

# Tips for Locating Bones, Body Parts, and Bodies in Rivers

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## Search upstream of obstructions

**Justification:** Bones, body parts, and bodies get caught on obstructions. Woody debris is incredibly effective at catching and retaining remains.

**Examples:** Woody debris, bridge piers, rocks/boulders, trash, other debris, etc. (Figure 1A, L).

## Search downstream of obstructions (in the eddies)

**Justification:** Bones, body parts, and bodies stay in eddies because water pushes remains against the downstream side of some obstructions.

**Examples:** Downstream of bridge piers, rocks/boulders, submerged tree trunks, etc. (Figure 1B, K).

## Search on bars of any kind (lateral bars, point bars, median bars, etc.)

**Justification:** Bars are locations of sediment deposition and remains are another kind of sediment.

**Examples:** Anywhere on a bar, including under water (Figure 1C, D, E, F, I)!

## Search all locations with flow velocity drops (where rivers get slower)

**Justification:** As river flow slows it has less ability to move material, including remains. As a result, most deposition occurs on the upstream side where water velocity slows. Deep pools in channels not associated with debris are less likely to capture remains.

**Examples:** Banks, upstream and lateral edges of deeper pools, edges of large bedforms (e.g., dunes, ripples, etc.) (Figure 1D, H, I, J).

## Search downstream and UPSTREAM in rivers with significant shipping, tidal influence, and large wildlife

**Justification:** Remains most frequently move downstream, but often move upstream too. Remains can be caught by towing cables between ships and pulled upstream (full or partial bodies), moved upstream by animals (e.g., large catfish), transported upstream in eddies, or by salt water influx when tides move in (salt wedges). These mechanisms can move remains upstream tens of miles in low angle rivers and/or slow or halt downstream movement in higher angle rivers.

**Examples:** Remains have been found upstream from where they entered the water in tidally influenced rivers.

## Focus search on the same side of the river as remains entered (if known)

**Justification:** In large rivers, often there are few or no cross currents, or they are weak. So remains often stay on the same side of the river as they entered or remains slowly move to the other side.

**Examples:** Remains have been found preferentially on the same side of the river as they entered.

## Remains can float, so river transported remains can be anywhere high water reached!

**Justification:** Bulk density of bones, body parts, and bodies can be less than water, so remains can float, even when isolated bones! Flood strand lines frequently contain remains and are often out of the river channel.

**Example:** Remains have been found in shrubs, and other vegetation with other flood debris (Figure 1G).

## Remains will be buried and transported episodically, so repeatedly search before and after high flow events

**Justification:** Remains can and will be completely or partially buried, so repeatedly search after high flow events when sediment has moved, thus potentially exposing and transporting remains.

**Examples:** Remains would not be visible for years after seeded in rivers, but some would become visible after sediment transport events (e.g., floods or high flow) (Figure 1E).

## Search hard to access locations with waterproof cameras (e.g., Gopros) on poles (e.g., hiking sticks, monopods, ski poles, etc.), then review the footage

## Search using people trained in osteology of any kind

**Justification:** They know what bones and partial bones look like, so they can find remains more readily

## Utilizing cadaver dogs can be useful if dogs are trained well: dogs work better when flesh still on remains

## Side scan sonar can be useful with a skilled technician and appropriate river bed conditions

**Justification:** Side scan sonar can give you views of the riverbed nearly impossible using any other technique. Unfortunately, this method requires a boat, towfish, and an experienced operator. This method works poorly when the river bed has significant topography, is choked with debris or rocks, or a body has decayed a lot.

## Contact jurisdictions downstream and upstream for help searching rivers and for lost person information

**Justification:** Agencies downstream or upstream may have additional remains or missing persons.

## It is normal to find large remains and not smaller material

**Justification:** Small remains are either transported away or buried making them hard to find!

**Examples:** There are numerous cases where investigators and volunteers found many remains, but additional material was found when people trained in general osteology or human osteology searched the same areas.

**Recommendations taken from:** Evans, Thomas, 2013, Fluvial Taphonomy, In: (Pokines, James and Symes, Steven, Eds.), Manual of Forensic Taphonomy, CRC Press, Chapter 6, p. 115-142

