Chapter 9: Measuring Success

Over the next ten years, implementation of this WPP will require the coordination of many dedicated stakeholders. The goal is to achieve water quality targets by addressing the most readily manageable sources of *E. coli* in the watershed. To achieve these targets, this plan has identified the needed substantial financial commitments, technical assistance, and education and outreach programs. The management measures identified in this WPP are voluntary but supported at the recommended levels by watershed stakeholders.

Implementing a WPP on water quality and measuring its impacts is a critical process. The data needed to document progress toward water quality goals are obtained through planned water quality monitoring. Water quality data collected over time and implementation accomplishments will facilitate adaptive management by illustrating which recommended measures are working and which measures need modification. While improvements in water quality are the preferred measure of success, documentation of implementation accomplishments can also be used to measure success.

Water Quality Targets

An established water quality goal defines the target for future water quality and allows the needed bacteria load reductions to be defined. The appropriate goal for water quality in Bois d'Arc Creek is the existing primary contact recreation standard for *E. coli* of 126 cfu/100mL. The target for Honey Grove Creek is currently established at the same standard. However, the Bois d'Arc Creek water quality target may change to Secondary Contact Recreation 1 if the RUAA is approved by EPA. The ongoing Honey Grove Creek RUAA study may also determine that a different water quality standard is appropriate for the water body once it's complete. If the water quality standards do change, the targets will be addressed during a WPP update. Table 38 outlines water quality targets identified by stakeholders. These targets are based on a geometric mean of water quality samples taken in each segment. The Data Review section further discusses how water quality data will be reviewed.

Table 38. Water quality targets

Station(s)	Segment	Current Concentration	5 yrs After Implementation*	10 yrs After Implementation*
15036	0202A_03 Bois d'Arc Creek	178	152	126
21030	0202L_01 Honey Grove Creek	444	285	126

* in units of cfu *E. coli*/100mL

Additional Data Collection Needs

Continued monitoring of water quality in the Bois d'Arc Lake watershed is necessary to track progress toward the goal of improved water quality. Monitoring data is needed to track changes in water quality resulting from WPP implementation. Currently, water quality monitoring is conducted by RRA on a quarterly basis at one site through the CRP and monthly by NTMWD at five sites (Table 6).

Increasing the frequency of currently employed CRP data collection at the upstream Bois d'Arc Creek site would improve data availability and better illustrate water quality variations within a year and in response to implementation of the WPP. The WPP recommends increasing frequency of data collection from quarterly to monthly at this index site with anticipation that the data will enhance trend analysis and better illustrate improvements in water quality.

Through the adaptive management process and WPP updates, future water quality monitoring recommendations may include targeted water quality monitoring efforts to better track the effects of specific implementation projects. Targeted water quality monitoring may include studies on multiple subwatersheds, paired watershed studies or multiple watershed studies. Targeted monitoring can also include more intensive monitoring along identified stream segments to better identify potential pollutant sources.

Data Review

Watershed stakeholders will use two methods to evaluate WPP implementation impacts on instream water quality. First will be TCEQ's statewide biennial water quality assessment approach, which uses a moving seven-year geometric mean of *E. coli* data collected through the state's CRP program. This assessment is published in the Texas Integrated Report and 303(d) List, which is available online at: https://www.tceq.texas.gov/waterquality/assessment/305_303.html. It is noted that a two-year lag occurs in data reporting and assessment, therefore the 2024 report will likely be the first to include water quality data collected during implementation of the WPP.

Water quality improvements are often harder to identify using the seven-year data window used for the *Texas Integrated Report*. Therefore, progress toward achieving the established target of 126 cfu/100 mL will also be evaluated using the geometric mean of the most recent three years of water quality data identified within TCEQ's Surface Water Quality Monitoring Information System. Trend analysis and other appropriate statistical analyses will also be used to support data assessment as needed.

The Watershed Coordinator will be responsible for tracking implementation targets and water quality in the watershed to quantify WPP success. Data will be summarized and reported to watershed stakeholders at least annually.

Interim Measurable Milestones

Implementing the Bois d'Arc Creek WPP will occur over a 10-year period. Milestones are useful for incrementally evaluating the implementation progress of specific management measures recommended in the WPP. Milestones outline a clear tracking method that illustrates progress toward implementation of management measures as scheduled. Interim measurable milestones are identified in the implementation schedule (Table 34). Participants and estimated costs are also included in the schedule. In some cases, funding acquisition, personnel hiring or program initiation may delay the start of implementation. This approach provides incremental targets that can be used to measure progress. If sufficient progress is not made, adjustments will ensue to increase implementation and meet established goals. Adaptive management may also be used to adjust the planned approach if the original strategy is no longer feasible or effective.

Adaptive Management

Due to the dynamic nature of watersheds and the countless variables governing landscape processes, some uncertainty is to be expected when a WPP is developed and implemented. As the recommended restoration measures of the Bois d'Arc Lake WPP are put into action, it will be necessary to track the water quality response over time and make any needed adjustments to the implementation strategy. To provide flexibility and enable such adjustments, adaptive management will be used throughout the implementation process.

Adaptive management is often referred to as "learning by doing" (Franklin et al. 2007). It is the ongoing process of accumulating knowledge of the causes of impairment as implementation efforts progress, which results in reduced uncertainty associated with modeled loads. As implementation activities are instituted, water quality is tracked to assess impacts and guide adjustments, if necessary, to future implementation activities. This ongoing, cyclical implementation and evaluation process serves to focus project efforts and optimize impacts. Watersheds in which the impairment is dominated by NPS pollutants, such as Honey Grove Creek, are good candidates for adaptive management.

Progress toward achieving the established water quality target will also be used to evaluate the need for adaptive management. An annual review of implementation progress and water quality trends will be discussed with stakeholders during semiannual meetings. Due to the numerous factors that can influence water quality and the time lag that often appears between implementation efforts and resulting water

quality improvements, sufficient time should be allowed for implementation to occur fully before triggering adaptive management. In addition to water quality targets, if satisfactory progress toward achieving milestones is determined to be infeasible due to funding, scope of implementation or other reasons that would prevent implementation, adaptive management provides an opportunity to revisit and revise the implementation strategy. If stakeholders determine inadequate progress toward water quality improvement or milestones is being made, efforts will be made to increase adoption of BMPs and adjust strategies or focus area if and when necessary.