

## **Acadia Senior College Schoodic to Schoodic course -- PDF #4**

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*“Maine is an amazing place. Here, there is a unique combination of extensive forests, clean waters, and globally important marine ecosystems. Interconnected, they form a remarkable and complex natural system.”*

- Kate Dempsey, Maine State Director, The Nature Conservancy

### **On to the Milky Way to Thoreau to Cashes**

What does that mean – to the Milky Way to Thoreau to Cashes??? In PDF #1 I said that the S2S story offers a framework for touching on a broad range of issues and for examining a wider geography. In this fourth PDF we will do just that, continuing to touch on quite a variety of issues *and* moving outside the red circle of the S2S map (on the first page of PDF #1).

#### To the Milky Way – and dark skies:

First, let's *not* go north, east, south, or west from S2S -- but UP. Says Friends of Acadia on its website, “Acadia is the only national park in the northeast that offers visitors the opportunity to enjoy a high-quality night sky and natural darkness, with stunning views of the Milky Way arching overhead – a sight that two-thirds of all Americans cannot see at home due to light pollution.” Dark skies are, of course, a quality of most of S2S, providing not only benefits to people's enjoyment of nature but also benefits to natural systems. The International Dark Sky Association reports, “Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures including amphibians, birds, mammals, insects and plants.” Treasure the dark skies of S2S -- and protect them by using outdoor lights designed to minimize impact on dark skies.

## To Thoreau – or on to the North Woods:



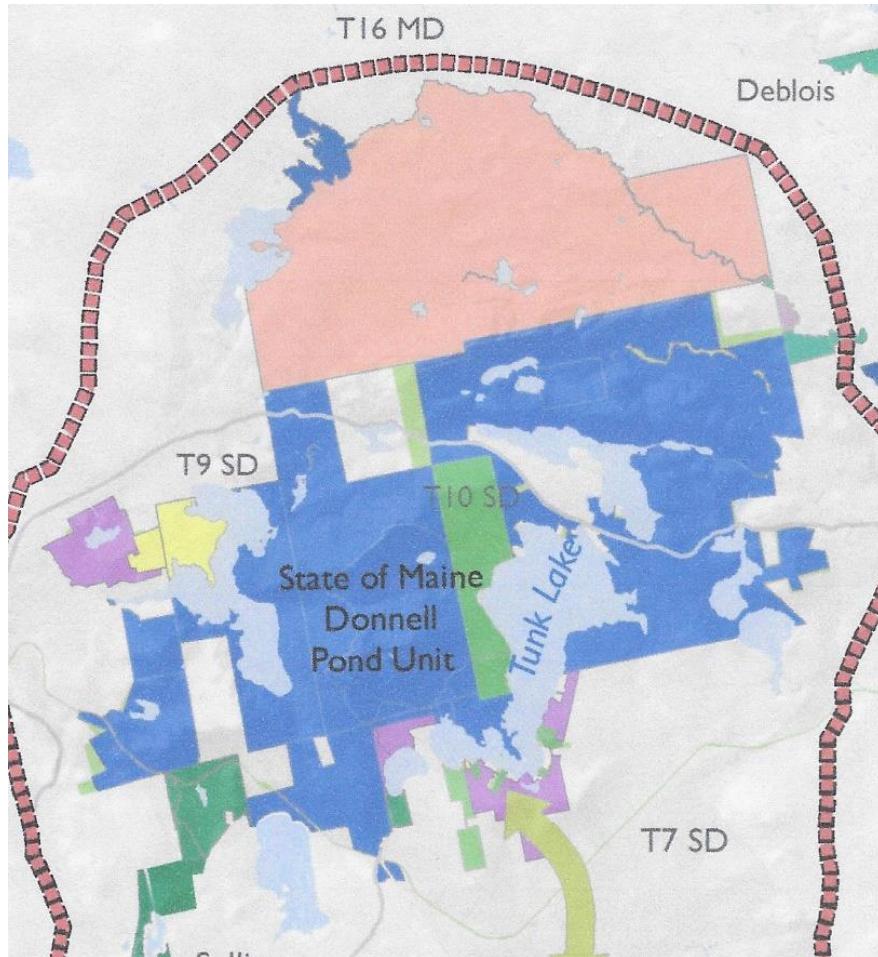
The Nature Conservancy's Maine forest program director Mark Berry, a resident of Winter Harbor and a leader in expanding S2S on to the north of the Donnell Pond Unit. Here, atop Tunk Mountain, he shows the author TNC land acquisitions to the north.

In 2005 The Nature Conservancy (TNC) purchased its Spring River Preserve, 11,682 acres abutting the north side of the state's Donnell Pond Unit. I recall at the time a Nature Conservancy staff member explaining that this science-driven organization was increasingly recognizing how sheer size of protected land parcels was important in preserving natural systems, often more so than exactly what was on or used a parcel.

Recall that in PDF #3, page 13, I mentioned the 2014 graduate level course of the Program on Conservation Innovation at the Harvard Forest, a course held at Schoodic Institute. I commented that the resulting report *Landscape Scale Conservation in the Schoodic to Schoodic Region of Maine, USA* (coauthored by Isabella Gambill, Jim Levitt, and Karena Mahung) provides considerable detail about particular land projects. It is worth quoting from the report that within wetlands, lake frontage, and forests "TNC found that many streams in the [Spring River Preserve] were too warm and acidic to support trout, as a result of a legacy of log-driving dams that had impounded streams, and poorly designed culverts creating significant barriers to fish passage. More recently, TNC has heralded [the Spring River Preserve] as an example of successful river restoration, working with contractors to replace undersized culverts at four locations in the parcel with new bridges or large, open-bottom arches that span the entire width of the river,

allowing fish and other species to pass through a less obstructed environment.” Here again we see an example of the jobs-providing “restoration economy,” pointed out by Dwayne Shaw of the Downeast Salmon Federation and mentioned in PDF #3 on pages 10 and 11. As for the connections between land conservation and water, that will continue to be a theme of this PDF.

I want to show again the map on page 9 of PDF #2. The pink is The Nature Conservancy’s Spring River Preserve, abutting the blue of the State of Maine’s Donnell Pond Unit.



(map courtesy Maine Coast Heritage Trust)

Now look at the map on the next page. Number 21 is printed on The Nature Conservancy’s Spring River Preserve, what is pink on the above map, but the green on the map on page 4 shows all of the now conserved land, regardless of the conservation entity owning it or holding conservation easements. The yellow shows another parcel being preserved, taking the S2S ecological corridor yet further north toward the North Woods world of Thoreau.



(map courtesy The Nature Conservancy)

Actually, the land shown in yellow is already in conservation ownership but not yet closed upon by The Nature Conservancy, the ultimate owner. Wrote The Nature Conservancy recently under the headline *Opportunity to Assure Access Downeast for Wildlife and People: A unique land deal ensures that forest remains forest*, “The Maine Coastal Forest Partnership, a collaborative effort between The Nature Conservancy, The Conservation Fund, Maine Coast Heritage Trust, Blue Hill Heritage Trust, New England Forestry Foundation, and Downeast Salmon Federation, has created opportunities to conserve more than 17,000 acres of coastal forest in Hancock and Washington Counties.

“... The Conservation Fund, a national nonprofit leading the partnership, purchased 17,881 acres of forestland – allowing time for TNC and the other members of the collaboration to raise funds to permanently protect wildlife habitat, ensure future recreational access, and support the economies of nearby coastal communities.” Of these lands purchased by The Conservation Fund, 13,799 acres will become The Nature Conservancy’s Narraguagus Spring River Forest

following completion of fundraising, with a closing hoped for in 2020. This project is another excellent example of pre-acquiring (see PDF #3, page 4), where a nonprofit moves quickly to secure land for other nonprofits or government agencies, and of how effective and important are partnerships.

The protected ecological corridor has now pushed well north of Schoodic Mountain, although Schoodic to Schoodic and S2S still seem handy ways to refer to this major conservation effort by multiple parties. Further opportunities to continue north are being pursued.

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#### To the east (1) -- Tunk Stream and Narraguagus River:

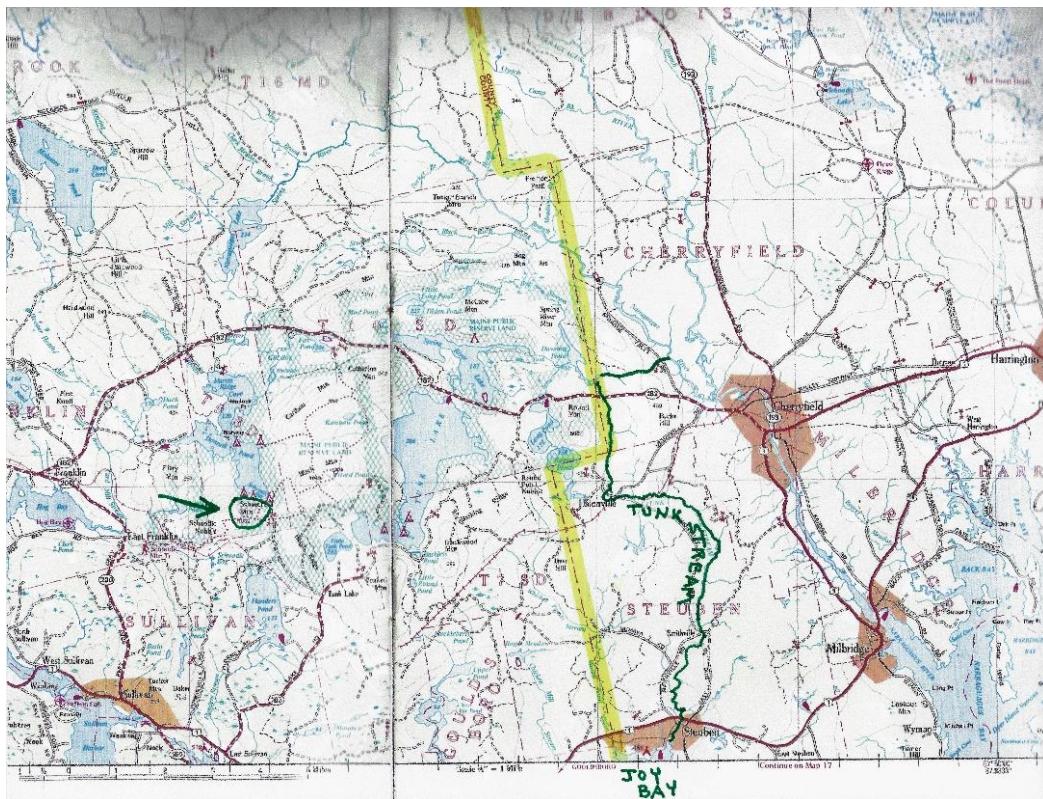
S2S is mapped as being wholly in Hancock County, but two aspects of its relationship to conservation work to the east in Washington County merit discussion. *First* is that Tunk Stream flows to the east out of Spring River Lake, which is just across an isthmus from the northeast shore of Tunk Lake. Tunk Stream flows into nearby Downing Pond, then, barely having crossed the Hancock/Washington County line, turns south down the western edge of Washington County in Steuben to reach Joy Bay, the very northern part of Gouldsboro Bay. From where Tunk Stream leaves Downing Pond, a second stream heads east a short distance to the Narraguagus River, intersecting just west northwest of Cherryfield village. At estuarine Joy Bay, the mouth of Tunk Stream is within a mile of the Frenchman Bay Conservancy's Frances Wood Preserve, described in PDF #1 and one of the S2S stepping stones. And it is only about two miles from the national wildlife refuge salt marshes of the U. S. Fish and Wildlife Service's Gouldsboro Unit. The topic of estuaries is one we will very shortly come back to.

Protecting both the Tunk Stream and Narraguagus River watersheds have long been priorities of Downeast Salmon Federation. It has a land trust component to its program, identifying the land trust's service area as Tunk Stream – just outside the eastern edge of S2S – to the Machias River. Preserving forests along stream and river banks that keep the water cool for heat-sensitive fish like salmon and brook trout is vital protection for that habitat.

The Narraguagus River is one of just eight Maine rivers where wild Atlantic salmon populations still exist. Not only is the Narraguagus watershed a priority of

Downeast Salmon Federation, it also is a priority of Maine Coast Heritage Trust and The Nature Conservancy. Again we see the power of partnerships. We also witness how those latter two entities that began as strictly land preservation organizations have broadened their missions to address what happens in the rivers. At Cherryfield Downeast Salmon Federation is working with The Nature Conservancy, Maine Coast Heritage Trust and the Atlantic Salmon Federation to fund a feasibility study by the Army Corps of Engineers to look at options for removal or modification of an ice control dam. Says the Downeast Salmon Federation website, “The ice dam currently impedes diadromous fish passage between salt and fresh water, contributing to the decline of the once highly productive salmon fisheries along with American shad, alewives, blueback herring, sea-run brook trout, American eel, sea lamprey, and striped bass.”

Tunk Stream, spanning the Hancock/Washington County line, and the Narraguagus River, which also flows from Hancock County into Washington County, underscore that conservation planning and work ultimately are not bounded by arbitrary political divisions -- despite S2S, as defined on maps, being totally within Hancock County.



Tunk Stream, labelled, is the dark green line just east of the greenish yellow Hancock/Washington County line and ending at Joy Bay. The second stream, splitting from Tunk Stream and also marked with dark

green line, flows into the Narraguagus River a short distance northwest of Cherryfield village. The Narraguagus River, having come from well inland, flows through Cherryfield village and continues on to Milbridge, where it enters Narraguagus Bay. Circled farther to the west is Schoodic Mountain, marked by arrow. Clicking on “View” on your toolbar and then zooming in on the map will make it much easier to read! (map from DeLorme’s *The Maine Atlas*)

To the east (2) – eastern Maine’s great estuaries:

And so, on to the *second* connection between S2S and conservation work to the east. The Hancock County tidal estuaries on the east side of Schoodic Point are part of greater Gouldsboro Bay, and they form the western edge of eastern Maine’s extensive estuarine areas, also a focus for conservation effort. These Hancock County estuaries include the estuarine portions of the national wildlife refuge land at the north side of West Bay off Gouldsboro Bay, mentioned above and in PDF #1. They also include Corea’s Grand Marsh, two miles to the south, fed from North Corea Heath, 600 acres of which belong to Frenchman Bay Conservancy -- yet another S2S stepping stone.

As said above, Tunk Stream enters estuarine Joy Bay just on the Washington County side of the county line about two miles from the national wildlife refuge salt marsh. The mouth of Tunk Stream is mapped as the very western edge of a major project known as the Heads of the Estuaries Partnership, the purpose of which is to protect Washington County’s tidal estuaries from Tunk Stream on eastward past Machias Bay to Cutler. The partnership includes the various government and nonprofit programs working along that coast, most of whom are also engaged in S2S. I reread now with interest a 2009 email from me to the Pleasant River Wildlife Foundation, leader of the Heads of the Estuaries Partnership. Said I eleven years ago, “One thing that interests me on your maps because of my close involvement with the Schoodic to Schoodic initiative is how the estuarine areas of West Bay off Gouldsboro Bay are really the ecologically western edge of the great complex of estuaries stretching along the downeast coast. Schoodic Point, not the political county line, is really the significant dividing point.”



Salt marsh at Gouldsboro Unit, Coastal Islands National Wildlife Refuge, the western edge of eastern Maine's great estuaries – nurseries for fish and critical for many bird species.

An important point about estuarine preservation is that rising sea levels will flood over time areas that are now salt marsh. In establishing priorities for protecting salt marshes, conservation planners look hard at the topography behind the marsh, whether the land is low enough to enable the marsh to slowly migrate inland.

Estuaries and rivers, ponds, and streams are all critical bird and fish habitats. Again let's turn to Dwayne Shaw of the Downeast Salmon Federation, who wrote me two years ago, "The fisheries and the critical habitats need our collective attention. Hancock and Washington Counties constitute the most fisheries dependent region on the east coast of the U.S."

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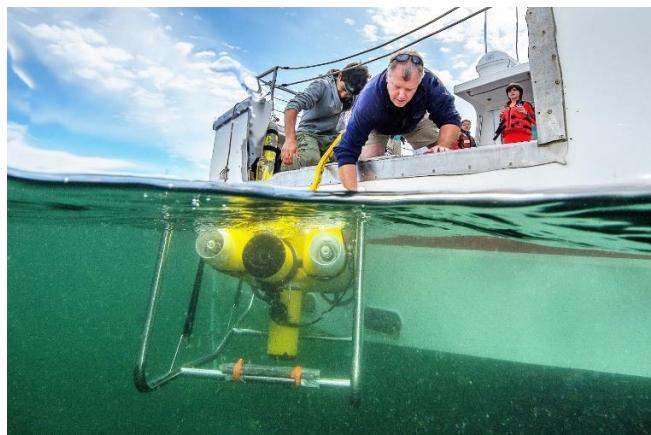
### Out to sea from Schoodic Point:

Let's expand our S2S thinking beyond the land (and the sky!), the streams and rivers, and even past the intertidal zone. I will first let Sedgwick resident Peter Neill speak. In his *The Once and Future Ocean: Notes Toward a New Hydraulic Society* (Leete's Island Books 2015) he says, "I submit that the ocean begins at the mountaintop, and descends to the abyssal plain; that is, everything that occurs on land – be it development, manufacturing, agriculture, or financial enterprise – descends to the sea."

Peter's thinking is certainly reflected in the focus of the Eastern Maine Coastal Current Collaborative (EM3C), which is developing a research framework

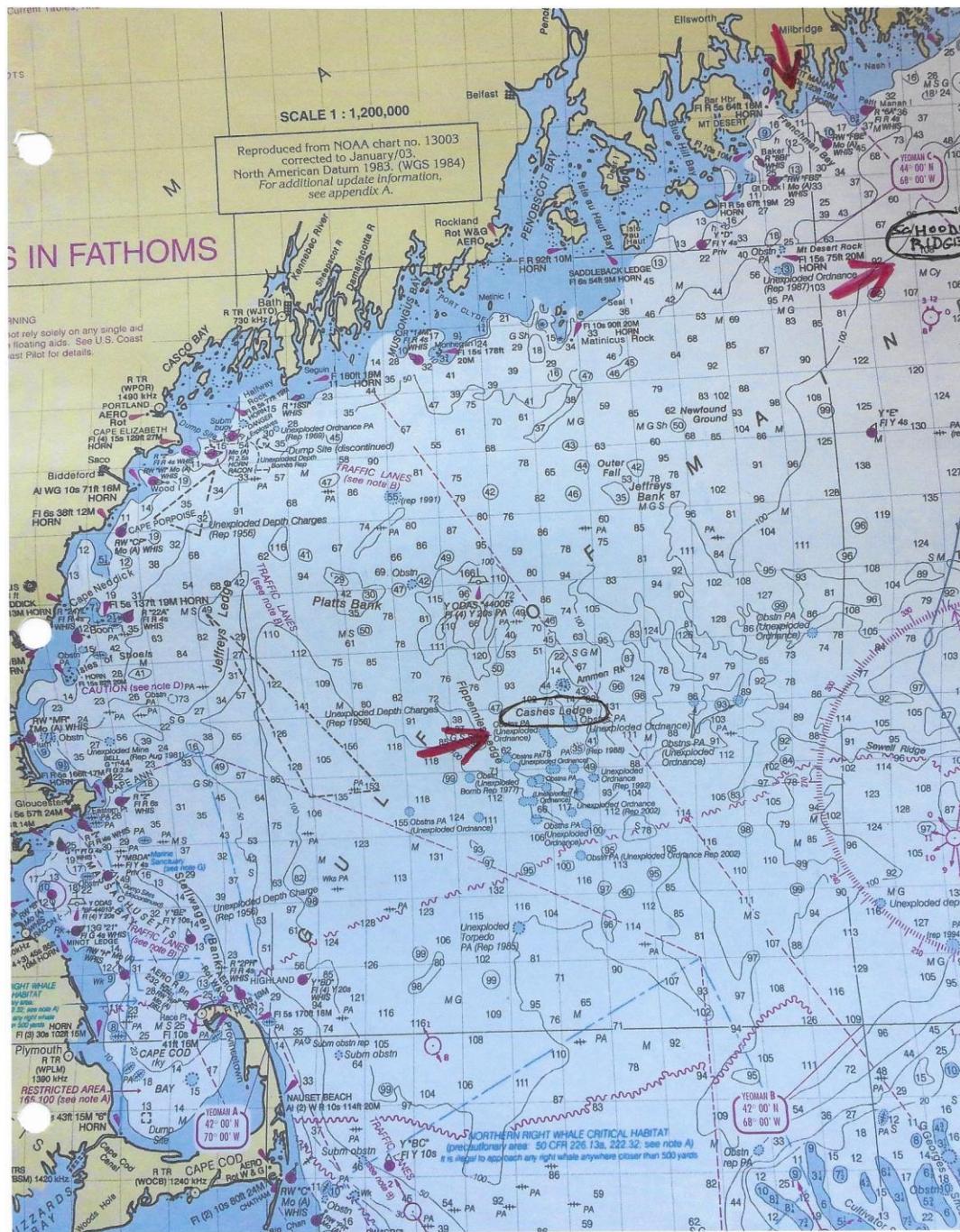
that supports ecosystem-based fisheries management. Leading this project is the Stonington-based Maine Center for Coastal Fisheries, coordinating a partnership with the Maine Department of Marine Resources and the National Oceanic and Atmospheric Administration. Engaging many stakeholders, the project includes not just Maine's ocean waters from the western edge of Penobscot Bay to the Canadian border but also "all upland watersheds in between." That includes the S2S geography. Wrote the Maine Center for Coastal Fisheries in 2019, "Focusing both inland and offshore will produce a more detailed understanding of the ecosystem connections." And said Dr. Heather Leslie, director of the University of Maine's Darling Marine Center, "We aren't just focused on the salty pieces. We're also thinking about how the rivers and lakes and streams are connecting to the coastal and offshore habitats."

Acadia National Park's science coordinator Dr. Abe Miller-Rushing commented on the land – sea connections in a 2015 email: "Marine systems in the Gulf of Maine and in the immediate vicinity of Acadia National Park are critical to the health of the park because of their role influencing climate, plants, animals, geological processes, natural disturbances, scenery, culture, and livelihoods in and around the park. . . We have authority to work with partners to conserve resources over large land- and seascapes, because that is frequently essential to preserving the resources within park boundaries. For example, diadromous fish, such as alewives and eels, and many of our intertidal species regularly cross park boundaries at key points in their lives. Many seabirds that breed in Acadia rely on marine fish and other marine resources. For seabird breeding to be successful, the fish must be in the right place at the right time and in adequate abundance. . ."



What's under the ocean surface? OceansWide founder Buzz Scott lowers a small, camera equipped ROV (remotely operated vehicle) into the waters off Schoodic Point from the College of the Atlantic boat *Osprey* during an OceansWide residential educational program held at Schoodic Institute.

Now look at this chart of the Gulf of Maine off the Maine coast:



Red arrow at top right marks Schoodic Point; red arrow upper right Schoodic Ridges; red arrow in center Cashes Ledge.

Note Outer Schoodic Ridge along the upper right edge of the chart. Outer Schoodic Ridge is about 25 miles southeast of Schoodic Point. About 10 miles closer is Inner Schoodic Ridge. The September 8, 2014, issue of the *Ellsworth*

*American* certainly caught my attention with the headline “Massive hanging coral gardens found off Mount Desert Island.” According to the article, although fishermen have known of corals in the Gulf of Maine for more than a century, having pulled them up accidentally, the spectacular 25 to 40 foot high vertical walls of sea fans at depths of about 650 feet at Schoodic Ridges was not known before the 2014 research cruise. The Pew Charitable Trusts refer to these slow-growing deep-sea corals as forming “a vital foundation for marine life.” Some fishery regulations for parts of the Outer Schoodic Ridge area have been established to protect the corals although lobster pots are permitted. The Schoodic Ridges are a frequent destination for Bar Harbor Whale Watch boats.

I will come back to Schoodic Ridges regarding their connection to the S2S story, but first we will stretch our thinking even further by heading much farther offshore to Cashes Ledge. Its Ammen Rock, only 24 feet below the surface, lies approximately 95 miles south southwest of Schoodic Point and about 80 miles east of Portsmouth, New Hampshire. After a dive several years ago famed marine biologist and great ocean advocate Dr. Sylvia Earle called Cashes Ledge “the Yellowstone of the Atlantic.” The abundance and size of marine life there in the otherwise greatly depleted Gulf of Maine is reportedly astounding. Critically, Cashes Ledge provides habitat for adult large cod. I encourage any of you who enjoy videos to watch the TED talk on Cashes Ledge by the University of Maine’s Dr. Robert Steneck. (<http://www.youtube.com/watch?v=svWIwQDBX2g> -- or just google “Robert Steneck TED talk Cashes Ledge.”)

The Obama Administration considered declaring Cashes Ledge a national monument when it created the Northeast Canyons and Seamounts Marine National Monument southeast of Nantucket. Given that marine protected areas inevitably generate opposition from some segments of the fishing industry, perhaps one new marine national monument off New England was all the Administration felt could be achieved. The Conservation Law Foundation, based in Boston with an office in Portland, pushed hard for the national monument designation for Cashes Ledge, and conservation interests certainly hope that some day a different administration in Washington than today’s may establish such protection.

A major reason to bring Cashes Ledge to the attention of people interested in or visiting Acadia National Park is they are a very large audience that should understand the natural resource values of this undersea treasure and may help build public support for its eventual protection. There may be even a stronger tie to S2S.

I was chatting one afternoon with Conservation Law Foundation attorney Peter Shelley, who has been a leader of efforts to get Cashes Ledge protected. I told him what I said in PDF #1, that the Forest Society of Maine's late president Alan Hutchinson frequently stressed that eastern Maine is the only place on the U.S. Eastern Seaboard where forest still meets the sea. Talking about the ties between the Gulf of Maine and the North Woods quickly led to conversation about Cashes Ledge. Peter spoke of a possible geological relationship to Acadia National Park in that the rocks of Cashes Ledge have been identified as the same as those of Acadia and possibly are an extension of the same mountain range.

I emailed Schoodic Institute's marine ecology director Hannah Webber about my conversation with Peter Shelley regarding Cashes Ledge. Thinking about the research and education work at the Institute, she emailed me back the following in July 2018, "What a fortuitous meeting! I think the intention of the Schoodic to Schoodic whole place concept is to eventually extend our focus from Schoodic Mountain to the Schoodic Ridge – an extraordinary place (although no Cashes Ledge). Whether it is Outer Schoodic Ridge, Cashes Ledge, or both, weaving the relationship of undersea mountains and other features in the story of our own land-based concept of mountains and valleys, hills and ledges, and conservation would indeed be a great story for Schoodic [Institute] to share."

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Preserving an ecological corridor from Schoodic Point north to Schoodic Mountain and beyond has made huge strides over the past decades. More parcels of forest, wetlands, and frontage on ponds, lakes, and streams continue to be protected, two as recently as this month. Other projects are in the pipeline. The dedicated, skilled work of staffs, board members, and volunteers – government and nonprofit -- has been extraordinary. Funding sources have been generous. Now, though, we face great uncertainties about the future of everything. Our lives and the economy are paused or worse -- but we know there is no pausing changing climate and growing threats to biodiversity. Maximizing resilience to climate change and protecting animal and plant habitat are ever more urgent. Also, reports from many places of heavy use of trails in recent weeks underscore that in this stay-at-home period with outdoor exercise permitted and encouraged, opportunities for outdoor recreation such as exist in S2S are invaluable. Unfortunately, the next year or two are likely to be challenging for continuing S2S conservation progress.

Although this fourth PDF is the last scheduled, I continue to welcome comments, questions, and corrections of errors. If I receive any that should be circulated, I will send them out with my own comments. Thank you for your interest in Schoodic to Schoodic. And stay well!

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After he read PDF #3 last week, Dan Poteet sent the following thoughts and question. My response to him follows his message. I much appreciate Dan's taking time to write this:

*"Another good and interesting essay. It did also make me put my old manager's hat on as I thought for the second week about the interlocking complexity of all of these initiatives and this week about the question by the anonymous Winter Harbor resident as to why so many disparate organizations. I think it's important that the separate distinctive purposes and projects and missions persist, but I wonder also if there could be an independent "omniscient" "go to" observer who knows pretty much everything and could help insure that individuals and organizations with good bright ideas don't stumble over each other (complicated of course because of the frequent need for confidentiality). Would something like this add value, or would it be a fifth wheel and an entrepreneurship squelcher?"*

*Best, Dan"*

My response:

*This is an excellent question, Dan. When the Schoodic to Schoodic concept truly crystallized fifteen years ago, Frenchman Bay Conservancy (FBC) initially led the push for it, making S2S a major component of its strategic plan at the time. I mentioned this on page 17 of PDF #3 in the brief summary of FBC's mission. Barb Welch was then executive director of FBC. Seeing a need for coordination of the many potential players, FBC urged the creation of what was called the S2S Coordinating Committee, and FBC asked me to chair it as a volunteer, which I did. I represented no one of the organizations although I had close ties with several and personally knew the various players. We met numerous times to discuss and coordinate on challenges. We engaged Misha Mytar, then a graduate student at the Muskie School of the University of Southern Maine, now Maine Coast Heritage Trust's land conservation person for MDI, to flesh out the concept including interviewing a considerable number of local residents. The process and her 2007 report proved most useful.*

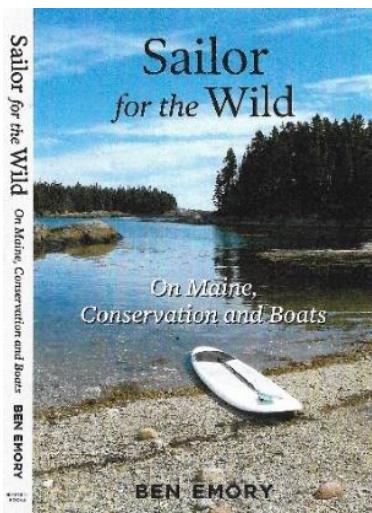
*Over time the need for the S2S Coordinating Committee seemed to lessen, for the various organizations were doing an excellent job of coordinating with each other directly without holding committee meetings. The committee as such came to an end. The effectiveness of the various entities working closely together continues to this day, in my opinion, and is evidenced by a number of the project and priority examples I cite in these PDFs.*

*For S2S I do not see a current need for an objective “go to observer” who basically would be a coordinator. The system as it exists works well. (A number of professionals and others from these entities are receiving these PDF’s, and if anyone cares to differ with me or would like to otherwise comment, I would welcome their input and will distribute it to everyone.)*

*Beyond S2S on land conservation issues around the state, I think the many organizations state-wide are doing an excellent job of working together, although certainly turf battles and differing styles and priorities no doubt cause problems. In fact, I’ve witnessed some – but not many. Maine Coast Heritage Trust has within it a land trust service bureau, which is set up as a communication channel between Maine land trusts and to help all of them be as effective as possible. On state level issues such as building Legislature support for Land for Maine’s Future bonds I have watched very close coordination between Maine Coast Heritage Trust, The Nature Conservancy, and the Trust for Public Land (the latter not a player in S2S). In my two terms on the Land for Maine’s Future Board I saw many examples of how the leaders of both nonprofits and government agencies know how to maximize the synergies of cooperating with each other.*

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I do not want to be too self-promotional, but if anyone is interested in reading more about this type of land conservation in eastern Maine, you might enjoy my book *Sailor for the Wild: On Maine, Conservation and Boats* (Seapoint Books 2017). It is much more personal than these PDFs, but I do have chapters on Maine Coast Heritage Trust’s early years, Acadia National Park, protecting bird habitat (especially the seabird nesting islands), preserving a Sedgwick hay farm, conservation projects in Washington County, the Land for Maine’s Future Program, and the evolution of Maine land conservation over the past half century. The on-line book sellers like Amazon offer it as do bookstores including Sherman’s, Blue Hill Books, and Leaf & Anna – when such shops can reopen. I know that some of you have already read it.



Cover photo at Roque Island archipelago, Washington County

Finally, you may find interesting the addendum on the next page – a quick summary of the evolving Gulf of Maine over millennia. In typing it I drew on two (excellent!) sources.

ASC S2S Evolving Gulf of Maine

**The Past:** From *The Swordfish Hunters: The History and Ecology of an Ancient American Sea People*, Bourque, Bruce, PhD (Bunker Hill Publishing 2012):

First humans to enter North America, the Paleo-Indians, arrived in Northeast about 10,500 years ago. Red Paint people a culture that lasted for several centuries about 4,000 years ago.

Marine resources available to Red Paint people 4,000 and more years ago staggering compared to modern times.

Cod up to 6 feet long and likely weighing up to 130 pounds.

Swordfish inshore; may have been a separate population from swordfish farther offshore; some may have exceeded 10 feet and weighed up to 1,200 pounds

By 3,600 years ago swordfish had disappeared, based on digs, and cod in decline, giving way to flounder, sculpin, and dogfish. Seal hunting increased, perhaps because indigenous fishermen had impacted local fish abundance.

Near-shore waters of Gulf of Maine dominated by kelp forest ecosystem; historically very productive but relatively species depauperate, only one or a few species occupying each trophic level. Cod were the main keystone predator in the system.

Whale pump: the diving of whales brings nutrients from bottom to surface, where nourish plankton blooms. Fewer whales means less circulation of nutrients and lower productivity.

**The Future:** From *Working Waterfront* report on Gulf of Maine 2050 International Symposium by Catherine Schmitt:

2050 predictions -- 3 issues: sea level rise, acidification, temperature (warming with more stratification and possible less salinity because of Arctic melt)

Southern species moving up: summer flounder, scup, black sea bass, longfin squid, Jonah crab

Northern species moving out: cod, pollock, herring, cusk, Northern shrimp

Kelp forests collapsing in southern Maine due to warmer water

Circulatory systems likely to speed up

Lack of consensus on amount of sea level rise (how fast will West Antarctic Ice Sheet melt?)