

# Developing Power and Speed in Wildwater

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Power is the ability to produce force rapidly. Power is a critical component in the endurance sport of wildwater racing. Wildwater is competed over a finite distance, so the winner is the person who completes the distance in the fastest time – in other words, the most powerful person. While endurance is obviously important, you still need power and speed to be successful. Speed and power in any sport depends on **genetics, metabolic capacity, muscle strength and size, nervous system capacity, and skill**. With the exception of genetics, your training program must address each factor to maximize speed and power for wildwater.

## Genetics

Great wildwater athletes like Marcus Gickler and Vladi Panato were born with the capacity to produce great power when they move. They are genetically gifted. However, they have had to train very hard to maximize this potential to become the multiple World Champions that they are. Average people cannot expect to equal their physical prowess no matter how hard they train. However, you can dramatically improve your performance if you systematically develop the remaining components of power.

## Metabolic Capacity

Wildwater uses all three energy systems (ATP – Aerobic – Anaerobic), placing primary emphasis on the aerobic system for classics and the anaerobic system for sprints. Unlike most sports that rely on one system, the successful wildwater paddler must master two. You must develop the energy systems that sustain the movement in our sport.

## Muscle Strength and Size

A muscle's ability to exert force is largely determined by its size. Larger muscles have more tissue to contract so they exert more force. However, the rate that muscles exert force is more important than the absolute force in determining performance. While weight training is very important for developing power for wildwater, it will not be effective unless you can learn to use your new strength in the boat. Effective strength (strength you can use while paddling) is determined by your nervous system's ability to control your muscles and the skill with which you execute movements.

## Nervous System Capacity

Your nervous system's ability to recruit motor units (muscle fibers + nerve) is critical for generating power. Scientists have discovered that you can only train motor units if you recruit them. The large, powerful motor units are only recruited during maximum powerful movements. If you want to train those motor units, you have to do maximum, explosive movements while training. High resistance weight training helps recruit these difficult to train motor units. Doing high speed training exercises and plyometrics also overload the motor units that make you paddle faster. Not only do you turn on these "performance" motor units, you activate them longer. This allows you to sustain powerful movements during racing. Like strength training, plyometric and speed exercises are only effective for improving sports performance if you also practice the skill. Research studies show that simultaneously practicing speed and plyometric exercises and the skill produces rapid improvement in sports performance. Strength training takes much longer to transfer to skilled movement. However, both weight training and speed-plyometric training eventually produces more powerful movements if integrated into a long-term, systematic training program.

## Skill

Skilled paddlers make it look easy with an economy of effort and little wasted motion. All their force is focused on moving the boat forwards. This is possible because these athletes can precisely channel their power into the skilled movement of paddling forwards. Skill is the capacity to perform a specific movement. Skilled movements are orchestrated by your nervous system so

that body positions and muscle contractions occur in precise sequences and speeds. The purpose of practice is to reinforce correct movements that produce more skillful performance. At the same time, you try to eliminate inefficient or incorrect movements. Skill is a prerequisite to successful performance in sports regardless of your physical condition. Many athletes mistakenly emphasize weight training at the expense of skill development. Strength gained in the weight room transfers very slowly to the river. In fact, you can increase strength by 20 to 30 % in the weight room and have absolutely no improvement in power in the boat. Only if you practice the skill will your movements become more powerful. Powerful, skilled movements depend on skill practice as well as conditioning. Skill can overcome physical and conditioning deficiencies. Proper body positions, use of leverage, and timing can produce great force. Also, you are much less likely to become injured when you move skillfully. Skilled movements depend on good movement postures, which place much less stress on the bones, muscles, and joints.

### **Training for the Sprint**

When sprinting, peak power occurs during the first 3-5 seconds, after which power starts to drop off. The winner of a sprint race (assuming a flat and easy course) is the person with the highest peak power output and the person who slows down the least. When developing power for wildwater, you need to enhance the capacity to accelerate (go from a stationary position to full speed in a short time) and change directions rapidly. You can build these capacities with proper training and conditioning. Technique is critical to powerful movement. When sprinting, use the large powerful trunk muscles and legs to drive the boat forwards. Don't simply spin your arms.

#### **Short Sprint Training**

Short sprints from 5 to 15 seconds help develop the paddling muscles and also acceleration. As mentioned above, emphasize correct technique. Drive your torso muscles and do not flail your arms at high speed. Increase repetitions as you develop fitness.

#### **Lateral Sprints**

Rarely in wildwater do you point downstream and simply paddle powerfully. There are obstacles to avoid and faster lines to hit. Using buoys set a zigzag course where you only paddle straight for a boat length or two, change direction, speed and repeat.

#### **Resistance Sprinting**

Adding resistance to the boat also overloads your muscles (fast twitch motor units) during high speed sprinting. Eastern European coaches learned the benefit of resistance a time ago. Two types of resistance can easily be added to your boat. External Resistance - Add a bungee or rope around your boat. Position it around the boat in front of the cockpit and the boat will still handle well. The more bungee you add the bigger the resistance. Sprint 3-15 seconds adding repetitions as you gain fitness. Do not attempt any resistance sprints until you have first practiced short sprints for several weeks. Internal Resistance - After getting in your boat, place a large rock, brick or stone inside your boat between you legs. The heavier the rock the greater the resistance you will experience. Adding weight inside your boat does not affect the way your boat will handle too badly, so this form of short sprint training can be comfortably practiced on whitewater.

#### **Upstream Sprints**

Paddling upstream is a tried and true technique for developing power. Find an easy river with numerous rapids and paddle upstream. You'll need tremendous power and speed to attain up some rapids. As you develop power and confidence you can attain harder and harder rapids.

#### **Bounding**

This common exercise from running and swimming can be modified for wildwater paddlers. Bounding helps build stroke length. Rather than take many strokes in a short distance, attempt to take as few strokes as possible over a longer distance. As you develop power, the number of strokes will be reduced.

### **Designing your Training Program**

To improve sports performance, one must balance skill and fitness development. People interested in higher levels of fitness should do some type of aerobic exercise 3 to 5 times or more per week, resistive exercise 2 to 3 times a week, and flexibility exercises 5 to 7 times per week. If you want to become faster and more powerful, include interval training and power and plyometric exercises in the program. Choose enjoyable aerobic exercises but place primary emphasis on paddling. Do aerobic exercise for at least 20 minutes. If you cannot do 20 minutes at first, build up to it gradually. You can do resistive exercises on the same day as you do aerobic exercises. However, serious weight trainers and paddlers often do resistive and aerobic exercises on separate days. For example, you might paddle distance on Monday, Wednesday, and Friday and lift weights or focus on power sprints on Tuesdays and Thursdays. Rest on Saturday and Sunday. Do flexibility exercises at the end of each workout. This insures, your muscles are warm and able to stretch more than when they are cold. Also, you will be less susceptible to injury. Be consistent with your stretching program. You can develop considerable flexibility by stretching for only 10-minutes a day.

### **Fitness Programs for Power Sports**

There is no single program appropriate for everyone. In general, during the off-season, develop skill and general strength, endurance, and flexibility fitness. As the season nears, place increasing emphasis on skill, power, and speed. The central goal of the wildwater racer is to develop movement skills in the sport. A tennis player who cannot serve or hit a good forehand or backhand will not do very well in a match, no matter how good his or her physical fitness. The best results are achieved by systematically integrating fitness and skill.

### **Skill Development**

Work on specific skills all-year long. This is important for both the competitive and recreational paddler. If you only race seasonally, try to work on skills at least 2 days per week during the off-season. Make sure to practice the correct movements. Repeating mistakes will only reinforce mistakes and poor movement patterns. Do not use bad weather as an excuse. When it is raining stretch, go to the gym, cross train, or better yet use a paddle ergo like a SpeedStroke by KayakPro. There are also good forward stroke instructional videos by Brent Reitz and Greg Barton. During the season, increase the amount of time practicing skills. During the race season, practice skills at least four days per week. Do not substitute fitness for skill development. The paddler with poor technique will still be slow, even if he or she can run fast or has a great bench press. When combining sports and fitness, develop strength and endurance during the off-season. As the season nears, place more emphasis on power, speed, and plyometric training. During the race season, the goal is to maintain strength and endurance fitness.

### **Endurance Fitness**

Endurance athletes should practice over-distance training to develop endurance capacity, interval training to develop speed and pace, and weight training to develop strength and power. During the off-season, emphasize over-distance training. As the season nears, include more interval training workouts. Lift weights all-year long. During the competitive season, strive only to maintain strength by lifting weights 1 to 2 times per week.

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