also may create lighting levels that increase predation.

City of Sacramento
Unfortunately Sacramento has not been so progressive both in lighting on the river and lighting that impacts the night sky, creating an over all light polluted environment. Currently the Sacramento River Walk and Dock lighting have a serious impact on the nighttime riverfront environment. We also note that stray light from cities generally extends hundreds of miles and

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[1] *Vancouver Sun 19 May 2007 noted in part, "about 40 seals are lining up most nights along the line of the shadow cast by the lights to feed on out-migrating smolts and returning adult salmon." . . . . " They lie on their backs along the shadow line of the bridge lights and inhale them." . . . ."The city plans to place side baffles on the bridge lights so the light is confined to the bridge deck and the sidewalk.". . . . "Fisheries officials have also asked that lights be turned off at a nearby tennis court and lawn bowling area during the salmon migration period." See also Chapter 7 "Artificial night lighting and fishes" in Ecological Consequences of Artificial Night Lighting by Catherine Rich and Travis Longcore, eds. (2006).*

[2] *"Light on the River Kills Salmon", Redding Record Search Light (2013), by John McManus, director of the Golden Gate Salmon Association, "Potential Effects of Artificial Light from the Sundial Bridge on Juvenile Chinook Salmon Migratory Behavior and Predation by Predatory Fishes in the Sacramento River, Redding, Shasta County" (2012), Andrew Jensen, M.S. Staff Environmental Scientist, California Department of Fish and Wildlife.*

in the local area can increase the ambient light levels to what could be described as crepuscular levels associated with increased predation.

On the east side of the river we are confronted with a history of over lighting and a disregard of the environmental impacts of night lighting. Lighting on the river walk and docks to the south of the Tower bridge are a serious issue and dock lighting upstream of the Tower Bridge are a similar concern. While lighting of the Tower Bridge may very well be ill-advised, recent efforts to relight the Tower Bridge provides the opportunity to light with more attention to the environment, e.g., lower light levels, directing all light on the structure, and no spill light above or below the bridge would be beneficial changes.

American River
Lighting issues also extend to the American River; light sources include Fairbairn Water Treatment Plant, Guy West Bridge, and Howe Avenue Bridge. There are a number of visual predators in the American River including occasionally Sea Lions.

Outdoor Lighting
The future of lighting is LEDs or Solid State Lighting. This new lighting technology presents challenges and huge advantages in terms of ecological friendly lighting. On one hand because it is so efficient it has the potential to create ecological disaster because of over lighting and spectral content. On the positive side it is far more controllable in terms of color, direction, intensity and timing. It has the potential when properly applied to be very environmental friendly. It is critical to this issue and other ecological issues including human health that LED technology be properly designed and appropriately applied.

Solutions
With the above in mind, how can this problem be eliminated or mitigated?

First, both cities should step back and review plans for the riverfront with preservation of salmon and the future of our environment in mind.

Technology has provided options for timing and levels of light, and the color spectrum of light used. Local lighting professionals are available to help cities address these issues with creativity and advanced technology. In some cases, removing existing lighting and replacement with lower impact lighting including High Tech Motion Sensor would be appropriate.

The City of Sacramento and City of West Sacramento present themselves as technology and innovation hubs. This is an opportunity to show how new technology can be applied to help improve salmon habitat and contribute to recovery of our salmon population.

Can you pledge to help conserve our wildlife resources through wise choices in city project lighting? We ask for your commitment that your City will actively work to ensure that private and public development along and near salmonid bearing waterways will be lit so as to minimize impact on these light-sensitive species. We ask that you direct City staff to review existing plans as they are updated to add appropriate policy language and implementation measures. And we ask that you direct City staff to include consideration of light impacts on fish as part of all project initial studies. We recognize the critical importance of the Sacramento River corridor as a focus of a revitalized regional urban core, but we think this goal can be achieved without sacrificing

habitat for a species that we are collectively spending hundreds of millions of dollars to protect.

Thank you for your consideration of the concerns in this letter. We would be happy to meet with you, your fellow Council members and City staff to discuss further. Please respond with your pledge to help protect juvenile salmon from predation. Please provide us with the name and contact information for an appropriate staff person with whom to further discuss these issues. The best way to reach us is by email at habitat@ecosacramento.net.

Sincerely,

Rob Burness, Co-Chair
Habitat 2020

Sean Wirth, Co-Chair
Habitat 2020

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The following individuals and organizations are on record via email as additional signatories to this letter: Keith Pfeifer, Ph.D., Conservation Director for the California Fly Fishers Unlimited, kimnkon@pacbell.net; and William Templin, President, Sac-Sierra Chapter, Trout Unlimited, wetemplin@att.net

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California Department of Water Resources
California Department of Transportation
US Fish and Wildlife Service and NOAA Fisheries Service
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