

**10.4 Update process for a streams GIS database.** A field forester working on the Brown Tract has compared mapped locations of streams to actual stream locations, and has discovered differences. She has proposed that the mapped streams be updated and has asked for your guidance in how this process might be accomplished. Describe three options for gathering the data necessary to facilitate an update of the streams GIS database, and the merits of each approach.

The main question to ask the field forester is: How good (accurate and precise) does the streams GIS database need to be?

Heads-up digitizing may be used to assist in the GIS database update process, using digital orthophotographs, if the orthophotographs are registered appropriately to the correct landscape position, and they have been stored in the coordinate and projection system consistent with the GIS databases to be updated. The spatial position of the streams can easily be modified by editing the appropriate vertices that define each stream reach, using the digital orthophotograph as a guide. This is a relatively fast method of updating GIS databases, assuming digital orthophotographs are available for use.

If, however, one needed to be very precise regarding the location of the streams, information from either a land survey or from data collected with GPS would be more appropriate in updating the spatial position of the streams.

Land surveys are relatively expensive and require more time to complete than using GPS to collect data in the field. The precision and accuracy of land surveys may be slightly better than when using GPS (and both better than heads-up digitizing), so you would need to decide whether the extra cost of land surveying is worth the incremental increase in quality of the streams GIS database.

GPS is commonly used by field personnel in natural resource management organizations. In fact, the field forester could be trained (if not already) to collect GPS data herself. However, the field forester would need to develop a schedule for data collection, centered on when the appropriate satellites are available. Also, there are some concerns about the ability of GPS receivers to capture signals adequately through tree canopies.

The data collected from both land surveys and GPS would need to be formatted for input into the GIS software program that you use, something that is not an issue with heads-up digitizing. In all three cases, protocol for integrating the new features into the streams GIS database need to be designed, as do processes for attributing the new features and removing the features being replaced.

After updating the streams GIS database, other GIS databases should be examined. A corresponding update of other affected landscape features (stands, culverts, etc.) may be required, if their position was based on the position of the stream system.