



DECISIONS AND ACTIONS

Steering Committee
Wednesday, May 16, 2018

Victoria Canoe and Kayak Club

Present: Jacques Sirois, Dorothy Chambers, Bruce Bevan, Ben Chow, Rick Daykin, Doug Critchley, George and Vicki Blogg, Brian Koval, Brad Proctor, Don Monroe, John Mullane, Julian Anderson, Mick Collins, Ann Klein, Yogi Carolsfeld, Cathy Carolsfeld, Brianne Czypyha, Natalie Bandringa, Kitty Lloyd

Guests: Bill Brown, Esquimalt; Linda, Peter (local residents)

DECISIONS				
1				
Next Meeting: July 18, 2018				
ACTIONS			ACTION BY	DUE
1	Send a CRD organizational chart reflecting changes at CRD since recent re-organization		Natalie	ASAP
2	Ask Eva Riccius to next meeting		Kitty	July
3	Send Kitty link to amenity fund survey when available https://www.esquimalt.ca/news-events/news/round-2-public-input-opportunities-mcloughlin-amenity-funds		Rick	[done]
4	At link above: Submit ideas about renovating and adding to the Nature House; have info about this at the Nature House for the public		All/WFT	Summer
5	Promote iHerring app through social media at CRD		Kitty	ASAP
6	Forward letter from Transport CA regarding public input on Victoria Harbour airport		Brianne	ASAP
7	Forward PIPS' letter to the group (<i>appended here</i>)		Doug/Kitty	Done

Agenda changes:

- Natalie is facilitating the meeting (no Morley tonight)
- Joe Boyd not at the meeting

Review of Action items from 21 March 2018:

- Annual report 2017 finalized and distributed
- MoTI McKenzie interchange – on the agenda
- Lighting effects - on the agenda

INFORMATION

- Natalie Bandringa is new CRD Harbours and Watersheds Coordinator, replacing Jody Watson who has moved into a new position as Supervisor of Environmental Planning & Initiatives

ACTION: Send out a CRD organizational chart reflecting changes at CRD since recent re-organization

Presentation: Esquimalt Draft OCP Update – Bill Brown, Director of Development Services

- Official Community Plan review started in Sept 2015, lots of community consultation, surveys, open houses, community events
- Draft can be viewed here: https://www.esquimalt.ca/sites/default/files/docs/business-development/OCP-review/2018/public_hearing_version_may_28_2018_w_bylaw.pdf
- Draft OCP received first reading end of March, 2nd reading – early May
- Public hearing will be held 28 May, in Esquimalt council chambers
- Last OCP dates from 2007, current review will update all legislative mandates and include a regional context statement
- Updated temporary use conditions, development info section – enables municipality to ask for environmental assessment, traffic studies, tsunami reports, etc prior to re-zoning
- Of interest to GWI – DPAs for greenhouse gas reduction, conservation, protection of natural environment, conservation of water; in addition to meeting form and character guidelines, have to meet guidelines for above
- Special provisions along the Gorge, 20m no-build zone still there, building within the 20m setback can be allowed by compensation of habitat elsewhere
- 7.5m naturalization buffer still exists, many more guidelines for preserving natural environment, natural vegetation, importance of Gorge to Esquimalt's ecosystems, still has the provision for municipality to take strip of land along waterway if/when re-development occurs, to provide increased public access to water and potential for future waterfront walkway
- Q: Does Esquimalt have control of the waterway?
 - Only to halfway across, Saanich has jurisdiction over the opposite side
- Q: What are the bylaws for anchored boats?
 - Provision for prohibiting anchoring, very susceptible to legal challenge; will probably change this bylaw
- Q: What does Esquimalt plan to do with amenity funding from sewage treatment plant?
 - Not addressed by OCP, Rick will answer this
- Q: Does an environmental assessment have to be submitted before rezoning application?
 - Yes
- Do Victoria and Saanich have similar requirements for developments?
 - Don't think they have community-wide environmental permit area [*See page 75 of the OCP, DPA No 1: Natural Environment*]
- Is Green Shores incorporated in this OCP?
 - Yes, including tsunami provisions, 8m setback – mostly pertains to Esquimalt Harbour side of the municipality [*Green Shores is mentioned on page 80*]

VCKC Dock expansion: Joe Boyd unable to attend

- Don Monroe – trying for the 3rd time to get an extension for the dock, our dock is old, we're losing some members as it's getting difficult to lift boats (outriggers) out of the water

- VCKC applied in the past for an extension, application was unsuccessful due in part to objections from GWI
- Dorothy – Joe gave a presentation to GTCA, concept was not supported due to environmental concerns
- What is Olympia oyster situation here?
 - Yogi: Where there is eelgrass, there are no oysters; where no eelgrass, lots of oysters
- Dock could be built using oyster-friendly pilings, but the float still has to remain 1m or more above the bottom even at low tide – this is a problem at VCKC location, very shallow here

Meeting with Ministry of Transportation and Infrastructure RE McKenzie Interchange - Julian Anderson and Mick Collins

Julian:

- Met with MOTI staff and restoration expert Dave Polster twice recently
- Dave believes that the berm should be constructed using “rough and loose” concept: undulating terrain, don’t need to add topsoil, use the native soil; he is opposed to hydro-seeding; best to plant saplings rather than large trees, these take hold and grow better
- Dave’s suggestions were well-received by MoTI environmental staff, but not sure if this is true of the staff in more senior positions
- Going to start moving fill within 3 weeks, need to get a plan together quickly
- Julian wrote to Saanich to see whether they are amenable to changing their plan, not sure where things are at, feels like they will go ahead and hydro-seed, plant 600 trees, and bring in topsoil that probably has invasive species, etc
- Valuation for trees that were destroyed is too low
- Sound attenuation – MoTI feels there is no need for that
- Plants don’t work for sound attenuation
- Design of path from parking lot at Burke St still up in the air
- Not as optimistic as he was earlier, not convinced that this will make a difference
- Did Dave have anything to say about proximity of berm to creek?
 - Not really, the berm is going to breach either the slope steepness or the creek setback requirements
- Is there riprap? Open riprap is prime rat breeding habitat
 - Right now it’s rock, going to be 6” of soil on top
- Dave Polster’s report has lots of info and ideas of other approaches to slope stabilization, potential to do this on just the parks side, maybe not the MoTI side
- Very urgent as things are happening very soon
- Sent Polster’s report to Saanich; everyone is well aware of Polster’s approach
- Dorothy: there’s a perfect example of two different approaches along the Colquitz where BC Hydro used shotcrete to stabilize a bank of the creek where their infrastructure had failed. It’s adjacent to an area that Polster remediated which is now all treed
- Not planning to plant any understory; 600 trees, not all native species, and some native ones like grand fir that are not really site-appropriate

Mick: (looked at economic side of things, see document attached in Appendix 1)

- Reviewed the chronology of the project, put trees in perspective
- 3 areas, \$450K compensation package that Saanich accepted for this project
- Creation of the berm – not in original specs, nor the original compensation

- 50m setback from the creek was offered by MoTI, but Saanich accepted 30m
- Almost 500 Garry oaks and trembling aspen were cut down
- MoTI feels directly responsible for tree compensation, valued at \$1.25 million
- In discussion about the berm, leadership is on Saanich side
- At interchange website can see the technical report:
<https://engage.gov.bc.ca/app/uploads/sites/166/2018/02/FINAL-DRAFT-McKenzie-IC-Ecosystem-Mitigation-Plan-Ecosystem-Valuation-....pdf>
- This report is in 10th draft, was prepared by a respected GO expert, Matt Fairbairn
- Asked Matt for a discussion, but wants to wait until it's finalized
- Based on value of trees; all values are rounded up, but using lowest possible values
- 182 Garry oak trees = \$766K, Trembling aspen: 309, valued at \$477K
- Total value – \$1.25 million
- MoTI agreed to ask Fairbairn to come up with a more fair, higher value. Discounts were made for being in a transportation corridor (50%), and 40% decrease for being in a park – why??
- Contentious report, Mick is cautiously optimistic, that they will come up with a proper compensation package
- Possible hazmat contamination due to campers in the park
- Not the best place to replace trees – maybe compensate elsewhere?
- Openness and communication needs to be improved
- Scale of devastation is shocking, this was not in any plans
- For 15 months we have been witnessing this
- Now is the time to plan the restoration

ACTION: Ask Saanich Parks Senior Manager Eva Riccius to attend a GWI meeting

Proposal for a visitor centre on roof of new sewage treatment plant: Jacques Sirois

- New sewage treatment plant at McLoughlin Pt to be completed by 2020
- \$17 million amenity package for Esquimalt
- CoV as well (for pump station at Clover Pt)
- Sees opportunity for a visitors' centre, as a window on the Salish Sea, Victoria Hbr, the Bird Sanctuary, celebrate decades of restoration, de-industrialization, all the clean-up efforts
- Bike paths will go past there at some point
- Remarkable wildlife in the urban setting, natural and cultural heritage
- Fantastic story, lots of stories that could be told, could be a remarkable centre, unique in Canada
- Positive end to a very long sewage saga
- Is this a good idea? Rick Daykin is in charge of some of the amenities

Rick:

- Sewage amenity bylaw says \$7 million for waterfront park, \$5 for recreation facilities: Archie Browning, Bullen Park field, Esquimalt Rec Centre; \$5 million for a safety building
- Phase 1 – gathering initial input, park acquisition, expansion of facilities, new park/rec facilities, all capital related
- Received 4900 ideas from public input – grouped into themes, 21 themes for waterfront parks, boardwalks, performance area, picnic, gazebos, dog parks, etc
- Only capital related ideas to be considered
- Phase 2 – to start around May 24 or 31st, simple online survey, and at most events through summer

- We had the opportunity to comment on this to help provide direction on where funds should be spent
- Plant itself – reason they are giving Esquimalt \$17million is that there wasn't room for these amenities on the site
- Ideas will be ranked by the public
- Open to anyone, not just Esquimalt residents, but there's a survey question about whether you live, work or play in Esquimalt
- What about Ogden Pt? – it's in CoV, but Greater Victoria Harbour Authority is very interested
- Natural history interpretive centre was an idea brought up during public input

ACTION – Rick send Kitty link to survey when available

Link is here: <https://www.esquimalt.ca/news-events/news/round-2-public-input-opportunities-mcloughlin-amenity-funds>

ACTION – submit ideas about renovating, adding to the Nature House; have info about this at the Nature House for the public

Lighting on Johnson St Bridge – Yogi and Mick

- Concerns have been raised about the effects of lighting on the marine environment
- Yogi – put a letter together based on input from lots of people including Dave Robinson, urban lighting specialist
- Excess bright lights on new bridge
- Stantec was contracted to do a lighting study
- This report is in a draft format, which was shared with Yogi and GWI
- Opportunity to provide input to final report, we have till Friday
- Concerns:
 - Human health – blue LEDs create stress in people, makes it difficult for eyes to focus, not good idea for lighting a road
 - People living next to the bridge will be exposed on an ongoing basis, potential for health problems, especially blue wavelengths
 - Some evidence that it may produce cancer
 - Recommend it's on for only a short period of time
 - Human health was not considered in the report
 - Stantec only considered impacts compared to the old bridge, should be broader considerations
 - There was a focus on sensitive periods – salmon migration, herring movements
 - But animals are actually there year-round; eg cutthroat trout, herring, many other species are there throughout the year
 - Stantec did not mention cutthroat trout at all in their report; stated that adult salmon would not react at all to the lights, only the smolts; this isn't true, they may be attracted so they can feed more effectively
 - Birds – herons likely to respond to the light – would likely go to bridge to fish, be part of the problem
 - Mammals – seals, otters, raccoons, etc
 - Recommendation in Stantec report – install a sonic boomer under bridge to scare the seals;
 - Western WA university prof specialized in this urban lighting effect on wildlife, interested in helping out, he has published papers that allow prediction of effects of different lighting on different species

- What about lighting on the new Craigflower Bridge?
- Stantec report was done in March, before lights were installed
- Mick and Dave Robinson started looking into this 2 months ago, finally received the draft report and this is a good opportunity to provide input
- Incremental lighting study (Stantec report); the letter that Yogi et al have put together has a lot more information than Stantec included
- Other groups can add their name to this letter, may not be time to get GWI name added to this (due to CRD process)
- There may be funding for studies of the lighting effect
- Friends of Vic Hbr MBS, PISCES, GWAS, Esquimalt Anglers, PIPS all want to add their names to the letter
- Dorothy: Hemmera reached out initially to locals to get information about fish in the area, Stantec did not take this approach
- GWI provided the link that allowed us to get the draft report and submit comments
- Brianne – council meeting tomorrow night, could present a late agenda item and have 5 min to address council about this
- Council contacted Dorothy about the lighting, which is how this opportunity was provided
- Coastal Cutthroat is being considered as a subspecies of concern

ACTION TAKEN: Several groups at the meeting added their names to the letter. Final submission is attached here as Appendix 2.

Partner Updates:

WFT – iHerring app – hope to start getting info about local herring populations and movements outside of the spawning season, not just herring but other forage fish, please record all these events on iHerring app
ACTION – promote through social media at CRD

- Reef balls going in tomorrow at Fisherman’s Wharf; Veins of Life and Point Hope Shipyard put in 60 reef balls as compensation for shipyard construction
- Idea of using reef balls full of oyster spat into areas where there are presently none
- Putting some in with different types of concrete to see if settlement will be different, maybe a camera on them; putting them in shallow water, will be partly out of the water at low tide
- Victoria International Marina put some reef balls in their area at same time

Victoria Golden Rods & Reels: There is a move to take Royal Oak Golf Course out of the Agricultural Land Reserve; VGRR is interested in Normandy Creek, tributary of Colquitz, vision is to have CRD or Saanich Park, maybe some allotment gardens; working to keep it in the ALR or at least not become housing. New Elk/Beaver Lake Initiative coordinator: Jill Robinson, RFP going out for technology for oxygenation of Beaver Lake, looking at sites, electricity sourcing, solar possibilities

Vic West CA: Park at the west end of the new bridge, want more green area, Jacques suggested an eagle perch. Kitty met with Andrea Hudson, CoV Community Planner, yesterday about Green Shores possibilities for this waterfront park. Options are limited there due to presence of concrete bulkhead that supported blue bridge, and riprap along rest of the waterfront along this park. Still options for many trees and an open green area

VCKC – Club has been very busy in last 3 months, Paddle for the Kids, Brentwood Bay to clubhouse, raised \$15K for kids with disabilities; Wake up the Gorge canoe race, 32 people came from all over the area; May 5th 22nd year of shoreline clean-up of the Gorge; Power To Play coming up, Big Brothers and Sisters picnic event; Canada Day picnic, raise money for kids with disabilities; 50th anniversary coming up

in Sept., dragon boat races coming up; lots of courses, all booked up; canoe trip around Haida Gwaii later this summer

GWAS: Nature House open on weekends, open every day starting in June, restoration event in spring in Gorge Park, project this summer - restoration on salt marsh with UVic RNS program; doing summer volunteer drive to keep NH open; World Oceans Day Celebration on June 2

Saanich: no report

Peninsula Streams: Blenkinsop Creek – doing a Garry oak restoration there along Lochside Trail, as compensation for the BC Hydro Substation expansion; pollinator project, doing bee surveys, looking for volunteers to do bee surveys; beach clean-ups all over Saanich Peninsula, want to start doing that along the Gorge – any ideas? Craigflower has lots of garbage in the roadside ditches

PISCES: clean-up, broom cutting, concerned about illegal boats in the inlet

CoV: Committee of Whole report related to contamination at Laurel Pt park, cleanup by Transport Canada where old paint plant was, looking at remediation in tandem with Transport CA; report went up last week related to Cecelia Ravine Park; combined manhole, high fecals were reported by Sara Stallard, going to improve infrastructure, looking at lining pipes, or replace them if that's not possible; 4ha of land was purchased, want to enhance nature elements, encourage nature play; Ship Pt plan – staff proposed complete redevelopment there, deteriorating dock, great plan to revitalize as a festival space, markets, looking at different stormwater treatment elements, many constraints at the site, can't infiltrate at the site; lots of contamination at this site; letter from Transport CA to Mayor RE public consultation about Vic Hbr water airport – **ACTION:** Brianne will send the letter; CoV is reviewing rainwater rewards program – looking at improving program and increasing uptake

PIPS: Concerned about arrival of liveaboards in Portage Inlet; following ruling in CoV, boats are moving into PI, concerned about access to property, dragging boats through shoreline vegetation; concerned about property rights; **ACTION:** Forward PIPS' letter to the group . Letter is attached here in Appendix 3

Esquimalt: Refrigeration project at Archie Browning; new playgrounds, washrooms in different parks; education signs at Highrock Park, expanding works yard, will be 300ft² larger

Esquimalt Anglers: Some members involved in moving hundreds of 1000s of fry in Sooke, auto defibrillator device now at the Craigflower fish fence site; Royal Oak group – concerned about new HandiDart bus drop very near the Craigflower counting fence; helping with new treatment centre in View Royal very close to the fish fence, they are putting in bee hives; working with CRD Parks to ensure adequate water flows in Craigflower Cr (CRD controls water levels at Thetis Lake)

Dorothy: Selkirk boats coming up to PI, some of them have pro bono legal advice; April 23 – final reading of bylaw aimed at reducing campers in parks; people have to remove chattels during the day, same legislation as in CoV; large container of acid, fuel etc found near campsites, soil may need remediation there

Friends of Vic Harbour MBS: Lots of communication with GVHA – dealing with bird nesting on their roofs; adding goose eggs on Trial Is; lots of birds moving through, elephant seal on Gonzales Beach – needed police to keep people back; lots of *Velilla* (by-the-wind sailor) in the Salish Sea – 1000s in the last 2 weeks, on Macauley Beach; Gonzales Beach and elsewhere

Meeting adjourned: 10:00pm

Appendix 1: Presented by Mick Collins, RE McKenzie Interchange Project

The following table was prepared by Mick Collins, Conservation Director, Victoria Golden Rods and Reels Fishing and Social Club, for a meeting with Julian Anderson, Friends of Cuthbert Holmes Park and Ministry of Transportation and Infrastructure (MOTI) officials Mark Traverso, Director, Environmental Branch and Joanne Letkeman, Regional Manager, Environmental Services on May 9, 2018. Source data is from “McKenzie/Highway 1 Interchange Ecosystem Mitigation Plan Part 1: Ecosystem Valuation” by Aruncus Consulting July 2017.

This report provides an estimate of the minimum value of the two ecosystems. Mr. Traverso said that he would ask the consultant to also provide a higher estimate which would give a range.

<https://engage.gov.bc.ca/app/uploads/sites/166/2018/02/FINAL-DRAFT-McKenzie-IC-Ecosystem-Mitigation-Plan-Ecosystem-Valuation-....pdf>

SUMMARY OF ECOSYSTEM VALUES LOST

	NUMBER OF TREES	VALUE OF ECOSYSTEM (\$)	“VALUE PER TREE (\$)”
Garry Oak *	182	66,146	4,209.59
Trembling Aspen**	309	477,127	1,544.10
(includes 2 Oregon Ash)			
Combined	491	1,243,273	2,532.12

	Ave Diameter (cm)	Ave Height (m)	Ave Condition
Garry Oak	23.5	10.3	93.7
Trembling Aspen	15.1	9.16	-----

* Ranked as imperilled (deep soil) critically imperilled (shallow soil)

** ranked as imperilled. Also note loss of 473 Trembling Aspen stems 15-300 cm diameter

Please note: The Garry Oak ecosystem also contained 30 other trees for a total of 212. If these trees are included the value per tree is \$3,613.89 in the Garry Oak ecosystem

Appendix 2: Lighting under the new Johnson Bridge

Kara Hewgill,
Assessment, Permitting and Compliance,
Stantec
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Adam Steele
Sewer and Stormwater Quality Technologist
Engineering and Public Works
City of Victoria
1 Centennial Square, Victoria BC V8W 1P6
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Cc: Brianne Czypyha, Jonathon Huggett

May 18, 2018.

Dear Kara and Adam,

Thank you for the opportunity to comment on the report on lighting impacts of the new Johnson St. Bridge.

We appreciate that the new bridge is a pleasing architectural solution that has substantially enhanced automobile, bicycle and pedestrian traffic management. Congratulations to the designers and builders! We also understand the desire to showcase the structure in some fashion, and appreciate that the LED lighting is more environmentally benign, from an energy consumption point of view, than conventional lighting.

We are, however, concerned about the environmental and health impacts of the light being used to embellish the structure, in the sense of intensity, colour, and directionality. In this context, we urge the bridge project go beyond the current Stantec report to not be limited by the baselines of impacts of the original bridge, but also consider potential improvements and/or raising the environmental bar, as it has with traffic management.

Our concerns are about both light intensity and quality, and their impacts on humans, birds, fish, and other animals. This includes the brightness of the LED lighting and the blue wavelength chosen as the main embellishment.

Human impacts

Human impacts of the bridge lighting are not covered in the Stantec report, and likely were not part of the requested work. Studies have shown that the blue component of LED lighting, including that in perceived white LED street lighting, reduces the human eye's capacity to focus and resolve images – particularly amongst the elderly. In part, this is due to excess scattering of light of this wavelength, compared to that of other colours. This is of particular concern to users of the bridge and of boaters under the bridge, especially to avoid accidents on the bridge and in the transition areas leading to the bridge. However, it is also of concern to the condominiums close to the bridge, as much of the bridge's light is being reflected into the neighbouring sky and buildings.

Other factors of concern to people regularly exposed to the lighting, both because of the brightness and the blue quality, include impacts on sleep and stress through melatonin-mediated mechanisms. The American Medical Association issued a guidance statement on this in July of 2016:

<https://www.ama-assn.org/ama-adopts-guidance-reduce-harm-high-intensity-street-lights>

That statement was based on the following report

<https://www.ama-assn.org/sites/default/files/media-browser/public/about-ama/councils/Council%20Reports/council-on-science-public-health/a16-csaph2.pdf>

- Of particular note are the sections on Health and Environmental Effects which points out the negative effects of blue light at night on humans, animals, insects and fish.

There is also some evidence of increased cancer rates, specifically with blue lighting:

<http://emailing.isglobal.org/t/ViewEmail/j/4A16CB30C7337A0A2540EF23F30FEDED>

(The actual paper is here:

https://ehp.niehs.nih.gov/wp-content/uploads/2018/04/EHP1837.alt_.pdf)

While other urban lighting also contributes to these effects, the bridge project is particularly bright when operating at maximum potential, but its management could well be an example of good practice on the use of appropriate urban lighting.

Our recommendations:

- Review overall lighting intensity and quality with respect to impact on regular users and near-by residents, both for safety and health, and use the minimum necessary;

Impacts on other animals

As identified in the report, animals potentially affected by the lighting include:

Terrestrial and marine mammals – especially raccoons, otter, and seals; these are in and around the harbours throughout the year. Presumably the physiological impacts of the lighting are similar to that of humans, however these animals would also aggregate if prey items, such as juvenile salmon and herring, also aggregate in the light at night;

Birds – Great Blue Herons appear to be particularly responsive to lighting in the harbor, but the visual acuity of other birds in flight may also be highly compromised with the unusual spectra and reflection under the bridge. This includes a variety of seabirds that congregate in the harbours, but both seasonally and throughout the year, that are spooked at night;

Salmonids – as indicated in the report, coho salmon pass through the area as adults to spawn from September to December, and the juveniles migrate out of the creeks February – May. They have an unknown residence time in the harbours, but as recent studies are showing the importance of estuarine and coastal habitat to juvenile salmon, presumably they stay several months. Anglers report that adult Spring salmon and some Chum are also present in the harbour throughout much of the year, but their distribution is largely unknown. Sea-run cutthroat trout are a particularly iconic species of the harbour, maybe not so emphasized in the report. It is fished in the upper corners of the harbour throughout the summer, but also under the old Johnson St. Bridge and has been observed in front of the Empress. They are probably present in most parts of the harbour during the summer, probably go up the creeks for a while in the fall with the coho, and may spawn in the creeks in April/May. The coastal cutthroats, of which these are part, are being considered for COSEWIC listing because of falling numbers.

As you know, there are concerns about the effects of urban lighting on salmon, as described for Puget Sound in this news article:

http://knkx.org/post/light-pollution-identified-potential-issue-threatened-puget-sound-chinook-salmon?utm_source=Sightline+Institute&utm_medium=web-email&utm_campaign=Sightline+News+Selections

This article describes how young salmon are attracted to lights at night, with associated risks of increased predation and energy losses, and discusses how the intensity of blue LED lights may be particularly damaging in this regard. Adult salmonids may not be directly attracted to lights as much, but may be attracted by the concentrated invertebrate and small fish that collect under the lights, and may need to swim a gauntlet of directly or indirectly light-concentrated predators during their spawning migrations and foraging periods.

Dr. Dave Beauchamp, of the USGS Western Fisheries Research Center, has researched and published on the

impacts lights have on the behavior of salmonids and their predators, which is a bit more recent than the references used in the report. In the case of an art installation with blue and green lighting, for example, he observed increased predation of salmonid smolts of about 30%. We have some of these publications, if you need them, including methodologies to estimate effects based on measures of luminosity and water turbidity. It is important to note that measuring surface illumination alone is not adequate to estimate environmental impact – light penetration is dependent on luminosity, wavelength, and turbidity.

Dr. Beauchamp's research is also looking at lighting on bridges, and he would be willing to collaborate on any monitoring or research that might be done here (through UVic and/or WFT). As indicated in the Stantec report, the responses to lighting may be complex and should be managed on an adaptive basis with monitoring. In general, we feel that the report does not emphasize adequately that fish (including salmonids) are in the harbour all year, not only during sensitive seasons;

Herring – herring are a particularly important forage fish – serving as food for salmon, other fish, birds, marine mammals and birds. There is evidence that the “Gorge” herring are a genetically distinct stock, which is very unusual for the BC coast. These appear to be at a historically low level. While it is uncertain where they spawn, they are seen as adults in the Gorge primarily from late January to late March, presumably coming through Victoria harbor and under the bridge. In addition, reports indicate that some are angled in the Gorge throughout the year, suggesting that some adults are actually passing through throughout the year. The harbour also hosts remarkable schools of juvenile herring throughout the summer, presumably both of this Gorge stock and other stocks – our harbours may be a particularly important nursery for these fish. Research at UVic and SFU have demonstrated the sensitivity of herring to blue light (as well as that of salmonids); the report also cites some interesting literature on the response of herring to lighting and also emphasizes that it would be important to monitor the effects of the bridge lighting. We certainly agree with this.

Smelt – these are also an important forage fish, with largely unknown biology. At least some of their spawning occurs at the top of sand/cobble beaches. Increasing numbers have been angled in the Gorge herring fishery, and larval smelt are being observed, suggesting that this fish is finding new spawning habitats in the Gorge, and maybe other parts of the harbor. This is relatively new information that is not in the report.

Other fish – large schools of perch and stickleback develop in the harbours throughout the summer, aggregating close to the surface. Numbers are reduced during the winter. These, together with the juvenile herring, are the most likely to be attracted to lights in numbers that would also attract predators like herons, juvenile and adult salmonids, and seals. Other, more benthic fish species are also abundant in the harbours, and some of their larvae are common in the plankton. We have not found specific references on how these would be affected by lighting, though some is mentioned in the report. Blue light penetrates further than other wavelengths, the local impact may be significant.

Invertebrates – the harbours are rich with benthic and pelagic invertebrates, including all kinds of plankton, shrimp, crabs, worms, and clams as well as (seasonally) squid. Nightlighting is a well-established technique for concentrating these animals, both for research and fishing (eg squid fisheries). Lights directed into the water, particularly blue light with greater penetration, are likely to have this effect at the bridge as well. Most remarkable are likely to be worms that come out of the mud to spawn normally in response to bright moonlight – and things like squid. Other, less visible concentration, will also likely attract predatory fish, which in turn attract predators of the fish. It is largely unknown what the long-term effect of such impact is on invertebrate populations and the associated food chains (negative or positive). While we have not done a literature search of recent data on this, the bridge could provide an interesting research opportunity to explore the issue. The report does not deal with marine invertebrates.

- *Our general recommendation is to reduce lighting as much as possible, with particular emphasis on the light oriented towards the water, monitor the effects **throughout the year**, and manage lighting regimes accordingly. There is substantial potential to celebrate both the beneficial structural and environmental novelty of the new bridge.*

Other more specific recommendations:

The report lists a mostly good set of best practices, including:

- The Johnson Street Bridge lighting should be designed to restrict lighting to the bridge structure, roadway and walkways only, with minimal spill elsewhere. Only minimally required Transport Canada hazard marking and lighting should be used under the bridge and on its abutments.
- Johnson Street Bridge Lighting should be designed to eliminate or minimize light spill, either directly or by reflection, into the Victoria Harbour and Gorge Waterway, particularly under the bridge. This may require reorientation and shielding of lighting fixtures and a reduction in lighting intensity.

Our particular concern is that:

- A seasonal restriction of lighting is unlikely to mitigate the impact on the different portions of fish and invertebrate life phases. Hours of operation of structure lighting should be subject to a curfew from 10pm to 6am to minimize effects on people and the aquatic habitat. Roadway and walkway surface lighting need not be subject to the curfew as long as it is confined to the road and walkway surfaces.
- Adaptive management based on monitoring. Graduate research support could be interesting for this.
- We feel that sonic deterrents, in the report's recommendations, should ONLY be used if there is a demonstrated need from monitoring: we know that fish and other animals are also sensitive to sound and may be negatively affected. A better approach is to manage light levels.

We look forward to hearing how these issues are addressed.

Respectfully,

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Appendix 3: Letter from Portage Inlet Protection Society

Portage Inlet Protection Society. (PIPS) May 16 2018.

PIPS is concerned about the arrival of live-aboards in Portage Inlet.

In recognition that the City of Victoria enforced an injunction from Supreme Court on May 7 2018 it is probable that more boats could arrive.

Waterfront residents are probably the most affected re dumping of sewage in the water or on land, garbage, and noise etc. PIPS are stewards of the Gorge Waterway and Portage Inlet as well as an organization to protect upland owners' property rights including "Riparian Rights", which include:

- (1) Protection from erosion by an upland property owner.
- (2) The right to unimpeded access to and from navigable waters from all points along the natural boundary of the upland parcel.

There is a need for docks from which to launch boats (canoes/kayaks) in order to protect the banks from damage as the boat is dragged through vegetation.

PIPS supports any policies to remove abandoned boats or evict live-aboards providing no policy affects our use and the existence of our long established rights to use docks, stairs, floats, wharves as well as structures to prevent erosion.

Doug Critchley
Research Director PIPS.