The Mountaineers
EXPLORE • LEARN • CONSERVE

Navigation Northwest

A Quarterly Newsletter of the Seattle Navigation Committee
Volume 4, Number1 **April 2016**

--Navigation Northwest April Features--

Online, On Demand Wilderness Navigation Instructor Training

Mountaineers Books, the Seattle Navigation Committee and Trillium Publishing (contractor) are putting the finishing touches on three versions of a wilderness navigation instructor-training course. They are expected to go live this spring.

Course 1 targets instructors for the Seattle in-person workshop with a course overview and special attention to skills that students find puzzling or fall prey to misconceptions. The Seattle Navigation Committee has identified points that students find the most difficult and require carefully crafted instruction.

Course 2 is for prospective wilderness navigation eLearning instructors. Three instructors (Brian Starlin and Peter Hendrickson—Seattle and Dave Coate—Foothills) piloted the course over the past several weeks with 26 students. This component walks instructors through Litmos, the learning management system, and through the tailored modules that make use of elearning media. The actual navigation content closely follows the in-person course.

Course 3 targets instructors bound for Seattle's Heybrook Ridge wilderness navigation field trip off Hwy 2 near Index, WA.

These instructor-training courses are one component of a three-part eLearning pilot. Developers have kept in mind that the training should be easily edited to adapt to the unique field trips offered by other branches.
--Editor.

Leadership Challenge: Managing a Large Volunteer Course

By Brian Starlin

The Seattle Wilderness Navigation Course is one of the largest courses offered by The Mountaineers. It graduates 250-350 participants per year. But in 2015, the inputs didn't quite match the outputs. I felt we had too many who could not finish the course. I hoped to change that in 2016 by improving the ratio of registration to graduation and reducing the forfeitures. I know we'll have a waitlist, but I believe we started with enough capacity to handle our target participants from Scrambling, Climbing, Snowshoeing, etc.

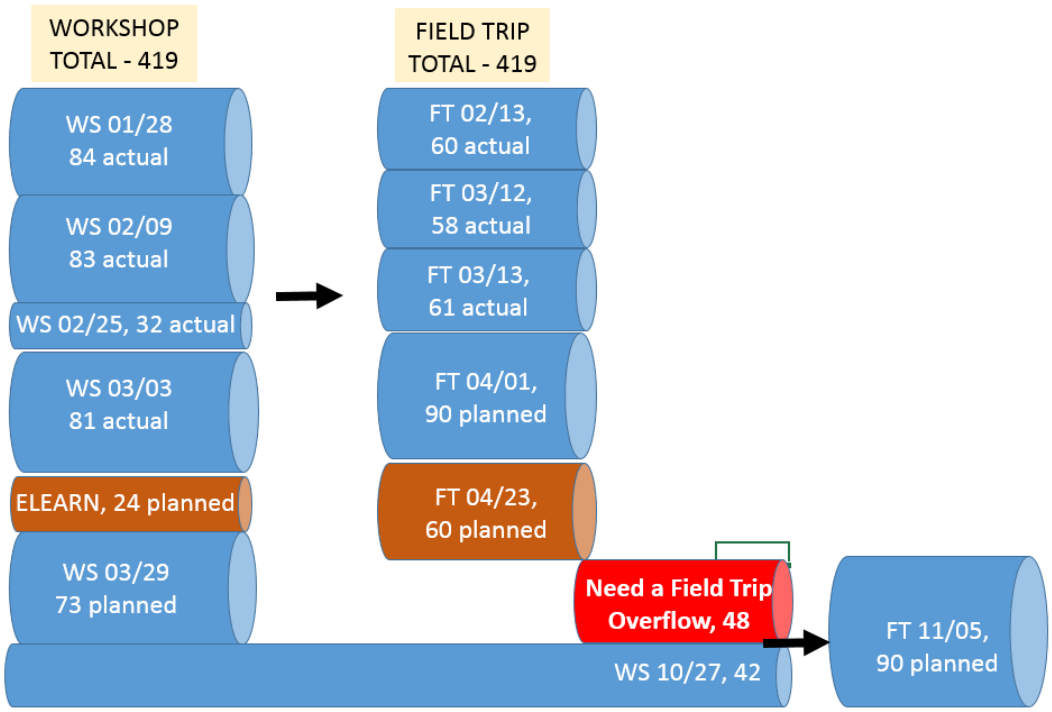
Table 1 compares the data from 2015 with state of the registration as of late March 2016.

Table 1. Seattle Wilderness Navigation course numbers (March 30 data)

	Course Year 2015	**Course Year 2016**
Registered	478	402
Graduated	289	179
Waitlisted	81	0
Cancels	29	21
Forfeits (Paid, not finish)	48	0

I know the waitlist is about to begin, because we only have about 50 spots remaining. This is the important time to manage those who haven't graduated because they need a field trip. We've held several workshops and field trips, so we can see where we are. Figure 1, for example, shows that we already have an overflow of 48 participants into the November field trip, because they didn't fit into a field trip in the spring.

Figure 1. Graphical representation 2016 Wilderness Navigation students, Seattle



Let's explain. In Figure 1, WS = Workshop, FT = Field Trip, and ELEARN is a new elearning course this year. The numbers represent the event dates and number of participants:

1) Up until 3/13, the workshops had been attended by 304 students (including 24 through elearning). The 3/29 workshop was expected to have 73. That comes to 377 students from spring workshops in need of a field trip.

2) The Field Trips weren't attended to their capacity of 85-90 students each. In the first three field trips to 3/13, we could have handled 265 students. Yet only 179 students attended. The remaining 86 slots weren't used. They were just gone. Therefore, subtract 179 from 377 people who finished a workshop, and that means 198 of those people still need a field trip.

3) Those 198 people cannot fit into the two remaining field trips in the spring, 4/2 and 4/23. They only have capacity for 150, not 198. So 48 people must overflow into the November field trip, as shown in the red cylinder.

4) The November field trip can take 90. It already gets 48 from the spring overflow, so that leaves room for only 42. That also means the 10/27 workshop can only hold 42.

There is a possibility that we can expand the 4/23 field trip by 30 additional students, and pull in some of those 48 people from the overflow. We'll try that, if we get enough instructors to handle that additional load. I'm sure there are some future waitlisters who would be happy if we can expand upon the 4/23 field trip. We can't just add another field trip. We're limited by our Forest Service permitting to our approved dates.

The chart doesn't show my other efforts to improve graduations. I've been monitoring the rosters every week since January. I've been comparing them against the Basic Climbing and Alpine Scrambling rosters to be sure we fit in those students. We visited the kickoffs for those other courses and urged them to register for Navigation. I gauged the impact of Compressed Scrambling and Intensive Climbing, which started later in the spring. I warned them that our capacity may be tight, and they prioritized some students who had already completed Navigation.

Then, once we had 80+ students in the 3/12 and 3/13 field trips, I emailed all of them to urge them to remain there. Unfortunately, we had the same kind of attrition I've seen in the past. In the week before the field trip, we lose 15-20 students to something or another. Our ability to fill the slots is so dependent on the participants themselves. We offer too much flexibility. That's my challenge for next year.
--Brian Starlin is Seattle Navigation co-chair and a veteran navigation instructor. He is also a climb leader, Mountain SAR volunteer, Boy Scout leader and Washington Trails Assn. trail maintenance 100+ volunteer.

****

Wilderness Navigation eLearning Pilot—Four Branches

Some 27 students from Seattle, Tacoma, Everett and Foothills Branches participated in the March through April Wilderness Navigation eLearning pilot. The Board of Directors October 1 approved a release of bequest funding for a navigation elearning 2016 pilot. The pilot steering committee includes, Doug Canfield, project manager (Mountaineers Books Director of Sales & Marketing), Tab Wilkins (alpinist & past BOD chair), Peter Hendrickson (Seattle Branch Chair) and Margaret Sullivan (Books Managing Editor).

At this writing, 14 of the students were scheduled to attend the Seattle field trip on Heybrook Ridge Saturday, April 23. Another six were offered slots in the November 5 field trip and positions are open in Tacoma field trips for other students.

The goals for the pilot are to serve students who may not live near a physical course location or who prefer to take the workshop at their own pace; to assist instructional volunteers with a fully vetted and packaged curriculum; and to make it easier to recruit instructional volunteers. Initial feedback from students is positive, in some cases, glowing. As ever, the ill, the overwhelmed by work and the procrastinators did not fare so well. A more formal program evaluation commences with the field trip.

There are two other deliverables:

1. A series of 4 to 6 navigation skills videos available to all who access The Mountaineers website. Hendrickson, immediate past Seattle Navigation Chair, is writing the scripts. Another team of four Seattle Branch navigation leaders (Greg Testa, Brian Starlin, Bruce Crawford and Lynn Graf) serves as technical consultants for the videos and other aspects of the project. Suunto of Finland is also underwriting some of the video expenses. Many Mountaineers use Suunto hand-bearing compasses and wristwatch ABC (Altimeter, Barometer, Compass) tools.

2. An on-demand instructor training course for both the elearning and the in-person course options. Seattle lead training instructor Paul Thomsen consults on this project.

Trillium Publications of Shoreline & Chicago is the contractor for instructor training and the workshop. Weekly conference calls have kept the project moving forward. A video contractor search is underway.
--Editor

****

Changes to *Wilderness Navigation*, 3rd Edition, for 2nd Printing

By Bob and Mike Burns

Mountaineers Books recently contacted us to say that it was about to do a second printing of the 3rd edition of *Wilderness Navigation (2015)*, and invited us to make corrections for any errors in the first printing. The following is a listing of the changes we requested.

1. There were a few minor errors in the Index on pages 187-190, mostly in error by one or two pages, due to last-minute figure layout changes, which were made after the Index was created.
2. We requested minor changes to the clinometer drawings of figures 53 and 55 on pages 122 and 124, to clearly identify the small clinometer needle, and to reword, shorten, and clarify the caption for Figure 55.
3. On page 178, in the Practice Problems, Problem #8 is difficult, because the white space around the "T" obscures some of the contour lines needed to find the answer. To correct this, we changed the location "T" in the problem wording to "U". This makes the problem more straightforward. The answer on page 186 will be changed to 185^0.

[NOTE: This problem is included in the pre-workshop quiz for the Seattle Mountaineers' Wilderness Navigation course. Instructors grading this assignment should be informed of this change, and should be aware of the two different answers to the problem, depending on the printing.]

4. Figure 19 on page 49 is a line drawing that shows a nonadjustable compass corrected for a declination of 20^0 W by applying a piece of tape in the shape of an arrow to the underside of the compass (a practice not allowed in The Mountaineers' navigation course, but included in the book for other readers who may already own a nonadjustable compass and do not wish to buy an adjustable compass). In the drawing, the point of the taped arrow actually points to about 15^0, not 20^0. We requested that the drawing be corrected to show the correct placement of the arrow.

If anyone sees other errors or items in need of correction, please feel free to send your comments to BurnsRobert@comcast.net and we will consider making changes for future printings of WN3.

We wish to express our appreciation to the Navigation Committee and the navigation community for their support of our book, and for many inputs and suggestions made by the Committee in preparation for the Third Edition. Its success is largely due to its use in the Mountaineers Wilderness Navigation course.

--Bob and Mike Burns are long-time Mountaineers members and volunteers.

The Making of a Compass Checking Station

By Bob Boyd

Over the years, many of us have discovered that not all handheld compasses point in the same direction. There are primarily two reasons for this type of problem. First is the construction of handheld compass and second is the human pointing error that we all have.

After checking over 400 handheld compasses and constructing 10 compass checking stations, what follows is my recommended way of making and using a Compass Checking Station.

Location is everything. Move away from steel objects, but where the station may be found and used by compass navigators. Interferences, primarily from steel, are everywhere and it produces local magnetic fields that interact with the earth's magnetic field. After a site is selected, make observations to a distant object using a reliable compass-- more on that later. The location of these observations should be within 15' (5m) of the intended station, and they should all yield the same reading. If inconsistencies are found, buried steel may be present, so try another area.

A reliable compass will also be needed. Three types work well: a Surveyor's Transit, a Forester's Staff Compass, and a Suunto KB-14. Each will function well when placed on a level, nonmetallic stand. My preference is an old wood and brass tripod.

A distant sighting target is also needed. At a distance greater than 200' (60m), find a flag pole, a light pole, a corner of a barn, a gate post, an edge of a window, a roof vent--almost anything that is about the same elevation as your checking station.

Finally, you will need a nonmagnetic magnification glass to carefully read and align compass needles and other compass parts.

From this point forward, the aid of a qualified surveyor or forester is advisable.

1) Set up the Surveyor's Transit, Forester's Staff Compass or Suunto KB-14 over a yellow, plastic tent peg, driven almost flush with the ground. This peg will become ground zero for the compass checking station and will need to be visible to all who wish to test their compasses.

2) Determine accurate bearing(s) to object(s) over 200' (60m) away, using one or more of the three instruments listed. While observing the bearings or azimuths, take care to lightly tap the tripod or homemade stand. This will set free a sticky compass needle and yield better results. It is advisable to make these

observations prior to checking compasses. You could be experiencing solar and or geomagnetic interferences.

3) If a number of compasses are to be checked, consider taking measurements using magnetic bearings--fewer steps--and add the local declination later to arrive at a true bearing or azimuth.

4) Remove the transit, staff compass, or KB-14 from the tripod and replace with a handheld compass. Follow these steps:

- Set this compass to each predetermined bearing
- Align the compass needle with a magnifying glass
- Note of the direction the compass is pointing. If the handheld compass points to the right of the target, increase the declination by 1º increments, forcing the handheld compass to point more left, etc.

5) For an individual checking their handheld compass, without aid of a tripod, follow these steps:

- Stand over the compass checking station,
- Set the compass to the published bearing(s) or azimuth(s)
- Align the needle and note where the compass is pointing.
- Adjust the declination, as above

This hand held exercise adjusts for two error sources, compass error and human pointing error. Pointing error should reduce with additional usage of the compass.

Other things to watch out for:

- Bubbles in the compass oil will get larger and will interfere with the needle.
- A compass needle balanced to work in the Northern Hemisphere, will have the wrong needle dip in the Southern Hemisphere.

--Bob Boyd is a Washington licensed Land Surveyor, stalwart of the Washington Search and Rescue community, and member of the Mountaineers Seattle Navigation Committee. He is a frequent contributor to his column.

Back Country Trip Plan Checklist: Navigation Focus

One of the recommendations from the June Navigation Summit 2015 was to place a greater emphasis on pre-trip planning. Both Seattle's workshops and field trips call for a hard copy plan to submit to lead instructors.

Figure 1 shows a Back Country Trip Plan Checklist prepared for the Wilderness Navigation eLearning pilot course. We anticipate a clean template will soon be posted in the Seattle Navigation public folder. Thanks to the Seattle climbing community for a similar template.

Figure 1. Planning template for back country outings—navigation focus

Back Country Trip Plan Checklist

Check	Destination	Peak or Feature & Route			Navigation Gear	Details
	First Choice	*Kendall Peak 5784' via PCT fromPCT N TH elev3000'*			Topo Map All	*SnoPass Gtwy*
	Second Choice	*Kendall Katwalk 5400' as above*			Compass	
	Third Choice	*Peak, then Katwalk*			Altimeter	*Sami*
	County	*Kittitas Co 911 or 509.962.7527*			GPS--Map/Track Loaded	*Sami*
	TH/Park	*PCT North TH , I90 Exit 52 towards Alpental*			SmartPhone	*All*
	MeetUp Date Time Place	*July 5 Sunday 7am Bear Crk P & R Redmond*			Backup Power	*Jazz*
					Headlamp	
	Return				Pencil	
	Expected Date Time	*July 5 4pm at TH*			Hand Lens	
	Overdue Date Time	*July 5 8pm at TH*			PLB	*Nisa*
					Other 10 Essentials	
	Trip Plan Details				Sun protection	
	Weather forecast	*Clear, 80's N wind 5-10, chance pm Tstorm*			Insulation	
	Road conditions	*Dry, clear*			First Aid	
	Trail conditions	*No reported blowdowns, washouts*			Fire system	
	Car pool check	*Sunita drives, Ilinisa & Jazz passengers*			Repair kit, tools	
	TH car make, model, color, plate state	*2006 Honda Accord Blue WA plates*			Nutrition	
	TH car make, model, color, plate state				Hydration	
					Emergency shelter	

	Name	Email	Mobile	Emer Contact	Phone
Lead	Sunita Herd	sherd@gmail.com	955.425.6000	Bill Daboz	955.425.5000
2	Ilinisa Marston	ilinisa4@yahoo.com	956.444.3434	Frank Li	956.444.4343
3	Anita Joshi	ajosh2@clearwire.com	923.555.3000	Star T Ling	923.555.2000
4					
5					
6					

--Editor.

Who Would've Guessed? A Braille Compass

By Steve McClure

This discontinued pocket compass formerly produced by Silva, is an intriguing device for the visually impaired. The user aims the compass in the desired direction with the lid closed, allowing the magnet to float freely. Opening the lid locks the compass in position. There is a raised arrow for north and other directions marked in Braille with raised dots for each 30 degrees for the user to determine direction. A similar Brunton compass is also out of stock.

--Steve McClure sits on the Mountaineers Board of Directors is active on Seattle Climbing, Scrambling, and Navigation committees. He is an intermediate climbing student. Contact him at McNorth@Gmail.com.

Figure 1. British members of the Boundary Survey, setting up to take astronomical observations. Photo from the Bancroft Library, University of California Berkeley

Finding 49 Degrees North: The Northwest Boundary Survey

By Brian Carpenter

Where exactly is 49 degrees north and why does it matter? In 1846 the United States and Britain agreed by treaty that 49 degrees north latitude marked the east-west boundary between the Washington Territory and British Columbia. But in the North Cascades the boundary existed only on paper, as no one had explored, let alone mapped the wild valleys and peaks.

At first this was not an issue since very few people ventured into the area, but in the late 1850s gold was discovered in the upper reaches of the Fraser river in British Columbia. Suddenly it mattered where the boundary line was. The next major gold strike could be in Washington territory or it could be in British Columbia. Now that serious money was at stake, both countries agreed to fund and staff expeditions to explore the North Cascades, determine with some precision where 49 degrees fell on the landscape, and designate it with markers.

The surveys began in present-day Whatcom County. At the time, the main route leading east was up the Fraser River. A crude trail also ran from Whatcom (now Bellingham) northeast to Sumas, then north to the Fraser. Between Sumas and the Similkameen River valley on the east side of the Cascades was a blank space on the map. It was this *terra incognita* that would test the mettle of the boundary survey.

The American expeditions were organized and run by the Topographical Corps (TC) of Engineers, a division of the United States Army that lasted from about 1830 until the Civil War and was responsible for mapping a great deal of the Western United States. TC Engineers were military officers who also received training in surveying, astronomy, engineering, mathematics and navigation. The most famous member of the T.C.E. was John C. Fremont.

In addition to the Topographical Engineers, the American survey party included astronomers for taking celestial observations to determine latitude, horse packers, and axe men to cut trails and boundary markers in the forest. Native Americans living in the area were hired by the surveys as guides, canoe paddlers and porters. At any given time between 100 – 200 individuals were employed by the United States Survey.

Also included were artist James Madison Alden, to draw and paint sketches of the landscape, and George Gibbs, an ethnographer, expert in Northwestern Indian languages, naturalist and all-around gentleman-explorer. Gibbs' many journals, notebooks, field observations, language studies and other papers are now part of The Smithsonian Institution archives.

The foremost field explorer on the American side was probably Henry Custer. Originally from Switzerland, Custer led exploratory survey parties in the heart of the wildest part of the North Cascades. He was probably the first European to explore the Skagit river valley, Nooksack cirque, Whatcom Pass and a host of other places.

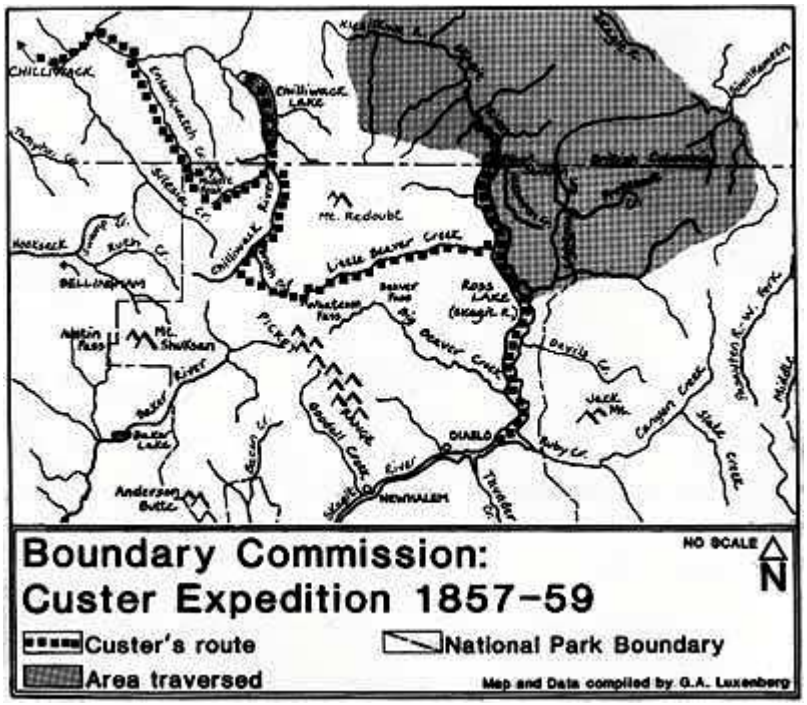


Figure 2. General area of the Boundary Commission. Map source: www.royalengineers.ca/CusterEx18157.html

Early on both sides realized the impossibility of simply traveling from west to east, marking 49 degrees along the way. The landscape was simply too rugged, travel too difficult. Instead, working from a series of camps, storage depots and caches in present-day British Columbia, various parties traveled roughly southward up valleys and over mountains, taking observations and locating 49 degrees north.

As a result, the original concept of literally cutting a swath through the forest all along the border was replaced by border markers, which were intended to be closely spaced, but ended up being separated by many miles of wilderness. Stone cairns, metal posts and areas that were cleared of trees marked the boundary in various places.

The survey parties' journals mention many of the same challenges faced by modern-day mountaineers: rain, bugs, brush and avalanches chutes. They struggled to cross rivers and streams, navigate snowbanks, and snake around rock cliffs.

> "The mosquitoes have now regularly set in; it is perfect agony performing even the regular actions of life…they settle en masse upon you perfectly covering every portion of the body exposed...
>
> "From Semiahmoo the Sumass the country is low, in many places very swampy, and covered with perhaps the densest forest that can be seen anywhere, for not only are the trees of enormous girth, from 25-35 feet in circumference, but the spaces between them are filled with an impenetrable mass of underbrush and fallen timber.
>
> "…they are the vine maple and another bush whose name I do not know. They extend along…the margins of the creek clear up to the mountain sumits, and there is no alternative, but to break your way through it, to do so you have work with hand & foot, or hold away the very elastic twigs of the bush, which if not careful, will give you such a lesson you will not forget. Add to this a most disagreeable thorny plant with large leaves and red berries [*devil's club*], which obstructs itself continually in your way."[1]
>
> On the other hand they did find huckleberries:
> "...the Mts. sides were covered with extensive patches...the largest & finest of peculiar brownish blue color that could be seen. They are of excellent flavor. To withstand the temptation of a large tract literally covered with these delicious berries goes beyond the moral strength of a white man, much less that of an Indian. To halt & eat & to eat & halt is all you can do under these circumstances.[2]

[1]Pgs 174, 177, 185, Range of Glaciers: Exploration and Survey of the Northern Cascade Region, by Fred Beckey, Oregon Historical Society Press, 2003.

[2]Custer, Henry. "Report of Henry Custer, Assistant of Reconnaissances made in 1859 over the routes in the Cascade Mountains in the vicinity of the 49th parallel." May 1866. Typescript (57 pp.);

The main focus of the Boundary Survey's activity extended from Sumas east to the Similkameen river, north of present-day Oroville, Washington. The Similkameen ran north to south through British Columbia and Washington and had been more widely explored by trappers, traders and prospectors out of Fort Colville and Fort Okanogan in eastern Washington.

The British and American survey teams by and large operated separately in the field. Each year the senior officers from each side would meet to review their work but relations were not always friendly. While there was no rivalry or much serious argument about boundary markers, cultural differences were noted.

The British viewed the Americans as a bunch of savage frontier brutes, while the Americans thought the British too stuffy and formal. The British were especially horrified by the Americans' practice of putting their knives in their mouths when eating!

Even with all of their modern (for the time) equipment and careful observations, mistakes were made by both survey teams. In the end, each side produced a slightly different map, the final version simply an average of the two. Where the boundary lines varied, the final map put the boundary line in between the two. Both sides produced maps at a scale of about 1:120,000 with some more detailed maps of the area close to 49 degrees at a scale of 1:60,000.

Unfortunately the Boundary Survey's end products, its maps and reports, disappeared into the black hole of Civil-War-era federal government. Publishing the maps and reports was deemed too expensive in light of war-time shortages, so most of the reports and maps languished in various locations until 1900, when USGS cartographer Marcus Baker tracked down what he could and produced a summary report as a USGS Bulletin. Baker never found the final official report produced by the Survey but he did calculate the Survey's total cost as $600,000, not adjusted for inflation.

Modern-day explorers of the North Cascades can leisurely paddle a canoe on Ross Lake, easily passing over a valley that Henry Custer and others struggled to navigate. We can drive far up the road to the Hannegan Pass trail, or to Twin Lakes, routes pioneered by the Survey that took months to thrash. Should you venture close to the border, you might even find remnants of the survey, including strips of felled trees, stone cairns and metal boundary posts. The mosquitoes and huckleberries of course remain.

--Brian Carpenter was 2015 Volunteer of the Year for the Seattle Branch. He is a Seattle Navigation Committee member and leads the Introduction to Map & Compass class. Brian is a well-regarded hike and backpack trip leader with a long volunteering resume.

Wilderness (Basic) Navigation Course Offerings 2016--Seattle

Basic Navigation transitioned to Wilderness Navigation in 2016, clearly focused on wilderness/back country travel including off trail navigation to meet requirements for Alpine Scramble, Basic Climbing, Snowshoe and BC Ski students (and others). Altimeters and GPS units (basic point position) are included. We are developing a Seattle version of Foothill's Staying Found, which does not meet other back country course requirements. https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/course-templates/basic-navigation-course/basic-navigation-course-seattle-2016

Date & Day	Workshop	Date & Day	Fieldtrip
		Sat, April 23	Heybrook Ridge
Thur, Nov 3	Program Center	Sat, Nov 5	Heybrook Ridge

Smart Phone and Dedicated GPS Navigation Course--Seattle

Are you interested in learning to use your smart phone as a wilderness GPS? Maybe you have had a dedicated GPS for years and want to get the most out of it? The Smart Phone and Dedicated GPS Navigation course is for you! We will cover basic usage of both dedicated GPS units and some select GPS apps for smart phones, as well as common issues that can affect GPS accuracy and ways to avoid them. This course is an evening at the Mountaineers Seattle Program Center in Magnuson Park, split between a classroom lecture and a hands on outdoor exercise. This course is open to Wilderness (Basic) Navigation students and graduates. Fee and Badge.

Topics include:

- Overview of how GPS works
- Common accuracy issues and solutions
- Review of UTM coordinates
- Entering waypoints
- Navigating to a way point
- Back tracking a route
- Overview of emergency locating beacons (SPOT, PLB)

Students need to bring a GPS enabled device to the class; loaners are not available. We cover both Gaia for iOS and Android devices ($20, pro not required) and Garmin dedicated units. Other brand GPS units are welcome, but instructors may not be familiar with them. Lead course administrator is Brain Seater.

The current URL provides a description and the 2016 dates are on the calendar: https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/course-templates/smart-phone-dedicated-gps-seattle/smart-phone-dedicated-gps-seattle-2016

Smart Phone & Dedicated GPS Course	Location
Thursday, May 12	Seattle Program Center
Tuesday, June 21	Seattle Program Center
Tuesday, August 9	Seattle Program Center
Monday, October 3	Seattle Program Center

Introduction to Map & Compass—Getting Started--Seattle

The Seattle Navigation Committee scheduled six 2016 Introduction to Map and Compass dates at the Seattle Program Center from 6:30 to 8:30 p.m. Instructors are drawn from the pool of Wilderness Navigation Course teachers. You can enroll at: https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/course-templates/introduction-to-map-compass/introduction-to-map-compass-seattle-2016-1. Administrative lead is Brian Carpenter. This Getting Started introductory class does not satisfy the navigation requirement for Alpine Scramble, Basic Climbing, Snowshoe or Backcountry Ski.

Introduction to Map & Compass 2016	Location
Tuesday, May 10	Seattle Program Center
Thursday, June 16	Seattle Program Center
Monday, August 15	Seattle Program Center
Thursday, September 15	Seattle Program Center

Other Branches 2016 Navigation Courses

Branch	Course	Dates
Tacoma	Wilderness Navigation Lectures 1 & 2	May 3 & 10
Tacoma	Wilderness Navigation Field Trip	May 14
Tacoma	Wilderness Navigation Lectures 1 & 2	August 10 & 17
Tacoma	Wilderness Navigation Field Trip	August 20
Olympia	Basic Navigation Course Lectures	April 12, 14
Olympia	Basic Navigation Course Field Trip	April 16, 17
Olympia	Basic Navigation Course Lectures 1 & 2	April 12 & 14
Olympia	Basic Course Field Trips	April 16 & 17
Foothills	Staying Found—For Hikers & Backpackers	May 14
Foothills	Staying Found—For Hikers & Backpackers	June 11

Navigation Project(s)

>>Our Seattle Volunteer Park effort to create a self-guided navigation map, compass, and SmartPhone (altimeter & UTM coordinates) practice course is online. You may download the PDF (with answers) here: https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-navigation-committee/files/seattle-navigation-self-guided-practice-volunteer-park/ Thanks to Nancy Temkin and Bob Boyd for their beta testing last fall.

>>A second practice course focused on GPS use is under development for Lincoln Park in West Seattle by Mountaineers Safety Chair Dave Shema.

Navigation Gear, Apps & Links of Interest

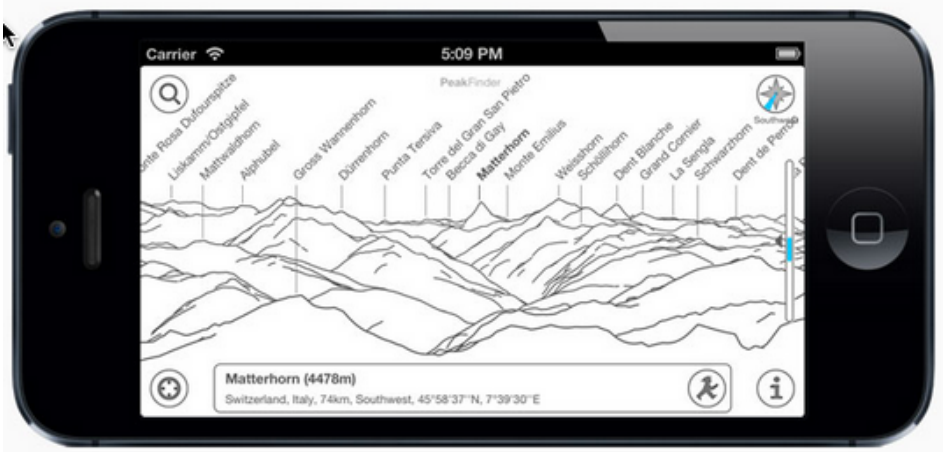
Your comments and suggestions are ever welcome regarding the Seattle Navigation website and links in Navigation Northwest.

The Gear…

- **LIFEPROOF iPhone 5** series case has served me well for some two years. Submersible for an hour at 2 meters. Sealed from dirt & dust. And handles repeated 2 meter drops (to demonstrate to students). I use it on paddle, hike, scramble and trek outings but revert to lesser protection for work about town. Remarkably, I've not lost the tiny, knurled screw that seals the earbud port. For me voice and hearing quality are best with earbuds. Used to new price range: ~$30 to ~$70. Yes, there are many cases for other models. And here's a wilderness medicine guy's case review: http://wildernessmedicinemagazine.com/1161/Unbreakable-Smartphone-Cases--Editor

The Apps…

- **Backpacker Magazine promotes the "10 Best iPhone Apps for the Outdoors":** http://www.backpacker.com/gear/electronics/gps-units/10-best-iphone-apps-for-the-outdoors/
- **PeakFinder** - Names peaks on a sketch of the panorama where you are located or a point you select. It makes the whole "What is that mountain?" exercise child's play. Catches: You pay for it, you need to download a database before you go (60Mb for the version I use, with the app + db at 132Mb), isn't perfect (shapes are simplified and rounded a bit, no local names, etc.). URL: https://www.peakfinder.org/mobile/



I have not used it in the field yet, so need to find out how well it works without connectivity. Supports iOS, Android & Nokia operating systems. — *Bruce Crawford, Seattle Navigation Committee*

And the links…

- **OSM: The simple map that became a global movement.** http://www.directionsmag.com/entry/osm-the-simple-map-that-became-a-global-movement/466280
- **City of Seattle explores barriers to limited mobility folks. Will someone please note walking issues near The Mountaineers PC?:** http://www.accessmapseattle.com/
- **Tips and Myths About Extending Smartphone Battery Life**: NYT 25 Feb 2016 http://www.nytimes.com/2016/02/25/technology/personaltech/tips-and-myths-about-extending-smartphone-battery-life.html?emc=edit_ct_20160225&nl=personaltech&nlid=59586226
- **Monarch butterfly navigation unraveled**: http://www.washington.edu/news/2016/04/14/scientists-crack-secrets-of-the-monarch-butterflys-internal-compass/
- **Self study Maps and the Geospatial Revolution from Penn State—Free (if you can get an account)**: https://www.coursera.org/course/maps
- **3D Maps from book pages**
- http://www.huffingtonpost.com/entry/ji-zhou-map-mapart_568561dde4b06fa688824b67?utm_hp_ref=books&ir=Books&section=books

Navigation Gear--Compasses

Required Compass Features: Seattle Wilderness (Basic) Navigation Course

Seattle Mountaineers—Revised April 2016

1. **Adjustable declination**: If there is one feature that simplifies map and compass work, this is it. Compasses with adjustable declination can often be identified by the presence of an adjustment screw, usually brass or copper-colored, and a small key attached to the lanyard. It allows you to move the orienting arrow in relation to the azimuth ring.

· All students MUST have a compass with adjustable declination. The presence of a declination scale does not guarantee that it can be adjusted. Avoid the 'tool-less' declination feature on the Brunton (see below).

· Even if you already have a compass without adjustable declination, you may not use it in this course. Experience indicates that such compasses detract from the learning experience.

2. A **transparent rectangular base plate** with a direction of travel arrow or a sighting mirror.

- Transparency allows map features to be seen underneath the compass.
- A rectangular shape provides straight edges and square angles to plot and triangulate on the map.

3. A **0 to 360 bezel** (the rotating housing) marked clockwise from 0 to 360 degrees in increments of two degrees or less. In general, bezels should be large to allow use while wearing gloves - the larger size also improves accuracy. Do not get one marked in 0-90 degree quadrants OR one marked in O-6400 mils!

4. **Meridian lines**: Parallel 'meridian lines' on the bottom of the interior of the circular compass housing rotate with the bezel when it is turned. Longer lines are better. Meridian lines run parallel to the north-south axis of the bezel, however turned, for plotting and triangulating on the map.

5. A **ruler and/or gradient scale** engraved on one of the straight edges, used for measuring distances. In the U.S. 1:24000 scales (rather than 1:25000) are preferred.

6. A **3 to 4-inch base plate**. A longer straight edge makes map work easier.

Additional recommendations

- A sighting mirror in the cover: Reduces error introduced when moving compass from eye-level after sighting to waist-level for reading the dial.
- A liquid-filled housing: Reduces erratic needle movement (common on better compasses). In some cases, steadying the compass needle can be difficult
- An inclinometer: A gravity driven arrow that allows you to measure slope angle.

Current favorites: Silva, Suunto, Kasper & Richter, and Brunton are the common favorites. Their quality and usability varies, so **keep any receipt**. We have unfortunately seen many defective compasses in the past. Beware the UST ~$7 knock-off baseplate compass available via Amazon and other outlets. Our gear tests show it to be unreliable.

--From Silva, with a sighting mirror, is the Silva Ranger 515 CL (not the CLQ). Without a mirror is the Silva Explorer Pro (not the 203 or Polaris). Silvas are available at Cabela's or online.

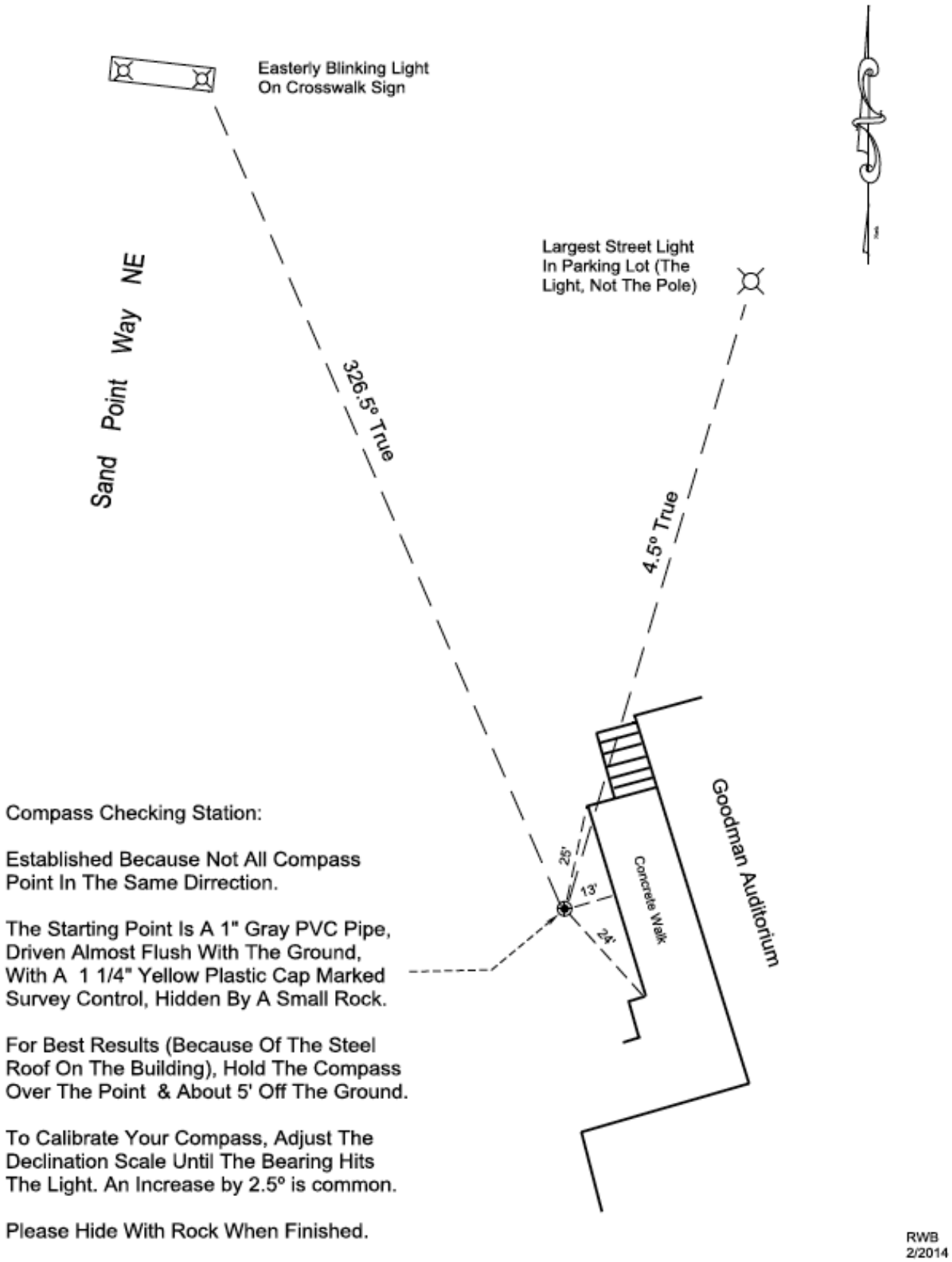
--K & R has the Sherpa and Alpin using 1:25,000 vs. 1:24,000 rulers. They are available online.

--Brunton has several compasses that meet our requirements but present issues with "tool-less declination", lack of clearly visible meridian lines or scales and curvy shapes. Several tool-less declination models have come apart in user hands. Preferred models are TruArc 15 (mirrored), and TruArc 5 (non-mirrored). The TruArc 10 has measurement scales (good) but curvy sides (not good). The TruArc 3 lacks clear meridian lines and is short. Bruntons are available at REI, Cabela's or online.

--Some Suunto models have had accuracy problems in recent years. Older MC-2s frequently needed to be set 2-3 degrees higher (i.e., 165 degrees East became 18-19 degrees East). We await the retooled MC-2 (mirrored) and M-3 (non-mirrored) 2016 models. Suunto is currently available at REI, Feathered Friends and online.

Some older Suunto M-3 and MC-2 lines exhibited a 2-degree magnetic error and are corrected by adding 2-3 degrees East (i.e., 16 degrees East would need to be 18-19 degrees East). Needles in newer models are not impacted. Meridian line length has also been sacrificed for Suunto branding on both models. If you are comfortable with foreshortened meridian lines, the M-3 and MC-2 lines are OK. Manufacturers make continuing improvements and corrections in models.

(Rev April2016/bs.ph)



Seattle Program Center Compass Calibration Station

Navigation Northwest Copy and Publishing Deadlines 2016

Calendar 2016	Copy Deadlines	Publish Dates
Volume 4, Issue 2	June 1	Late June 2016
Volume 4, Issue 3	September 1	Late September 2016
Volume 4, Issue 4	December 1	Late December 2015

Inquiries, Contributions, Letters to the Editor to Peter Hendrickson
p.hendrickson43@gmail.com

OK to forward

OK to use with attribution

Email Navigation Northwest to any friends/outdoors partners to distribute

Guidelines for contributors: Kindly contact editor.

"Do not go where the path may lead, go instead where there is no path and leave a trail." *--Ralph Waldo Emerson, American writer, 1803-1882*

(Rev. 3May2016/ph)