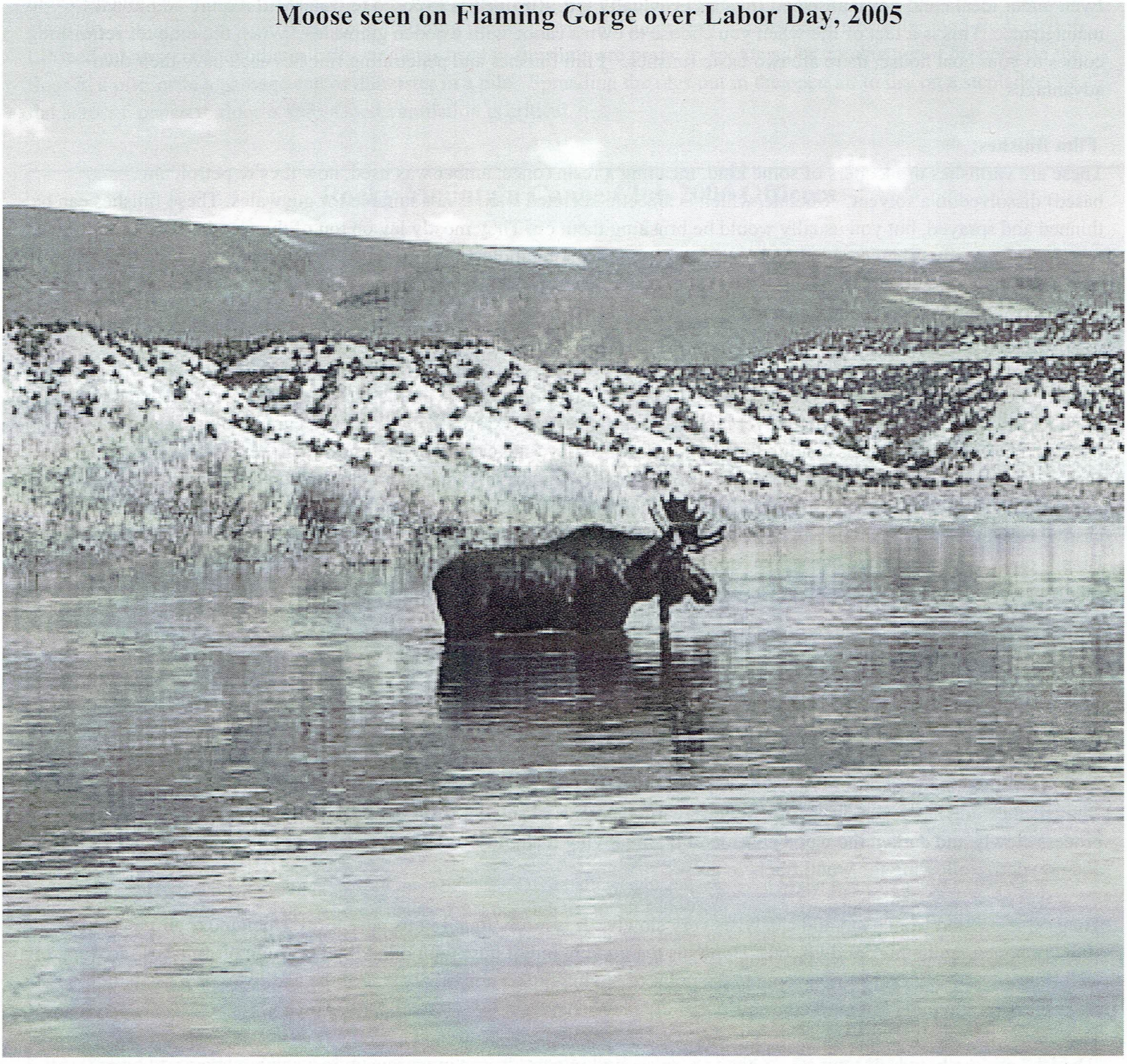
The Voyageur's Companion

Newsletter of the Rocky Mountain Canoe Club November 2005

Moose seen on Flaming Gorge over Labor Day, 2005



Keep in touch with RMCC on the web at:
www.Rockymountaincanoeclub.org

Photo by: Marci Nolan

The Care of Canoes with Wooden Gunwales

by Doug Green

A canoe with wooden gunwales will require more care and maintenance than a canoe with vinyl gunwales. As winter approaches, the first thing a canoe owner should do is loosen the gunwales RIGHT NOW because it's going to freeze TONIGHT and the canoe could suffer cold cracks when left outdoors or even in a garage. Next, store the boat upside down on its gunwales to prevent warping.

Even under ideal conditions, all wood finishes eventually fail. All finishes exposed to water will require additional maintenance. This is a fact of life when you choose to own a canoe with wooden gunwales. When the time for refinishing comes to your boat house, there are two basic finishes. Film finishes and penetrating finishes each have their own advantages.

Film finishes:

These are varnishes or lacquers of some kind, meaning a resin (once, amber was used, now they're petroleum based) dissolved in a solvent. Shellac, which is a beetle-secreted wax, is not suitable for gunwales. These finishes can be thinned and sprayed, but you usually would be brushing them on. They mostly lay on top of the wood and bond to the wood mechanically. They cure in hours to a day by cross-linking molecules into sheets as the solvent evaporates. When a film finish fails, it will peel in sheets. The canoe owner may sand out the rough spots each winter and recoat. The finish gets lumpy and pitted and gains "character" every year.

Lacquer would probably work but is such nasty stuff to brush on and clean up. Spar varnish is soft and yellows and fails quickly but is easy to sand out smoothly when it fails and therefore yields a nicer finish over the years. Urethane varnishes lay thicker and cure into layers better, yet yield a "feel-the-wood" texture. Poly-urethanes cure both in sheets and between sheets within a layer, making them tougher yet visibly thicker with a "feel-the-finish" texture and are harder to sand out smooth over time. Water-based polyurethanes still contain solvents, and are prone to whitening called "blush", but clean up easier with water. Oil-based single- and poly-urethanes brush on and clean up with odorless mineral spirits easily. However one should use an organic vapors respirator even with good ventilation when working with all of them. Brands don't matter but price does. You might want to use the cheapest brand and follow the maker's directions. Watch out because some makers are adding colorants now. Use clear gloss or satin unless you want some color.

Penetrating finishes

These are oils which penetrate into the cellular structure of the wood to a degree. There are two kinds of penetrating oil finishes, curing and non-curing. Curing oils eventually polymerize into a solid resin which resists degradation quite well except around water. Non-curing oils do not polymerize and eventually wash away. Mineral oils never cure. Vegetable, nut and seed oils rarely cure and usually go rancid. So called "lemon" oils are nonsense -- there's a lot of snake oil in the "oil finish" market, most of it mythic, misleading and deliberately confusing. Linseed oil does not cure unless it is "boiled" meaning has Japan driers (mostly rare-earth elements in small quantities) mixed in which catalyze the curing process slowly and darken the wood considerably, muddying it slightly. When oil finishes fail they don't peel, they whiten and powderize allowing the wood fibers to grey.

Tung oil is pressed from a nut and catalyzes very slowly. It is rarely found in its pure form which looks and feels like slippery honey, quite thick and viscous. Hope's is the good brand of pure tung oil. All other "tung oil finishes" are tung oil well-thinned with mineral spirits, some to the point of having little Tung oil at all. All the additives such as "lemon oil" are useless for anything but marketing.

"Danish" oils are blends of tung oil, urethane varnish, and mineral spirits in various ratios; some makers add boiled linseed oil, causing the finish to muddy and cure more slowly hence looking more "antique". Danish oils without linseed oil cure faster and are clearer, penetrating, and form a slight film finish.

Refinishing

When refinishing, sand well with 150 or so grit and wipe clean. For oil finishes, sand again with 220 grit. For varnishes, brush on with a bristle brush and clean up according to the can. Observe any temperature restrictions. All oil finishes should be applied with a rag, allowed to tack, then wiped clean and rubbed out with more clean rags before it dries. For gunwales, use small quantities at a time. Wet a good clean cotton t-shirt rag about 8" square and keep it wet without dripping finish away. Apply finish liberally to the gunwale, repeating applications to keep the surface moist for at least 20 minutes, until it starts to get tacky to the application rag. Don't drench the gunwale or the rag; just keep the gunwales moistened by continually wiping on a little more finish until it starts to get tacky. Then wipe it off completely with more clean dry cotton t-shirt rags. Wear good finishing rubber gloves and an organic vapors respirator with good fresh airflow. Linseed oil also cures exothermically, and rags used in finishing are prone to spontaneous combustion if dropped on the floor in a pile, or in a garbage can or dumpster in a pile. Spreading the rags out in the open air to dry on a stepladder or flat across a concrete floor is safe. Good ventilation is critical.

Rocky Mountain Canoe Club 2006 Officers

Trip Planning Coordinator:	Ned Banta	President:	Dave Allured
Conservation:	Greg Jankowski	Treasurer:	Paul Holscher
Membership Recruitment:	Karen Jankowski	Webmaster:	Jeanne Willson
Quartermaster:	Doug Hurcomb	E-mail list manager:	Dave Allured
Advertising:	Clem McHale	ACA Instructors:	Bob &Jill Stecker
Newsletter:	**Help Wanted**		Jeff Oxenford

Letter from the Outgoing Presidents

Dear RMCC Paddlers,

Justin Gilbert and I have greatly enjoyed our year as Co-Presidents. We would like to thank everyone for their support, especially the retiring officers of the club. Lyn Berry edited countless newsletters over the last several years, and having tried the newsletter job myself now, I know what a time consuming position the newsletter can be. (I wondered how Lyn would lose the articles I had sent to him for publication, but I know now, since I lost two articles that people had sent to me!) I would also like to thank Karen Amundson for her years as Trip Coordinator, especially for having motivated so many people to lead trips and to apply for permits. Thanks to Doug Hurcomb for a wonderful job of contacting advertisers for the newsletter since our club treasury is showing the positive results of Doug's efforts. Doug Green has also retired as our conservation officer and we would like to thank him for keeping us aware of the many conservation issues in our region. Thanks also go out to the Aikens, (quartermasters), and Dave Allured (webmaster) for their time given to our club.

At the annual meeting Lara from American Innotek showed us a light weight and approved Mylar bag alternative to the white box we carry on our multiday trips. Our Treasurer reported that our club has about $4000 and about 180 members, up about 20 members from last year. Discussion was held on club expenditures. The decision was made to obtain rebar steel stakes for the rendezvous tent. Also club funding was approved for the Dragon Boat race, trip leader incentive lottery gifts, and river permit application party funding. A Newsletter Editor and a leader for the Dragon Boat race are needed as soon as possible. Please contact Dave Allured if you are interested in either of these positions.

It has been a successful paddling year in that many were able to paddle the Dolores River for the first time in many years. It was a welcome treat in 2005 to have had rivers running with adequate water. The multitude of trips on our website and the number of people in attendance at the Rendezvous was spectacular. Thanks to everyone for making it a great year!

Justin and I are looking forward to seeing everyone on the river again next year!

Bonnie Gallagher

Member Spotlight

This month the spotlight is on **Bob Cook**, a name synonymous with running the toughest rivers in the region. **The interview conducted and scribed by Scott MacDonald**.

How did you get started in canoeing?

Bob: Back in the late '70's, right out of college, I got a job as a church camp counselor in the Boundary Waters Canoe Area. They had a two week training session. After that I got together with friends and we would do about one trip a year in aluminum canoes.

I joined up with the RMCC in '94, after moving back to Colorado. I

first paddled with Lowell Stevens (a past RMCC president) on Shoshone where I got my first feel for whitewater.

You've paddled many boats. What do you paddle now and what was your favorite?

Bob: I paddle the Ocoee for technical water and I paddle the Outrage X in bigger water. I consider both my favorites for their

respective purposes. I also have paddled a Penobscot 16 with my wife when we get the opportunity to go together.

What are your favorite rivers?

Bob: I enjoy paddling our Colorado Rivers, like the Poudre and the Ark,

but my favorite is probably the Kananaskis in Alberta. The Rogue in Oregon, the White Salmon in WA Washington and the Middle Fork, Selway and Lochsa in Idaho were also wonderful. I would also love to run the Eleven Mile section of the South Platte with club members if it ever comes back up past 200 cfs. That ran for about a month after the Hayman Fire a few years ago and was a wonderful class IV-V run.

What was your toughest river?

Bob: Probably the Bailey Run on the North Fork of the S. Platte. Barrel Springs and Black Rock section of Clear Creek were also challenging.

What other activities do you participate in?

Bob: I do backcountry and telemark skiing, hiking, backpacking, peak

climbs and some biking as well.

If you won a million dollars what would you do?

Bob: Huh? What? I guess if money was no object I would involve

myself in creating an experiential educational center for young people. I have been privileged to be part of professional endeavors that were wonderful growth experiences for staff and students, but funding always ran out before we could see programs fully develop.

Bob Cook paddles Pine Creek Rapid on the Arkansas River

Basic Physics of Whitewater Canoeing by Jim Baker-Jarvis

Overview of the Physics of Turning

Each type of canoe reacts differently to paddle strokes. However, there are some generalities. As we plant the paddle in the forward stroke and exert force, the reaction force of the water on the paddle moves the canoe forward. Ideally, the paddle stays relatively stationary in the water and we move the canoe up to the planted paddle. The angle that you hold the paddle in the forward stroke in the water is important. Generally, it is best to have a vertical paddle close to the boat. This brings us to torque.

If a turning torque is applied to a stationary, rockered canoe, it will pivot about the center of gravity. However, the canoe behaves differently when it is moving. When underway it is harder to move the bow sideways with draw strokes, whereas the stern moves relatively easily in the eddy-like flow. This difference in the bow and stern is important in maneuvering. Some whitewater boats are so rockered, the bow is out of the water such that correction from the bow does work as the boat moves through the water. Touring boats, with less rocker, can be hard to correct from the bow and a paddler may have to resort to a strong bow pry. We learned this lesson from our 20' tripper loaded with gear, kids, and dog.

Turning Dynamics

If a single forward paddle stroke on the left side of a solo canoe is exerted on a canoe that is at rest and flat in the water, it will both move ahead and rotate. The center of gravity will move pretty much straight ahead and the canoe will rotate about the center of gravity.

Torque and the Pivot Point

Turning a canoe can be accomplished by a combination of leans and paddle strokes. Torque is a force applied through a lever arm. Turning with paddle strokes uses torque exerted on the canoe by the paddle. Leans can enhance or impede turning a canoe by merely shifting weight on the knees. (*For the technically minded: The torque applied on the canoe is equal to the force exerted times the component of the lever arm perpendicular to the force.*) There are two important classes of torque that the paddler applies to the canoe. In the first torque the lever arm is the distance from the point of the forward paddle force application to the axis of the canoe (type A, forward strokes). The other torque is from the center of gravity along the axis of the canoe to a point adjacent to the application of the paddle force (type B, pry corrections and draw strokes). In the forward stroke we minimize the torque effects by keeping a vertical paddle close to the boat. For example, in the forward stroke, the turning torque is approximately the force times the distance from the paddle to the centerline of the canoe (see Figure 2). In the extreme case if we could paddle directly underneath the canoe, the boat would not turn at all. We see that as the distance increases from A_1 to A_2, this torque increases. This is the reason for maintaining a vertical paddle close to the canoe. In sweeps we maximize the turning torque applied. The stern pry and draw use torques of type B and have more effect if executed further from the pivot point. This is illustrated as strokes B_1 and B_2 (see Figure 2). However, body mechanics may not favor a position as far back as B2. The J stroke and pitch stroke maintain canoe direction by introducing compensating torques. The torque from the forward stroke (type A) turned the canoe offside is compensated by a torque of type B turning the paddle blade during the stroke and applying a force away from the canoe. It is usually more efficient (and also more advanced and difficult) to cancel out the unwanted torques of type A and B by well-executed leans. Also consider a stern pop pry. This stroke is a short powerful stern pry of about 6-12". The idea is to produce a short stroke with a large force to maintain forward momentum and yet cancel out the torques. If we sweep out too far in a pop pry, we lose our forward momentum and we get in the familiar mode of "one stroke forward" - "one stroke back". In short, a strong stern pop pry does the same torque correction without slowing.

If a canoe is moving forward, a bow wave forms around the bow and the stern is in eddy-like water as shown in Figure 2 and the frictional forces on the canoe are no longer the same along the canoe. In rockered whitewater boats the bow is nearly out of the water so there is little bow wave. When moving, a pry stroke at the stern turns the canoe easier than a pry at the bow. When the canoe is moving forward, the force of resistance of moving the bow sideways or laterally (f_s) is greater than for moving the stern sideways (f_s) and therefore we can say the effective pivot point is in front of the center of gravity. We can define the effective pivot point as the point along the canoe where when a draw stroke is performed the canoe moves perpendicular to its forward motion. An extreme example of this is on a smooth surf wave where it is almost impossible to correct from the bow, but the stern moves freely. In this case the pivot point is near the bow. The opposite case is when someone paddles a tandem boat solo from the stern and the bow is out of the water. Then the pivot point is near the stern. For a stationary canoe it is near the center of gravity. In canoe tripping sometimes paddlers over-weight the bow, moving the pivot point forward, making it easier for the stern person to maintain a course.

Where is the effective pivot point at various speeds?

One way to study the pivot point in a solo canoe is to perform static sideslip draws as shown in Figure 2 (Draw 1 and 2). In a sideslip a static draw force (f_s) is used on a moving canoe to move sideways. The net torques about the static draw from the bow and stern frictions must cancel to prevent rotation. This requires delicate paddle placement. As the canoe moves forward and sideways there are friction forces opposing both the forward and sideways movements. Torques about the static draw can be shown as originating from friction forces at both the bow and stern. Consider a canoe moving forward with a static draw performed to move the canoe left (draw #1 in Figure 2). For solo whitewater boats to move sideways with the bow continuing to travel straight ahead, the static draw is planted adjacent to the paddler's hip (static draw #1 in Figure 2).

In whitewater boats we can use lean to turn the boat in a graceful arc. A solo whitewater boat can move in a circle (called "inner circles") if we lean the boat toward the center of the circle and paddle on the side of the canoe that is toward the center of the circle using forward strokes or cross-forward strokes without correction. This type of motion is analogous to riding a bicycle on a banked racetrack. The slight lean to the inner part of the circle keeps the boat moving in a circle rather than going in a straight line.

Peel-outs and Eddy Turns

In an eddy turn the paddler must lean into the turn as the center of the boat crosses the eddy line. This maneuver is again a cancellation of torques. If the paddler remains in a vertical posture or leans downstream, the boat flips due to a sudden change in the direction of the current which creates strong torque, moving the canoe out from under the paddler, now swimmer. To counteract this, a paddler must lean upstream when crossing the eddy line to produce a counter torque. The same is true for a peel-out, although now the paddler must lean downstream, because the change in current direction is opposite.

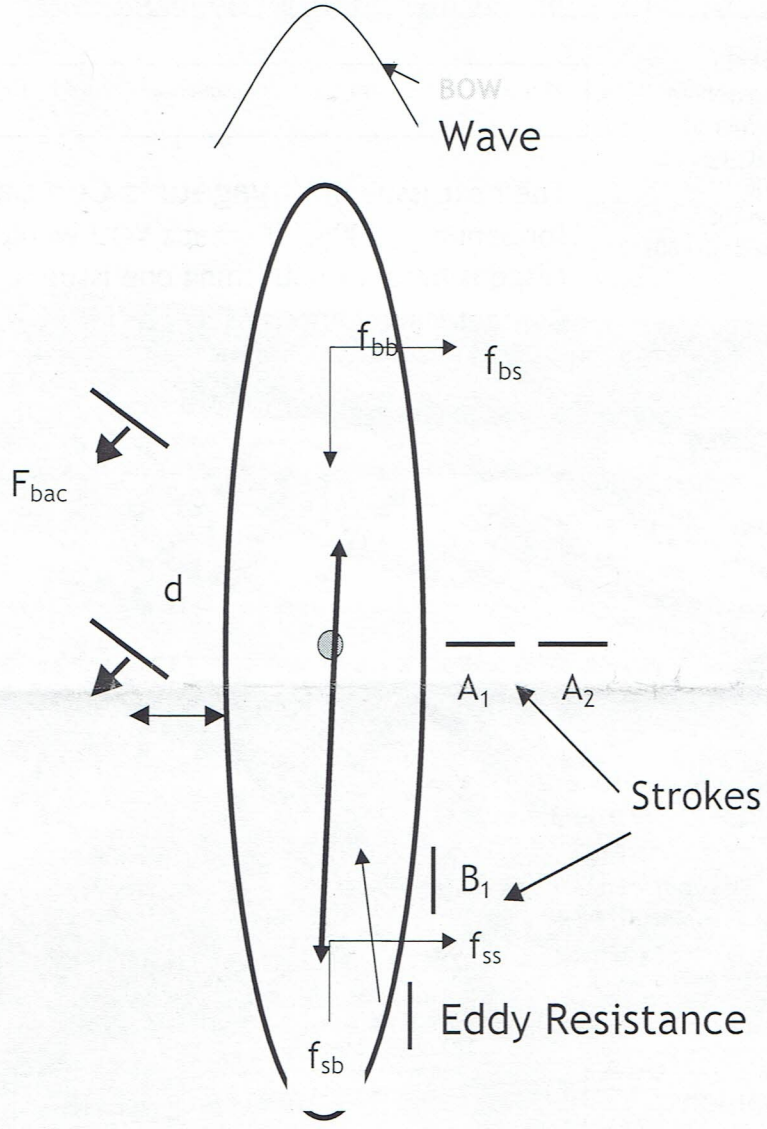


Figure 2: Strokes and torque. Also sideslip draws. f_{bb}=forward friction at bow, f_{bs}=sideways friction at bow, f_{sb}=forward friction at stern, and f_{ss}=sideways friction at stern.

Who were those Mystery Paddlers????

Did you guess that Karen Amundson summitted Popocatepetyl? Paddler A

Did you know Don Griffiths of McCall Idaho built "Old Ironsides?" Paddler B

Kelly Banta was paddler C and was first canoeing at age 1 with her parents, Ned and MaryAnne.

RMCC 2006 Pool Sessions

Canoe Only	George Myers Pool	Shared Session with CWWA
January 8, 22	7900 Carr Drive, Arvada	January 15, 29
February 5, 26	11a.m. to 2p.m	February 19
March 12, 26	$7.00	March 5, 19
April 23	Contact Karen Jankowski with any questions 303-989-4833	April 9, 30

RMCC Membership
$20 per year per Household
Contact Paul Holscher at

This issue of the Voyageur's Companion was edited by Ken Bauer and Bonnie Gallagher.

The next issue of **Voyageur's Companion** is scheduled for January, 2006. Perhaps **YOU** would like to assume the responsibility of publishing one issue or being the Editor. Contact Dave Allured or any other Board member.

Newsletter of
The Rocky Mountain Canoe Club,
An **American Canoe Association Paddle America** partner.

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C/O Membership

Englewood, CO 80113