CANYON CREEK SUBWATERSHED (MIDDLE FORK GILA RIVER TO HEADWATERS)

TMDL reach length: 14.2 mi; **Subwatershed area**: 47 sq. mi.
Elevation range: 6700–8200 ft.
Watershed cover: 36% forested; 64% rangeland
Watershed management: 99% USFS (Reserve and Wilderness RDs); 1% private
Wilderness: 5.5 sq. mi. (~12%)
Counties/SWCDs: Catron (San Francisco SWCD)
TMDL: http://www.nmenv.state.nm.us/swqb/Plant_Nutrients_TMDL_for_Canyon_Creek_12-18-2001.pdf
Record of Decision: http://www.nmenv.state.nm.us/wqcc/303d-305b/2004/AppendixB/2004-2006ROD.pdf
WQS reference: http://www.nmcpr.state.nm.us/nmac/parts/title20/20.006.0004.pdf (Section **20.6.4.503)**

TMDL parameter exceeded: Plant nutrients

Current exceedance: Aquatic productivity exceeds standard by 2.58 lbs/day (75%)

Unsupported use: high-quality coldwater aquatic life

Possible mechanisms	Action (identification of MPs)	Possible MPs
Natural nitrogen sources (springs) Loss of riparian vegetation and subsequent reduction in filtration and nutrient uptake capacity Grazing management: animal waste inputs to stream Road condition, including road crossings: nutrient transport in sediment runoff Streamside livestock trampling; increased nutrient transport to channel Reduced baseflow from loss of streambank storage Loss of high-elevation and/or near-channel wetlands	Evaluate local spring sources of nitrogen Evaluate animal waste levels, compaction, and grazing impacts near riparian zone Evaluate stream bank vegetative cover density Evaluate potential for increased bank storage through natural or bioengineering techniques Evaluate potential sediment inputs from road crossings, road design, and recreation impacts, including in-stream vehicular traffic (GNF & partners travel planning)	Riparian exclosures (to decrease cattle/elk floodplain compaction effects and in-stream animal waste) Filter strip, and/or pole plantings to increase vegetation filtration capacity and nutrient uptake In-stream structures to enhance floodplain/bank water storage, increase base flow Road realignment; culvert improvement; seasonal or OHV closures Reclamation of meadows, wetlands

CANYON CREEK SUBWATERSHED (MIDDLE FORK GILA RIVER TO HEADWATERS)—continued

TMDL reach length: 14.2 mi; **Subwatershed area:** 47 sq. mi.
Elevation range: 6700–8200 ft.
Watershed cover: 36% forested; 64% rangeland
Watershed management: 99% USFS (Reserve and Wilderness RDs); 1% private
Wilderness: 5.5 sq. mi. (~12%)
Counties [SWCDs]: Catron [San Francisco]
TMDL: http://www.nmenv.state.nm.us/swqb/Turbidity_TMDL_for_Canyon_Creek_12-13-2001.pdf
Record of Decision: http://www.nmenv.state.nm.us/wqcc/303d-305b/2004/AppendixB/2004-2006ROD.pdf
WQS reference: http://www.nmcpr.state.nm.us/nmac/parts/title20/20.006.0004.pdf (Section **20.6.4.503)**

TMDL parameter exceeded: Turbidity

Current exceedance: Turbidity (as total suspended solids) exceeds standard by 263 lbs/day (61%)

Unsupported use: high-quality coldwater aquatic life

Possible mechanisms	Action (identification of MPs)	Possible MPs
Loss of riparian vegetation and subsequent reduction in filtration capacity Road condition, including road crossings: sediment runoff Streambank destabilization Herbaceous cover loss: reduced upland infiltration rates; increased overland sediment delivery to channel Tributary channel gullying; increased sediment input during runoff events Loss of high-elevation and/or near-channel wetlands; reduced filtration capacity	Evaluate animal floodplain compaction and grazing impacts in riparian zone Evaluate stream bank vegetative cover density Evaluate potential sediment inputs from road crossings, road design, and recreation impacts, including in-stream vehicular traffic (GNF & partners in travel planning) Identify other streambank stability impacts Evaluate potential for thinning/burning to improve herbaceous cover	Riparian exclosures (to decrease cattle/elk floodplain compaction effects; enhance riparian vegetation survival) Filter strip, and/or pole plantings to increase vegetation filtration capacity In-channel structures to improve bank stability Road realignment; culvert improvement; seasonal or OHV closures Prescribed thinning/burning Reclamation of meadows/wetlands

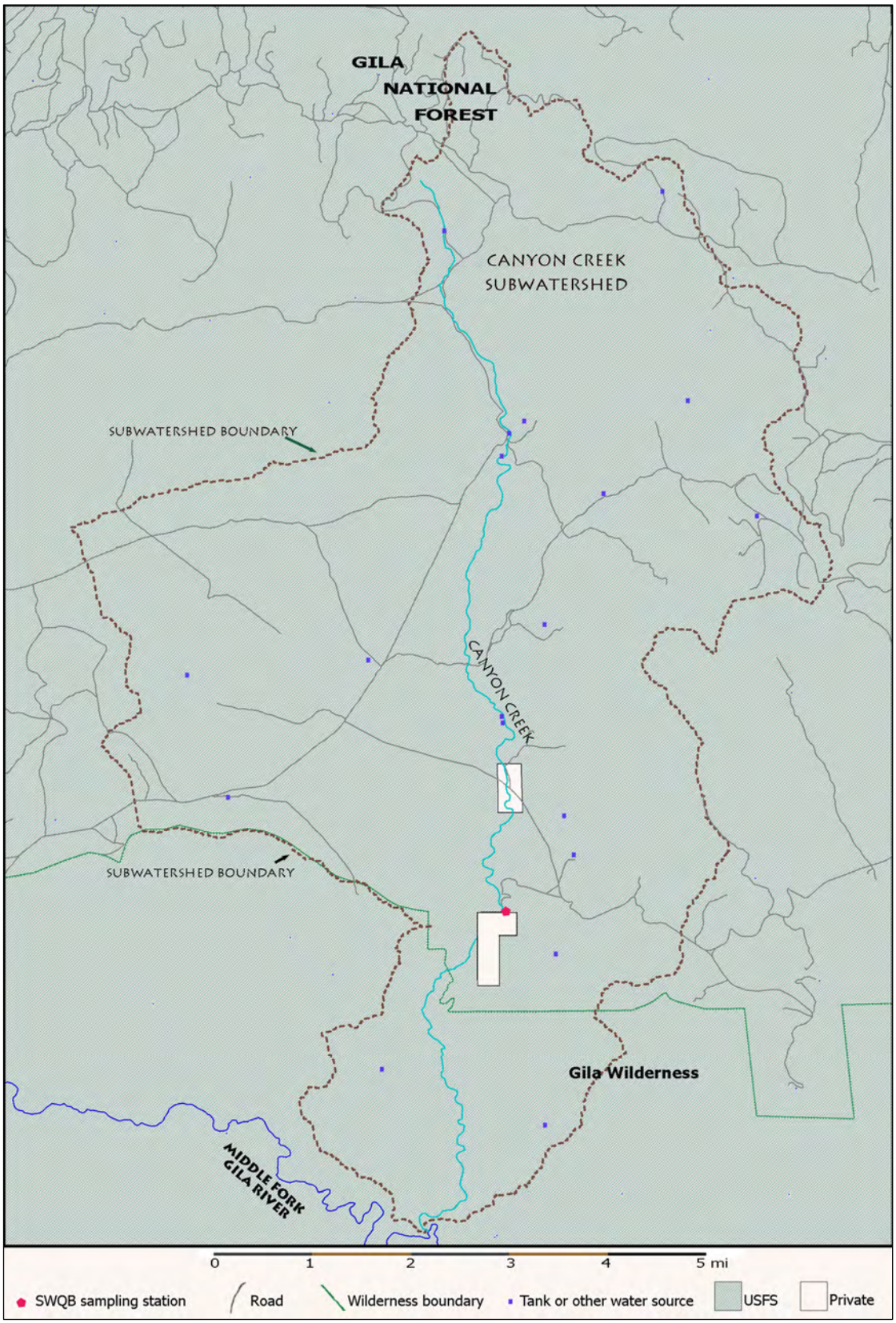
CANYON CREEK SUBWATERSHED (MIDDLE FORK GILA RIVER TO HEADWATERS)—continued

Milestones	Schedule	Target criteria
Agency/landowner liaison to establish working group/plan	2007-2008	Filter strips and/or exclosures constructed on 20% of most heavily impacted floodplain areas
Document existing canopy; vegetative cover (GNF planning)	Dependent on GNF scheduling	Increase streambank vegetative cover by 20% Increase upland herbaceous cover by 20%
Document road and vehicle impacts (travel management planning)	2007?	Reduce aquatic vegetation productivity by ~25%, from 3.45 lbs/day to 2.6 lbs/day
Travel management planning finalized (GNF & partners)	2008?	Reduce nitrite level from 0.25 mg/L; nitrate from 0.21 mg/L, and phosphorus from 0.078 mg/L
Future work plans developed: silviculture, road improvements/closures; streambank and floodplain measures	GNF schedule	Reduce average turbidity levels by 25%, to 519 lbs/day
Costs and funding sources ID'd	Dependent on above	

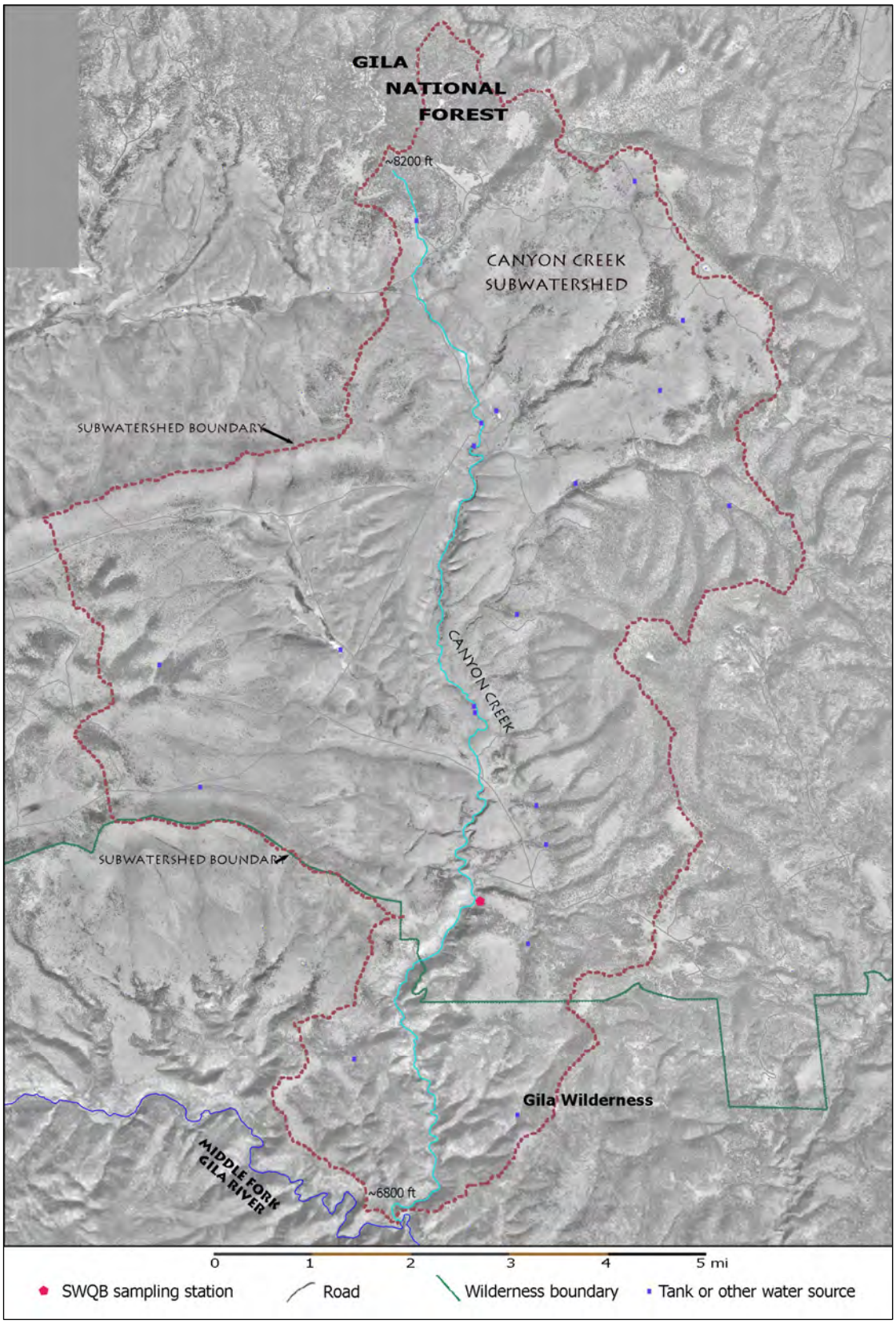
Monitoring (suggested monitoring protocols are described in Section 6):

- Canyon Creek is an extremely remote site. Ideally, local landowners/permittees would be engaged in planning and monitoring efforts.
- Appropriate monitoring protocols will depend on implemented MPs
- Regular NMED/SWQB monitoring and sampling at established stations
- Long-term volunteer monitoring programs under development to document riparian condition, water quality, nonpoint source contributions

Map TMDL-05. Topographic map, Canyon Creek subwatershed. Base image from USGS 1:24000 quads. All data from USGS, NMED, and USFS Gila National Forest .



Map TMDL-06. Land management status map, Canyon Creek subwatershed. All data from NMED, USGS and USFS Gila National Forest.



Map TMDL-07. Aerial photography relief map, Canyon Creek subwatershed. Base image: 1996-2002 USGS digital orthophotoquads. All data from NMED, USGS, and USDA Gila National Forest.

CANYON CREEK—continued

Canyon Creek photos. Clockwise from left: Downstream past NMED sampling site, May 2001; FR 142 and culvert near sampling location, May 2001; NMED/SWQB staff in dense aquatic vegetation at sampling site, June 2001. All photos courtesy NMED, Silver City.