SUMMARY MEETING NOTES
2005 Puget Sound Seabird and Seaduck Research meeting
Thursday September 29, 2005
Marysville, Washington

Prepared by Joe Gaydos

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Introduction

There are more than 30 species of seabirds and seaducks in the Puget Sound region. Many of them are declining to dangerous levels and approximately 30% of them are listed as threatened or endangered or are candidates for listing in the region. Overall, the total number of marine birds in the region has dropped by 47% since the 1970s. To solve the problem of declining marine bird populations, 34 scientists and managers gathered to review existing science and management information, identify research and management gaps, and plan how we can move forward to develop lasting solutions.

Joe Gaydos (SeaDoc Society) welcomed the group and thanked everybody for attending. He pointed out that the goals of today's meeting were to:

- Focus on seabirds and seaducks in the Puget Sound Georgia Basin ecosystem; considering other areas in as much as them impact these bird populations (i.e. summer nesting habitat)
- Spend more time on anthropogenic influences (ones we can influence) as opposed to naturally occurring cyclical changes that we don't have the ability to control
- Come to a general agreement on (a) top research and management needs for select marine bird populations and (b) top research and management needs for multiple species and ecosystem issues
- Identify some next steps to get us there
- Come to a general agreement on importance of public involvement and education needs.

Seaducks: current knowledge, threats, science gaps

Dave Nysewander (WDFW) gave a brief presentation on the status of seaducks in the region based on PSAMP Aerial surveys (1992-2005) and MESA studies from the late 1970's. Individual species and groups of species were addressed. In general, seaduck populations are stable or decreasing. None are increasing.

Scoters:

- Trends from Alaska to the San Francisco Bay all show declining trends, especially in the past 20 years (steeper decline). Surf scoter declines are driving the major decline trends.
- Correlation to Cherry Point Herring decline considered to be major factor.
- Other considerations include climate oscillations, food chain changes, additional mortality factors such as sport hunting for trophies and past hunting and killing with depredation permits by the cultured shellfish industry, and derelict drift net and fishing gear mortalities
- Surveys at nesting sites show small broods with few young raising concern about reproductive success

Harlequin ducks:

- Relatively low numbers but highly concentrated
- Major molting areas in pacific northwest are in the Straits near tanker routes; population recovery has been slow following the Exxon *Valdez* spill
- Hunting pressure

Grebes:

- All species (Western, red necked, and horned; very few Clark's grebes here) are decreasing in number with Western grebe declines being the most dramatic, especially in Bellingham Bay.
- There is concern that Western grebes could have moved to a different wintering ground such as southern California.
- Other concerns related to western grebes include declines in forage fish, lack of good transmitter technology for the species, oil spills, Human-caused mortality (controls aimed at fish-eating bird species, etc.), and disturbance at breeding areas in Northern plains of the US and Canada.

Loons (Common, Pacific, and Red-throated):

- Common loon's occur at very low density, which was higher in the past; they appear stable
- Red throated loon – has been a collapse in the population since the mid 1990's
- Pacific loons – inadequate data to give a clear picture of what's happening

Species of concern include:

- Diving Ducks (Scoter, Scaup spp., Harlequin Duck)
- Alcids / Loons/Grebes (Western Grebe, Marbled Murrelet, Tufted Puffin?, Cassin's Auklet?, Red-throated Loon)
- Other Species (Black Oystercatcher, Snowy Plover, Brant (High Arctic or Gray Bellies), and Trumpeter Swans

Marine Bird Density mapping Information is available at www.wdfw.wa.gov/mapping/psamp

US Fish and Wildlife Service: current research and future plans

Maura Naughton (USFWS) gave a presentation on the USFWS projects and plans. She noted that there is increasing awareness in the agency that they need to better coordinate marine bird management activities with state and local partners. As a result, they developed a regional seabird conservation plan in which they reviewed the seabird resources of the Region and discussed threats and management issues (see references for URL link). The objectives of this plan were to identify Service priorities and outline a strategy to direct future FWS activities

The USFWS works from the West Coast to Hawaii and the Pacific Islands. Within the agency there are four divisions that operate at very different scales with different responsibilities. They include the Migratory Birds and Habitat Programs, National Wildlife Refuges, Ecological Services, and Law Enforcement. The migratory bird and habitat program deals with birds at the largest scale. National wildlife refuge is other end of the scale system: landscape, regional, site specific scale.

Current programs include designing and implementing a comprehensive monitoring program of seabirds of the California current system (CCS) designed to (1) detect and understand changes in the status and trends of seabird populations in support of conservation strategies in the CCS and (2) integrate seabird monitoring into an overall assessment of the health of the marine/coastal ecosystem in the CCS. Additionally USFWS is planning to Compile and disseminate seabird colony inventory data from multiple areas in the Pacific that also will include Washington State. This was last done in Washington by Spiech & Wahl (1989) and the update is scheduled for 2006.

There are two NWRs within Puget Sound (the Washington Maritime NWR Complex and Nisqually NWR). Along with 3 NWR's on Washington's outer coast, these provide some of the most important seabird nesting and roosting habitat in the state. It is estimated that >80% of the states seabirds nest on Refuge lands. The Maritime NWR Comprehensive Conservation Plan (CCP) for the outer coastal islands underwent public review in spring 2005 and they hope to have it finalized this winter. It guides the management of the Refuge for the next 15 years. The CCP for Protection Island and the San Juan NWR is just in the initial scoping process and anyone that would like to be on the mailing list to be involved in this process should contact Maura. The Nisqually NWR is undertaking a 700 acre estuary restoration project. Their mid-winter surveys continue while other surveys and monitoring have been cut.

Ongoing or recent actions undertaken by the Western Washington Field Office include work on

- Pigeon Guillemots with PSAMP and Protection Island nest productivity and life history work.
- Marbled Murrelets including the USFS Demographic Study, habitat restoration and/or purchase
- Scoters – Funding to University of Wyoming for telemetry and habitat use study

Research and monitoring needs include:

- Impacts from underwater sound pressure
- Derelict Fishing Gear (entanglement rates and removal of gear)
- Entanglement rates in active gill nets
- Education for motorboat operators near seabird colonies

- Need to better understand the threats to seabirds and how to counteract those threats with restoration opportunities.

State listings of seabirds and seaducks: the process, priorities and current

Gary Wiles (WDFW) presented information on the listing process for declining species in Washington State, focusing on seabirds and seaducks. He noted that the laws for listing have been around since 1991. In Washington, the following marine birds are listed:

- Endangered: brown pelican
- Threatened: marbled murrelet
- Sensitive: common loon
- Candidates: western grebe, Brandt's cormorant, common murre, Cassin's auklet, tufted puffin, short-tailed albatross

He noted that candidate species receive no added protection under state law, however some counties extend protection to candidate species. He then went on to describe the listing process for candidates and on to endangered, threatened and sensitive species through the preparation of a draft, the final status report. Ultimately the Fish and Wildlife Commission decides whether to list the species. The benefits of state listing include protection for endangered species by a separate WAC, protection of listed species from direct take and destruction of nests, and the development or recovery plan for state listed species. Additionally, listing guides WDFW in setting work priorities, habitats of listed species receive various protections under the Growth Management Act (i.e., CAOs) and Forest Practices WAC, and listed species gain increased public recognition.

Audubon's Important Bird Areas

Tim Cullinan (Washington Audubon) gave a presentation on Important Bird Areas (IBA), which started in Europe. Audubon is now leading the effort to define the important bird areas at the state and national scale. The goals of these are to:

- Identify areas that are the most important for maintaining bird populations.
- Focus conservation efforts at protecting, enhancing, or restoring these sites

At the state-level, selection criteria for these include:

- Regional or state-listed species of concern
- Assemblages associated with representative, rare, or unique habitats
- Significant congregations (lower thresholds)

Approximately 58 sites have been identified in Washington. Good marine bird examples are Padila and Samish Bays. Other marine-related priority sites include Port Susan Bay, South Willapa Bay, and Skagit Bay. After site identification, Audubon plans to prioritize conservation efforts on the sites and develop needs assessments and site conservation strategies. A terrestrial bird example was given: reducing threats from wind-powered turbines. This was relevant to marine birds as well as these are being place in marine waters in the North Sea, where many have been shut down due to bird mortality. Better data on bird presence and abundance is needed to properly site these turbines.

Seabirds: current knowledge, threats, science gaps

Unfortunately neither seabird speaker was able to attend the meeting so Joe Gaydos facilitated a brief discussion on seabird species of concern and common threats. Species of concern (primarily seabird, but others slid in) identified by the participants were:

- Rhinoceros auklet
- Tufted puffin
- Common murre
- Marbled murrelet
- Red throated loon

Species also were identified where we needed more information. These included:

- Cassin's auklet
- Pigeon guillemots
- Brandt – high arctic
- Pelagic cormorant
- Horned grebe

Common seabird threats underlying some of the species declines (in addition to those mentioned by Nysewander in this morning's presentation) included:

- Fisheries: active (need more data from tribal fisheries) and derelict gear
- Oil spills: significant declines after large oil spills with very slow recovery
- Common diet component of schooling forage fish
- Bald eagles disturbance and predation

Other potential concerns were identified where more data are needed including:

- The effects of contaminants (contaminant levels are unknown as compared to other predators)
- What is happening when birds are at sea? Where are the birds going?
- Impacts of human and dog disturbance
- Development pressure on boreal forest (summer breeding habitat) including draining lakes, mining and timber operations

Many of these large-scale issues will hopefully be addressed at this winter's Pacific seabird conference in Alaska this winter (Seabirds as indicators of marine health).

Species of greatest concern in the Puget Sound Georgia Basin Region

After lunch participants collectively developed a list of individual species that were either in decline or might be in decline but for which we really needed more data to assess their status. These species are listed alphabetically and some have reasons for listing as provided by the person recommending the bird. Ultimately each participant was given 3 votes to identify the top 3 species we should address today. Keep in mind this in no way reflects the true status of the species identified, however was used as a democratic way of addressing species that most people considered top priority. The number of votes each species received is listed in parenthesis after the species. Species that did not receive votes are listed in alphabetical order:

Bird receiving votes (number of votes in parenthesis)

- Western Grebe (25 votes) – declines all along coast

- Rhinoceros auklet (21 votes) – Washington has colonies of global significance; no apparent idea of why there are declines; are a sentinel species studied from CA to Japan; a focal species for the California current
- Scoters (especially surf) (15 votes) – declines are significant; very coastal species – focused on nearshore environment where there is interface between people and marine waters.
- Pigeon guillemot (6 votes) – a good bird for monitoring forage fish; is a citizen's group that is working on guillemots now (sponsored by Island County MRC).
- Marbled murrelet (5 votes)
- Glaucous-winged Gull (3 votes) – monitored carefully by some and are disappearing rapidly from some islands in the region (catastrophic reproductive failure of this "trash" species this past summer), while urban conflicts are increasing
- Caspian turn (2 votes) – only 1 colony in Puget Sound – 2nd largest in entire Northwest; good species for monitoring forage fish because you can identify what they area eating; are removing ½ of the colony on sand island in the Columbia river
- Red-throated loon (2 votes)
- Harlequin duck (1 vote)

Bird discussed, but did not receive votes:

- Barrow's goldeneye
- Black oystercatcher – low global population, restricted range from S. Alaska to N. California 200 yards wide; probably not in trouble now, but worth research efforts NOTE: is a shore bird and has a working group – NOT VOTED ON TODAY
- Brant (Western High Arctic)
- Cassin's auklet
- Common murre
- Long-tailed duck
- Red-necked grebes
- Scaup (lesser and greater)
- Snowy plover
- Tufted puffins

Due to time constraints, research and management needs were developed only for the top 3 ranking species:

Western grebe

- Winter survival rates and movements including habitat use
- At which phase of annual life cycle are we seeing mortality
- We need to know links between breeding, molting, and wintering areas
- Physiological condition in different habitats
- General foraging ecology
- How do you decide on forage fish needs
- Need a modified sampling scheme that will tighten up the sampling of the population
- There are a little data on diet, and a lot more is needed
- We need to understand what actual forage fish base is available to these birds.
- A Washington State status review is needed for this candidate species. This would probably would cost about $40,000. A letter should be sent to WDFW stating that

there is a need for a status review. (Note: Joe Gaydos sent a letter to the director of WDFW on October 5, 2005 alerting him to the fact that this was brought up during our meeting and encouraging the agency to proceed expediently with a status review on the Western Grebe.)

Rhinoceros auklet

- At what life history stage are we seeing problems – juvenile survival, adult productivity (nesting success), adult mortality
- Habitat use – most leave offshore for the winter except for a small group that comes into south sound
- We need better information on diet (USFWS might have some data that need to be analyzed)
- What are their key foraging areas - possibly a 50 mile range from their colonies (Tatoosh, Protection Island)
- How important is current fisheries by-catch? – some information from Chris Thompson and Monique Lance's work but we need better data from Tribal fisheries
- Are contaminants a factor for this species?
- There is a theory that the adults actually feed on plankton and feed their chicks with forage fish. What are the adult food habits?
- Do we really know if this species is declining and how much? The USFWS has these data. Analyze population trend data at breeding colonies in Washington need to be evaluated.
- We need to understand what actual forage fish base is available out there for these fish to eat.

Surf scoters

- We need better information on the impacts of hunting on this species especially at key selected areas (more detailed information than we are receiving from the hunter harvest data)
- These birds are truly a threat to the mussels and clams industry. What is the impact of illegal harvest by shellfish growers?
- What is the impact of toxins on scoters including fecundity? Before more field work is done, we need to better understand Hg, Cd, Se and their impact. Are they like marine mammals and can tolerate a high level of Hg. What is the impact of these on their eggs? What are the sources of these heavy metals (exotics are possibly implicated in the San Francisco Bay area).
- What is the role of exotic invertebrates on the foraging role of scoters (i.e. *Nutalia* sp. and others)
- What is the relationship of forage fish (esp. herring roe) and spring conditioning and reproductive success? What else are they eating during the spring migration?
- It seems that major things are happening on the breeding grounds. Could this be due to problems with pre-conditioning of scoters? The inland marine waters of Washington provide an important staging area for this species. Even birds from San Francisco Bay stage here before moving north to
- Where are the habitats in which they concentrate in the spring staging and what can be done to better protect birds in these areas.

- Surf scoters are Blue listed in Canada, but are not candidate species in Washington State. It is on the new conservation strategies for Washington State as at-risk but cannot be considered for listing as a Candidate, Threatened or Endangered species because they are a game bird.

Common issues or threats to multiple species

Looking at seabird population world-wide two threats have risen to the top, climate change and forage availability including fisheries interaction from harvest of forage fish. It's important to remember that all the changes we are seeing may not be anthropogenic, some could be naturally cyclic. Numerous efforts have been made to identify research and management needs for seabirds and seaducks. Using answers to questions supplied by meeting attendees prior to the meeting and information from other gap assessments and projects (NWSC Gap Assessment, 2000; California Current Marine Bird Conservation Plan, 2005; etc.) to identify several large categories. Participants were asked to expound on these categories focusing on potential anthropogenic impacts and regional needs:

1. Contaminants and water quality
   - How does land use change impact habitat quality and prey availability for marine birds? To make these links, need to better understand the effects of contaminants to survival and reproductive performance on individuals and populations.
   - Are there contaminant data on seabirds from this region (Henney, Mahaffey, etc)? Is there a need for a review and then possible a preliminary survey to see what points a finger at contaminants influencing population declines? Despite high levels of contaminants in birds from San Francisco Bay, they have not shown any smoking guns in that region so far.

2. Human bird interactions
   - We need good data on net fishery by-catch for seabirds and seaducks (there was work done by Thompson and Lance for the state fishery and some changes were implemented). We don't have data from tribal fisheries. What are the impacts from tribal fisheries?
   - The boat disturbance issue is a tough one and on individual pointed that out with an e-mail he sent prior to the meeting. Some work was done in Glacier Bay and there are now limitations on boat use there (i.e. 25 boats / day). There are no current MPAs in the Puget Sound Georgia Basin Region where boats are excluded. Due to heavy boat use in this area, this issue needs to be investigated. It might be species specific or location specific. A graduate student just did a review looking at this and there is a paucity of quantitative data available. The first step might be to do some energetic work. There might be some times of the year that are more crucial than other times. There might be some species for which it is more important especially disturbances at colonial nesting species at breeding locations or seabirds at their summer breeding grounds.
   - BC has Blue-listed double-crested cormorants because of disturbance by recreational kayakers and boaters disturbing these species.
   - There might be impacts of underwater acoustic trauma or disturbance on diving marine birds (sonar, geological exploration, etc.).

3. Prey resources
    - There was a historical attempt to get some forage fish people to talk to seabird people and this effort needs to be re-invigorated.
    - There is a need to use hydroacoustic information to look a forage fish availability
    - We need more information about where forage fish are present at which age classes.
    - Shellfish are important for all of the ducks – we could use more information about shellfish distribution over time. Duane Fagergren (PSAT) has done some work looking at marine bird impacts on shellfish aquaculture. Do scoters deplete regional shellfish stocks then focus on aquaculture? There is interest by commercial shellfish growers in seeding areas for seaduck consumption. This project is ballparked at $40K excluding in-kind contribution by growers.
    - Are there declines in other species that eat forage fish? Are there declines in planktivorous species?
    - We do know that we haven't seen declines in Buffleheads, Goldeneyes, Harlequins and other species that tend to focus more on crustaceans.
    - What happens to fish and invertebrate prey resources during winter months – especially for over-wintering birds that are in decline here?
    - Which seabirds and seaducks are dependent upon squid?
    - What are the impacts of forage fish fisheries (i.e. harvest of sand lance for dog food) on forage fish availability on prey bases for seabirds and seaducks?

4. Habitat
    - What is the association between the health of eelgrass meadows and the health of seabird and seaduck populations?
    - What are the habitat quality needs for forage fish and other prey resources?
    - There are plenty of spatially explicit data available. What are the critical habitats needed by these birds?
    - What is the quantity and quality of habitat needs for marine birds and seaducks in the PSGB region? What is the really big picture? There are numerous databases that are disparate and not compatible.
    - Note: the issue of habitat is complicated and is an issue of scale. If you want to relate these birds to food supply and where the food is located you need to get a one-time sample of all of these things simultaneously, which will permit multivariate analysis.

Education

Based on a questionnaire sent out to participants prior to the meeting and supported by the meeting participants, there is a huge need for better education of the public about marine bird declines. The goal of this education could be to

- Develop a marine bird constituency that would support a larger financial investment in restoring marine bird populations
- Change people's behavior if human disturbance is implicated for contributing to declines of certain species
- Tell a story about the state of our ecosystem. Marine birds are high-level predators that reproduce slowly and are good indicators for the health of our marine ecosystem.

It was mentioned that it would be helpful for those educating the public to have better access to the information. Agencies should continue to try and publish findings in peer-reviewed journals and try to send reports to these organizations that educate the public.

Also, it was pointed out that there might be a role for citizen science in the collection of data. Cautions were raised about the quality of data and the investment of time needed to train people to collect these data. It also was pointed out that there are lots of potential for using people to collect data for surveys like the MESA study that did line transects on ferries. Having people on the ferry observing birds and educating people simultaneously might be a great project. Beach seining also was brought up as a great way to get the public out into the field.

It was mentioned that migratory species are a hard sell to the public. We need to get the story out that these birds spend a significant period of time here and that they are indicators of what is happening in our marine waters.

Nobody volunteered their organization to spearhead a public education campaign.

Scientific Synthesis

Several points were brought up that might benefit academic researchers, managers, and NGOs:

1. There might be merit into have an organization develop a database that brings baseline data together in one place.
2. It would be useful for this group or a subset of this group to produce a prospectus to summarize the different trend data for seabirds and seaducks and to develop a matrix a way of thinking about bird declines that might help hone down the issues that need to be developed. There would be added merit if this could be done and published in a peer-reviewed journal. This would be helpful in refining the arguments AND for applying for funds. A majority of people felt this would be helpful.

Take home messages and common themes

- Numerous populations of seabirds and seaducks in the Puget Sound Georgia Basin are in decline. Approximately 20 species were identified during this meeting (pg. 5)
- Despite being good indicators of the health of our ecosystem and enjoyable to watch, the general public is not as aware of regional seabird and seaduck declines as they are of declines in other top level predators like salmon and killer whales.
- There are numerous and probably synergistic factors involved in the decline of these species (some understood, some not). One common concern that was raised again and again was the relationship between forage fish availability and declines in seabirds and seaducks, many of which depend on forage fish for some percentage of their diet.
- There is need and merit for management organizations (USFWS and WDFW for example) to work together and with other organizations in better understanding these declines and restoring these populations.
- Among meeting participants, there is strong support for a wide-spread campaign to alert the public and law makers to declines in regional seabird and seaduck populations. No person or group has been identified to do this.

Action items and research needs identified at this meeting (not prioritized):

- Research needs were enumerated for 3 species (Western Grebe, Rhinoceros auklet, and Surf Scoter (see pgs. 6 & 7). A similar list should be developed for other species identified, but not addressed during this meeting (pgs. 5 & 6).
- With the increasing human population in the region, there is concern about human and dog disturbance contributing to the decline of many of these species. In BC, human disturbance of nesting colonies has been identified as a major threat to cormorants (double-crested, pelagic, and Brant's). More work needs to be done on studying the role of human disturbance in declines of seabirds and seaducks as well as other marine birds in Washington.
- More data are needed on the diet of some species. Some of these data are available and need to be analyzed. For other species, these data need to be collected. It would be ideal to collect data on what birds are eating while simultaneously collecting data on what is available.
- A better understanding of fisheries impacts are needed as they relate to seabird and seaduck declines. This includes understanding what species are currently being caught in nets (tribal and state), what species are being found beneath derelict fishing gear that is removed (which species are being impacted), and what fisheries exist for forage fish in the region and how could they be competing with marine birds for resources.
- Little to no data exists on causes of mortality (infectious diseases, traumatic, toxic, etc) for seabirds and seaducks in the region.
- An organization or group of organizations should spearhead a campaign to educate the public and lawmakers about seabird and seaduck declines in the region.
- A subgroup should be identified to proceed with writing a manuscript detailing trends for seabird and seaduck declines in the Puget Sound Georgia Basin Region.

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Appendix I: list of meeting participants

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Appendix: Avian Species of Concern in the Georgia Basin / Puget Sound Marine Ecosystem

SPECIES	BRITISH COLUMBIA	WASHINGTON STATE	CANADA	U.S. A.
American Golden Plover (*Pluvialis dominica*)	Blue List			
Ancient Murrelet (*Synthliboramphus antiquus*)	Blue List		Special Concern	
Bald Eagle (*Haliaeetus leucocephalus*)		Threatened		Threatened
Canada Goose, Aleutian (*Branta canadensis leucopareia*)	Not listed to **Blue List**	Threatened		Threatened to **Species of Concern**
Caspian Tern (*Sterna caspia*)	Blue List			
Cassin's Auklet (*Ptychoramphus aleuticus*)	Blue List	Candidate		Species of Concern
Common Loon (*Gavia immer*)		Sensitive		
Common Murre (*Uria aalge*)	Red List	Candidate		
Cormorant, Brandt's (*Phalacrocorax penicillatus*)	Red List	Candidate		
Cormorant, Double-crested (*Phalocrocorax auritis*)	Red List			
Cormorant, Pelagic (*Phalocrocorax pelagicus pelagicus*)	Red List			
Forster's Tern (*Sterna forsteri*)	Red List		Data Deficient	
Great Blue Heron, Pacific (*Ardea herodias fannini*)	Blue List		Special Concern	
Long-billed Curlew (*Numenius americanus*)	Blue List			
Long-tailed duck / Oldsquaw (*Clangula hyemalis*)	Blue List		Special Concern	
Marbled Murrelet (*Brachyramphus marmoratus marmoratus*)	Red List	Threatened	Threatened	Threatened
Peregrine Falcon, American (*Falco peregrinus anatum*)	Red List	Sensitive	Threatened	Species of Concern
Peregrine Falcon, Peale's (*Falco peregrinus pealei*)	Blue List	Sensitive	Special Concern	Species of Concern
Phalarope, Northern / Red-necked (*Phalaropus lobatus*)	Blue List			
Short-billed Dowitcher (*Limnodromus griseus*)	Blue List			
Surf Scoter (*Melanitta perspicillata*)	Blue List			
Tufted Puffin (*Fratercula cirrhata*)	Blue List	Candidate		Species of Concern
Western Grebe (*Aechmophorus occidentalis*)	Red List	Candidate		

***Items in bold represent legal status changes made between September 2002 and September 2004.**

From: Brown, N. and J. K. Gaydos. 2005. Species of concern in the Puget Sound Georgia Basin: changes between 2002 and 2004. Proceedings of the 2005 Puget Sound Georgia Basin Research Conference, Seattle, WA, March 2005