

Black Water - River Diver Specialty Course Outline

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I. Course Overview

The purpose of the Black Water - River Diver course is to familiarize the student with the knowledge, skills, organization, procedures, hazards, benefits, and enjoyment of making a safe and enjoyable dive in conditions of rapid current and limited visibility. The goals of the Black Water - River Diver course are:

- A. To enable the student to plan, organize and conduct a dive in an Riverine environment characterized by tidal current flow, limited light penetration, and varying bottom composition.
- B. To properly evaluate a river site to determine the probable bottom composition, and to predict the effects of water movement on the diver during various phases of the planned dive.
- C. To properly navigate in a current in order to safely return to a point of entry before entering a low on air situation.
- D. To acquaint the sport diver with the different ecosystem characteristics of black water and rivers.
- E. To acquaint the diver with the tools, techniques, and procedures for conducting a dive in a rapid current situation.
- F. To prepare the diver for the rigorous diving situations which may be encountered on dives conducted as part of the Underwater Archaeology Diver Course which may be conducted in historic dive sites along the coastal rivers.

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II. Black Water - River Diver Course requirements.

*ask
to change
these
prerequisites*

- A. Prerequisite Certifications: ~~PADI Advanced~~ Open Water certification or equivalent rating (as defined in the PADI Standards and Procedures Manual edition current as of the time the course begins). Previous limited visibility diving experience is highly recommended.
- B. Minimum age requirements: 18 Years of age *12?*
- C. Student to instructor ratio: 8:1
- D. Confined water training may be added at the discretion of the instructor conducting the specialty course. As a preassessment before the course begins, a confined water session may include a scuba skills review. The skill evaluation circuit is an excellent way to accomplish this review.
- E. Dive Data
 1. Two scuba dives, which may be conducted in one day.
 2. Dives are to be conducted no deeper than 100 feet. The PADI Deep Diver Course (or equivalent) is a highly recommended prerequisite if training is to be conducted at depths which would be recognized as a deep dive by the PADI Standards in effect at the time of the course start date.
 3. At no time are divers to be encouraged, required, or intentionally allowed to make a dive which would require a decompression stop. Safety Stops, however should be included on all dives.

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III. Student and Instructor Equipment Requirements

A. Student equipment.

1. All personal standard diving equipment appropriate for the local diving environment including:
 - a. Mask, Fins, And Snorkel
 - b. Exposure suit appropriate to the local diving environment and depth, including hood, boots and gloves or mitts, if needed.
 - c. Quick release weight belt or weight system.
 - d. Regulator system with submersible pressure gauge.
 - e. Alternate air source suitable for sharing air with other divers.
 - f. BCD with low pressure inflator mechanism.
 - g. Complete instrumentation, including a means to monitor depth, time and direction.
 - h. RDP, The wheel or table version, and/or a dive computer capable of determining remaining no decompression times.
 - i. Diving tool or knife capable of cutting line.
 - j. ~~Pliers, such as electricians sidecutters, capable of cutting trotline and heavy duty fishing line.~~

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- k. Extra weights to act as ballast during heavy current dives on hard bottom dives sites.
- l. Major Dive light and ~~two~~ ^{one} secondary lights.
- m. ~~Buddy line consisting of 1/8 inch nylon cord.~~
- n. Slate with pencil.
- o. Whistle.
- p. Diving log book.

2. Instructor Equipment.

- a. All personal standard and specialty equipment required of students.
- b. Safety Equipment
 - (1) Boat or surface float with weighted line or other arrangement for making safety stops at the 15 foot level, unless the dive is to be conducted to a depth of less than fifteen feet.
 - (2) First aid supplies and equipment. Recommended: First aid kit, pocket mask, and oxygen, if not precluded by state law.
 - (3) Rescue throw rope

3. PADI Materials that may be used to teach the course

- a. PADI Instructor Manual.

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- b. Student Record File.
- c. Student folder.
- d. The PADI Adventures in Diving - Advanced Training for Open Water Divers.
- e. The PADI Encyclopedia for Recreational Diving.

4. Other materials and tools provided for the course

- a. Rope and weights for constructing reference lines.
- b. ~~Steve Ranger~~ Compasses for use as back up compasses.
- c. 7.5 minute topographic maps of the dive area

5. Other Reference Materials

- a. The South Carolina Institute For Archaeology and Anthropology Underwater Archaeology Manual for South Carolina Sport Divers.
- b. ~~White water canoeing instructor's manual (for "Reading the water" and river topography analysis)~~

6. Recognition Materials:

- a. PIC Envelopes
- b. Distinctive Specialty Diver Certificates

IV. Academic Topics

- A. Introductions, Course Overview, and Welcome to the course.

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1. Staff Introductions.

- a. Yourself, assistants, visitors.
- b. Students introduce themselves.

2. Course Goals.

- a. To acquaint the student with the origin and characteristics of black water.
- b. To acquaint the diver with methods of reading the river water flow and analysing the underwater effects of surface currents.
- c. To provide the student with a basic knowledge of underwater navigation techniques in a rapid current, low visibility environment.
- d. To provide knowledge about Animal life indigenous to black water and riverine environments in order to overcome the natural fear of these creatures.
- e. To improve the student's diving skills so that he may safely perform diving activities in a local diving environment somewhat more hostile than typical ocean or lake diving.

3. Course Overview.

a. Classroom presentations

- (1) There will be one classroom presentation during this course

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b. Pool Sessions

- (1) There will be one pool session during the course to evaluate your diving abilities. *if deemed necessary*

c. Performance Assessment

- HP* (1) Your diving skills will be assessed ~~during the pool~~ and open water dives. Your academic assessment will be made from the practical exercises done during the course.

4. Certification

- a. Upon successful completion of the course, A PADI Black Water - River Diver distinctive specialty card will be issued.
- b. Certification means that the student will be able to:
- (1) Plan, organize, make and log dives in local riverine and coastal swamp areas.
- (2) Apply for the rating of Master Scuba Diver if:
- (a) You are a PADI Divemaster with certifications in four other specialty areas (in addition the Underwater Archaeology Research Diver), or
- (b) You are a PADI ~~Advanced Open Water Diver~~ *Open Water* or ~~Advanced Plus Diver~~ and a PADI Rescue Diver with certification in four other specialty areas (in addition the Underwater Archaeology Research Diver).

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5. Class Requirements

- a. Cost of Course.
 - (1) Include all costs, license fees, etc.
 - (2) Does NOT include transportation or lodging
- b. Equipment needs (Discuss the equipment needs listed earlier)
- c. Materials used during the course
- d. Attendance requirements and make-ups

6. Administration

- a. Collect :
 - (1) Course fees
 - (2) Enrollment
 - (3) Standard Safe Diving Practices Statement of Understanding
 - (4) PADI RSTC Medical Statements
 - (5) Affirmation and Liability Release
 - (6) License Applications (if required)

B. Black Water - River Diver Concepts

1. Objectives: By the end of this session, you will be able to:

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- a. Understand what is meant by the term Black Water, and the psychological and physical differences in diving the black water environment.
 - b. Properly read the underwater characteristics of the dive site by analyzing a topo map of the area and observing the surface movement of the water.
 - c. Identify the major hazards of diving in rapid current.
 - d. Identify methods of configuring your personal diving equipment to minimize the effects of rapid current during the dive.
 - e. Identify and preplan several methods of self rescue which may be useful in Black water - river environments.
2. Presentation: (references in square brackets)
- a. Define Black Water
 - (1) Water which has attained a dark tint due to the effects of tannic acid leached from the trunks of fallen cypress trees in the rivers and swamps from which the water originates.
 - b. Local Sites and Conditions:
 - (1) Discuss the various rivers and swamp areas which are frequented by divers in the general area.
 - (a) Site name
 - (b) Entry sites typically used

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- (c) Equipment needed for this site (boat, drift line)
 - (d) Bottom characteristics and cross sections
 - (e) Wildlife hazards
 - (f) Historical structures (docks, locks, landings, shipwrecks)
- (2) South Carolina Sport Diver Program
- (a) Underwater Antiquities Act-responsibilities
 - (b) Ownership resides with the collector, but the state reserves the right to make copies/casts of the artifact for sixty days after reporting.
- c. Recording the Site (Preliminary Site map)
- (1) Locate on a map
 - (a) Intersecting azimuths
 - (b) Ranging landmarks
 - (c) Combination of the two
- d. Psychology of Black Water diving
- (1) Clear water, but no light penetration gives the diver the impression he is falling into a black hole. This is very disorienting to the descending diver.

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- (2) The presence of a current causes suspended particulate to drift laterally, further causing disorientation.
 - (3) A fear of animal life that resides in the area (alligators, snakes) which are commonly thought of as dangerous may cause further anxiety, much like the beginning diver feared sharks during his first open water experiences.
- e. The Black Water - River Environment
- (1) Characteristics
 - (a) Low light penetration
 - (b) Nonexistent to rapid current flow, which changes direction rapidly in response to tidal flows.
 - (c) Winding river course
 - (d) Generally shallow depth
 - (e) Animal life is a mix between fresh and salt water. Even have fresh water "Corals"
 - (f) Bottom composition varies from mud to sand to marl.
 - (g) Many historical shipwrecks, artifacts and building structures exist, making this dive environment most interesting.

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(2) Hazards

(a) Current

- i) Varies direction with the tide and eddies.
- ii) Can be extremely strong
- iii) Less severe along the bottom

(b) Visibility

- i) Generally clear, but short distance

(c) Fishing activity-trotlines

- i) One heavy line with many hooks can snare the diver's equipment in several places, making it difficult to retrieve a diver's knife.

(d) Wildlife

- i) Alligators - seen frequently on the surface but rarely encountered underwater. When encountered, back off slowly and change directions. Stay out of nesting areas located on grassy marsh areas. Alligators appear underwater as a log with ridges (body) or as a palm frond (tail)

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- (ii) Snakes - Can bite underwater, but generally will not. Most snakes will retreat from you. The Moccasin will become aggressive and attack without provocation. The moccasin will generally let you know he is around as soon as you get into his area, therefore, if you suspect moccassins are around, enter and exit via a descent line, and have a surface tender keep the entry area clear. Run a boat around the dive site often to keep them out of the area. If a snake is spotted, do not react quickly to it, but watch it, back off slowly, and descend quietly. If bitten, do not fight the snake. It will release and wait for any venom to take effect. Move away and exit the water.

f. Tools and techniques

(1) Current is friend and enemy

(a) Can help to tell direction and location

(b) Studying surface movement can assist in navigating underwater. Study eddies and backflows, draw a site map on your slate with a layout of the river course and visible current changes.

(c) Tides can make the currents stop or reverse direction. be aware of the effects and check the local tide tables.

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- i) Remember that tides do not follow the moon and sun. The tidal bulge must travel down the coasts to the rivers entry, then up river. This can take some time.
- (d) To travel in a current, travel across the bottom, keeping a low profile. Face into the current, and use a screwdriver or dive knife to dig into the bottom as a hold-fast. If severe currents arise, use two screwdrivers and "walk" your way across the bottom.
- (e) Travel the entire dive against the current. When the dive is ended, ascend and float diagonally back to the entry site.
- (f) DO NOT BREAK LOOSE IN A CURRENT. Traveling underwater in a heavy current, and with low visibility is dangerous and should not be attempted! Surface and call for assistance.
- (g) Carry a lift bag and line with you. You may be able to tie off to an object, inflate the lift bag, and use it as a surface support station until you can rest, set your compass bearings, or be picked up by a support crew.

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(2) Equipment Modification

- (a) Maintain a low profile. Consider under arm regulator hoses, and extra long alternate air source hoses. They may be looped over the shoulder against your neck inside the BCD and maintained against your body without sticking out or dragging.
- (b) Currents can open regulator exhaust valves if you turn your head sideways to the current. Different exhaust tee profiles are available to minimize this.
- (c) Gauge consoles may be placed on your lower back, under the tank to prevent them catching on submerged objects.
- (d) Lights may be mounted on helmets or headstraps to free up the hands. Consider also mounting them on arm straps. Keep spares inside the wetsuit top for easy access.
- (e) Drill holes in the handles of screwdrivers and insert lanyards to keep them on your wrists. These can be used to assist in movement against the current.
- (f) Carry lineman's pliers to cut fish hooks that get caught in your equipment. This takes only one hand and is quick and easy. Do not fool around with a knife in a current if you are hooked.

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- (g) Consider making and using ballasted creepers for use on the hard bottoms in the main channel. [NOAA Diver's Manual]

V. Open Water Training

A. Dive one (Orientation to Black Water)

1. Dive Objectives

- a. Students will be able to accurately draw a preliminary site map, indicating the following:

- (1) Direction references (North , Current flow)
- (2) Relative positions of major site features, such as entry points, bridge pilings, curves in the riverbed, etc.
- (3) Students will be able to indicate on the site map, the anticipated currents and compass directions relative to the current flow and bottom contour. (ie, the heading when parallel to the channel at point x is 270 degrees)

- b. Descend along a reference line to the bottom of the training site and rig a buddy line to each buddy member.
- c. conduct an orientation tour with a certified assistant.
- d. Return to the entry point, assemble and ascend.

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2. Conduct of the dive:
- a. Briefing by the instructor(s)
 - (1) Hazards in the area
 - (2) Safe Diving procedures
 - (3) Signs and signals to be used
 - b. Students plot the location of the entry point on a site map drawn on the dive slate or waterproof paper.
 - c. Don and check diving equipment.
 - d. Students will enter the water with the instructor, descend along a reference line, and assemble with a certified assistant at the bottom of the site.
 - e. The students will rig a buddy line of a length not to exceed ten feet and adjust it to a comfortable length.
 - f. In buddy teams, tour the training area with a certified assistant. The Assistant will indicate points of interest and demonstrate techniques of navigation discussed in the classroom. Students will each attempt to navigate a straight line for a short distance to ascertain the difficulty of the exercise.
 - g. Students will follow the progress of the tour on their site maps and make notations of navigation points that they may find useful on the subsequent dives. This will give the students practice using lights, maps, and compasses simultaneously.

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Must 10ft*

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- h. Reassemble at the entry point, and ascend as a team.
 - i. Exit the water and log the dive.
- B. Dive two (Navigation Exercise)
- 1. Dive Objectives:
 - a. Conduct a dive in a Black Water - river environment
 - b. Accurately navigate along the bottom for a distance of 100 meters and return to a point within 50 feet of the entry position. Keep in mind the principle of offset.
 - 2. Conduct of the dive:
 - a. Briefing by the instructor(s)
 - (1) Hazards in the area
 - (2) Safe Diving procedures
 - (3) Signs and signals to be used
 - b. Don and check diving equipment
 - c. Enter the water and descend along the reference line.
 - d. Assemble at the bottom of the site and rig a buddy line as in dive one.
 - e. Working as a team, layout a base line perpendicular to the current radiating out from the descent line for a distance of fifty feet. This line will serve as a reference line on the return trip.

also
navigation
(b.i.d.)

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- f. Note the depth ranges along the reference line as you return to the starting point.
- g. Navigate as a team upcurrent for a distance of 100 yards using the current (constant bearing) and return to the starting point by maintaining a depth appropriate to the range noted for the reference line. Upon reaching the reference line, return to the starting point.
- h. Again navigate upcurrent using the Compass for a distance of approximately fifty meters, and return to the starting point by using the reciprocal course.
- i. Exit the water, log the dive, and fill out the field book entries