All Rocker

GEAR OPTIONS DEPEND ON SKIER TYPE AND TERRAIN PREFERENCES

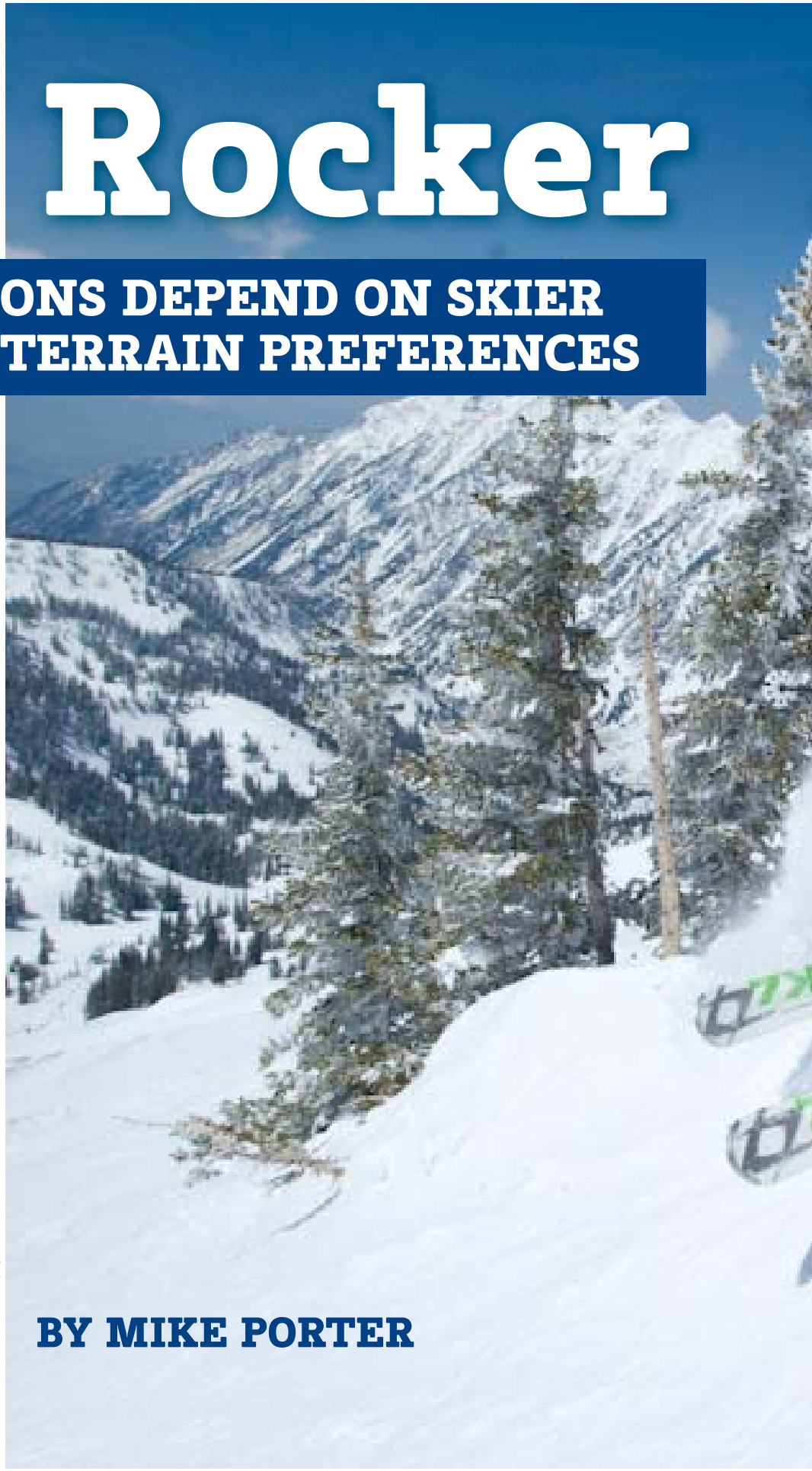

Photo courtesy of Marker Völkl USA / Scott Markewitz

BY MIKE PORTER

Rocker is the rage in today's ski design and is widely hyped on the Internet and in the ski press as the new revolution. In reality "rocker" is a broad category name and actually represents many different variations of a ski's baseline design—from shallow early tip rise/low rocker, high-tip rocker, and tip-and-tail rocker all the way to full reverse-camber rocker.

This article and the accompanying chart describe the different types of rocker—along with skiing characteristics and related waist widths and turn radius—and offers some general recommendations relative to skier ability, terrain preferences, turn shape preferences, and snow conditions. All with the intent of giving you a better idea of what to look for when selecting gear or advising those students who seek your expertise before making their own choices.

EARLY RISE OR TIP ROCKER

This is a traditional camber ski in which 70–90% of the running surface is traditional camber but the final 10–30% toward the tip rises up slightly. If you place the ski on a flat surface and flatten it you will see the front bit of the ski angle upward, with the tip being about 1 centimeter (early or low rise) to 5


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centimeters (high rise) in the air.

- The traditional camber of the ski provides power underfoot, precision, rebound, and edge hold.
- Traditional cambered skis are the quickest for turn initiation and provide the strongest tip pull into the turn but are more demanding and require more effort and accuracy of movement than early rise skis.
- Early rise allows easier and more forgiving turn initiation than a traditional ski while providing smooth transitions between turns. It also offers good turn versatility.
- The smaller the early rise the faster and more precise the turn initiation. Conversely, the longer and higher the rise the slower the initiation. The longer the rise the easier and more forgiving the ski will be.
- The longer and higher the rise the more the ski will float in variable and soft snow conditions. It supports easy turn initiation but, again, the turn initiation will be slower because the tip will take a little longer to engage.
- These types of skis still boast plenty of performance but they represent more ease and forgiveness for all-day performance.

TIP AND TAIL ROCKER WITH TRADITIONAL CAMBER UNDERFOOT

This ski profile has the same tip characteristics as the early rise models, but the tail also rises up. The all-mountain skis in this category often feature 70% traditional baseline camber with 15% tip and 15% tail rocker, while the more powder-specific skis have 50% camber and 50% tip and tail rocker.

- Easy turn initiation and turn completion, requiring less energy to drive it.
- Very forgiving.
- Transitions easily between turns but lacks the power and rebound that a traditional tail provides.
- Good flotation in soft snow, powder, and variable snow conditions.
- Traditional camber provides edge grip, power, energy, and all-mountain versatility.

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THE GOODS ON GEAR: EQUIPMENT CONSIDERATIONS BASED ON STUDENT PROFICIENCY AND TERRAIN PREFERENCES

SKIER PROFICIENCY	IDEAL SKI CHARACTERISTICS	HOW THE CHARACTERISTCS WORK	THE RIGHT CHARACTERISTICS	MANUFACTURER OPTIONS (For more details see the "Web Extras" for 32 Degrees at TheSnowPros.org)	WAIST WIDTH (MILLIMETERS)	TURN RADIUS (METERS)
BEGINNER	Early tip rise; tip and tail rise. Well-tuned traditional camber with 1-2 degree base bevel, detuned tip and tail.	Rise can make it easier to steer or guide the ski, which is an easier skill to learn than tipping and carving the ski. Easy turn initiation helps reduce tip-crossing in a wedge. Because the tips don't pull into the turn, there's less risk of them crossing and overturning.	Most important is a well- tuned and waxed ski.	Two companies make beginner skis with rocker.	72-80 mm	15-18 m
INTERMEDIATE	Generally, the ski features 70% traditional baseline camber and 30% rise. Tip or tip-and-tail rocker.	Easier to initiate, more forgiving, and less demanding. The tip rise allows the skis to be steered or guided through the turn (rather than require tipping) and permits an easy release to initiate the new turn. Turns are more shaped—rather than carved—at initiation. Full rocker and reverse camber are excellent powder skis as they provide maximum float and easy steering at slow speeds.	Place the ski bases close together, then see how much the tips "open" (1-3 cm) and how far back the opening goes (15-20 cm is best). Tails should be about 1-2 cm open and start 5-10 cm back.	Almost all major companies.	72-86 mm (lower level) 86-120 mm (upper level)	15-34 m
ADVANCED	Match rocker type and waist width to specific preferences (see the specific tabs).				68-140+ mm	15-21 m

TERRAIN PREFERENCES						
GROOMERS	Early rise tip or tip–and–tail rise. The more you like to carve and do short-radius turns the less rocker you'll want. For longer turns or crusier turns, opt for more rocker.	Ease of initiation and less demanding transitions between turns. More energy efficient for all-day skiing.	Check to see if there is tip or tip–and–tail rocker. Tip rocker should be shallow (1-3 cm) and gradual toward the bindings. The more radical the bend the less the tip will pull into the turn.	In this waist width some companies have only tip rocker while others have only tip–and–tail rocker.	72-86 mm	12-18 m
CARVING	Traditional camber or slight early rise in the tip. If you favor short turns, go with no rocker or minimal rocker; for medium–radius turns a slight early rise is good. For advanced skiers especially, traditional–rise skis offer the best performance for carving.	The less early rise the quicker the tip engages. More performance but less forgiveness. Early rise will make turn consistency easier and add more forgiveness.	Traditional camber race ski, recreation race ski, or a ski with shallow early rise (1-2 cm) and a flat tail.	All manufacturers. Some are recreational race, others speed rocker or carving–specific skis.	68-80 mm	12-18 m
BUMPS	70% traditional baseline camber and 30% rise, either tip or tip–and–tail.	Early rise helps keep the tip from catching on the downside of the bump and causing over turning. Tail rocker can help keep the tail from getting caught as you finish the turn. Easier to hold line and maintain speed control.	Lots of skis work here. Some skiers favor a wide ski with a large turn radius to slide through the bumps, while others prefer a narrower ski with sidecut that can arc through the bumps. Generally an all-mountain ski will work just fine here.	Most manufacturers have either early rise tip or tip–and–tail.	72-86 mm	16-21 m
STEEPS	70% traditional baseline camber and 30% rise, either tip or tip–and–tail. Traditional camber underfoot is desirable for edge hold and as a platform from which to link turns.	In steeps, skiers generally favor short-radius turns with an emphasis on speed control. Early rise helps the initiation, allowing easier, consistently linked turns, while traditional camber offers a strong base of support, edge grip, and rebound. Consistency and speed control are inhanced by rocker.	A proper tune is important, and the tips and tails should be detuned so they don't hang up and cause you to lose your rhythm.	Most manufacturers have either early rise tip or tip–and–tail.	72-86 mm	16-21 m
PARK	Twin tips with traditional camber underfoot to full rocker. Range of mounting points—from traditional to center mount—determined by how much you ride switch.	Tip and tail rocker make for easier initiation, smearing, and skidding for tricks and airs. Camber underfoot creates a solid platform for landing tricks and turn shape if desired.	There are three types of twins, depending on how much switch you want to ride: directional (the tip is wider than the tail) Bi-directional (the tail is closer to tip width), and symmetrical (tip and tail are the same width).	This is an evolving category, so innovation is constant. All companies have something going on here.	80-105 mm	18-22 m
PIPE	Twin tips with a little tip–and–tail rocker and traditional camber underfoot.	To hold on the walls and support the landings, camber is usually desired underfoot.	Look for either directional or bi-directional ski taper. This is evolving, so anything goes.	See "Park."	80-105 mm	18-22 m

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- Small tip and tail rocker can be good for all-mountain skiers, but it foregoes a little short-turn quickness and the precision and accuracy of a traditional ski. On the plus side, the ride takes less effort. This ski is good for longer-radius turns and shaped—rather than carved—short turns.
- Large tip and tail rocker offers a very surfy feel in soft conditions and powder snow, but on the groomed your arcs will be less carved. A round, skidded arc is more common.
- This is a broad category with ski sidecuts and widths from narrower all-mountain shapes to wide, powder-specific options.

FULL ROCKER

This is a ski with no camber. Its shape resembles a banana or rocking chair.

- Very easy to initiate turns. Extremely maneuverable and playful. The most float of any ski shape in softer conditions.
- Different versions—from twin tips to more traditional shapes and sidecuts.
- Full-rocker twin tips are good for powder, tricks, park sessions, skiing switch, and just being innovative.
- Traditional sidecuts are very good in powder, junk, crud, and variable conditions. Easy to initiate, very forgiving. Best in bigger arcs.
- Best off-piste. Reverse camber makes arcing turns on groomed terrain a challenge, but the design is capable of making long and stable cruiser turns. The more ski you have up in the air at the tip and tail the more it will just bounce around.

DON'T FORGET ABOUT WAIST WIDTH

Just as the type and amount of rise/rocker plays an important role in ski performance, so too does waist width—especially with regard to turn quickness, edge grip and hold, and the ability to float in soft, cruddy, or loose snow conditions. Here's how:

- The narrower the ski underfoot the less mass (swing weight) it has, which makes for easier and faster

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THE GOODS ON GEAR: EQUIPMENT CONSIDERATIONS BASED ON STUDENT PROFICIENCY AND TERRAIN PREFERENCES (con't)

TERRAIN PREFERENCES	IDEAL SKI CHARACTERISTICS	HOW THE CHARACTERISTICS WORK	HOW TO LOOK FOR THE RIGHT CHARACTERISTICS	MANUFACTURER OPTIONS (For more details see the "Web Extras" for 32 Degrees at TheSnowPros.org)	WAIST WIDTH (MILLIMETERS)	TURN RADIUS (METERS)
SIDECOUNTRY	Early rise, tip-and-tail rocker.	Tip rocker or tip-and-tail rocker helps the ski float, making turn initiation easier in the variable conditions found in the sidecountry. Full rocker can be a challenge to use if traversing is required or you need to use skins to hike in or out of the terrain.	Do you plan to use skins to hike or traverse out to your lines? Tip rocker works for skins, while full rocker is a challenge. Traversing is easier with tip rocker whereas full rocker can be more work. Your choice here.	Broad range. If you are hiking or skinning you might want lighter skis made without metal. All have wide skis that will work.	90 mm and up	21-34 m
OFF-PISTE	70% traditional baseline camber; 30% rocker to full rocker.	Wide waist and rocker help the ski float, providing easier turn initiation and more consistent for/aft balance. The more challanging the snow conditions or variable the powder, the more float and more consistent the ride. Tip rocker allows the strong arc associated with groomed turns while full rocker allows for all varieties of smeared, pivoted, and skidded turns—plus a decent arced turn.	The wider the ski the more the weight and energy needed to drive it all day. For most, 100 to 110 mm waist is all you need. Tip rocker makes nice arcs while tip-and-tail rocker allows for easy short turns and the ability to skid in the powder.	If you want lighter skis look for ones without metal. For high-speed charging you probable want metal and can put up with the extra weight.	98 mm and up	18-34 m

CHUTES	70% traditional baseline camber and 30% rocker, either tip only or tip–and–tail.	See “Steeps.”	See “Steeps.”	See “Steeps.”	78-110m	18-23m
ALL-MOUNTAIN	70% traditional baseline camber and 30% early rise or tip and tail rocker.	Here you are looking for skis that do everything; short to long carving to cruising. Groomers to powder. The more you prefer ski performance and precise arcs the less rocker you look for.	Where do you spend the most time? If groomed, use the 74-78 mm waist width; 50/50, try 78-82 mm; more off-piste, go for 83-98 mm. The same goes for rocker. In groomed use less; off-piste, go for more. Weight here can become an issue. The wider the ski the more the weight and the slower the turn initiation.	Ski weight is an option. You will find skis with no metal to metal top and bottom. For normal speed and those who like to link turns, a ski with no metal should be fine. For higher speeds and or large turn radius, metal will give you the dampness and stability you need.	74-98 mm	15-21 m
FOR THE CONDITIONS **PACKED**	Tip early rise to 70% traditional camber and 30% tip and tail rocker.	See “Groomers.”	See “Groomers.”	See “Groomers.”	See “Groomers.”	See “Groomers.”
ICE	Traditional camber, early rise; 70-30% tip-and-tail. Traditional is generally the best for really hard snow (ice); if you are on ice you need to learn to engage the tips.	Traditional camber gives you the largest ski surface for edge grip and power, and allows the tip to engage to create edge grip from initiation. Early rise makes the turn initiation easier, which can create more consistent linked turns, allowing better control. However, it does promote steering to initate, which limits initial edge grip. Tip–and–tail rocker allows for a more pivoted or skidded arc. Easier control but less performance and pop out of the turn.	A narrower-waist ski gets the best edge purchase and is quicker edge–to–edge. The smaller the turn radius the more responsive the ski will be, but also the more demanding to control. The ski tune is really important. Do you want high performance or controlled, linked turns? This is the difference between using race skis or tuned all-mountain skis.	Look for race skis or groomed category skis. Some manufacturers have skis with progressive sidecut that work well here and on groomed slopes.	68-78 mm	12-18 m
POWDER, CRUD, WET OR VARIABLE	Tip rocker to full rocker. The tip rocker is longer, closer to the binding, and is more pronounced. Tip–and–tail rocker models can have either traditional camber underfoot (to help with traversing and skiing on groomed runs) to full rocker, which becomes more powder specific. The tip rocker or full rocker with camber is more versatile, while the full rocker skis are more one-dimensional but fun.	All rocker helps the skis float. The more rocker the more the float but the less arc you will have in your turn shape in short- to medium-radius turns. Full rocker allows easy speed control and the ability to actally skid turns in powder while the early rise tip allows more traditional turns with easier initiation.	Longer tip rocker with flat tails are the norm here for traditional turn shapes and lines. Large tip and tail rocker allows a surfy feel and innovative turn shapes, from smearing to skiing powder switch. Some people don’t like the tip and tail of large rocker skis bouncing around as they work their way around the mountain. It’s a trade-off, so you make the call.	Lots of choices here.	100 mm and up	21-34 m

Sherri Harkin

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turn initiation. The smaller the waist the quicker you can roll the ski from edge to edge. Conversely, as you go wider the weight increases, quickness decreases, and it takes longer to roll from edge to edge.

- Narrower waists provide better edge grip since the edge is under your foot in the middle of the turn. In other words, the closer the waist width of the ski is to the sole width of your boot the more the edge is under your foot in a turn. The wider the ski the longer it takes to roll onto the edge, and since the edge is farther away from your boot sole it takes more leverage/energy to keep the ski on its edge.
- As the ski width increases there's obviously more surface area, which allows the ski to float higher on the snow. Skis in the realm of 102–145 millimeters can be wide enough to actually let you skid or pivot on top of soft snow just as you would on the groomed.

Recognizing the close relationship that exists between waist width, turn radius, and rocker, ski manufacturers have come up with some general performance guidelines regarding waist width:

- 68–78 millimeters: These skis are carve-oriented, thanks to the combined edge grip and quickness of a narrow ski. Carving-or race-inspired skis usually have a traditional camber or, at most, a small amount of tip rise to allow the tip to play an active role in pulling the ski into the turn and creating power and energy through turn completion. This category is home to the highest-performance groomed/hard snow carving skis, requiring high performance, high energy, and high mental and muscular output.
- 80–95 millimeters (mid-fat or all-mountain category): Rocker skis in this category make for easier turn initiation since they are more steered than carved. You give up some edge hold and carving performance for all-mountain versatility. Those who favor these skis can still lay down some tracks but, with a turn radius of 15 to 20 meters, they mostly have a medium to long turn shape. Generally, the wider the waist the longer the turn radius.
- 100+ millimeters: The emphasis here is on off-piste skiing, where flotation and smooth turns are the order of the day. The larger and more pronounced the rocker the more the ski floats—at the expense of the tip pulling through the turn. With these skis, turns are more guided and shaped versus carved, except for long-radius turns where you can potentially lay them on edge. The width, combined with reduced edge surface due to rocker, makes for less edge grip in harder snow conditions. Turn radius goes from 21to 40-plus meters, since in this category you don't really want to make quick turns—or have the ski tip "hook up."

SUMMING UP

Today's skis represent a very good blend of performance, forgiveness, and versatility, so it's hard to make a poor choice. The decision should be based on what terrain and conditions you want the skis for. Are they your main daily ski or are they for more specific conditions? Selecting ski width and rocker profile is as much a matter of function as style and image in many areas.

A general trend I'm starting to see is less emphasis

AS FOR WOMEN AND JUNIORS...

The information in the accompany chart generally applies to women as well as men, except for the fact that women-specific skis have flex profiles, sidecut dimensions, and mounting points that do make a difference for female skiers. Within lines of women's models, skiers have the same options with regard to construction (metal or no metal), ski weight, waist widths, and rocker options.

Skis made for the junior market may feature similar rocker choices, but it depends on the manufacturer. There will be less choice of waist widths relative to the type of rocker. That said, the waist widths in the chart are quite close to the offerings in junior skis, which run from 65 millimeters underfoot to approximately 100 millimeters.

The logic holds true of narrower waist widths being quicker, more responsive, and lighter. The wider you get the better the float and more all-mountain versatile the ski is—with the 100 millimeter waists being more off-piste driven.

The skier's weight plays some role here but, in reality, juniors like the wider skis more because they are cool, not because they boost actual performance. Tuning is very important. A good tune and proper wax makes more of a difference than actual waist width, except for carving/race situations, where a narrower-profile ski is a definite advantage. ***—Mike Porter***

on "wider is better," as rocker has had a big impact on the skis' ability to float, reducing the need to always go wider for good performance in off-piste, variable snow. That said, width is often a matter of the skier's location and preferences for snow type and terrain. In the West, many ski with a waist width of 86 to 100 millimeters as an everyday ski, while on the East Coast the daily go-to ski is usually in the neighborhood of 74 to 86 millimeters. In powder-specific gear, I'm finding skis from 95 to 120 millimeters underfoot are the norm, with specialty skis going all the way up to 145 millimeters underfoot.

If you want more float you can either go wider or select a ski with more rocker. The wider the ski the slower the initiation, and the additional weight at tip and tail requires more energy to steer it over the course of the day. Powder-specific and specialty skis are still getting wider but become less versatile and more terrain-specific.

For those favoring more groomed and hard-snow performance, early rise/low rocker provides more forgiving initiation and consistency in transitions between turns while coming close to the performance of a traditional camber ski. Remember, too, that ski design and performance is directly related to how well the skis are maintained and tuned. Traditional skis are usually tuned with 1–2 degrees of base bevel, plus the tips and tails are detuned to minimize the risk of the tips hooking at initiation and the tails catching at the completion of the turn. Rocker skis have this built into the design.

And now for one last bit of advice before you or your student makes that new ski purchase. The best option is to demo some of the models to get a first-hand feel of the ski's performance or talk to someone who has the models you are looking at and read the reviews to see if the traits you are looking for are there. The good news is that ski quality is really good, so it's hard to miss.

If you take the time to get informed, you (and the students you advise) will be in for a great ride—whatever rocker option gets the nod. 32°

Mike Porter was on K2's product development team for 29 years, and from 1988 to 2002 served first as the training director and then the director of Colorado's Vail and Beaver Creek Ski Schools. He was a member of the PSIA Alpine Team from 1974 to 1996, serving as head coach for 16 years.

For more specifics on rocker offerings from various manufacturers and an article on how to teach rocker-equipped students, log on to TheSnowPros.org and check out the "Web Extras" for *32 Degrees*.