Marine SGCN Comments
Compiled 10/29/14

1A. Email from Barbara Vickery, The Nature Conservancy (9/26/14)
I asked Geoff Smith, our marine program director for his review. He agreed with most of what he saw but raised two questions:

1. Why are scallops, I think he is thinking inshore populations of sea scallops, not in the same category with hard and soft shelled clams, that is Priority 3?
2. On the other hand, he wondered about the inclusion of spiny dogfish since it is his understanding they have come back gangbusters recently

1B. RESPONSE to Barbara Vickery:
1. Scallops were added as a priority 3 SGCN due to their likely high climate change vulnerability (Orr et al., 2005; White et al., 2013; White et al., 2014).
2. Spiny dogfish have been removed from the SGCN list since DMR is increasing the daily commercial catch allowance due to apparent population increases.

2A. Email from Barbara Vickery, The Nature Conservancy (9/29/14)
Jeremy Bell on our staff suggest that blue mussel be added to the Priority 3 list because of vulnerability to ocean acidification, like clams, on the basis of the attached article.

2B. RESPONSE to Barbara Vickery:
We agree, Mytilus edulis has been added as a priority 3 SGCN due to its high climate change vulnerability (O'Donnel et al., 2013; Melzner et al., 2011).

3A. Email from Andy Pershing, Gulf of Maine Research Institute (10/1/14)
I was pleased to see cod on the list. If you want to be provocative, you could consider adding lobsters. The increase in shell disease noted in the last few warm years is troubling. Also, I didn't see a slot for plants and algae. I think eelgrass are interesting. My understanding from Curtis Bohlens was that there were massive losses in the last few years that they think may be due to green crabs.

3B. RESPONSE to Andy Pershing
Although Maine's lobster populations are currently stable, recent changes in the GOM temperature regime have shown that lobster populations and life cycles can be affected by the abiotic (temperature) changes predicted, and biotic (shell disease) factors that may become exacerbated by predicted climate changes, however evidence has not been conclusive. Recent surveys have shown that shell disease is an increasing factor among many local populations, and juvenile recruitment has been lower in recent years. Additionally ocean acidification may stress populations (Keppel et al., 2012), however other work has found that lobsters may gain calcium under ocean acidification (Robert Steneck, University of Maine).

Currently, it is unclear how the population size will change over the next 10 years, and the lobster fishery is the largest commercial marine fishery in the state and adult populations are at all-time highs. The Species of Greatest Concern List and the State Wildlife Action Plan is designed to provide status and funding for those species which are not game or commercial species, but are in need of conservation. Although the SGCN does currently contain species with limited commercial harvest, the fishery of each species that is currently listed has been recently reduced,

put under moratorium, or managed extremely closely and has within-season shut-down triggers. With each of these considerations, lobster may not be a suitable SGCN.

4A. Email from Andy Pershing, Gulf of Maine Research Institute (10/2/14)
Zooplankton are tough to think of in this context, because there isn't much we could do to protect them. *Calanus finmarchicus*, our dominant copepod, is at the southern end of its range in the Gulf, so it's one that will likely be challenged in the future. However, at the North Atlantic scale, the population is doing great. Another candidate might be the planktonic snail Limacina. These pteropods seem to be very vulnerable to acidification.

4B. RESPONSE to Andy Pershing:
Calanus finmarchicus is listed as priority 3 SGCN due to its high vulnerability to climate change (warming, e.g. Reygondeau and Beaugrand, 2011; ocean acidification: Mayor et al., 2007) and our lack of knowledge about the species. Additionally, we have decided to list Limacina helicina as a priority 3 SGCN due to its high vulnerability to global climate change (e.g. ocean acidification: Comeau et al., 2009).

5A. Email from Meredith White, Bigelow Laboratory (10/1/14)
I suggested adding the blue mussel (*Mytilus edulis*) and sea scallop (*Placopecten magellanicus*) since they share similar ocean acidfication vulnerabilities with soft shell clams and quahogs. If I followed the criteria correctly, Priority 3 species only need to meet one criterion.

I also added the climate change vulnerability to the oysters, starfish, and sea urchins (with references for each).

5B. RESPONSE to Meredith White:
We have added the blue mussel and sea scallop as priority 3 SGC using the supporting documentation for each suggestion. We have also added climate change vulnerability as a criterion for the American oyster, the starfish, and the sea urchin.

6A. Email from Jeff Runge, University of Maine, Gulf of Maine Research Institute (10/2/14)
Not only is the species presently outside of its habitat (as defined by Reygondeau and Beaugrand in the 2011 article), there have been recent concerns by Canadian colleagues about the low abundance of C. finmarchicus (and consequently of northern right whales) in the Bay of Fundy in the fall of 2013.

I have recently submitted a research article to the Journal of Plankton Research reporting on results of our time series data about the abundance of C. finmarchicus in the western Gulf of Maine. While we find that it is still abundant and that there may be advective mechanisms for its persistence here, there are several reasons why its abundance in the Gulf of Maine would be sensitive to future climate forcing, making the whole pelagic ecosystem vulnerable.

I would be happy to explore the possibility of putting this species on the SGCN list further with you. At the moment, we don't have a sufficient monitoring program to assess its abundance in the Gulf of Maine- perhaps SGCN status could help raise awareness of the need to observe its population status.

6B. RESPONSE to Jeff Runge:

Due to Calanus finmarchicus' high vulnerability to climate change (warming, e.g. Reygondeau and Beaugrand, 2011; ocean acidification: Mayor et al., 2007) and the lack of knowledge about this ecologically important species, we have decided to list it as a priority 3 SGCN.

7A. Email from David Fields, Bigelow Laboratory

I think it would be appropriate to list C. fin [*Calanus finmarchicus*] on the SCGN list largely as a result of temperature effects on the species. At this point C fin is at or below the southern limit for this species. The primary reason we continue to have high abundance is due to advection from N. Atlantic stocks. Increased temperatures coupled with the increasing stress of ocean acidification will likely push this species northward further uncoupling the trophic links to herring, mackerel, cod and whales in the Gulf.

7B. RESPONSE to David Fields

Due to Calanus finmarchicus' high vulnerability to climate change (warming, e.g. Reygondeau and Beaugrand, 2011; ocean acidification: Mayor et al., 2007) and the lack of knowledge about this ecologically important species, we have decided to list it as a priority 3 SGCN.

8A. Email from Malcolm Hunter, University of Maine (7/7/14)

1. I am not sure about "down listing" the sea turtles based on absence of breeding as that is true of many birds listed. And leatherbacks may be more common than widely appreciated.
2. Do Chimney Swift and Golden Eagle and Blueback Herring make Priority one on the basis of two criteria?

8B. RESPONSE to Mac Hunter:

1. *Many of the sea turtles in the SGCN list were listed as priority 2 even though they are endangered because they minimally occur in Maine, as this is the extreme upper part of their range. In contrast to many bird species that do not have breeding ground in Maine but do spend more time in Maine as part of annual migrations through the state, the sea turtles are at the upper portion of their range here are rarely observed. There are reports of them in Massachusetts where they have cold stunned stranded turtles, but they have not made their way up this far in general. The species we do get reports of with some regularity are leatherbacks. Depending on the year and the distribution of their prey, we have had problems with leatherbacks getting entangled with fixed fishing gear such as lobster buoy lines. Given that we have the largest fixed gear fishery on the East Coast entanglements for turtles, endangered whales, and other species are of great concern to us and have warranted a fair amount of outreach and resources in the past. This has included time mounting disentanglement efforts, upkeeping specialized tools and training for staff, outreach with the fishing fleet and a large coordination with federal agencies.*
2. *Blueback herring were listed as priority 2 on the September draft SGCN list, but their criteria and priority level have been revised. They are now listed as priority 1 based on risk of extirpation (IUCN), recent significant declines (ASMFC Stock Assessment), and high regional conservation priority (ASMFC Fisheries Management Plan).*

9A. Notes from July 8, 2014 Fish break-out group

- NatureServe data- may not be complete for Maine.
    - How do we address w/ endemic definition? Do we need a broader definition of “endemic”?

        - Peer-reviewed, published documentation of phylogenetic distinction should be acceptable as well.
    - NatureServe utilizes historic range data, but what do we do with species with limited data (horseshoe crab) in NatureServe or species that are not listed as endemic (Arctic char)?
    - Need to add species: Horseshoe crab, cod, cusk, wolfish, shad, etc.? Claire Enterline from DMR to address with staff.

9B. RESPONSE to Fish break-out group

We have added horseshoe crab as a priority 1 SGCN; cod, cusk, wolfish, and shad have been added as priority 2 SGCN. DMR, MCP and IFW staff have proposed many revisions to the list and received comments on these revisions from other experts.

10A. Notes from Q&A sessions following SGCN presentation July 8, 2014

- Why not marine invertebrates like horseshoe crab?
    - Don't know the answer, will talk with Dee Blanton at USFWS to get answer; could be part of species @ risk assessment. DMR is the agency with primary jurisdiction over marine species – standby for more marine taxa to be added to the SGCN list.
- What about considering species that don't currently receive funding – many species on the list are T & E but other species like horseshoe crab are understudied and no dedicated funding- they might be more deserving of money

10B. RESPONSE to Q&A session comments:

We have tried to list species that are most at risk, regardless of their current funding status. We recognize that for many marine species in particular, there are not enough data to determine the population status. We have added a few species that are known to be ecologically important yet are still drastically understudied (e.g. horseshoe crabs, copepod Calanus finmarchicus, etc.). We hope that listing these species as SGCN will raise awareness about their important ecological roles and vulnerabilities. Additionally, these species will become eligible for State Wildlife Competitive Grant funding, which we hope will be used to fill in some of these knowledge gaps.

11 A/B. Robert Steneck, University of Maine

COMMENT 11.i: Sturgeon (both species) are rare and worthy of protection but I think trends are positive over the past decade.

RESPONSE 11.i: *Due to their current listing under the ESA as endangered and threatened species and the fact that they have been identified as high regional conservation priority species by the Atlantic States Marine Fisheries Commission, they fall within the defined criteria for priority 1 listing.*

COMMENT 11.ii: Atlantic salmon have declined in the wild but may be coming back in several estuaries. Salmonids need cold oxygen rich water which may be increasingly in short supply as temperatures in Maine continue to rise.

RESPONSE 11.ii: *The majority of Maine's watersheds are within ESA listed Distinct Population segments. Populations within these segments have experienced dramatic declines and despite significant effort to rebuild the species (dam removals, protection of rearing habitat, stocking at*

different life phases), the populations have not substantially increased within the DPS segments. Atlantic salmon will remain as priority 1 species.

While cold water rearing habitats may be impacted by climate change, this effect has not been demonstrated.

COMMENT 11.iii: River herring (especially blueback herring and alewives) are important forage fish. They are also important sources of nutrients up estuaries. River restoration should help increase spawning runs but there is evidence that most mortality occurs in the marine realm where they comingling with Atlantic herring.

RESPONSE 11.iii: *Blueback herring were listed as priority 2 on the September draft SGCN list, but their criteria and priority level have been revised. They are now listed as priority 1 based on risk of extirpation (IUCN), recent significant declines (ASMFC Stock Assessment), and high regional conservation priority (ASMFC Fisheries Management Plan Amendment 2). In Maine, few blueback herring runs are monitored and few population increases have been documented (the only population increase documented has been on the Sebasticook River).*

Alewife populations in Maine have been stable or increasing in all monitored runs during the past 10-15 years (ASMFC 2012 Stock Assessment), however their populations are still well below recorded numbers in the early 1900s. They are listed as priority 2 because of significant declines during 1970-1990, (ASFMC Stock Assessment), and because they are a high regional conservation priority (ASMFC Fisheries Management Plan Amendment 2).

Both species are subject to mortality as bycatch in the Atlantic herring fleet during the marine phase of their life cycle, but it has not been demonstrated that this mortality is more significant than mortality during other life phases. One current hypothesis is that Maine's populations may be more stable/increasing compared to populations in southern states because they follow a different ocean migration pattern and are there subject to less mortality as bycatch in the Atlantic herring fishery.

COMMENT 11.iv: Whales have relatively low numbers (true globally for natural and unnatural reasons). Large organisms have fewer individuals than do small organisms and thus are more prone to extinction.

RESPONSE 11.iv: *Due to the high risk of extirpation of all of the whales in the Gulf of Maine, we have listed them as priority 1 and 2 SGCN. Those that are listed as priority 2 are rarely encountered in Maine state waters. The North American Right Whale is listed as priority one because it is more frequently observed in Maine waters, has a distinct population in the Gulf of Maine, and has the largest number of gear entanglements in Maine among the whales.*

COMMENT 11.v: Harbor porpoise? I am not aware of them qualifying for any of the key criteria.

RESPONSE 11.v: *The harbor porpoise is listed as a priority 2 species because it has been identified as a high regional conservation priority by the Northeast Fish and Wildlife Diversity Technical Committee, it is a globally vulnerable species by the IUCN and is listed on Appendix II (currently not threatened with extinction, may become so without trade control)s of CITES throughout its range.*

COMMENT 11.vi: Horseshoe crabs were harvested for bait. Their northern limit is Maine but they stretch to Florida on the east coast.

> ***RESPONSE 11.vi:*** *The American horseshoe crab is listed as a priority 1 species because the ASMFC documented significant population declines over the past 15 years and identified it as a high regional conservation priority.*

COMMENT 11.vii: Of the turtles that are listed, the leatherback is the only one that is frequently encountered in the Gulf of Maine. They are the world's largest marine turtle and they have huge migration ranges. Nevertheless, they are rare and will likely remain rare in Maine's waters. This has always been the case. As far as I know, no turtles have been found in Indian middens dating back at least 5000 years. Turtles are minor players in Maine.

> ***RESPONSE 11.vii:*** *All sea turtles in the Gulf of Maine are listed under the ESA as endangered or threatened and listed by the IUCN as Endangered or Critically Endangered. Many of the sea turtles in the SGCN list were listed as priority 2 even though they are endangered because they minimally occur in Maine, as this is the extreme upper part of their range. There are reports of them in Massachusetts where they have cold stunned stranded turtles, but they have not made their way up this far in general. The species we do get reports of with some regularity are leatherbacks. Depending on the year and the distribution of their prey, we have had problems with leatherbacks getting entangled with fixed fishing gear such as lobster buoy lines. Given that we have the largest fixed gear fishery on the East Coast entanglements for turtles, endangered whales, and other species are of great concern to us and have warranted a fair amount of outreach and resources in the past. This has included time mounting disentanglement efforts, upkeeping specialized tools and training for staff, outreach with the fishing fleet and a large coordination with federal agencies. For these reasons, leatherbacks are listed as priority 1.*

COMMENT 11.viii: Sea stars can be explosive. We've seen booms and busts but I am not aware of a protracted decline in this group.

> ***RESPONSE 11.viii:*** *Anecdotal reports indicate that there have been recent declines in Asterias spp. populations, but these have not been well-documented in the literature perhaps because they have occurred rapidly and recently (2013 and 2014). We have also identified these species as SGCN due to their high vulnerability to climate change (Appelhans et al., 2012; Keppel et al., 2014) and the lack of knowledge surrounding these species.*

COMMENT 11.ix: Sharks and rays: I don't know anything more than what is listed. I am not aware of spiny dogfish meeting the criteria. I've never heard of a smooth hammerhead being found in Maine's waters.

> ***RESPONSE 11.ix:*** *Spiny dogfish have been removed from the list because their population appears to be on the rise so we have removed them from the list of marine SGCN. Although there are few reports of smooth hammerhead in Maine, their range does include part of Maine's waters. Because smooth hammerhead are not observed in high numbers in Maine, they are being listed as Priority 3 instead of Priority 2.*

COMMENT 11.x: *Calanus finmarchicus* may be an important component of the diet of many creatures. It is also thought to be in decline. This could be an important forage base for organisms but someone needs to critically review that concept.

> ***RESPONSE 11.x:*** *We have identified Calanus finmarchicus as a priority 3 species because of its high climate change vulnerability due to ocean acidification (Mayor et al., 2007) and warming (Reygondeau and Beaugrand, 2011) stressors.*

COMMENT 11.xi: American oysters suffered a large die off during the past century. It is coming back in some estuaries and it is commonly used in marine aquaculture. Its economic value is high.

> ***RESPONSE 11.xi:*** *We have listed the American oyster as a priority 3 species due to its high vulnerability to climate change (Talmage and Gobler, 2009) and because it is understudied.*

COMMENT 11.xii: Soft shell clams do not fare well when attacked by green crabs. The 2012 & 2013 warm water anomaly triggered a population explosion of green crabs with a precipitous decline in soft shell clams. The winter of 2013/2014 seems to have taken a toll on green crabs so the immediate threat to soft shell clams is slightly relaxed of recent.

> ***RESPONSE 11.xii:*** *Soft shell clams are listed as a priority 3 SGCN due to their high climate change vulnerability in regard to ocean acidification (Clements and Hunt, 2014), and also potential increased predation from invasive species, like green crabs, whose populations may increase with warming water temperatures.*

COMMENT 11.xiii: Atlantic sea scallops have fluctuated over the past several decades. I understand they are now more abundant in some coastal zones than ever before. It is unclear why this species was listed.

> ***RESPONSE 11.xiii:*** *DMR dive surveys have shown that scallop populations have decreased dramatically since the 1990's and the proportion of "clappers", or dead adult scallops due to unknown causes has increased dramatically in the past 5 years. Although scallop populations increased in some areas in Maine within the past five years, this was due to the introduction of closed areas and rotational management, and populations in these areas declined dramatically again when the areas were opened to fishing. Atlantic sea scallops are listed at priority 3 because of the increases in natural mortality that have been documented in the past few years, and because of the documented total population decline within the past 20 years.*
>
> *Presently, no ocean acidification studies have been conducted on sea scallops, which is likely due to the fact that they are difficult to rear in the laboratory. However, several other studies indicate widespread detrimental impacts of ocean acidification on bivalve species (e.g. Orr et al., 2005; White et al., 2013; White et al., 2014). This criterion has not been applied to sea scallop because no direct studies have been performed.*

COMMENT 11.xiv: Blue mussels declined in recent years statewide but they look to be coming back this year. Their abundance corresponds with green crab abundance (see above for soft shell clams).

> ***RESPONSE 11.xiv:*** *We have identified the blue mussel as a priority 3 SGCN due to its high vulnerability to climate change. Specifically, it has been found that not only the shell, but also*

the byssus are negatively affected by ocean acidification (O'Donnell et al., 2013; Melzner et al., 2011). They are also listed because of potential increased predation from invasive species, like green crabs, whose populations may increase with warming water temperatures.

COMMENT 11.xv: Pteropods (*Limacina*) has no data for Maine that I know of. I've seen them in Maine but do not know if they are trophically important or trending up or down (despite their well-known susceptibility to OA).

RESPONSE 11.xv: *We have identified Limacina halicina as a priority 3 SGCN due to its high vulnerability to ocean acidification (Comeau et al., 2009).*

13A. Comments from Thomas Trott, Suffolk University
Note: Comments were received in email and also in spreadsheet form. The following includes comments from emails (multiple dates) and also paraphrases species additions suggested in spreadsheets.

Email, 10/20/14:
To address range questions:

Questions concerning species ranges: species ranges are based on World Register of Marine Species (uses published information) and OBIS (uses databases). Go to WoRMS (http://www.marinespecies.org), type the species name in the search, then look at the distribution information (published locations). On that species page, go to the bottom and select "Occurrence Map" that will bring you to the OBIS mapper. The province (like Arctic) is assigned according to where the majority of records occur using both WoRMS and OBIS.

Question about blue sharks: I have asked for a reference form a Canadian colleague on COSEWIC Have to wait...

Questions about historical or not: There have been numerous surveys since 1973 (see attachment, from Trott, in review, please do not distribute). All of the mentioned species should have turned up and have not. Unfortunately, there is no funding for surveys that target selected species like those I have listed, and I suppose if there were and species were not found, someone could still fault the surveys' success. While absence of evidence is not evidence of absence, most people do not believe in unicorns, sea monsters, and big foot even though evidence of their existence is absent.

Mya truncata: I assigned as SH and not H because it was once listed among the species used to designate marine critical areas by the Maine STate Plannoing Office (see the reference I included on sheet).

Decreased occurrence of intertidal brachiopods: based on my unpublished survey data and NaGISA surveys done 2007-2009 in OBIS showing absence where once present.

I agree for "regional" on spotted wolfish.

I will not argue about change in Asterias abundance as long as it becomes listed. I could dig out historical info and a few Ph.D. dissertations that would clearly show decreased abundance in some coastal areas. I just don't have the time with the deadline you have given.

might you or someone else be able to respond to my question of why the justification of Cucumaria frondosa was changed from 2 to 3?

Email, 10/22/14:
Please find attached my response to questions about my additions. I have added new references shown at the bottom of the sheet highlighted in green.

For:
Arctic Distributions, OBIS and WoRMS are cited
Significant declines, Trott in review is cited
Blue Sharks; Campanula et al 2004 & Marine Fishers Specialists Subcommittee Annual Report are cited
Brachiopods: SH is added, Speel 1974 is cited
Cucumaria frondosus B, DMR catch data is cited

About C. frondosa, but I have been watching the DMR catch data for this species for a few years and the decline since 2005 is quite noticeable. I have attached what has been sent to me previously this fall from Ron Watts and Heidi Bray. Confidential are years when there are less than three dealers reporting. I was told state law prohibits the release of information in this situation. That does not help the overall harvest picture look better, though, from where I sit.

Email 10/24/14:
There have been few quantitative studies of macroinvertebrates in Cobscook Bay, even though there have been 89 surveys generating 3,767 records for 874 species, among which are the species in question. Since the last sighting of most species in question (I do not have the spreadsheet on this computer-I think a few were seen after 1970's last), 34 surveys of the same type, among them having the same spatial coverage and sampling methods as pre-1970s, have not recorded these species.

Since there is a direct relationship between between species incidence and abundance (Gaston and Lawton 1988. Patterns in the distribution and abundance of insect populations. Nature 331:709-712; Wright 1991. Correlations between incidence and abundance are expected by chance. Journal of Biogeography 18: 463-466) the absence of records (i.e., incidence) indicates that these species have declined to a point that they are not being detected.

This encapsulates my reasoning behind listing these species as declining. As might be expected, if a species has commercial value and is targeted as catch, then there will be quantitative data showing a decline. Most species like those we are considering do not have a commercial value and no agency would fund a proposal for long-term quantitative monitoring of their populations unless it could be shown that they serve critical ecosystem functions.

I hope the histogram now makes sense relative to how I interpret a declining population. My reasoning is not restricted to myself; there are many who use incidence as a measure of abundance. In fact, there are widely accepted methods for calculating abundance based on using incidence data. I have even been criticized for not using them in a recent paper I submitted (**NOT** the one in review that I have listed on the spreadsheet).

12A. Comment from Bruce Connery, National Park Service, Acadia (10/11/14)
During the meeting in Augusta, esp our breakout session, I began to wonder if we had really captured all the fish species that should have been identified in the list that Claire had brought to the meeting. These questions or doubts related to stories I had read in articles or heard from Linda Welch (FWS Seabird

Restoration Biologist) about crashing seabird chick survival rates in the last few years. These stories were matched to local reports by fisherman, biologists, and folks involved with ocean issues (warmer winter water temps, blooms, etc.).

In our break out session i wondered about all the little forage fish that supported some to much of the ecology of the GOM. Two days later Linda gave a presentation at the Downeast Science Convergence Meeting at Schoodic and in her presentation she showed some alarming findings about nesting success or chick survival, which seem unexplained by common possibilities such as predators, late spring storms, or disturbance by humans or something similar. instead it appeared that declining to completely absent forage fish around a half dozen nesting islands was a or the main reason for these recent drops.

While listing game or economically-significant species is what is backed by professional judgement or facts (trawl data, etc.) makes sense, i wonder if the fish or other creatures below these listed species are in peril too. I dont know but have concerns that if we don't identify these species or these habitats now there could be much more significant issues by 2025. Without solid population numbers there may be some push back about identifying these species, especially if the habitats where they live are covered by some of the other species that we listed.

Any way I thought I should bring this up for discussion. As I said I don't know if there is a need for these small forage species (fish, amphipods, copepods, etc.) to be listed as long as we think the habitat or system is covered by the bottom fishes (skates, sharks, etc.) invertebrates (clams / horseshoe crabs, cucumbers. etc.), or other species (i.e., herring, smelt, etc.). But after seeing Linda's presentation or reading some of the recent articles, it seems very important that if these species are not in the list of Cat 1 or Cat 2 that the habitats where they live is covered.

Hopefully you will get a chance to see Linda's PP or to talk with her about her recent results regarding nesting success / chick survival. Below are links to some of the recent articles about the apparent loss of forage fish in the GOM.

http://bigstory.ap.org/article/apnewsbreak-atlantic-puffins-peril-
ushttp://projectpuffin.audubon.org/letter-hope-watchers-steve-kress
http://www.pewtrusts.org/en/about/news-room/news/2014/08/21/puffins-love-forage-fish-and-so-should-you

12B. RESPONSE to Bruce Connery:
The list proposed to the SWAP group on Sept. 30 has been again revised to include small forage species including copepods and more mollusks and marine invertebrates. These species represent both a part of the ecosystem that had been under-represented in the Sept. 30 list, and also parts of the marine ecosystem that had not been represented by finfish species.

13B. RESPONSE/ACCEPTED ADDITIONS
Table summarizing Dr. Trott's suggested additions to the SGCN list and endorsements of proposed SGCN species. Each species was reviewed based on available reports and data. The accepted priority and criteria for each species is shown in the three far right columns.

CRITERIA KEY:
Key criteria for listing as Marine SGCN

A. Risk of extirpation: Current (or proposed) state or federal Endangered or Threatened status, or global endangerment status (International Union for the Conservation of Nature [IUCN])
B. Recent significant declines (15 or 30 yrs): Currently undergoing steep population decline statewide or regionally, which has already led to, or if unchecked is likely to lead to, local extinction and/or significant range contraction
C. Regional Endemic: Global geographic range is at least 90% contained within USFWS Region 5, the Canadian Maritime Provinces, and southeastern Quebec (south of the St. Lawrence River)
D. High regional conservation priority high regional or global species of conservation concern by one of the following species assessment authorities (see Table 1 for Priority 1 subcriteria):
    i. Northeast Endangered Species and Wildlife Diversity Technical Committee [NESWDTC] (all vertebrates and freshwater mussels) – Therres 1999
    ii. Northeast Regional Synthesis [RSGCN] (all vertebrates, freshwater mussels, and tiger beetles) – Terwilliger 2013
    iii. NatureServe (all taxa) – NatureServe 2014
    iv. Northeast Partners In Amphibian and Reptile Conservation [NEPARC] (herpetofauna) – NEPARC 2010
    v. American Fisheries Society (freshwater & diadromous fish) – Jelks et al. 2011
    vi. Atlantic States Marine Fisheries Commission Stock Assessments [ASMFC] - ASMFSC 2012
    vii. Eastern Brook Trout Joint Venture [EBTJV] - EBTJV 2005
E. Global vulnerability (IUCN): designated as Vulnerable under the International Union for the Conservation of Nature [IUCN])
F. State special concern: Current or proposed species of Special Concern in Maine
G. High climate change vulnerability: Whitman et al. 2013 (or other published source)
H. Historical: Currently listed as state (SH) or global (GH) Historical (by MDIFW or NatureServe) that have reasonable probability of rediscovery with further survey
I. Understudied rare taxa: Recently documented or poorly surveyed rare species for which risk of extirpation is potentially high (e.g. few known occurrences) but insufficient data exist to conclusively assess distribution and status

Trott Comment	SWAP Designation	Species Common Name	Scientific Name	Trott Proposed Priority	Trott Proposed Justification (short)	Trott Proposed Justification (long)	Accepted Priority	Accepted Justification (short)	Accepted Justification (long)
Endorse species addition	Fish	Atlantic wolffish	*Anarhichas lupus*	2	B, I	B Endorement by TROTT (Fed Species of Concern), I (little known about this species, so prof. judgement for P2)	2	B, D, I	D (NMFS Species of Concern), B(NEFSC trawl surveys), I
Add species	Fish	Spotted wolffish	*Anarhichas minor*	2	A	A (Threatened status COSEWIC), I (little known about this species)	3	D, I	D (Threatened status COSEWIC), I (little known about this species), limited range in Maine
Add species	Fish	winter flounder	*Pseudopleuronectes americanus*	2	B,G	B&G, DFO. 2012. Assessment of winter flounder (Pseudopleuronectes americanus) in the southern Gulf of St. Lawrence (NAFO Div. 4T). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/016.)	3	B	B (ASMFC Stock Assess, 30yr, and DFO. 2012. Assessment of winter flounder (Pseudopleuronectes americanus) in the southern Gulf of St. Lawrence (NAFO Div. 4T). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/016.)
Add species	Marine invertebrates	American Pelican Foot	*Aporrhais occidentalis*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Atlantic Great Piddock	*Zirfaea crispata*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Clathrate trophon	*Boreotrophon clathratus*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Colus snail	*Colus pygmaeus*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)
Endorse species addition	Marine invertebrates	Forbes sea star	*Asterias forbesi*	2	G, I	B, G (Appelhans et al., 2012; Keppel et al., 2014); I (Understudied)	2	B, G, I	B, G (Appelhans et al., 2012; Keppel et al., 2014); I (Understudied)
Add species	Marine invertebrates	Gaper Clam	*Mya truncata*	2	B,G,H,I	B (Trott 2004); G (Talmage&Goblin 2010; Clements&Hunt 2014);SH (Gilbert 1977); I	3	G,H,I	G (Talmage&Goblin 2010; Clements&Hunt 2014); H (Gilbert 1977); I (downgraded to 3 because sources cited questionable identification)
Endorse species addition	Marine invertebrates	Green sea urchin	*Strongylocentrotus droebachiensis*	2	B, G	B (Chen and Hunter, 2003; Steneck et al., 2013); G (Holtmann et al., 2013)	2	B, G	B (Chen and Hunter, 2003; Steneck et al., 2013); G (Holtmann et al., 2013)
Add species	Marine invertebrates	Icelandic Scallop	*Chlamys islandica*	3	G,I	G (Heilmayer et al. 2004; Orr et al., 2005; White et al., 2013; White et al., 2014) I (understudied as by-catch, Professional judgement)	3	G,I	G (Heilmayer et al. 2004; Orr et al., 2005; White et al., 2013; White et al., 2014) I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Lamp Shell	*Terebratulina septentrionalis*	2	G, I	B (significant intertidal population declines); G (Arctic Province species), I (understudied, targeted collecting by supply companies)	2	B, G, I	B (Trott 2004); G (Arctic Province species), I (understudied, targeted collecting by supply companies)
Add species	Marine invertebrates	Murex	*Boreotrophon truncatus*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Northern Basket Starfish	*Gorgonocephalus arcticus*	2	B, G, I	B (Trott, in review; Applehans et all 2012; last record in Cobscook Bay 1975; subjected to targeted collections for public aquaria display); G (Arctic Province species); I (understudied as dredge by-catch, Professional judgement))	2	B, G, I	B (Trott, in review; Applehans et all 2012; last record in Cobscook Bay 1975; subjected to targeted collections for public aquaria display); G (Arctic Province species); I (understudied as dredge by-catch, Professional judgement))
Endorse species addition	Marine invertebrates	Orange-footed sea cucumber	*Cucumaria frondosa*	2	B, G	B (Recent significant declines: http://www.maine.gov/dmr/cukes/chen2007.pdf, and ME DMR unpublished data from annual dive survey, 2010-13), G (Artic Province Species)	2	B, G	B (Recent significant declines: http://www.maine.gov/dmr/cukes/chen2007.pdf, and ME DMR unpublished data from annual dive survey, 2010-13), G (Artic Province Species)

Trott Comment	SWAP Designation	Species Common Name	Scientific Name	Trott Proposed Priority	Trott Proposed Justification (short)	Trott Proposed Justification (long)	Accepted Priority	Accepted Justification (short)	Accepted Justification (long)
Add species	Marine invertebrates	polar lebbeid shrimp	*Lebbeus polaris*	2	B, G, I	B (last record in Cobscook Bay 1973), G (Arctic Province species),I (little known about this species, Professional judgement)	2	B, G, I	B (last record in Cobscook Bay 1973), G (Arctic Province species),I (little known about this species, Professional judgement)
Add species	Marine invertebrates	psolus	*Psolus fabricii*	2	B, G, I	B (Trott, in review; last record in Cobscook Bay 1975; subjected to targeted collections for public aquaria display); G (Arctic Province species); I (understudied as dredge by-catch, Professional judgement))	2	B, G, I	B (Trott, in review; last record in Cobscook Bay 1975; subjected to targeted collections for public aquaria display); G (Arctic Province species); I (understudied as dredge by-catch, Professional judgement))
Add species	Marine invertebrates	psolus	*Psolus phantapus*	2	B, G, I	B (Trott, in review; last record in Cobscook Bay 1973; subjected to targeted collections for public aquaria display); G (Arctic Province species); I (understudied as dredge by-catch, Professional judgement))	2	B, G, I	B (Trott, in review; last record in Cobscook Bay 1973; subjected to targeted collections for public aquaria display); G (Arctic Province species); I (understudied as dredge by-catch, Professional judgement)
Add species	Marine invertebrates	Sea Cucumber	*Thyonidium drummondii*	2	B, G	B (Trott in review, last record in Cobscook Bay 1973); G (Arctic Province species), I (understudied as by-catch, Professional judgement)	2	B, G, I	B (Trott in review, last record in Cobscook Bay 1973); G (Arctic Province species), I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Sea Strawberry	*Gersemia rubiformis*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004; Arctic Province species); I(understudied, targeted collecting by public aquaria and supply companies)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004; Arctic Province species); I(understudied, targeted collecting by public aquaria and supply companies)
Add species	Marine invertebrates	Spindle shell	*Ptychatractus ligatus*	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)	2	B,G,I	B (Trott in review, last record in Cobscook Bay 1973); G (Southward et al. 1995; Schiel et al. 2004); I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	spiny lebbeid shrimp	*Lebbeus groenlandicus*	2	B, G, I	B (last record in Cobscook Bay 1979), G (Arctic Province species),I (little known about this species, Professional judgement)	2	B, G, I	B (last record in Cobscook Bay 1979), G (Arctic Province species),I (little known about this species, Professional judgement)
Add species	Marine invertebrates	Wavy lamellaria	*Limneria undata*	3	G, I	G (Comeau et al., 2009; last record Cobscook Bay 1975), I (little known about this species, Professional judgement)	3	G, I	G (Comeau et al., 2009; last record Cobscook Bay 1975), I (little known about this species, Professional judgement)
Add species	Marine invertebrates	Common Sun Star	*Crossaster papposus*	2	B, G, I	B (Cobscook Bay), G (Appelhans et al., 2012; Keppel et al., 2014); I (understudied as by-catch, Professional judgement)	2	B, G, I	B (Cobscook Bay), G (Appelhans et al., 2012; Keppel et al., 2014); I (understudied as by-catch, Professional judgement)
Add species	Marine invertebrates	Purple Sunstar	*Solaster endeca*	2	B, G, I	B (Cobscook Bay), G (Appelhans et al., 2012; Keppel et al., 2014); I (understudied as by-catch, Professional judgement)	2	B, G, I	B (Cobscook Bay), G (Appelhans et al., 2012; Keppel et al., 2014); I (understudied as by-catch, Professional judgement)
Endorse species addition	Marine invertebrates (4)	Common sea star	*Asterias rubens*	2	G, I	B, G (Appelhans et al., 2012; Keppel et al., 2014); I (Understudied)	2	B, G, I	B (unpublished reports from 2013 and 2014), G (Appelhans et al., 2012; Keppel et al., 2014); I (Understudied)
Add species	Marine invertebrates (4)	White Sea Star	*Stephanasterias albula*	2	B, G, I	B (last record Cobscook Bay 1973), G (Appelhans et al., 2012; Keppel et al., 2014); I (understudied as by-catch, Professional judgement)	2	B, G, I	B (last record Cobscook Bay 1973), G (Appelhans et al., 2012; Keppel et al., 2014); I (understudied as by-catch, Professional judgement)
Endorse species addition	Plant	Common eelgrass	*Zostera marina*	2	B, G, I	B (CBEP data, DMR data); G (due to apparent vulnerability to invasive spp); I (understudied)	3	B, I	B (CBEP data; I (understudied)
Add species	Sharks, rays, and skates	blue shark	*Prionace glauca*	2	B	COSEWIG anticipated assessment date of April 2016	2	D, E	D (http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2004/2004_069-eng.htm), E (IUCN Threatened)

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