CITY OF BELLEVUE
BELLEVUE PLANNING COMMISSION
STUDY SESSION MINUTES

October 28, 2009
6:30 p.m.

Bellevue City Hall
City Council Conference Room 1E-113

COMMISSIONERS PRESENT:	Chair Sheffels, Commissioners Ferris, Hamlin, Lai, Mathews, Orrico, Robertson
COMMISSIONERS ABSENT:	None
STAFF PRESENT:	Nicholas Matz, Department of Planning and Community Development, Michael Paine, Heidi Bedwell, David Pyle, Department of Development Services
GUEST SPEAKERS:	Tessa Francis, PhD.
RECORDING SECRETARY:	Gerry Lindsay

1. CALL TO ORDER

The meeting was called to order at 6:34 p.m. by Chair Sheffels who presided.

2. ROLL CALL

Upon the call of the roll, all Commissioners were present.

3. PUBLIC COMMENT – None

4. APPROVAL OF AGENDA

The agenda as submitted was approved by consensus.

5. COMMUNICATIONS FROM CITY COUNCIL, COMMUNITY COUNCILS, BOARDS AND COMMISSIONS – None

6. COMMITTEE REPORTS – None

7. STAFF REPORTS

8. PUBLIC HEARING

A. Capital Facilities for 2009-2015 CIP CPA (09-113932AC)

Senior Planner Nicholas Matz noted that both of the Comprehensive Plan amendments that were the subjects of the public hearing were the 2009 CPA annual work program. He said both were initiated by the City Council at the request of staff. The Commission will be asked to formulate a recommendation for each.

Mr. Matz said the Capital Facilities CIP reference update was initiated on May 18, 2009, and the recommendation of staff is for approval.

Mr. Matz said the amendment is predicated on the decision criteria listed for Final Review where there is a technical error in the current circumstance regarding a Comprehensive Plan amendment. The proposed change will correct that error. The specific amendment seeks to update the references in the Capital Facilities Element of the Comprehensive Plan to reference the current Capital Investment Program.

Motion to open the public hearing was made by Commissioner Robertson. Second was by Commissioner Orrico and the motion carried unanimously.

There were no speakers signed up to address the Commission for the public hearing.

Motion to close the public hearing was made by Commissioner Robertson. Second was by Commissioner Orrico and the motion carried unanimously.

B. Transportation Element Figure TR.2 – Travel Demand Forecasts Update CPA (09-113933 AC)

Mr. Matz said the proposed update to the Transportation Element of the Comprehensive Plan seeks to update the travel demand forecasts shown in Figure TR.2. He said the recommendation of staff was to approve the amendment. Mr. Matz said the amendment is predicated on the decision criteria listed for Final Review where there is a technical error in the current circumstance regarding a Comprehensive Plan amendment. The proposed change will correct that error. The amendment included an update of the Mobility Management Area boundaries to be consistent with the updates to their boundaries that came about as a result of the Bel-Red CPA; an update to the travel demand forecast year to 2020; and a proposal to show the travel forecasts in summary form.

Mr. Matz said the current format breaks down the travel demand forecasts by type of trip. Using the summary form will allow for better addressing the GMA requirement for traffic forecasts and capacity and which is located within the Transportation Element. As proposed, summarizing the trip forecasts for 2020 in all modes of travel makes them easier to represent graphically and understand intuitively. Measuring the forecasts in density of trips per acre allows for an intuitive understanding of travel demand and land use capacity. For example, the Downtown MMA is the most dense in trips per acre; the other Employment Centers are shown to have the next level of density of trips per acre. The residential areas are shown generally with the least density of trips per acre.

Motion to open the public hearing was made by Commissioner Robertson. Second was by Commissioner Orrico and the motion carried unanimously.

There were no speakers signed up to address the Commission for the public hearing.

Motion to close the public hearing was made by Commissioner Ferris. Second was by Commissioner Orrico and the motion carried unanimously.

9. STUDY SESSION FOR COMPREHENSIVE PLAN AMENDMENTS

A. Capital Facilities for 2009-2015 CIP CPA (09-113932AC)

Mr. Matz confirmed for Commissioner Robertson that the Capital Facilities Element of the Comprehensive Plan is updated every two years to sync with the biennial adoption of the CIP.

Motion to approve the Capital Facilities CPA was made by Commissioner Orrico. Second was by Commissioner Robertson and the motion carried unanimously.

B. Transportation Element Figure TR.2 – Travel Demand Forecasts Update CPA (09-113933 AC)

Motion to approve the Transportation Element CPA was made by Commissioner Orrico. Second was by Commissioner Robertson and the motion carried unanimously.

10. STUDY SESSION

A. Shoreline Master Program Update – Shoreline Urbanization and Aquatic Ecosystems

Environmental Planning Manager Michael Paine introduced Tessa Francis who he noted has two postgraduate degrees in environmental issues and who is co-author of eight peer-reviewed papers.

Dr. Francis said she is currently employed by NOAA's National Marine Fisheries Service, but pointed out that the material presented was all from the work she did while at the University of Washington for her PhD dissertation.

Dr. Francis said the Puget Sound region is a rapidly urbanizing environment. Humans tend to settle and construct residential structures near shorelines, both marine and freshwater bodies such as lakes and rivers. She said her dissertation focused on how residential settlement along the boundary between aquatic and terrestrial habitats is affecting the connections that exist between the land and the water and is affecting food webs in the ecosystems of freshwater habitats.

There are a number of reasons to suspect that the land/water connections on lakes are important. There is research done on lakes around the world which demonstrates that lakes are the recipients of organic matter, both dissolved and particulate, that flows in from surrounding watersheds. Much of the research has been put into tracking the fate of the organic matter through aquatic food webs. There is strong evidence that the lakes are receiving the organic matter even though it is not always known where the terrestrial material ends up in the lakes. The research on river and stream ecosystems shows that litterfall comprised of leaves, small branches and terrestrial insects from the surrounding land, is very important to the food webs; it provides subsidies for the insects and fish that live in the rivers and streams. The input of materials is directly associated with the kinds of vegetation found along the edges of rivers and streams. Because lakes in undisturbed states have shoreline vegetation that is similar to the vegetation along rivers and streams, it can be deduced that lakes and streams have similar relationships between vegetation and their food webs to those that exist along rivers and streams.

Dr. Francis said it can be expected that as the shoreline habitats of lakes are altered, as native vegetation is removed and replaced by houses, lawns and other human structures, the exchanges associated with the native vegetation that would otherwise exist become altered.

Lake food webs can be divided into at least two separate components. Typically the thinking about lakes is focused on open water or pelagic food webs. Such webs include fish that eat zooplankton and phytoplankton that is being produced by some background level of nutrients such as nitrogen and phosphorous. As it turns out, however, the food web is rather distinct from the food webs found on the edges of lakes associated with littoral, or shallow water, and bentic,

or the bottom of the lake. Such food webs have an entirely different description; the dominant organism is bugs that live in the bottom of the lakes. The littoral and pelagic habitats are strongly linked by fish; fish travel from open waters to the shorelines where they ingest bugs and the like.

Dr. Francis shared with the Commissioners a map of her study system. She noted that all of her research was conducted on lakes in western Washington and southern British Columbia. She said she included lakes along a gradient of shoreline development from undeveloped lakes in British Columbia to lakes in urban areas that have fully developed shorelines. In all, 32 lakes along the development gradient were studied. For each lake, the amount of littoral course wood was measured along with the riparian vegetation, primarily trees ten centimeters in diameter and greater, within the first ten meters of the shoreline. The amount of organic matter in the mud sediments on the edges of each lake was also measured. All of the shallow water habitat bugs were identified and counted, and the terrestrial litter inputs from surrounding watersheds into the lakes were measured as well.

Dr. Francis said her research demonstrated that as the intensity of development around a lake increases, the amount of wood in the shallow water habitat of the lake decreases. She shared with the Commissioners a chart comparing the number of houses per shoreline kilometer with the amount of wood in the water. She noted that for the lakes in the most highly urbanized areas there is almost no deadwood in the shallow water habitats. In pristine lakes there is a lot of deadwood in the water, as much as one large tree every two meters.

Increasing the number of houses per kilometer of shoreline relates directly to a sharp decrease in the number of trees and the total amount of tree wood in the riparian habitat. Within the reference lakes there was significant variability, but undeveloped lakes are generally densely forested while the more urban lakes have very little woods along the shoreline in the riparian habitat. As humans build structures, native forest areas are replaced.

The relationship between the loss of deadwood in the shallow water habitat and development is not necessarily the result of people clearing the wood out of the water to create swimming beaches or a cleaner lake bottom to allow for wading. While there is some of that going on, the loss of deadwood in the water is associated with what is happening on the land, specifically the removal of trees to facilitate development.

Deadwood material that falls into lakes, if not otherwise disturbed or removed, will take hundreds of years to decompose so they essentially become a permanent part of the habitat and lake structure. The waters of the lakes tend to preserve the logs. At the bottom of Lake Washington there are thousands of logs that have been there for more than a century. Those who dredge the logs from the lake bottom find that they are still very usable for lumber.

Commissioner Hamlin asked about Langwa Lake. Dr. Francis explained that the lake is in eastern King County. Most of the surrounding property is owned by the Girl Scouts. It has really steep slopes leading down to the lake. The lake is an outlier in that it has low development and a super high-density of wood, partly because when trees die they slide down the slopes onto the shoreline. Additionally, no one is removing the wood because the Girl Scouts use the site as a nature camp.

Dr. Francis said her study found a strong relationship between the amount of deadwood in the water and the amount of mud on the bottom of the shallow water areas of the lakes that were studied. The more mud there is, the higher the proportion of organic material. Analysis of the mud from pristine lakes revealed that most of the material was organic, whereas mud taken from

lakes in highly urbanized areas was composed primarily of sand, rocks and gravel. While to some degree that change can be tagged to property owners bringing in sand to augment their beaches, the real contributing factor is the loss of organic materials along the shorelines.

The Commissioners were shown a chart comparing measurements of organic matter from samples taken from shallow water habitat against samples taken up to 40 meters from the shore. Undeveloped lakes had the highest amount of nearshore mud, which decreased with distance from the shore. The opposite was true for the urban lakes where accumulations of organic matter were found offshore but not in the shallow areas. The conclusion reached was that dead wood in the shallow areas serves as a structure around which organic matter accumulates. It prevents the sloughing of organic matter down toward the bottom of lakes and retains it in the shallow waters. That is important, particularly to the species of organisms that live in the shallow water habitat and depend on the organic matter as the foundation of their food web.

Dr. Francis said she found a dramatic shift in the insect community between the two most pristine lakes and the two more urbanized lakes in her study. The undeveloped lakes had far higher numbers of all kinds of insects and the urbanized lakes far lower numbers. Additionally, there were shifts in the communities; in the urban lakes isopod numbers increased while odonate, which include mayflies and dragonflies, numbers decreased. Isopods tend to be highly tolerant of low-water quality, while mayflies and odonates tend to be less tolerant of poor water quality.

A direct correlation can be drawn between the loss of course wood and organic matter along the shorelines and shifts in the invertebrate communities on urban lakes. Mayflies and odonates are important fish foods according to studies done which analyzed fish tissue to determine the proportion of carbon atoms coming from different prey items. The studies show that fish in undeveloped lakes rely heavily on carbon from bentic invertebrates. About 75 percent of their carbon is from bentic invertebrates, which contrasts to about 45 percent for fish in developed lakes.

A lot of good work has been done on river and stream ecosystems showing that terrestrial insects such as ants, wasps and bees are important food for fish. Those who fish attest to the fact that the best baits for trout are terrestrial bug flies. Terrestrial insects are considered food subsidies for the fish because they come from outside the rivers and streams themselves. The insect subsidies are themselves associated with the vegetation on the land; the bugs that are falling into the streams are falling from the trees and other vegetation growing along the banks. The same relationships can assume to exist along lakes.

With increased development comes decreased vegetation, which results in decreased insect numbers and a decrease in the food subsidies available for fish to eat. There is evidence which shows that terrestrial insect inputs to lakes can be substantial. A paper published in 1984 regarding Castle Lake in California showed that in a single day between 24 million and 60 million ants died and rained down into the large lake. The measurements showed 200 to 500 ants falling per square meter per hour into the lake.

Dr. Francis said her study included an analysis of the stomach contents of fish caught in four specific lakes, two pristine and two developed, over the course of a year. The analysis centered on content and on the value of the food being consumed by the fish. Within each lake the study showed variation over time; there were at times a lot of terrestrial insects in the fish diets and at times there was none. Variations were also seen in fish diets between the two pristine lakes. There were no variations at all between the two urban lakes because there were no terrestrial insects at all found in the fish stomach contents.

Dr. Francis said one could argue that a terrestrial insect food diet may not be all that important to the fish if they will only substitute other food sources, such as bentic insects and plankton. She said to answer that question she took an average of all the terrestrial insects found in fish stomachs and compared them to all the bentic insects and the pelagic diet items found and determined the average energetic value of each category. She said her research showed that the caloric-equivalent value of terrestrial insects found in fish stomachs worked out to about 9500 joules per gram, and that the caloric-equivalent value zooplankton worked out to about 5500 joules per gram. Clearly a terrestrial insect diet is more energetically valuable. The average caloric value of the contents of fish stomachs from the two undeveloped lakes was about double the caloric value of the contents of fish stomachs from the two urban lakes. It can be concluded that the fish in the undeveloped lakes are getting a lot more energy that they can put toward growth and reproduction. That translates into undeveloped lakes being much more likely to have sustainable fish populations based on energetic intake.

Dr. Francis said in order to verify that the pattern is not unique to the four lakes studied, a survey of literature focused on North American lakes was conducted. Data was also pulled from the full study of 32 Northwest lakes. Similar patterns were found; there is a strong decrease in the amount of terrestrial insects in the fish diets corresponding to shoreline development. Terrestrial insects disappear altogether at the mark where 20 percent of the shoreline developed. That results in a strong decrease in the total amount of energy the fish are ingesting.

Dr. Francis summarized that shoreline development is strongly correlated with riparian deforestation and the loss of course wood in the water. The loss of course wood is associated with dramatic changes to the shallow water habitat and bentic insect resources. The loss of forest and riparian habitat is associated with losses of terrestrial insects from fish diets, and changes to the shallow water and shoreline habitat are correlated with reductions in the energy intake and growth of fish. Retention of shallow water habitat structure and riparian vegetation is important for sustaining top predators in lakes and lake food webs.

Dr. Francis suggested that there are some important questions about how scientists and politicians communicate, how science is used in policy, and what the challenges and barriers are to better communication between the two groups. She said she spent a couple of years asking those questions and focusing on how science is being used in local land use policy in Western Washington. Several years ago there was an amendment to the Growth Management Act approved which required all cities and counties to include best available science to protect the functions and values of critical areas, and Dr. Francis said she and a number of colleagues were interested in determining how jurisdictions were responding to the requirement and how they were interpreting and collecting the best available science. Interviews were conducted with city and county planners and their consultants to find answers to those questions. In all, 43 interviews were conducted in 27 jurisdictions in Western Washington. Bellevue was included in the survey.

There was quite a bit of variation in terms of how best available science was defined. Best available science was defined in four different ways: peer-reviewed literature, literature from agencies, expert opinion, and non peer-reviewed scientific information. There were marked variations between consultants and planners with respect to the definition of best available science; consultants were shown to be primarily using peer-reviewed literature irrespective of the jurisdictions they came from. In contrast, the same pattern was not seen among planners; some jurisdictions relied heavily on non peer-reviewed information and on agency literature. Within the planning group particularly, there were strong variations according to the size of the jurisdiction; the smaller jurisdictions were found to primarily be relying on peer-reviewed literature and the information received from agencies, whereas medium-sized jurisdictions are

using a healthy dose of non peer-reviewed information.

The interviews included questions aimed at determining the extent of the scientific reviews, the ways the reviews were being conducted, and how the science was being incorporated into the policy process. The state agency tasked with managing the process compiled a bibliography of best available science; it contains myriads of lists of papers considered to be best available science. That information was given to each jurisdiction, and some jurisdictions have elected to simply accept it. Other jurisdictions have a process in place to continually be looking for the best available science. Yet others have scientists on staff who generate their own scientific findings and conduct research; those are the jurisdictions that are generating their own inventories and using them in their critical areas update process. Finally, some jurisdictions simply look over their neighbor's fences to see what approaches they are taking. Typically, small jurisdictions with limited resources rely heavily on what the state has handed out, whereas the larger jurisdictions in most cases themselves served as the source of the state information through the generation of their own science. There have been a lot of discussions between agencies, tribes and other jurisdictions, though most of those have involved the small and large jurisdictions; the medium-sized jurisdictions have not engaged in a lot of outside discussions.

Dr. Francis said the data drawn from the interviews was used to sketch the typical process utilized by jurisdictions for their critical areas update process. She said for most jurisdictions the process begins with a review of the best available science, either by planners or consultants, followed by a comparison of the best available science against current ordinances. Where gaps are identified, recommendations are developed for how the ordinances should be updated. Those findings and recommendations are then carried to the respective planning commissions who review them, bring to light the realities of their specific jurisdictions, and then submit their recommendations to public comment. After revising their documents, the commissions send their recommendations on to their city or county councils for review and ultimate approval. For a quarter of the jurisdictions interviewed, however, the process began with the city or county council establishing goals for their ordinances and directing their staff to make the science meet the goals, followed by the typical process of generating policy and ordinances.

Dr. Francis summarized by saying the interviews uncovered quite a bit of variation in the process of incorporating scientific information and the content of what is considered scientific information. The variations are largely driven by resources and political realities. Small jurisdictions in general are very reliant on scientific information provided by state agencies, tend to communicate often with agencies and other jurisdictions, and are most likely to let scientific information guide their policy process. The small jurisdictions often take that tack because they lack the resources to fight court battles resulting from findings of being out of sync with best available science. Medium jurisdictions in general are more inwardly focused and spend less time communicating with other jurisdictions and agencies; they tend to rely on local information as opposed to information supplied by the state. Large jurisdictions often generate their own science, and they communicate with state agencies and other jurisdictions from the standpoint of informing their processes.

B. Shoreline Master Program Update – Public Questions

Chair Sheffels read questions submitted by the audience, beginning with what the difference is in fish populations on developed lakes versus undeveloped lakes. Dr. Francis said there is a difference in fish community composition between urban and undeveloped lakes. She said the data in her studies was all for trout, cutthroat trout in undeveloped lakes and rainbow trout in the developed lakes. Urban lakes have lots of warm water species such as bass, sunfish, perch and croppies.

The next question asked how landlocked lakes compare to lakes that lead to the ocean relative to fish count, and how the undeveloped lakes compared in size with the developed lakes in the study. Dr. Francis said she did not have an answer to the first part of the question. She said the test lakes were all similar in size, ranging from 15 to 20 hectares. She allowed that the study lakes were much smaller than either Lake Sammamish or Lake Washington.

Dr. Francis was asked if she studied other variables, such as bird populations and the degree to which the test lakes were fished by humans. Dr. Francis said she did not include those factors.

Chair Sheffels read a question asking what local research supports the buffers established under the critical areas ordinance. Dr. Francis said her research can be considered local though not specifically local to Bellevue. She said her research highlights the importance of vegetative buffers within ten meters of the shoreline. She said there is additional research that is specific to the average height of cedar and Douglas fir trees in the area, which is what a lot of the buffer widths in the area are based on; if the average height of those trees when they die is 30 feet, then a 30-foot buffer is indicated so some portion of the tree will actually touch the water when it falls.

Answering a question regarding the loss of terrestrial insects associated with shorelines that are 20 percent developed, Dr. Francis said she could not say from her fish diet work what the relationship is between the proportion of lake development and the amount of vegetation on that lake. The data cannot be used to conclude that ten percent developed means ten percent of the lake's vegetation is present or if ten percent of the lake is comprised of houses rather than vegetation.

Chair Sheffels read a question asking how the conclusions reached with regard to the small lakes in the study can be applied to large lakes like Lake Sammamish and Lake Washington. Dr. Francis said she would not apply the same small-lake metrics to larger lakes. The bigger a lake, the less important the edge of the lake is in terms of its relationship to the lake as a whole. However, in looking at the connections between the land and the water it must be realized that most of the organisms in the lake, the fish, the bugs, the birds and the turtles, are all using the lake edge, so it must be said that the lake edge is some of the most important habitat. That is particularly true on Lake Washington where there are a lot of juvenile salmon using the edge habitats.

Asked how the proliferation of blue-green algae impacts the bentic invertebrates, zooplankton and fish, Dr. Francis explained that blue-green algae tends to be less edible for zooplankton. When lakes are taken over by the algae, the zooplankton populations tend to suffer. Accordingly, the fish that rely on zooplankton also do not do as well.

The next audience question asked if urban development restrains contributions to fish habitat to the extent that merely adding shoreline restoration in any configuration will not correct for the urbanization impact. Dr. Francis said she has data from analyses looking at single plots. That data shows strong relationships between the amount of vegetation on the shoreline and dead wood in the water and the amount of sediment and bugs. She said her sense is that small changes in individual levels along the shorelines can make a difference; it is not necessary to require the restoration of all lake shorelines in order to find success relative to the goals.

Chair Sheffels read a question from the audience which noted that log-riddled shorelines do not lend themselves to promoting water access or safety, which is a goal of the Shoreline Management Act, and sought a response with regard to how that dilemma should be addressed.

Dr. Francis said the most important element is the configuration of the shoreline habitat. The data do not suggest the only solution to be one in which the shorelines are returned to a completely native state. There are multiple configurations of vegetated shorelines and natural habitats that will accomplish the goals.

The next question asked which ecosystem, the Sammamish River or the Lake Sammamish shorelines, has the greater impact on migrating fish. Dr. Francis said salmon migrating rivers must avoid high water temperatures. What they need in rivers is a sufficient supply of cold water refuges as they are returning to spawn. The salmon in Lake Sammamish are seeking to return to the hatchery, so protecting them will require focusing on the river and tributary streams.

Asked how blue-green algae can be suppressed and what makes it toxic, Dr. Francis said blue-green algae is a better competitor than other forms of algae in that they have the ability to fix nitrogen. Blue-green algae tends to take over in lakes where there is a lot of nutrient input, so the best way to reduce blue-green algae is to reduce nutrient inputs of nitrogen and phosphorous into lakes in the first place. Blue-green algae is inedible to zooplankton, and without being eaten for food their populations grow. She said she did not know why they are toxic.

C. Shoreline Master Program Update – Commission Discussion

Commissioner Lai noted that Ms. Frances' study focused primarily on trees along shorelines and he asked if there are studies that focus on vegetation other than trees along the shorelines. Dr. Francis said she did not personally have data on other types of vegetation, but allowed that terrestrial insects undoubtedly also use vegetation other than trees. She said she was not aware of any specific studies on terrestrial vegetation other than trees in shoreline areas.

Commissioner Mathews questioned why the size of fish in developed lakes tends to be larger than those in undeveloped lakes. Dr. Francis said fish in the developed lakes are stocked. There are more fish overall in the undeveloped lakes because they are not fished; the competition for resources is greater, so the fish tend to be smaller in size.

Commissioner Robertson asked why, if development is detrimental and reduces function over time, the lake environments are actually improving even though development has not been reduced; she wanted to know what is being done right so those actions can be repeated. Dr. Francis said there is more to the big picture story of lake ecosystem health than simply food webs, terrestrial insects and sustaining fish populations. Water quality is a huge issue and has typically been the worst problem resulting from inputs of nitrogen, phosphorous and pesticides. Improvements in water quality have come about through awareness and regulations governing the use of those materials.

Commissioner Robertson asked what shoreline property owners can do to improve the littoral zone, short of putting logs in the lakes and creating safety hazards. Dr. Francis said adding large woody debris to the shoreline is exactly what is needed, including discarded Christmas trees. She said there are ways to secure logs to keep them from becoming hazards. She said she would prefer not to see leaves swept from driveways dumped into the lake; an alternative would be to plant shrubs along the edge of the shoreline properties.

Chair Sheffels asked if there are places where course wood materials have been purposely added to shorelines and the results studied. Dr. Francis noted that the shoreline packet of materials provided by staff includes information regarding pilot projects around the shores of Lake Washington where the work of removing bulkheads and changing the shoreline is occurring.

Commissioner Ferris asked if the city could expect a greater likelihood of success if the shoreline improvements were focused on the areas where streams flow into the lakes rather than along the lakeshore generally. Dr. Francis suggested that targeting those areas would accomplish more than one thing and would be a good approach to take over choosing random locations along the shoreline.

Commissioner Ferris pointed out that while both Lake Washington and Lake Sammamish are natural lakes, neither of them has conditions that can be considered natural. Even before the shorelines were developed and in places armored, the level of Lake Washington was lowered by 15 feet or so, leaving all of the natural debris and shoreline ecosystems high and dry. Dr. Francis agreed that a new baseline has been created for Lake Washington. It will not be possible to move backwards, so it will be necessary to determine the best approach for moving forward with the lake and its ecosystem as it is currently. If the shoreline had been left alone after the water level had been reduced, the shoreline would have in time replenish its natural state. There is value in looking at the new shoreline and treating the new riparian zone as if it were the original.

Commissioner Orrico asked Dr. Francis if in her studies she saw a change in the species of fish in the lakes studied that corresponded to a change in the abundance of certain species of insects in the water. Dr. Francis said urban lakes have higher concentrations of warm water fishes, such as bass and perch, in addition to the rainbow trout that are stocked.

Answering a question asked by Commissioner Orrico, Dr. Francis allowed that leaves dumped into a lake to help improve the littoral area would be unlikely to remain along the shoreline absent some method for making sure they do not just float away.

Commissioner Mathews referred to the statement made earlier by Dr. Francis that each small improvement in the shoreline environment will have a positive impact and asked to what degree allowing ten feet of every one hundred feet of shoreline to revert to a more natural vegetative state would be significant, even where bulkheads exist. Dr. Francis said she did not have specific data on which to base a call for a certain percentage of the shoreline to be revegetated.

Dr. Francis confirmed for Commissioner Lai that the closer the vegetation is to the water, the more likely it is that it will have a positive impact on the shoreline ecosystem.

Commissioner Orrico asked if it would be better for each property along the lakeshores to have its vegetative state improved, or to mass government resources and concentrate rehabilitation efforts in certain areas. Dr. Francis said she did not have the data needed to answer that question qualitatively.

Commissioner Robertson asked what effect wave action from powerboats, and changing the water level of Lake Washington annually, has on the shoreline. She suggested that the placing of large woody debris and shoreline vegetation could be negatively affected by both of those factors. Dr. Francis said there has been a lot of work done on rivers and streams that shows that regular flooding actually positively influences nutrient cycles. Disturbances at moderate levels have been shown to actually benefit the ecosystem.

Chair Sheffels thanked Dr. Francis for sharing valuable information.

Commissioner Lai asked staff to comment regarding which of the processes followed by the small, medium and large jurisdictions most closely resembles Bellevue's process in updating the Shoreline Master Program. Mr. Paine said the large jurisdiction referred to by Dr. Francis as having its own staff of scientists is Seattle. Bellevue does not have a staff of scientists, but the

city's process has been to assemble the best available science with the help of consultants, to conduct a gap analysis, and to make recommendations to the Planning Commission. Where the staff recommendations departed from the best available science to reflect both political realities and realities on the ground, those departures have been made clear. The city did not generate its own science, though it did conduct a dock and bulkhead study by contracting for a literature review.

Commissioner Robertson said she recently heard about a new study done by Dr. D.F. Flora on Bainbridge Island which concluded that bulkheads have no impact on Puget Sound. Mr. Paine said staff has reviewed the study and would be glad to provide input at a later date. He added that the study was one of about 25 presented at a recent symposium.

Commissioner Ferris said while there may not be any scientific research to support it, the notion of improving ecological function by addressing the places where the streams enter the lakes should be considered. The shoreline inventory did not identify those locations and conditions specifically. He asked if a subdivision to the shoreline residential classification could be created to recognize those places by differentiating them. Mr. Paine said he would be willing to look at taking that approach. He said one concern he would have is that there would be a disproportionate impact on the property owners who happened to have streams on their properties. He said the outfall locations of the streams and pipe ends are documented, and it is known that some are used fairly regularly by fish, though with the screen that was used in the inventory their relative value could not be differentiated.

Associate Planner Heidi Bedwell said the issue will be brought forward when restoration planning is on the table for discussion. Commissioner Ferris suggested that when the discussion is on the table consideration should be given to creating incentives focused on the areas where restoration efforts may be the most beneficial for ecological functions.

Chair Sheffels agreed that incentives will be the best approach. She said those who live along the shorelines want to see them protected and want to see the overall ecology improved. As the process continues all consideration should be given to encouraging property owners to do things on their own or collectively that will improve waterfront areas.

Commissioner Lai asked if down the road when the focus is on specific techniques to mitigate ecological impacts the Commission will be given the science behind the recommendations. Mr. Paine said to the extent such information exists, it will be shared with the Commission. He allowed that the presentation by Dr. Francis highlighted the need for woody debris in the water; it is possible the city could require the incorporation of wood when a bulkhead is rebuilt, or when a beach is reconstructed. The problem is that there are few if any studies focused on the efficacy of the technique. A variety of topical studies are under way, and more will be launched in the coming years, but the full information is not in hand yet. What is known is that undisturbed lakes have healthy and viable ecosystems, and to improve degraded ecosystems steps must be taken to imitate natural environments to the extent possible.

11. APPROVAL OF MINUTES

A. July 29, 2009

Motion to approve the minutes as submitted was made by Commissioner Orrico. Second was by Commissioner Robertson and the motion carried unanimously.

12. PUBLIC COMMENT

Mr. Marty Nizlek, 312 West Lake Sammamish Parkway NE, complimented Dr. Francis on her presentation. He questioned whether or not wood in the waters of Lake Washington and Lake Sammamish is the answer, though he allowed that clearly it is the answer for the types of lakes included in the studies done by Dr. Francis. He said tall trees are being encouraged in the program as it exists in the city, and policy creep is becoming a factor. During the last study session on the Shoreline Master Program the Utilities director stated clearly that his department does not conduct any monitoring. There was a King County program in place at one time that was discontinued due to funding considerations; that program involved lake residents in the taking of samples and monitoring conditions. The amount of scientific information involved is mind boggling and trying to understand the terms is a formidable task. He said he personally reviewed the critical areas risk analysis to determine how often it talks about lakes, streams and shorelines. The document mentions lakes 92 times, shorelines 122 times, and streams almost 350 times; that tally gives one the true flavor of what the document is speaking to or about. A more recent document done by the Department of Fisheries mentions lakes 14 times, shorelines 131 times, and streams almost 260 times. The presentation of Dr. Francis was about isolated fresh water lakes that have different fish populations. Information generated about streams was applied to lakes. Dr. Flora's paper concludes that there is nearly no habitat harm at all associated with nearshore development; of course that study was not specific to either Lake Washington or Lake Sammamish and deals primarily with marine life. The American Forests study that was presented at the Commission's last retreat showed that over the past 20 years there has been a 20 percent reduction in the tree canopy in the city, 90 percent of which occurred to the south of Lake Sammamish in the Newport Hills area. A report presented to the city of Sammamish concluded that 90 percent of pollutants are removed in the first 30 feet above the highwater mark by vegetation.

Ms. Alfie Rahr, 16509 SE 18th Street, suggested that Phantom Lake offers a good example to look into. In the 1970s the area around the lake was developed, but there was no adverse impact on the lake. The lots are all at least half an acre in size, and the buildings are all set back from the shoreline. Most have elected to maintain shoreline vegetation, and motorboats are banned. It was not until the 1980s when 150 acres within the watershed was developed as the I-90 Business Park that runoff water began to silt up Phantom Lake. Up until that time the lake was fed only by springs. The inflow from construction activity turned the lake a muddy brown color even though the business park was developed with state-of-the-art detention ponds. Much of the vegetation around the lake, including tall cedar and cottonwood trees, has died, primarily because of flooding that never used to occur. Enough is enough.

Mr. Mike Lunenschloss,a resident along Lake Sammamish, said he agreed with much but not all of the presentation by Dr. Francis. He said he did not agree with the assumptions made. Non-biting gnats are absolutely essential to the salmon; there are some 7000 individual species that live on average between 24 hours and four months. Within that time they breed in the air and lay innumerable eggs in the water. It is in the water that the eggs turn into larvae and pupae and are consumed by the salmon fry. They do not breed in the trees; trees do not have bugs unless they are dead or dying. Bugs prefer bad water; there are more bugs in sewage than in clear mountain streams. That does not mean, however, that clear mountain streams are not as healthy as sewer pits for salmon. There are no trees in the Aleutian Islands, nor does the Alaskan Peninsula have trees. North of the tree line on the North Slope of Alaska there are no trees, but there are millions of mosquitoes. All of those treeless places are home to millions of salmon, however. Both of the lakes in British Columbia studied by Dr. Francis are in the Frasier drainage area, an area that saw dismal salmon returns in 2009. It cannot be assumed, however, that the fish run was down because those lakes have trees; neither can it be assumed that trees and vegetation on lakeshores will improve the fish habitat. Thirty-five miles from Mt. Redoubt in Alaska

everything is covered with highly acidic volcanic ash; all of it washes into the salmon streams, as it has for millennia. Every year, however, the bugs come back and so do the salmon.

Mr. Scott Sheffield, 2220 West Lake Sammamish Parkway, thanked the Commission for including the opportunity for the audience to write and submit questions about the presentations; he said it makes the process feel more open. He said recently he and a few of his neighbors went door-to-door to let people know the Shoreline Master Program process is going on. More than 80 homeowners were contacted. The majority of the property owners were not aware that the city applied the critical areas ordinance to lakes in 2006, and do not recall being notified of that action. Most do not understand the critical areas ordinance and how it affects them and their properties. Most who do understand the critical areas ordinance gained their understanding from having applied for a permit which they found took a long time to process and which resulted in significant requests on the part of the city. Most people thought the critical areas ordinance applied only to streams and wetlands. The current Shoreline Master Program process is unclear to most residents; most do not understand either the benefits or the costs of the proposed regulations. The property owners voiced the need to protect the lake and had many ideas that could help the salmon runs and the water quality. Many held the view that the city is singling them out to solve the issue and is offering as the only alternative a rezoning of the waterfront. Many expressed hesitation about getting involved out of fear of being adversely affected in the future should they ever need a development permit. Some indicated that they wished they had never been annexed into Bellevue. One property owner asked why the city has not put up public notice signs on the properties that will be affected.

Commissioner Orrico asked Mr. Sheffield to write up the results of his informal survey and submit it to the Commission for review.

Mr. Jerry Baruffi, 9236 SE Shoreland Drive, said his observation was that about half of the people at the Puyallup Fair are overweight, and said he could conclude from that that the fair is where overweight people hang out. He allowed that his observation had not been peer-reviewed. If half the 1200-foot shoreline for the new Meydenbauer Bay park property were to have felled trees put into the water, the fish would have a place to swim but the shoreline would not be very nice to look at or safe for visitors. There is a huge difference between river and lake ecosystems. It makes sense that rivers, streams and lake bodies proper have more of an impact on fish than lake shorelines have. The city could save a great deal of money by simply adopting the rules Redmond adopted for its shorelines; those rules require 35-foot setbacks while grandfathering in existing home footprints and bulkheads. It would appear from the work of Dr. Flora that bulkheads do not have much of an impact at all. None of the lakes studied by Dr. Francis had boats on them, and none had connections with the sea.

Ms. Anita Skoog-Neil, 9302 SE Shoreland Drive, said she was surprised to learn that buffer widths are related to falling trees. The fact is, property owners would be negligent in letting trees fall, and if one does fall it is promptly removed for safety reasons. If the need for woody content is a key solution, ways to strap logs to anchors should be looked into. Stocking the lakes and actually feeding the fish might be good ideas. Fishermen often angle close to docks, and not all of them are seeking bass. Mrs. Montgomery, an 85-year-old woman who has always lived on Meydenbauer Bay, says there never were salmon in the stream the city wants to daylight. Science evolves; it is never black and white. During the summer months when the temperatures rose above 100 degrees there were dead fish floating in Meydenbauer Bay; heat, however, is a natural event, as is falling trees in windstorms. Existing uses should simply be grandfathered and be allowed to rebuild should something happen to them. If more vegetation is truly needed along the shoreline, the city should seek to establish a realistic buffer and should seek to educate rather than to regulate.

Mr. Dallas Evans, 2254 West Lake Sammamish Parkway SE, noted that Dr. Francis is the first scientist to date brought in to address the Commission during the Shoreline Master Program update process. He said he has done a lot of research on scientists and how they operate in the field. He pointed out that Dr. Francis was very clear when expressing opinions whether or not they were based on her research. Her research was about small lakes. The staff always claim there is science behind their recommendations, but the science is not always made clear. The documents made available to the public regarding docks includes the statement that no science exists to support the conclusions reached, yet the staff continue to rely on the findings as real science. The staff appear to be attempting to incorporate science into policy even if it has nothing to do with shorelines. The staff should either rely on true science or admit which of their hypotheses are not based on true science. The city should offer incentives rather than impose penalties; that would bring a lot more people to the table. He said he was required to install on his dock nine prisms at $116 each, yet even the Watershed Company report questions whether they should be used.

Mr. Cole Sherwood, 3270 West Lake Sammamish Parkway SE, said natural spawning Chinook and Coho are stream dwellers whose food consists of almost any organic matter, live or dead, that drifts or swims past them. Naturally spawning Coho stay in fresh water for one, two or even three years; they can be found in streams or the in-shore areas of lakes. When small their diet includes bottom-dwelling organisms and free-floating plankton. Later they feed on smaller fish and mature insects, primarily those that fall from the air, trees or banks onto the water surface. Naturally spawning Chinook live mostly in larger river systems, and a residence time of less than three months is common. Chinook grow faster than Coho and are stronger swimmers, but they have eating styles similar to Coho. The Issaquah hatchery does a remarkable job of raising Chinook and Coho. While the fish are being reared at the hatchery, they are monitored for growth and health. When they reach a certain size, the fingerlings are released. Spring Chinook are released after eight to ten months, and Coho are released after about sixteen months. It is a carefully planned event to help ensure that there will be a larger population that makes it to the ocean, and to help ensure that the fingerlings will not stay for long in the freshwater environments. In November 1964 a major change resulted from a channel dredging and straightening project that included construction of a weir at the Lake Sammamish outlet; the project greatly reduced flood elevations and seasonable water surface elevations in the lake. The weir was modified in 1998 to improve passage for salmon. A chart on the Issaquah hatchery's website shows the Chinook and Coho salmon returns from 1990 to 2007. It shows that returns were less consistent in the mid- to early-1990s, especially for Chinook, and two greater consistent returns from 2001 onward, except for the 2002 Coho returns. There were impressive returns for 2003 and onward. One reason for the improved returns was the weir work done in 1998. Once released from the hatchery, the Chinook need between two and ten days to make it to and through the Ballard Locks; the fish do not stay in the waters of Lake Sammamish. Bellevue waterfront properties should not be punished by requiring the removal of bulkheads and requiring plantings that will die with water level increases. The improvement on the weir had positive effects on salmon runs, showing that there are other, more practical, solutions.

Mr. Bud Norquist, 372 West Lake Sammamish Parkway NE, said Chinook salmon have been one of the driving factors in most reports because it is an endangered species. Much of the folderol has been focused on protecting an endangered species by improving the waterfront along Lake Sammamish. The truth of the matter is that Chinook salmon stay in the hatchery until ready for release and make their way through the Ballard Locks and into Puget Sound within ten days. They do not spend any time along the shorelines. The Chinook are driven to reach salt water where they will live for four or five years. The city has used its critical areas criteria for streams and rivers to justify new ordinances covering shorelines. In some cases the ordinance exceeds

state and adjoining city standards. The special report done by The Watershed Company references studies done by a lot of scientists, and creeks and rivers are mentioned 22 times. Before the city adopts new standards for planting trees that overhang the lake, it would do well to study all of the reports that indicate the process will create an advantage for the major predator, the sea bass, which was introduced into Lake Sammamish in the 1920s. The Fish and Wildlife Service report dated February 2002 indicates that overhanging vegetation may have no effect, and in some cases a negative effect, on improving the shorelines. The planting of trees along Lake Sammamish should be a volunteer effort only; requiring the planting of trees, which will obstruct views of the lake, is in effect a taking of property owner rights. Requirements to place woody debris in the water are questioned by the report.

Mr. Richard Louis Johnson, 28224 West Lake Sammamish Parkway SE, said his family has lived on Lake Sammamish since the late 1870s. He said the science outlined by Dr. Francis is not necessarily applicable to a large lake. On Lewis Creek there is a small park. Just offshore, the depth of the organic material is so great that jumping up and down in the shallow water causes the bottom material to bounce. He said the shoreline along his property is rocky and has very little organic material; the rocks extend onto the shore and beyond the end of the dock and it has been that way for more than 100 years. Just to the north and south are beautiful sandy shores. The slope of the shore is so shallow that between the high water mark in the winter and the low water mark in the summer is in excess of 60 feet. To plant anything would be pointless. Blanket regulations that apply to the entire shoreline should be avoided; there are far too many variables in play. Meaningful change will only be affected on a property-by-property basis.

13. NEXT PLANNING COMMISSION MEETING

The next meeting was scheduled for November 4.

14. ADJOURNMENT

Chair Sheffels adjourned the meeting at 9:24 p.m.

Paul Inghram
Staff to the Planning Commission

1/13/10
Date

Pat Sheffels
Chair of the Planning Commission

1/13/10
Date