

## Watershed Resilience

Over time, all watersheds experience a variety of disturbance events such as fires and floods. Resilient watersheds have the ability to recover promptly from such events and even be renewed by them. Much as treating forests can make them more resilient to wildfire, watershed restoration projects can improve watershed resilience to both natural and human disturbances. Examples include:

- Restoring ground cover of plants and plant litter improves the sponge action of the watershed. Increased ground cover helps soils absorb water, resist erosion, and build up nutrients and organic matter to enrich future plant growth.
- Closing unneeded roads, improving drainage on open roads, and reclaiming other compacted bare areas disconnects disturbed areas from streams. Water can better soak into the soil to keep sediment on slopes and out of streams.
- Rebuilding channelized streams to restore their original slope, shape, and meander pattern can re-connect such streams with their floodplains. Floods can then spread out on the flood plain, reducing downstream flood damage and renewing riparian areas with flood-borne sediments.
- Restoring healthy riparian vegetation next to streams and lakes can strengthen stream banks, slow flood flows, capture flood-borne sediments, and improve habitats for fish and wildlife.
- Reclaiming gullied or drained wetlands (wet meadows, marshes, bogs, fens) rebuilds their soils and their vast natural water storage capacity. Such restoration enhances stream flows in the summer and fall. Re-introducing beavers to selected streams can have a similar benefit.
- Converting stream crossings from pipe culverts to rock-lined fords, bridges, or bottomless arch culverts can re-connect fragmented aquatic habitats. Such habitat renewal helps populations of fish grow, thrive, and re-occupy habitats if they are displaced by severe disturbance events.
- Restoring some natural stream flows to de-watered stream segments allows natural stream processes to recover lost aquatic habitats and re-connect fragmented aquatic habitats.
- Reclaiming abandoned hard-rock mines (most dating from the 1800s) reduces leaching of acids, metals, and other harmful chemicals into streams. The quality of aquatic habitat improves, and aquatic life can return to some streams that may have been “dead” for over 100 years.