

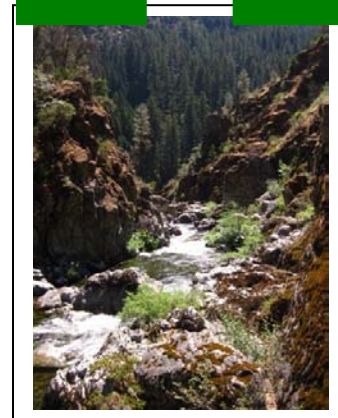


Lessons Learned

Fisheries Survey: Missed Take Out

Non-Injury Near Miss

August 2010



Note: This incident was reviewed using the June 2009 updated Facilitated Learning Analysis Implementation Guide.

Background:

Forest Service Fisheries Biologists have been conducting fish counting snorkel surveys in rivers on the Shasta-Trinity since 1978 with partner agencies and volunteers. Sections of rivers of varying length and technical difficulty are surveyed by teams of at least two divers. Each section or “reach” is flagged at one team’s put-in to identify the take-out for the team working upstream. Put-ins and take-outs can involve hikes of up to 3 miles and reaches can be from 1.6 to 5.8 river miles in length. The work is physically demanding, presents in-water hazards and is in remote areas often with poor radio communication. Divers are often exhausted before completing the reach and hike out. Access and exit points can be limited due to steep terrain along the river’s edge. Some survey reaches take two days and an overnight in wilderness.

Participants attend mandatory safety sessions for each event. Some dive gear is available although many participants provide their own gear including masks and snorkels. New volunteers select wading boots, wetsuits, hoods and gloves from a limited supply of equipment. Forest Service personnel must be First Aid and CPR certified. The Dive JHA and Field Medical Evacuation Plan are reviewed in the morning. Each dive team is provided with the JHA, Field Medical Evacuation Plan, laminated maps, radio, GPS, first aid kit, whistle, water thermometer and flagging to mark the put-in/take-out. The smaller items (paper, maps, flagging) are pre-packaged in Ziploc bags. All gear is carried in waterproof dry bags.

The survey team is made up of divers and non-divers. Non-divers act as support personnel to assist with shuttles, provide a human repeater network and check in divers. Pre-dive registration is required and an event fact sheet is distributed advising of schedules, operations, logistics and what to bring. Forest personnel reciprocate with partner agencies and also participate in other off-forest agency dives.

Incident Narrative:

After the morning JHA meeting, dive teams were provided with the Ziploc bags with needed items, including 3 foot sections of blue and orange flagging to mark the put-in/take-out. The dive team on Reach #5 decided to repack the items into a dry bag, but missed transferring the flagging. When they hiked in and reached their put-in, they realized they did not have the flagging to mark the take-out for the team on Reach #4 . They decided to improvise and found some old flagging and food wrappers to mark the take-out for the Reach #4 Team.

When the Reach #4 Team arrived at the improvised take-out marker, they were unsure if this was their marker. After deliberation, they decided that this was not their marker and continued down the river. After a distance and as fatigue set in, they realized that they were into the next reach and had missed their take-out marker. It was decided to hike upslope to the ridge to intercept the trail or road. It was not an option to complete the next reach to the next take-out because of the 5.8 mile distance, the technical difficulty of the reach and the lateness of the day. They selected an exit point and a cross country route to climb up toward the ridge. It was a steep, rocky route and took longer than expected. The goal was to reach the ridge by dark.

Contributing “Swiss Cheese” Factors:

- The date of this dive had been changed and there were cancellations and no shows on the day of the rescheduled dive. The result was that one team had to do two reaches to maintain the minimum two divers per team and there were not enough non-divers to provide shuttles and serve as a radio repeater network as originally planned.
- The felt-bottomed wading boots available for volunteers to choose from that morning at camp did not properly fit a new volunteer. As a result, river sandals were worn for the hike in, the river portion and the hike out.

- Since different agency radio frequencies differ, 2-way Garmin GPS/Radios (also known as “Family Service Radios”) have been used for communication between the dive teams. One Forest Service radio was carried for emergency calls and another was in a truck which served as a rendezvous site. Since much time is spent in the water, most radios are kept off until needed by a team.
- The 2-way radio had been tried twice: once at lunch and once at the start of the hike, but there was no contact.

Lesson(s) Learned and Recommendations from Participants:

- I would encourage divers to take the kit as provided and not re-pack it to ensure items are not misplaced.
- The trail at the mismarked take-out was not distinctive. I should have taken more time to scout around more to see if I recognized something. Maybe I should have hiked part of the 2.5 miles to see where we were.
- I think lat/long should be added to the river maps so that if in doubt about the take-out, the GPS could be used to confirm our location.
- I will take personal responsibility for any crucial pieces of equipment I will need.
- Volunteers should test available equipment before the day of the dive and/or be prepared to provide their own gear which requires a specific fit such as shoes and wetsuits.
- I would not recommend river sandals for the river portion or the hike out. They did not provide good footing or protection on steep terrain and were more slippery in the water than wading boots.
- I wasn’t in the right frame of mind that night. I’m glad I took the time to cool off before talking to the individual who failed to mark our take-out !
- **As a member of a team, each individual must recognize that the safety of others depends on us following the Plan. In this case, flagging the take-out is priority #1 for team safety.**
- I was exhausted from the dive and the hike out and probably should have considered getting some rest or sleep before driving home that evening.
- I always thought of After Action Reviews (AAR’s) as punitive, but now I see that AAR’s are good even if nothing goes wrong to identify opportunities for improvement.
- I would recommend doing trail maintenance on the trails in question.

Lesson(s) Learned and Recommendations from Facilitator:

- In addition to water filters, consider the adding a collapsible water bottle(s) for each team member to be available for overland sections if needed. Food and a small flashlight might also be added as contingency items.
- Trigger points should be identified that would call a stop to a planned activity. Related to fish survey dives, these should include:
 - If a team is unable to mark the take-out as planned, then they should remain there to serve as a human flag for the upstream team.
 - If there are not two divers per team, then that reach should be cancelled, or teams can combine two short reaches to do them all as planned.
 - If PPE in good condition and proper size is not available for all divers, the person without the needed gear may not be able to dive.
 - Other reasons to cancel the planned dives could include weather forecasts, water flows, lack of non-divers to provide support and if there are not enough radios for each team.
- Coordination with the Forest Telecom Manager could provide radio training, radio coordination between different agency VHF radios and assistance with developing and implementing an effective Communications Plan.
- The Dive JHA should be updated to include the above and what to do if you are unsure of the take-out, including referring to the lat/long on the maps, using GPS and radio.
- Radios should be left on in the dry bags to be ready to receive in case of emergency.
- Evaluate the usefulness of a SPOT Satellite Messenger as an option to send emergency 911 calls.
- Share Lessons Learned with other Agency Partners for future dive surveys.

Like the sticker on the bathroom mirror says, remember that:

“You are looking at the person responsible for your safety”