



# Foundation for Glacier and Environmental Research *Juneau Icefield Research Program*

## 2024 Gear List Supplement:

### SKIS, SKI BOOTS, AND SKI BINDINGS

There are many approaches to, and opinions about, backcountry ski setups. We provide these recommendations based on extensive experience with the particular conditions of a summer traverse of the Juneau Icefield. If you have questions about anything on this list, please contact the Program Manager.

**Conditions and Terrain:** We ski for most of the traverse and can spend 6-18 hrs a day in our ski boots. The vast majority of the terrain is low-angle (1° to 5° slope), although there are a couple steeper hills to both ascend and descend. Snow is consistently consolidated, old, wet, and dense.

**Setup Overview:** To best meet these conditions, we recommend medium-duty, medium-width, full metal-edged, backcountry/cross-country skis, with length sized appropriately for your height and weight, with medium-duty plastic touring boots and compatible touring bindings.

Ski equipment can be particularly expensive to buy. Check into options to rent from a local outdoor store, look around for secondhand equipment online and at outdoor gear consignment stores, and consider borrowing from a friend (it is the off-season for many people, after all). In addition, JIRP has some skis and ski boots to rent out, although quantities are limited and must be reserved early in the pre-season. There is a more comprehensive list of options for finding used ski gear on the website [Gear List page](#).

### SKIS

**Medium-duty** skis designed for **backcountry touring** with **full-length metal edges**. The best skis for JIRP are hybrid cross-country/downhill skis. These skis have often been called “XCD” - XC for the cross-country oriented features, D for the downhill oriented features, although this term is falling out of use. This type of ski is available with two types of base – waxless/patterned base (aka “fish scale”), and waxable/smooth-base. **We strongly recommend fish scales**, especially if you don’t have prior experience with waxing skis. Even with prior experience, the majority of people prefer pattern-base skis for their efficiency and ease of use.

Brands: Madshus, Rossignol, Altai, and Voile are the major brands making appropriate skis that we have had the most success with. Of these, Madshus and Rossignol are the more affordable options. Alpina and Asnes also make skis in this category, but we do not have a lot of experience with them. Fischer makes skis in this category, but we have had repeated issues with edges cracking and bases delaminating; we do not recommend Fischer skis for JIRP.

Ski model numbering: XCD skis are traditionally numbered between 80 and 120 (e.g Rossignol BC 100). This is the

width of the ski at its widest (near the tip) measured in millimeters. Note that this is a different numbering practice than for downhill skis. Downhill skis are traditionally referred to by their narrowest width, called the “width underfoot”. This is a quirk of skis, so just be aware of it when reading reviews and talking to salespeople.

To further the confusion, Madshus renamed their XCD for the 2021/22 season. The new line, called Panorama, is numbered with their narrowest/“width underfoot” measurement.

Generally, narrower skis are lighter, faster on flat terrain, and cheaper. Wider skis are more stable going downhill, more durable, slower on flat terrain, and more expensive. Within the range of skis here, the medium and wide options are better if you plan on doing any downhill skiing; most of our staff end up with these skis. If you’re just getting started with skiing and want to stay narrow, the Madshus Panorama 62 and the Rossignol BC 80 are reasonable options.

**\*\*If you already own a different backcountry setup and are very experienced using it, you may contact us to ask if it’s appropriate before buying new equipment\*\***

#### Typical specifications for required medium-duty skis:

<i>Use:</i>	easy-to-moderate backcountry touring/cross-country skiing
<i>Width:</i>	60 mm to 80 mm (underfoot width, the narrowest measurement in the ski specs)
<i>Length:</i>	depends on your height and weight (google “ski length” for more information)
<i>Base:</i>	waxless/pattern-base/fishscale
<i>Edges:</i>	full-length metal edges
<i>Camber:</i>	double is best, but partial or single camber is also acceptable



The bottom of a ski with fish scales. The fish scales are in the middle, under the binding. On this ski there is a geometric blue graphic on the fish scales; this is cosmetic. The tip and tail of the ski are smooth.



*Zoom in of the fish scales, which look like roof shingles with the convex curve pointing left. If you run your hand over them, you'll feel about half a millimeter of relief. Again, the blue graphic (pointing right) is cosmetic*



*Zoom in of the back half (tail) of the ski. The tip and tails are smooth to let you glide over the snow.*



*Ex. 1: Madshus Panorama Line (renamed for 2021/2022)*

*Med. Width: Panorama 68 (2021/22), aka Epoch (~2010-2020)*

*Wider: Panorama 78 (2021/22), aka Annum (~2010-2020)*

*Narrower: Panorama 62 (2021/22), aka Eon (~2010-2020)*



*Ex. 2: Rossignol BC Positrack Line*

*Med. Width: BC 100*

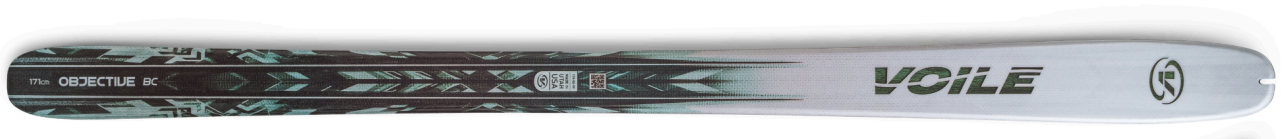
*Wider: BC 120*

*Narrower: BC 80*

***Rossignol BC 65 Positrack (even narrower, not recommended for novices)***



*Ex. 3: Altai Kom*



*Ex. 4: Voile BC line*

*Med. Width: Objective BC*

*Wider: Ultra/Hyper\* Vector BC*

***\*The "Hyper" line of Voile skis should not be mounted with telemark bindings, they should be mounted with AT bindings.***

***Voile skis are of excellent quality, however we do not necessarily recommend them to entry level skiers due to the significant difference in price when compared to Madshus and Rossignol skis.***

Most ski manufacturers have a sizing chart on their website, usually based upon the weight of the skier. When sizing based on weight, do not include the weight of your pack; this will result in a longer, less manageable ski length for your height when you are skiing without a backpack.



## SKI BINDINGS

There are three different paths to take with bindings: Telemark, Alpine/Touring, and Silvretta. All are acceptable. The difference between the broadest categories of bindings arise from what they were originally developed to do. We're many generations removed from those original purposes, and all three options have converged significantly on what you *can* do with them. People have *strong* opinions about types of ski bindings, but everything listed here will work for JIRP.

JIRP is all about learning and equipping our students to understand their equipment. In order to understand the ski binding options, some people are curious to understand a bit about the history of skiing. We've written up a summary at the bottom of this document. It is not at all necessary to get your gear, but it might help you feel more comfortable understanding all the jargon.

**NNN and SNS style nordic ski bindings are not durable enough for JIRP.**

**Telemark 3-pin:** Medium-duty, standard 75mm/three-pin bindings. We recommend these bindings for novice skiers. They are exceptionally durable, relatively cheap, and size-flexible. The difference between the two is the heel cable that allows for more control going downhill. It's great to have but not required. Note that these bindings have been on the market, largely unchanged, for a couple decades (warning: there were models in 60s/70s that do **not** work with modern plastic boots). If you can find a used pair that appear to be in good shape, they are probably fine. Note that Ex. 2 is *called* the "cable" option, but it's not what we're referring to as a "cable binding" below because the boot is attached by the three pins toe clip, not the cable spring tension.



Ex. 1: Voile Mountaineer (no heel cable)



Ex. 2: Voile 3 Pin Cable Telemark (with heel cable)

**Telemark Cable or NTN Bindings:** These are great if you are excited to try proper telemark skiing on the Icefield. These bindings should be designed for backcountry use and have both an "uphill/touring" and "downhill" mode. Voile and 22 Designs are manufacturers that currently make reliable bindings of this type. G3 and Black Diamond Equipment formerly made bindings in this category, you may be able to find them used. Within this category you can get into 75mm/duckbill (Ex. 3: Voile Switchback) or NTN/duckbutt (Ex. 4: 22D Outlaw or 22D Lynx). The differences between those two are great and better discussed on videochat. Come to office hours!

The short answer is that they both work for JIRP. The advantage of these bindings is that the two modes work better for their designed purposes than 3-pin bindings will- they offer better range of motion on flats and uphill, and more control on downhill. The disadvantages are that they are significantly more expensive, and that there are more (and more complicated) pieces to break.

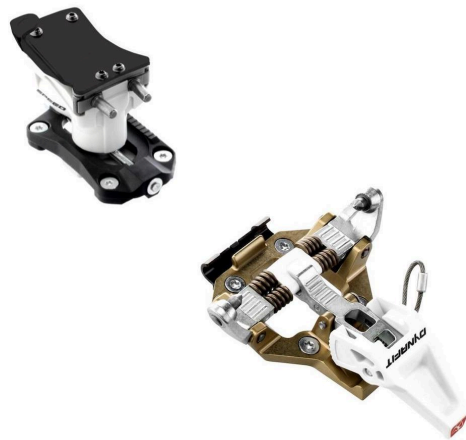


*Ex. 3: Voile Switchback X1 Telemark Touring*



*Ex. 4: 22 Designs Lynx Telemark Binding*

**Alpine/Touring (A/T) tech:** These are the relatively new and light A/T bindings with toe pins, not heavier frame bindings where your whole binding pivots up with every step. A/T bindings have a “touring” mode for going uphill and flat, where your boot pivots on two pins that clip into the toe of the boot. When you want to go downhill, you clip the heel in and go into “alpine” mode. Advantages: often the freest pivot for touring (fewest blisters), most control for going downhill, and widest range of boot options. Disadvantages: more expensive than 3-pin telemark bindings.



*Ex. 5: Dynafit Speed Radical*

**Silvretta:** This is the least common, and it’s mostly on here for people who already own and use these bindings. They are unique because they are compatible not only with A/T boots, but also with full shank mountaineering boots that have a heel and toe bail. In the past, folks have used Silvrettas with a single boot for both hiking and skiing, which definitely has advantages, but also significant disadvantages when that single pair of boots is soaked/giving you blisters. If you can find a Silvretta (Ex. 6) binding, they work well enough, but they are no longer made so they are hard to come by. Many folks also get blisters using these for the entire traverse, as

mountaineering boots don't necessarily make for good ski touring boots.. These are especially useful for faculty who are only coming up for a few weeks, own these bindings already, and don't want to buy a new setup.



Ex. 6: Silverta Touring

## SKI BOOTS

Medium-duty, two-buckle (best) or three-buckle (acceptable), ski boots designed to clip into your bindings. Ski boots are designed to clip into a specific type of bindings - **not all boots and bindings are interchangeable**. All ski boots must fit above the ankle and be designed for moderate backcountry use.

**Your ski boots should be fitted to be worn with both a thin liner sock and a midweight ski sock (at the same time).** Well-fitting boots are very useful in preventing blisters. Ski boots have a long lifespan and can be purchased used if there are no visible cracks or damage in the shell or the liner. Many plastic boots fewer than ten years old, and most new boots, will come with a heat-moldable liner. *It is worth your time to (re-)mold this liner.* A ski shop can do this, or REI has a good video on doing it at home here: <https://www.youtube.com/watch?v=8K7fRr-Jbfo>. If you're not comfortable doing it alone at home, we can also help you do it in Juneau.

JIRP has a small collection of worn, but usable, plastic 3-pin telemark boots for rent. We cannot guarantee fit as you won't be able to try them on until you get to Juneau. It is far better to seek out options locally.

Telemark 3-pin or Telemark cable bindings: Your boots attach to the binding via a "duckbill" at the toe of the boot. On the bottom of the duckbill there are three holes that fit onto the three little pins on the 3-pin bindings. On telemark cable bindings, the binding slips around the toe of the boot, while the heel cable applies forward pressure to keep the boot engaged. Appropriate boots are made of leather, soft synthetic material, or a hard plastic shell with a removable soft liner. Hard plastic boots (Ex. 2) are warmer and drier than leather or soft synthetic boots on the Icefield both because the hard plastic shells are more waterproof than a soft material and because you can dry the removable liner separately at night. **We strongly recommend hard plastic ski boots if you don't already have something suitable.** Examples of this type of boot are the Scarpa T4 (available new or used) and the Scott Excursion (formerly the Garmont Excursion, only available used).

Leather or soft synthetic boots are generally lighter and cheaper than hard plastic boots, but they quickly become

soaked through in Icefield conditions (even if they claim waterproofness) and provide less control when skiing downhill. Examples of current soft boots on the market are the Alpina Alaska 75 mm (Ex. 1 below), the Fischer BCX 675 (available new or used), or the Scarpa Wasatch (only available used).



Ex.1: Alpina Alaska 75 mm



Ex. 2: Scarpa T4 (plastic). **Recommended.**

NTN Telemark Bindings: Your boots attach to your binding via a plastic “duckbutt” under the ball of the foot. These boots are all plastic (not leather), they will be clearly marked for NTN bindings. NTN systems are absolutely not interchangeable with 3-pin/75 mm telemark systems, but some boots are manufactured in both versions. In other words, you could get a Scott Voodoo for 75 mm *or* NTN; it would only work with one or the other, but it would look very similar to the casual observer.

Additionally, there is another class of NTN bindings (unofficially known as NTTN bindings) that uses tech pins for the toe connection, and either a duckbutt or a wire cable heel connection. As aforementioned, if you’re interested, come to office hours and ask!



Ex 3. Crispi Shiver

A/T Tech Bindings: Your boots attach to your binding via metal pins in the toe and a metal heel fitting. These boots are all plastic (not leather), and they will be clearly marked for A/T use.



*Ex 4. Salomon MTN Explore*

**Mounting ski bindings:** Do your best to find a shop to mount your ski bindings at home. Leave extra time for this task, many ski shops are in their off-season. If you live somewhere without a ski shop, we can get bindings mounted in Juneau for a moderate fee. This is a logistically difficult process and we try to limit the pairs of skis we need to mount during the tight time frame, so please do your best to take care of it before the program starts.

**Check for damages:** Thoroughly examine your skis, ski boots, bindings, and poles for cracks, delamination, loose screws, worn parts, broken laces, and other defects in the spring. Pay particular attention to your ski bindings, as it can be very difficult or impossible to adequately repair these while on the Icefield. If you find problems with any of your gear, get the item(s) repaired in plenty of time before departing for Juneau.



## THE FOLLOWING TYPES OF SKI GEAR ARE PROHIBITED:

THESE OPTIONS, MEANT FOR CROSS-COUNTRY SKIING, ARE NOT DURABLE ENOUGH.

### PROHIBITED LIGHT-DUTY SKIS

Skate skis and classic cross-country skis are too fragile for the Juneau Icefield traverse. The surface of the glacier can be extremely sun-cupped, with a hard surface that has half-meter relief micro-topography. Additionally, these skis do not hold up well to the combined weight of an adult and a backpack.



*Example: Fischer Carbonite Skate*

### PROHIBITED LIGHT-DUTY BOOTS AND BINDINGS

NNN and SNS boots and bindings are likewise too fragile for the Juneau Icefield traverse.



*Example: Salomon Escape 7 Pilot CF*



*Example: Rottefella T4 Auto Touring*

**THESE OPTIONS ARE TOO HEAVY. YOU RISK GETTING HURT TRYING TO TOUR ON THEM FOR TWO MONTHS.**

**PROHIBITED SKIS**

- Downhill skis
- Super-wide alpine touring or telemark skis
- Skis that are shorter than recommended for your height and weight
- Ski bindings that include ski brakes

Downhill skis and super-wide alpine touring/telemark skis are too heavy and are overkill for 99% of the skiing you will do. Skis of this type will make you expend more energy, will dramatically increase your chances of developing long-lasting debilitating blisters, and will slow you and your group down.



*Example #1: Black Diamond Drift Telemark/Randonee*

**Typical specifications:**

- Use:* downhill skiing, advanced alpine touring, advanced telemark skiing
- Width:* 90 mm to 140 mm (underfoot width)
- Length:* typically shorter than the recommended length for backcountry touring skis
- Edges:* full-length metal edges
- Camber:* single
- Base:* waxable

See more examples of skis we will not allow on the Juneau Icefield at <http://www.rei.com/c/downhill-skis>

**PROHIBITED BOOTS AND BINDINGS**

- Heavier setups without prior permission from the Program Manager
- Four-buckle / heavy-duty ski boots without prior discussion with the Program Manager



Ex: Scarpa Maestrale RS Randonee



Ex: Marker Duke Randonee

## Telemark vs. Alpine/Touring:

### Why are there so many options that sort of all do the same thing?

So glad you asked! Skiing down a hill is all about turning- otherwise you'd just go straight, really fast, and crash. There are two types of ski turns you could do: the alpine turn and the telemark turn.

The first skis were most similar to what we call cross country skis today, designed to go over flat or rolling terrain. Cross country skis are only attached to the toe of the boot. This allows for much more natural motion similar to walking or ice skating. The disadvantage is that without as much connection between the ski and the boot, it's difficult to execute a controlled turn going downhill. Skiers (in Telemark, Norway) developed the "telemark turn" to control cross country skis on steeper downhill terrain. The turn is essentially a lunge, and uses the unattached heel to make the turn. This allowed skiers to go uphill on cross country skis, and then downhill using telemark turns. This enormous advantage opens up a much wider range of terrain, and has been around since the 1800s. Recently, telemark bindings went through an evolution and started offering a more freely pivoting tour mode, and a more controlled downhill telemark mode, but they more or less work on this same concept and they use the same lunging turn. The disadvantages to telemark bindings is that the telemark turn is much harder to master than the alpine turn, and that the bindings have only recently (~5-10 yrs) commonly offered a release option - so if you fell and twisted, the ski wouldn't release and you could do serious damage to your knee.

Alpine ski bindings are a more recent invention. They are designed to go downhill using an "alpine turn" with the whole foot attached to the ski. It offers more control, and since the 1950s/60s alpine bindings have allowed your ski to pop off if you do fall and twist, so you're less likely to injure your knee. The disadvantage is that with your whole foot attached to the ski, it's very awkward to move on flat or uphill terrain for even a few feet. Until the late 20th century, alpine skiing generally required a chair lift or a lot of hiking uphill with snowshoes. A few decades ago, a company figured out a way to add a "tour mode" where your ski pivots up and down at the toe. This allows the skier to move more freely on flat or uphill terrain. These bindings, which can quite effectively do both alpine (downhill) skiing and touring (uphill) skiing, are called "A/T" bindings. The fastest and lightest iteration, the A/T "tech" binding, was developed in the early 1990s and gained wide popularity starting in the early 2000s.

The summary of all of these fairy tales and origin myths, is that in the 2020s we've gotten to the point where telemark vs. alpine is a lot like driving a car with a manual transmission vs. an automatic transmission: telemark is wholly unnecessary, it is more difficult, and in some ways it's more dangerous. That said, some people grow up in families/regions where the skill is considered more graceful, more fun, more intellectually engaging, and aesthetically superior. Generally these folks are considered somewhat eccentric; JIRP is run almost exclusively by eccentric people, so the tele skiers have a home with us. Unless you're getting into steeper terrain than we access at JIRP, it is purely personal preference. You will see both types of bindings on JIRP staff and faculty skis, they both work really well.

One last thing... why does JIRP recommend bindings meant for a difficult ski turn to novice skiers? We never have to go downhill on steep enough terrain to require telemark turns. The JIRP traverse is mostly touring, and the 3-pin telemark bindings work just fine. And if anyone wants to learn to tele turn, there is no shortage of JIRP staff and faculty who are more than happy to help bring the next generation into the fold.