

Yule Log Message

By Mike Fenger

Fast away the old year passes, join the new year lads and lasses so the old carol goes, and yes we need to look ahead to what may be difficult times with regard to changes around the globe and shifts in species and ecosystems in response.

For me this year has flown by and FER is doing well – in the broad sense of doing well – but may need to take on more as we forge ahead into our 33rd year and the pace of change accelerates on the landscapes and watersheds of BC. A priority for us is to better understand and significantly expand on what we consider is a very modest ER network.

For those who follow Stuart McLean on CBC and his Vinyl Café, FER it's a bit like Dave's record store "*We may not be big, but we're small*". FER continues to peck/grind/badger away at issues related to ERs. We are not inclined to hire permanent staff. We want to keep a low operating budget and rely on project-specific donations or write proposals for grants to achieve advances for specific goals such as the Legacy Project which captured historic ER-related information or the more recent focus on a new approach to funding research related to big oil (Kinder Morgan) and the tanker transport risks to marine ERs and Marine ERs' role in understanding marine ecosystems (see article beginning on page 7).

Thanks again to FER members for your support over this last year. We hope your Christmas and New Year holiday season are the best and wish you many more to come. We want you to renew your memberships and we want you to invite/recruit friends and like-minded individuals to do the same. Possibly gift a membership to a like-minded friend if you are in the mood. It would be good to grow FER membership in the next year so if you can recruit one friend to support the Friends of Ecological Reserves, you are donating to the environment. Can we double the size of this modest organization in

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What Does Drizzle Lake ER and Superpredator Humans have in Common?

By Louise Beinhauer

Two late summer articles, one appearing in *Science* an online Journal of original scientific research and the other in *Smithsonian Magazine*, whose focus was on the research of Tom Reimchen, Chris Darimont, Caroline Fox and Heather Bryan caught my attention.

The article in *Science* is entitled “Superpredator humans are hunting other animals out of existence” by Elizabeth Pennisi and referred to Chris Darimont and Tom Reimchen’s newly published study entitled “The Unique Ecology of Human Predators”. The article stated that after a decade of compiling and analyzing 300 studies, Reimchen, Darimont and their fellow researchers came to the conclusion that predators like humans, wolves and grizzly bears kill wild herbivores at about the same rate, **but humans kill large carnivores at nine times the rate of other predators.** (predator - defined as ‘an animal naturally preying upon others’ - OED) And alarmingly, humans kill those carnivores, not for food, but for trophies or to eliminate them as competitors.

The article goes on to further state that the toll on fish is even greater. Reimchen and Darimont, both professors at the University of Victoria, report that people catch adult fish at a rate up to 14 times that of other predators. Thanks to large fleets of fishing factories, the annual human toll on marine fish may exceed 100 million tons and what is worse, they focus on catching large adults, removing these

individuals in their reproductive prime.

The *Smithsonian Magazine*’s article entitled “Modern Humans Have Become Super Predators” by Sarah Zielinski is also based on this same research by Reimchen, Darimont, Fox and Bryan. She states that the study got its start back in the 1970s when Tom Reimchen was studying predator-prey interactions in a remote Canadian Lake. Specifically he and his students were studying the effects of trout, loons and other predators on stickleback fish.

Despite the number of predators, the stickleback population remained steady, the premise being that this was because they consumed fry, juveniles and sub-adults and fed only on five per cent of reproductively valuable adults each year. This contrasted dramatically to the commercial fishing activity in adjacent marine waters where 40 to 80 per cent of salmon and herring caught were of reproductive age. This led to Reimchen collecting data from other studies that looked at predators, including humans, and the prey they were consuming. He and his colleagues gathered more than 2,200 data points on 399 prey species from every ocean and continent except Antarctica.

Chris Darimont stated that humans target adult animals for many reasons including the fact that older animals provide more meat. Also, most fisheries and wildlife management plans call for adults to be harvested, think-

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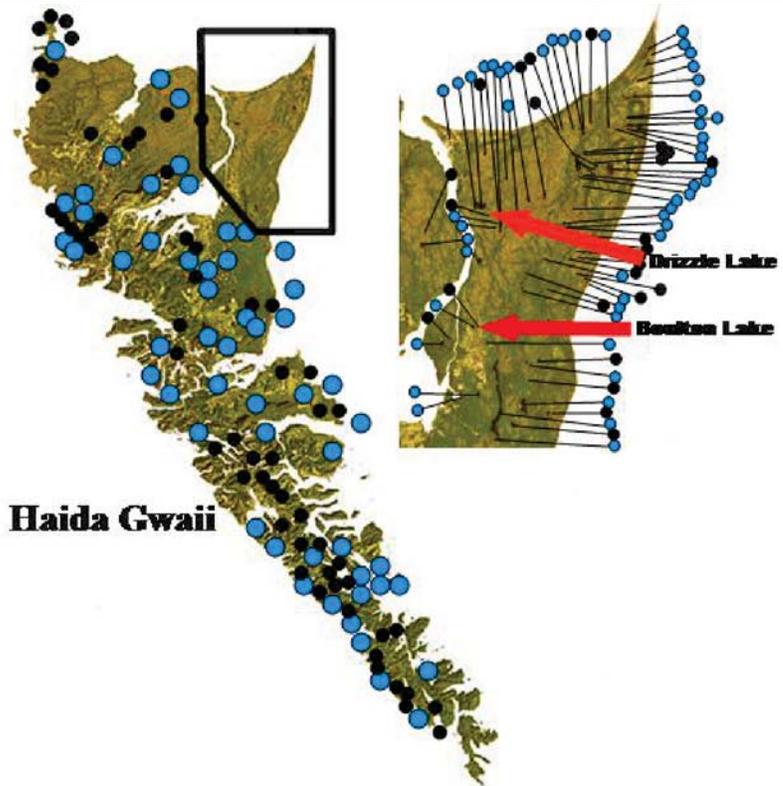
Drizzle Lake ER (Cont'd.)

ing this will free more food and other resources for juveniles. Those juveniles then grow to become adults available for harvesting in the future. Darimonts believes that this practice can have ramifications, especially for fish. Old, large fish tend to produce more offspring. Removing those fish lessens the reproductive capabilities of the population and may even affect the evolution of a species.

So what could these articles have to do with Ecological Reserves? Well the answer lies in the fact that Dr. Tom Reimchen's first studies from 1974 to 1997, were conducted from a field station at Drizzle Lake Ecological Reserve. From this field station, the researchers would study some 700 lakes and ponds in the Haida Gwaii archipelago to assess the distribution and characteristics of the Threespine Stickleback (*Gasterosteus aculeatus*).

Eventually Reimchen would focus on Drizzle Lake where he monitored predator diversity over 10 years. Total yearly stickleback mortality at Drizzle Lake was structured by 23 species of piscine, avian, mammalian and macroinvertebrate piscivores of which the Common Loon and the Cutthroat trout were the major consumers (taken from field notes of Tom Reimchen, see: <http://web.uvic.ca/~reimlab/index.html>).

Dr. Reimchen has gone on to publish many studies on such things as the seasonal and diurnal abundance of aquatic birds on the Drizzle Lake ER and focussed on the Common Loon and the Red-throated Loon in an 1980 study. He makes note that Drizzle Lake Ecological Reserve was established in 1971 for its unusual population



Map of Haida Gwaii and inset showing the location of Drizzle Lake ER and Boulton Lake where Dr. Tom Reimchen's original studies of Sticklebacks took place. (Source: — "Evolutionary and Ecological Studies in Reimchen's Lab <http://web.uvic.ca/~reimlab/index.html>)

of Threespine Stickleback and as a representative of High Moor bog. Friends of Ecological Reserves helped fund Dr. Reimchen's studies over many of these years.

In late summer of this year, the Friends of Ecological Reserves were made aware of logging plans close to and over the existing trail access to Drizzle Lake ER. Four cutblocks were advertised by BC Timber Sales, one of which is within 300 m of the reserve. The Board strongly opposed the sale of Block105 and made their feelings known to BC Parks. (see F E R website: <http://ecoreserves.bc.ca/2015/08/10/drizzle-lake-ecological-reserve-compromised-by-logging-plans/>). Tom Reimchen stated that the research investment which is in the order of 120 to 150 thousand dollars would be twice the value of the stumpage. Unfortunately

Parks did not agree with our assessment of the risk to Drizzle Lake ER if this cutblock is logged. BC Timber Sales in Haida Gwaii received several bids and issued a licence on Sept 21, 2015. As part of the licence BCTS included the obligation to deactivate the road at the entrance from the highway of block DRL105 to prevent vehicle access following the closing of the licence. The license was issued with a two-year term (legislation does allow possible extension up to four years total). However, this is not anticipated, as the licensee has already started operations in this sale. The logging operations should be completed in well under two years.

The Oxford English Dictionary also defines a predator as a "plunderer" – so there is more than one way to be a 'human predator'!

The Life of Ken Millard

By Rod Mickleburgh, Excerpted from the November 2, 2015 edition of *The Globe and Mail*

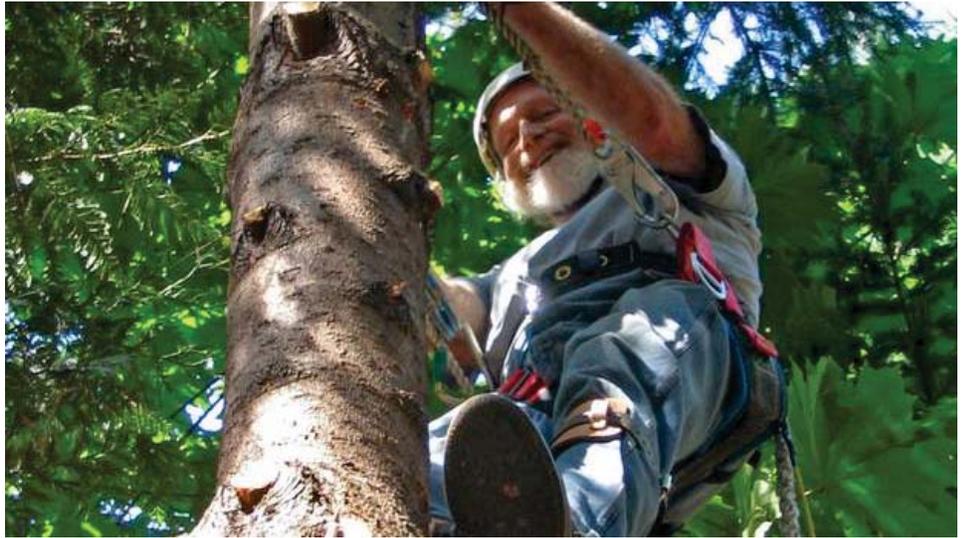
Soft-spoken and unassuming, Ken Millard thought nothing of leaving his small Galiano Island cabin, heading to the big city and taking on the captains of industry. He considered it a small task, given that the stakes were so high: preservation of a rare forest ecosystem that was under siege. If that meant wrangling a 20-minute meeting with billionaire Vancouver businessman Jimmy Pattison and stretching it out to an hour and a half, so be it. While he did not win over Mr. Pattison completely, Mr. Millard did buy enough time to stop development in its tracks.

For Mr. Millard, along with a small group of equally committed green activists, that struggle to preserve the island's Douglas fir environment from logging was the beginning of a long mission to save and restore as much of Galiano's natural habitat as possible.

His success was remarkable. By the time Mr. Millard died of a heart attack on Sept. 27 at the age of 74, he was a towering figure and mentor in the province's land-trust movement, revered for spearheading the transformation of a narrow, idyllic island of 1,200 mostly laid-back residents into a conservation juggernaut.

After thwarting the plans of forest titan MacMillan Bloedel Ltd., the Galiano Conservancy Association, which Mr. Millard co-founded in 1989 and essentially led, has gone on to purchase nearly 200 hectares of valuable tracts of land on its own. These richly diverse areas, including scarce wetlands, woodland trails, precarious forests of Garry oak and Douglas fir and majestic beach fronts, are now permanent nature reserves.

Among them is a large, formerly scarred and defoliated chunk of



Ken Millard (photo by Keith Erickson)

industrial land that the conservancy has spent 15 years restoring to its original state. Restoration has been so meticulous that it serves as a living lab for a University of Victoria environmental studies course on ecological regrowth. The property's acquisition was typical of the way Mr. Millard operated. The 68 hectares had been owned by Telus Corp. to allow a communications cable to slice across Galiano on its way to Vancouver Island. Mr. Millard saw possibilities. He boldly approached the company and suggested that it didn't need all that land, just the cable. Telus thought Mr. Millard had a good point; the company sold the property cheaply to the conservancy and kept the the cable's right of way.

"He didn't hold anybody in awe," said Risa Smith, also a co-founder of the conservancy association. "It could be the king, a big company executive or anybody. He was fearless."

The pinnacle of the conservancy's many successes is its ambitious Learning Centre, on 75 hectares of acquired forest, wetland and waterfront. Over the

years, the centre has hosted more than 30,000 visitors and focuses on teaching disadvantaged young people, seniors and immigrants about the joys and wonders of the natural outdoors.

Mr. Millard was the driving force behind it all. "From the very start, it was his vision that inspired us. Always," Ms. Smith said.

With his prominent white beard, Mr. Millard seemed to dominate public participation on the island, always showing up to fix something, cajole residents to get involved and most of all, indulge his great love for Galiano's trailblazing forest restoration project. A photo taken a few weeks before he died showed him up a tree in the middle of the forest. His smile could not have been wider.

For all his achievements as an environmental campaigner, that was only one facet of Mr. Millard's remarkable career. He started out as a university physicist, earning a doctorate in the complex field of statistical mechanics. Then, in his late 30s, he made an astonishing

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Jacques Sirois' Biosphere Dreams

By Maleea Acker

Reprinted with permission from the December 2015 issue of *Focus Magazine*

By December, rain and the darkness of winter blankets the Capital Region. Berries hang like rubies from the darkening limbs of the Arbutus. Storms shawl the coast with salt spray. Songbirds have migrated to their southern homes. But as the days shrink to their shortest and the Salish Sea takes on its jade-green clarity, a dark pulse of fish are gathering in the deeper waters of our coast, waiting for spring.

Biologist Jacques Sirois would like to see these fish – Pacific herring – return to their pre-1960s population, a restoration he argues would have cascading effects not just on marine life, but on how we live in and think of this region.

Pacific herring, a schooling fish found in the Pacific from California to Japan, have been called a cornerstone or foundation species for their key role in marine ecosystems. Herring and their eggs help sustain sea birds, black bears, wolves, eagles, fish and marine mammals. Fingerling herring, born in our region's harbours, bays, and shallow waters, leave their spawning grounds in early fall for the open ocean, where they follow currents and travel in schools until full maturity – about three to five years.

I met with Sirois at his home in Oak Bay, but he didn't stop at telling me about herring. A fast-talking transplant from Quebec City, Sirois is a passionate volunteer warden for Trial Island Ecological Reserve and



Jacques Sirois, volunteer warden for Trial Island ER. (photo: Tony Bounsall)

Chair of the Friends of the Victoria Harbour Migratory Bird Sanctuary (GVMBS), which stretches from Gorge Inlet to Ten Mile Point in Saanich. He also works as a lecturer in the polar regions, tying nature and culture together for those enthusiasts who travel vast distances to visit research stations and icebergs.

Sirois wants residents to think bigger when considering the south coast's future. Here at home, he points out, there isn't even a sign celebrating Trial Island's status as an ecological reserve. Our marine and terrestrial ecosystems are, in his view, "the best coastal environment in Canada," but will only remain that way through concerted efforts. Integrating a plan for herring restoration with cultural heritage and sanctuaries for species at risk would allow the

region to coordinate planning. This, he says, could happen with creation of a UNESCO Salish Sea Biosphere. Through the Cattle Point Foundation, he argues that a Salish Sea biosphere would provide opportunity for balanced interactions between humans and nature and champion the area as a model for sustainable living, cultural heritage and ecological diversity.

Sirois leans in at his dining room table to emphasize his points, "To *Lekwun* is to smoke herring." The Lekwungen, ancestors of the Songhees Nation, used this fish as a staple. *The Tyee* argues that herring may have sustained First Nations as much or more than salmon. Their bones, previously undetected in coastal archaeological surveys because of their size, date back to catches over 10,000

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years old. "This is ground zero for a paradigm shift" he argues.

UNESCO biospheres are internationally recognized areas of marine, terrestrial and coastal ecosystems. They support protection of biodiversity in tandem with sustainable development and also serve as testing sites for programs to help people live in concert with nature. Reserves normally have a core protected zone, a transition zone and a buffer zone where the greatest amount of development occurs. In Greater Victoria these areas might include the Oak Bay Islands archipelago, local green spaces and Victoria's urban centre. But Gavin Hanke, Vertebrates Curator at the Royal BC Museum, says development precludes the region as a viable area. "Intentions are good, [but] execution is impossible. I say put a wall around this region and humans have to stay inside...let wildlife roam un-molested outside of our communities."

Herring used to school so thickly in Victoria Harbour and Gorge Inlet that the water would turn black. In 1960s, and then again in the 1980s and 2000s, populations plummeted. Overfishing, creosote pilings and pollution took their toll; in 2014 and 2015 the Department of Fisheries and Oceans allowed fisheries openings in the Haida Gwaii, West Coast Vancouver Island and Central coast regions. The Heiltsuk, Haida and Nuu-chah-nulth succeeded in halting both years' openings based low herring numbers.

A return of the herring, Sirois argues, would allow species like



Nurturing herring would allow other species to rebound in the Salish Sea area.

migratory birds to rebound. In the last decade there has been a 70 per cent decline in coastal bird populations. Worldwide, populations of marine birds, mammals, fish and reptiles have declined by 49 per cent since 1970. Some species, like tuna and mackerel, have seen drops as high as 74 per cent.

Sirois wants to see revival of the GVMBS, marked as a protected area for migratory birds in 1923, through enforcement and education. The sanctuary protects, on paper at least, shorebird species, many of which are constantly on the move. Loons, grebes, plovers and terns use the GVMGS shores in winter as feeding locations on the way to their breeding grounds.

Sirois argues that the GVMBS was ideally situated. Birding BC keeps track of unusual species seen by residents. This year's sightings included the Golden eagle, Brown pelican, Cattle egret, Pacific golden-plover, Long-billed curlew and Wander-

ing Tattler, many seen within the boundaries of the sanctuary.

The region's richness, says Sirois, presents an ideal opportunity to create a biosphere. But it may takes some changes to how we currently live in it. For instance, one of the biggest obstacles to enforcement of the bird sanctuary might not just be development or pollution, but the species that accompany people to those shores.

Sirois helped count over 600 Canada geese in the area between Trial Island and Ten Mile Point in 2012. Federally, Canada geese are a protected species, but locally, where they are an introduced, invasive species, efforts are being made to reduce their numbers. Geese feces pollute lakes and other water bodies. They are a possible carrier of salmonella for cattle and they routinely trample and feast on endangered plant species in Garry oak ecosystems. The situation,

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Level The Playing Field for NEB's Pipeline Projects Conditions

By Mike Fenger and Garry Fletcher

The summer LOG 2015 included the Executive summary of the final written evidence from the Board of Friends of Ecological Reserves (Board of FER) sent to the National Energy Board (NEB) in May 2015.

We focused our concerns on the 19 Marine Ecological Reserves located in the shipping corridor of the Kinder Morgan Trans Mountain Expansion Project (KM/TMX). We recommended to the NEB that they include conditions similar to those applied to the approved Enbridge Northern Gateway project with regard to ecosystem monitoring, research, funding and reporting.

We also proposed an industry supported Marine Research and Monitoring Endowment Fund with a \$9 million annual budget as a permit condition, with guidance and oversight provided by a multi-stakeholder Trustee Council. This annual budget is based on what Alaskan's spent, in today's dollars, in response to the Exxon Valdez spill March 24, 1989 (26 years ago). The NEB did not include any of the Board of FER's recommendations for permit conditions in the 145 draft conditions for KM/TMX released in July.

In this article we compare the Enbridge approach to marine research, to those conditions proposed by FER for KM/TMX. We proposed a multi-stakeholder Trustee Council as being superior for directing research in the broader public interest. We believe that this is more acceptable than oil industry directed research programs which would be slanted more to oil industry interests.

A *Times Colonist* November 29th article by Lauren Krugel "Report urges more research into oil spills' effects on oceans" is also of interest



Black Oystercatcher Adult and Chick. These birds nest in the upper intertidal zone of rocky islands of the Race Rocks Ecological Reserve (Photo by Raisa Mirza 2010)

to the Kinder Morgan TMX project. (The entire article can be accessed at: <http://www.timescolonist.com/report-urges-more-research-into-oil-spills-effects-on-oceans-1.2122846>). The report referred to by Lauren Krugel is by the Royal Society of Canada and provides guidance to the NEB on determining whether Enbridge has met permit Condition #167 - *Enhanced marine spill trajectory and fate modelling*, Condition #169 - *Research program on the behavior and cleanup of heavy oils* and Condition #170 - *Annual research program progress report*. (The complete list of conditions for Enbridge Northern Gate can be found at: <http://gatewaypanel.review-examen.gc.ca/cif-nsi/dcmnt/rcmndtnsrprt/rcmndtnsrprtvlm2-eng.pdf> pages 364-398 list the exact wording of the conditions.)

As intervenors in the on-going Kinder Morgan Trans-Mountain Expansion project, the Board of

FER reviewed the conditions imposed on Enbridge and expected at least some level of equivalency which we reflected in the 12 conditions we recommended for the KinderMorgan/Trans Mountain Project. We see our recommendations as essential because of the enormous increase in transportation of diluted bitumen (dilbit) in the Salish Sea if the Kinder Morgan project is approved.

A central reason for designating Ecological Reserves is to preserve representative and special natural ecosystems thereby providing research and educational opportunities. (See: Ecological Reserves Act. http://www.bclaws.ca/civix/document/id/complete/statreg/96103_01#section2 Purpose 2. (c) areas that serve as examples of ecosystems that have been modified by human beings and offer an opportunity to study the recovery of the natural ecosystem from modification. In the draft conditions proposed to NEB by the Board of FER, we maintain that

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Kinder Morgan has a responsibility, over the life of their project, for marine ecosystem research in general and that the oil industry in particular bears significant financial obligations for benchmark ecosystem monitoring in order to establish baselines for recovery should a spill occur. This research must include learning more about the effects of heavy oil in the marine environment.

Ecological Reserves (ERs) alone do not provide a sufficient network of monitoring sites and many of the research needs cannot be met in ERs alone. Therefore the Board of FER proposed a more encompassing approach that allows other stakeholders a voice, together with industry and government to set research priorities. We were proposing to enable NGOs as well as government scientist and industry selected consultants, to propose research into marine systems.

The Enbridge-funded Royal Society report is an opportunity to look at research priorities through the lens of the terms of reference set by the oil industry. It is good that the oil industry, in this case Enbridge, voluntarily proposed marine research during the hearings process and agreed that they have some financial obligations for marine ecosystems in the pre-spill period, as a cost of an oil exporting company doing business. It is also good that the NEB panel of the Northern Gateway transferred the voluntary commitment to binding permit conditions for Enbridge and that Enbridge found wider support from Oil Producers to help cover costs linked to meeting their permit conditions.

There are so far, no voluntary conditions that have been put forward by KM/TMX nor the requirement of such conditions by NEB. Arguably NEB is allowing fewer obligations than those imposed on Enbridge. Since the

human population and marine enterprise on the shores of the Salish Sea is greater and the species at risk and the biological productivity is also much greater, this lowering of the industrial obligations for KM/TMX is not logical, as well as not acceptable. If anything, in our opinion, the obligations placed on KM/TMX should be much higher than those placed on Enbridge.

The *Times Colonist* article indicates that the Royal Society acknowledges research gaps, however the degree of risk the NEB is willing to accept is up to them – but more research is needed. From the Board of FER's point of view, the risk the Enbridge Panel was willing to accept is lower than the risk the KM/TMX panel is willing to accept. This is based on the differences in conditions between these panels for similar projects.

The NEB panel of KM/TMX has placed no conditions on KM/TMX for any marine obligations whereas the NEB Enbridge panel placed several obligations on the Enbridge proposal. The following are quotes from the Royal Society report's executive summary.

A panel of leading experts on oil chemistry, behaviour and toxicity reviewed the current science relevant to potential oil spills into Canadian marine waters, lakes, waterways and wetlands. The review, which examined spill impacts and oil spill responses for the full spectrum of crude oil types (including bitumen, diluted bitumen and other unconventional oils), is among the most comprehensive of its kind. It surveyed scientific literature, key reports and selected oil spill case studies, including tanker spills, an ocean rig blow-out, pipeline spills and train derailments. The Panel also consulted industry, government and environmental stakeholders across the country.

The Panel found that the

dozens of crude oil types transported in Canada exist along a chemical continuum, from light oils to bitumen and heavy fuels, and the unique properties of each of these oil types (their chemical 'fingerprints') determine how readily spilled oil spreads, sinks, disperses, impacts aquatic organisms, including wildlife, and what proportion ultimately degrades in the environment. Despite the importance of oil type, the Panel concluded that the overall impact of an oil spill, including the effectiveness of an oil spill response, depends mainly on the environment and conditions (weather, waves, etc.) where the spill takes place and the time lost before remedial operations. The Panel recommends that this critical research should concentrate on seven general high-priority research needs:

High-Priority Research Needs Identified by the Expert Panel

- 1. Research is needed to better understand the environmental impact of spilled crude oil in high-risk and poorly understood areas, such as Arctic waters, the deep ocean and shores or inland rivers and wetlands.*
- 2. Research is needed to increase the understanding of effects of oil spills on aquatic life and wildlife at the population, community and ecosystem levels.*
- 3. A national, priority-directed program of baseline research and monitoring is needed to develop an understanding of the environmental and ecological characteristics of areas that may be affected by oil spills in the future and to identify any unique sensitivity to oil effects.*
- 4. A program of controlled field research is needed to better understand spill behaviour*

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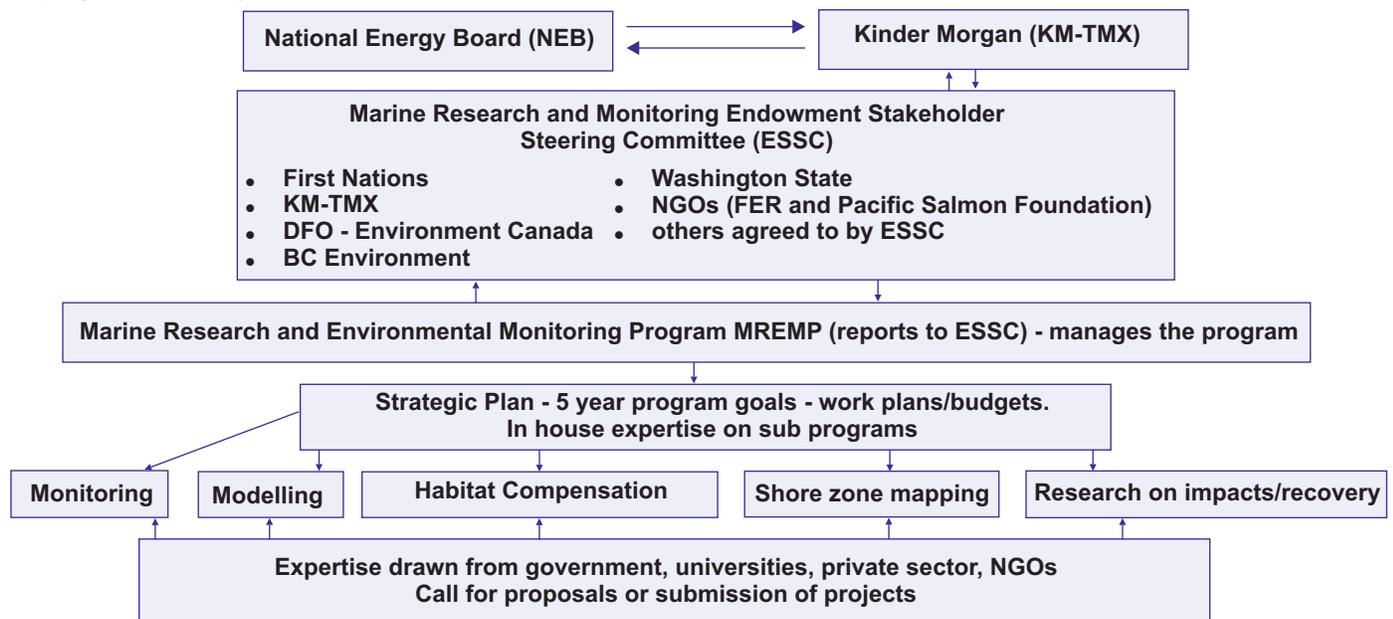


Figure 1: Endowment Reporting and Multi Stakeholder Board as proposed by FER to the NEB in our Final Arguments Report.

and effects across a spectrum of crude oil types in different ecosystems and conditions.

5. Research is needed to investigate the efficacy of spill responses and to take full advantage of 'spills of opportunity'.
6. Research is needed to improve spill prevention and develop/apply response decision support systems to ensure sound response decisions and effectiveness.
7. Research is needed to update and refine risk assessment protocols for oil spills in Canada.

Ecosystem impacts and recovery were not clearly present in the oil industry dictated Terms of Reference but are of great interest to the public as are the impacts and resilience of marine ecosystems. The public interest can better be served if the setting of the research agenda is not solely left to private firms with oil exporting interests. FER has proposed that industry, together with governments and First Nations is the appropriate group to balance research efforts. Corporate research interests do not entirely match public research interests yet both must be addressed.

Recommendation 3 above is of concern as it is a call for "A national, priority-directed program of baseline research" and appears to be an off-loading to the Canadian public of the research costs for what should be an oil industry obligation. This off-loading of costs to the public is inconsistent with concepts more widely accepted such as *polluter pays* or a *no net loss* type of approach when there are private interests pitted against public assessed value and public liability. To that end, the conditions proposed by the Board of FER for KM will more fairly place the costs of research directly onto Kinder Morgan to ensure that multiple stakeholders' research priorities and the best projects able to meet broader public goals are selected.

Figure 1 shows the proposed governance structure the Board of FER is seeking from the NEB as a condition on Kinder Morgan for a more equitably focused research and monitoring program in a pre-spill environment.

There has been dissatisfaction with the KM-TMX process expressed by many of the intervenors and

some have dropped out. The Board of FER hopes the NEB will see the benefit of additional provisions along the lines that we have advocated. There may however be a review since there is a new Federal government and the Board of FER is of the opinion that the status quo is inadequate and that the approach of Enbridge is an improvement. There is still a strong case to be made to provide for permit conditions that will force Kinder Morgan to shift the status quo to a more inclusive multi-stakeholder approach with a greater industry role for managing risk and understanding of the marine environment. With just the status quo, there is a lack of transparency and an inadequate learning / communications environment between the public, industry, governments and the NGO community. This can and needs to be changed. The Board of FER has provided a road map toward meaningful change and we are seeking support for such a shift. We are confident that our approach, if accepted by the NEB could help to shape a more constructive dialogue.

career switch – to hand-crafting bows for violins. They were not the modern bows used by most violinists. Rather, Mr. Millard specialized in baroque violin bows, which were only then beginning to be made again after an absence of 200 years, to meet a growing interest in playing early music on period instruments.

Within a year, operating mostly on instinct and what he called “a feel” for the wood he was shaping, Mr. Millard had emerged as a pioneer luthier in a field where there were almost no original baroque bows left to study.

“Ken went to museums, he read treatises, he looked at old paintings. He investigated,” said violinist Marc Destrubé, a pillar of Vancouver’s early-music scene and one of Mr. Millard’s first customers. There was soon a two-year waiting list of international musicians for his bows, which Mr. Millard liked to finish on the sun porch of his Galiano cabin. “His best bows combined agility with suppleness and the ability to draw a warm, rich sound out of the violin,” Mr. Destrubé said. “I have two of them. They are fantastic.”

Sadly, Mr. Millard was eventually forced to abandon his bow-making because of serious health problems resulting from sensitivity to oils in the tropical wood he used.

Despite his acclaim, he remained modest; he would dismiss opinions that his bow-making prowess was that of an artist. “Maybe a craftsman,” he would respond. With his wife Linda, he lived a frugal, simple life in their self-built cabin that barely exceeded 500 square feet. But there was no mistaking his passion when he cared deeply about something. “He would absolutely embrace it,” said his daughter Lisa. “That’s how he did everything.”

In the B.C. Legislature, MLA Gary Holman, who worked with Mr.

Millard in several environmental organizations, paid tribute to him as “a gentle man, with a sharp wit that belied a steely determination.”

The second of three children, Kenneth Young Millard was born July 10, 1941, in Takoma Park, Md., not far from Washington, D.C. When he was 10, his father died, and his mother had to raise the family on a secretary’s salary. He attended Bethesda-Chevy Chase High School, where he met Linda Lowden, three days his senior. They became high school sweethearts, marrying at 20 and forging an exceptionally strong partnership that lasted 54 years.

Mr. Millard earned his doctorate at Case Western Reserve University in Cleveland, where the couple’s daughters, Beth and Lisa, were born. He liked to joke that he chose physics because everything could be reduced to just a few equations, making it easier for his poor memory. Following a dispiriting year at a rural college in Missouri, the family moved to British Columbia in 1972, when he accepted a visiting professorship at Simon Fraser University. He left academia three years later, shortly after refusing to cross a picket line set up by striking teacher assistants, among them his wife.

The Millards were enchanted by Galiano, from their first visit in the late 1970s. They soon bought property overlooking the ocean and settled there permanently in 1988, just as Mac-Blo was gearing up to clear cut a large swath of its forest holdings. The end of his bow-making left Mr. Millard free to embrace the Galiano Conservancy as a full-time cause. When Mr. Pattison, a member of the board at MacMillan Bloedel, challenged the group to raise \$1-million to show they were serious about offering to buy the company’s forest lands, Mr. Millard led an astonishing fundraising drive in the small community, which somehow came up with the money. But Mac-

Blo brushed them off, deciding instead to divide and market its land into large residential lots.

A lengthy, bitter fight ensued that included an unsuccessful suit by the company against the conservancy to stop its activities, one of the first examples in Canada of a strategic lawsuit against public participation. The dispute also engendered numerous other legal battles and hard feelings by those who had purchased the lots. The matter was eventually settled by the governing Islands Trust, which made it very difficult for owners to build on their lots without preserving most of their land as forest. Mr. Millard’s legacy endures.

He leaves his wife, Linda Millard; daughters Beth Thiessen and Lisa Millard; brother John Millard and sister Doris Spencer; and five grandchildren.

Karel Klinka - 1937 - 2015

It is with great sadness that we share the news that Dr. Karel Klinka, Professor Emeritus of the Forest and Conservation Sciences Department of UBC died on September 15, 2015.

Dr. Klinka was an outstanding ecologist, forester, supervisor, mentor, collaborator and friend. His knowledge of plant distribution and ecology was encyclopedic and his ability to recall Latin names legendary. His research and contributions to biogeoclimatic ecosystem classification provide the foundation for many provincial policies and practices.

Dr. Klinka was born in Czechoslovakia in 1937 and earned his For. Ing degree from Charles University in Prague in 1960. He immigrated to Canada in 1969 and earned his Ph.D. in the Faculty of Forestry at UBC in 1980. He carried on the research of Vladimir Krajina, the father of BC’s Ecological Reserves.

Conservation of the Coastal Douglas Fir Ecosystem

By Garry Fletcher

The Board of Friends of Ecological Reserves has attempted over the past two years to get the government departments of BC Parks and BC Forests Lands and Natural Resources to clarify the process needed for the establishment of Ecological Reserves. Since we have not been successful yet in determining that process, it was encouraging for me to see that perhaps there are other ways of dealing with needed conservation in this province.

At the 13th HABITAT CONSERVATION CONNECTION FORUM on October 8, 2015 in Sidney BC, the focus of the forum was on the need to have a strategic and collaborative approach for effective conservation efforts in Coastal Douglas-fir ecosystems. The Coastal Douglas-fir Conservation Partnership (CDFCP) brings a strategy of shared stewardship and has identified conservation priorities that reduce duplication of effort, share resources and information, and provide support to its participants.

The agenda of the sessions and bios of speakers can be found at <http://www.hat.bc.ca/our-blog/conservation-connection-forum>. Since there were concurrent sessions, brief outlines of a few of the sessions are included here.

Andy MacKinnon, Biologist and Forester who was responsible when working with the Ministry of Forests for Ecosystem mapping for BC, laid out the current status of the Coastal Douglas Fir Bioregion. Warm dry summers and wet winters of the Southern part of Vancouver Island have determined the small range of this ecosystem. These conditions also attract people to move here so that most of the traditional range has been occupied by development. The statistics are telling.

Only three per cent of the old



growth ecosystem remains. Forty-four per cent has been logged, urban and agricultural take up 46 per cent and non-forested wetlands and rock occupy seven per cent.

The land ownership figures detail the problem with the sustainability of this ecosystem which has 127 plants listed by COSEWIC and 26 listed as species at risk (SAR) as well as 81 animals of concern.

- In British Columbia as a whole, five per cent of the land area is privately owned and 95 per cent is crown land.
- In the Coastal Douglas Fir zone 93 per cent is privately owned and seven per cent is publicly owned, therefore we would have to set aside a lot from private land to assure adequate conservation.

Andy listed some of the Research initiatives in CDF Zones. With Climate change being a major concern, it is fairly simple to make climate predictions but harder to

see what is happening on the ground. On South East Vancouver Island they have been looking at various features such as microclimates, understory vegetation, decomposition nutrient cycling and dendrochronology. It is called the integrated Climate change study.

Why we might care: We live here, not much of it is left in BC, ownership is variable, such a small amount is currently in protected areas and as a consequence it includes many species at risk.

Darryn McConkey, a BC government FLNRO ecosystem biologist presented a report on the CDFCP Conservation Strategy. On the website:

<http://www.cdfcp.ca/index.php/about-the-cdfcp/conservation-strategy>, you can see how the CDFCP has developed a Conservation Strategy to guide the activities of the Partnership and identify important partnership opportunities. This is a

Continued on page 12

living document and will change over time. The Partnership will endeavour to have the most recent copy posted here, and welcomes comments and feedback at info@cdfcp.ca.

The Partnership has identified five primary goals. These goals express the ways in which CDFCP is working towards the vision of ecological integrity for Coastal Douglas-fir and associated ecosystems. The first three are core business of the CDFCP, the other two are activities supported by the Partnership.

1. Provide sound science
2. Conduct education and outreach
3. Cultivate effective partnerships
4. Facilitate securement of additional protected ecosystems
5. Support active ecosystem management

Dr. Richard Schuster presented sessions on how new tools have been developed to identify areas with high conservation values. Dr. Richard Schuster has developed and deployed the MARXAN server which aids in the identification of areas that meet targets for a range of input features for minimal cost. The Marxan server Uses concept complementarity, can maximize compactness can include data on ecological processes, threats and conditions, and can offer decision support, although it is not intended to be a decision maker.

To see how the program operates and find out how Marxan can sort out financial values, opportunity costs, boundary costs and calculate whether the target for each conservation feature is met including a cost for any target conservation area see the website at:

<http://arcese.forestry.ubc.ca/marxan-tool/>

Dr. Peter Arcese spoke on the

need for prioritizing conservation. Human Influence on ecosystems is considerable, but by engaging private landowners, conservation of biodiversity could be furthered greatly. Usually the cost of acquiring land for conservation purposes is too high so we need to think about how to engage federal, provincial and private land managers and how do we could fund those efforts.

In the CDFCP Study Area we could identify priority parcels and then emulate the Agriculture Land Reserve in getting an 85 per cent cut in taxes. Target best management practice for high biodiversity-value properties, and shift tax burden from high to low biodiversity-value properties

Other applications of using this type of tool for Conservation management may be applied to sequestering of carbon where the maximum return on investment in C storage and sequestering of old growth is assured. There are also applications with planning for Salmonid enhancement, and determining what are the best practices for Species at Risk.

Dr. Amanda Rodewald of the Cornell Lab of Ornithology in the US provided examples of how private land conservation requires new partners and creative approaches with her presentation on Conservation Incentives: Tax Shifting, Lessons, & New Approaches from the United States. The typical traditional approach has been to purchase properties outright, establish conservation covenants or easements, incentives for specific management practices or education. However most of these traditional methods are looking at a fixed time scale.

Now we have examples of how to use *Dynamic Conservation*, a complementary approach that can work in a variable environment. In some ecosystems there are variable

and changing environments, ephemeral resources or temporary needs of species during specific periods of their annual cycle. Expensive land creates a renters market, so by paying farmers to welcome birds, for instance at different times of their migratory seasons has proven successful In California. Bird returns pays farmers for allowing rice fields to remain flooded at certain times.

Nature conservancy can evaluate where bids are most needed. It is based on science driven estimates of the amount of habitat they need. The system is flexible, adaptive and economical. The example of payments to farmers to delay or forgo mowing... for ground-nesting birds at specific times of the year has been successful as has payment for riparian conservation that benefit salmon that temporarily use the habitat and time sensitive efforts for instance for recolonizing bluebirds.

These methods complement the more traditional approach of permanently protected areas. Dynamic conservation works for public land too. Six species of birds with more than 50 per cent of global population have habitat in the US National forests. Global tools for conservation such as e-bird, which is Citizen science driven have proven useful in plotting the distribution and values of certain areas for conservation.

These examples from the HAT Conservation Connections Forum have provided some indication that even if the current government has little appetite for the creation of more protected areas, there are ways that a partnership of conservation organizations, governments, and other stakeholders can develop conservation plans, and use tools to set and recognize their own conservation priorities.

'Yule Message', Cont'd. from p. 1

2016? Now that would be amazing.

FER remains focused on how to maintain the integrity of BC's ecological reserve system and individual reserves, support ER wardens and opportunities to improve research, monitoring and reporting for each of these small gems of the protected areas system. We know it is not all about membership and donating funds and so appreciate the time that ER wardens donate to their ERs and that is "priceless" – thank you.

It is fair to say that supporters of FER understand human kind is dependent on the environment and that our collective future depends on vastly improved and accelerated acquisition of ecosystem knowledge. This will only be possible through accelerated focus on monitoring, research and knowledge of the extension of the limits, thresholds of natural ecosystems, and anticipation of where tipping points lie. We need to know this so that we do not exceed ecosystem capacity for change and ecosystems retain sufficient elements so they can be resilient as the global climate shifts around us all.

In this Yule LOG you will find information on the contributions that research in ERs has made to our collective understanding and our desire to put in place a governance model that facilitates learning in the marine environment should the Kinder Morgan Project be approved. We are fairly certain NEB will approve the project with conditions. We want conditions that ensure learning and adaptation along the way. You will find an



Over 30 years of Research has occurred at Drizzle Lake

article on 40 years of research in Drizzle Lake Ecological Reserve (page 2 & 3) and an update on how we worked to reduce risks to this important ER. The Drizzle Lake ER example highlights just how important private donations have been for advancing ecosystem understanding. FER was pleased to be able to support Dr. Tom Reimchen (I was able to hand a cheque to Tom for \$5,000 a few years ago so he could carry on his research). We can see just how well such funds are used by Tom whose inquiring mind and keen students helped understand productivity and predation within a relatively closed pristine aquatic system.

I encourage you, or if you know of other potential donors, to consider FER a worthwhile group to contribute to. If you have a favoured researcher, then rely on FER to flow your private donations to a specific researcher so you can obtain a tax deduction for your contribution however big or small.

The hard questions on ecosystems resilience and

human wants/pressures on ecosystems need informed answers. FER can help. In this age of seemingly endless diversion of research funding by senior governments (your tax dollars) to industrial corporate research questions, FER understands the need to invest in questions more in the public interest. FER will attempt to leverage research towards the broader public interest questions. Should we have funding we would go in search of matching funds to accelerate understanding natural ecosystems.

We have worked quietly with the BC government to address the need for new ERs and improve the boundaries of existing ERs to ensure their ecological integrity. To that end we were indeed saddened by the loss of a stellar conservationist Ken Millard (see article beginning on page 4). We had the privilege of walking the Galiano Bog ER with Ken and are in total agreement with him on the need to make boundary changes to

Continued on page 14

this ER so that the watershed of this bog is entirely within the boundary of the ER.

We have, for the last year and a half, been in discussion with both Parks staff and crown lands staff in the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) who manage lands outside of parks. We have submitted a list of candidate ERs to FLNRO and Parks. We also requested a modest boundary change to the Galiano Bog ER. We have been getting the inter-departmental shuffle between Parks and FLNRO Victoria staff; possibly a red tape indecision loop or lack of will from staff to help a group such as FER pursue conservation protection in the public interest and without an economic driver for treasury board. Another ER candidate put forward to the BC government is

Pink Mountain. Please visit Ron Long’s website with details at: <http://www.pinkmountain.ca/home/ron-long>. Ron will be in Victoria in February presenting an update on Pink Mountain. For details, please see box on back page.

FER will continue to promote to government the need for a process that evaluates the merits of candidate ERs such as those we have proposed. We note that recent amendments to the *Parks Act* (<http://www.env.gov.bc.ca/bcparks/aboutBCParks/legis.html>) allow for changes in Park boundaries. It seems to us that boundary changes can be pursued only if they promote private economic interests (which have been equated to the public interest) and there is no quid pro quo for boundary changes in the public interest for conservation and improved integrity for our shared environmental future. Ecological Reserves appear

to be of low or no consequence as they are not bringing an economic resource opportunity to the government. FER’s only concern is for our shared future based on what we strongly believe, is our understanding of the natural environment on which we all depend.

So please renew your membership, recruit new members, and think about others you know who are concerned about the environment. Ask if they think that they may be a good fit for a donation to FER. FER aims to increase understanding and accelerate knowledge on sustainability of ecosystems and the use of Ecological Reserves as important benchmarks. Visit the membership portion of our web site:

<http://ecoreserves.bc.ca/get-involved/membership/> and the donate portions of the web site. <http://ecoreserves.bc.ca/get-involved/to-donate/>. Thanks.

Jacquois Sirois Cont’d. from p. 6

agrees botanist Matt Fairbarns, who restores native habitat on Trial every summer, “continues to deteriorate despite two years of egg addling.”

Sirois would also focus on a domestic pet. “We have a dog problem,” he sighs. “Our beaches and our rare plant habitats that are used as dog parks, this is highly questionable. We have many wild versions of Butchart Gardens, but better. We need to treat them like we do those gardens.” The Dallas Road walkway features a two kilometre off-leash area, where dogs swim on beaches and romp along shorelines. Signs exist in parks like

Dionysio, on Galiano Island, warning of nesting oystercatchers and other seabirds, but disturbing the established Dallas Road ecosystem of dogs and their owners may prove a hard sell.

Sirois names off local natural areas – Uplands Park, Cattle Point, Dallas Road, the Oak Bay archipelago that could constitute core conservation areas in the Salish Sea Biosphere. “Right now, we still have all of the ingredients here,” says Sirois. “The bald eagle has returned. The northern elephant seal returned, where they bred on Race Rocks in 2010.” As a recent success story he cites Howe Sound, where the Squamish

Stream Keepers began a herring reintroduction program in 2004, covering creosote pilings with environmental wrappers to protect roe from contamination. The eggs began surviving. Within ten years, he tells me, Orca, salmon and birds returned to what had been an industrially decimated area.

Sirois continues: Purple martins and Coho salmon are returning; Olympia oysters have survived decades of pollution in the Gorge. Herring could also return. “I think we have to ask, do we want this kind of beauty, or do we not?” He pauses and leans closer, “What we do today is what we will have in the future.”

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Pink Mountain Biodiversity Report

Date: Tuesday, Feb. 16, 2016
Time: 7:30 pm
Where: Swan Lake Nature House
3873 Swan Lake Road,
Victoria

Please join Ron Long on Tuesday, Feb. 16, 2016 for his presentation on Pink Mountain - a potential new Ecological Reserve.

In 2010, he began to develop a research plan and raised funds for an examination of Pink Mountain. The objective of the work was to survey the natural history of Pink Mountain. Its biodiversity seems to be unmatched in British Columbia and it all began with a meeting of the Victoria Natural History Society. This talk will report in detail what the research has revealed.



West Coast Ecological Reserve Wardens' Meeting

A meeting of West Coast ER Wardens has been scheduled by BC Parks for February 26 and 27, 2016 to be held at the Vancouver Island University in Nanaimo.

The agenda includes time for ER Warden Profiles - Stories from the Field; BC Parks update and the role of ER Wardens with Erica McClaren; BC Parks update on First Nations relationships with Don Cadden; the State and Future of BC's Ecological Reserves; Resourcing and Support Needs for ER Wardens and a recognition dinner and celebration.

Day two will include ER Warden training opportunities as well as a field trip to Mount Tzuhalem ER and Woodley Range ER. The day will wrap up at 2:30 pm.

The Log



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