

Ground Water Recharge Restoration Pilot Projects Strategy Worksheet: RB-S8

<p>Strategy: Implement a ground water recharge restoration pilot project in each physiographic province in subwatersheds that have lost significant recharge due to past land use changes.</p>	<p>Strategy Priority: M (H/M/L)</p>
<p>Objectives Addressed by Strategy: NSSM-O2A: By 2010, develop a system for tracking impacts on ground water and baseflow. NSSM-O2C: By 2010, have 10-year recharge restoration programs in place for all subwatersheds that have lost greater than 10% of recharge since 1986. LRLM-O1A. Land use and management practices will maintain ground water at a level that sustains year round stream base flows while providing for both human needs and basic ecosystem functions in the Lower Raritan WMA. LRLU-O1B. By 2012, new development and redevelopment will not diminish the quality and quantity of ground water. 30% of municipalities in the Lower Raritan will adopt such requirements by 2008; 100% of municipalities will adopt such requirements by 2014. MWS-O1C: Safe and dependable yields of surface and ground waters are improved, where they have been diminished</p>	<p>Strategy Schedule: (Begin/End)</p>
<p>Narrative Description of Strategy: Using a ground water recharge estimation model (NJGS's GSR-32) and the 1986 and 1995 land use/land cover data, estimates for ground water recharge losses exceed 10%, 15% and even 20% in many Raritan Basin subwatersheds. Expected impacts include reduced stream flow during dry weather periods, impaired stream ecosystems, and less water for public and private wells that use the upper (surficial) aquifers. No evaluation has been undertaken of local scale impacts, as GSR-32 is based on data from larger watersheds, for the most part, and assumes that all impervious surfaces route precipitation toward runoff and away from recharge. No projects in New Jersey (and few if any nationally) have been developed to mitigate subwatershed recharge losses of this magnitude. This strategy provides for development of three pilot projects by NJDEP and regional partners to establish remedial targets, assess the feasibility of restoring ground water recharge to these targets, set evaluation methods for current losses and future improvements, and implement feasible projects. NJDEP is proposed as the project lead due to the experimental nature of this approach, plus the link to stream ecosystem health through the TMDL program. The strategy proposes one pilot project in each of the Highlands, Piedmont and Coastal Plain, to maximize applicability to other subwatersheds in both the Raritan Basin and other watersheds.</p>	
<p>Areawide WQM Plan Consistency Determination Issues: Potential TMDL strategy to address severely impaired streams where loss of base flows has damaged stream biota through concentration of pollutants, loss of habitat quality, or both.</p>	

Action Plan (Steps or Tasks)	Responsible Parties for Planning, Design & Implementation	Responsible Parties for Oversight	Resource Needs (L,M,H,VH)	Committed or Recommended Resources	Major Challenges and Opportunities	Evaluation Method & Indicators	Schedule and Milestones for Implementation
1. Establish pilot projects as task in NJ Statewide Water Supply Plan and obtain demonstration project funding	C: R: NJDEP, Legislature	C: R: Water Supply Advisory Council	L	C: R: WS Bond Act	Regional v. state issue – need rationale for NJDEP and Legislature to focus on Raritan	Plan amended Project funding appropriated	
2. Establish pilot project partnership	C: R: NJDEP, NJWSA, local water supply utilities, affected municipalities, USGS	C: R: RBC	L	C: R: WS Bond Act		Partnership established and sufficient to accomplish success	

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3. Select pilot project areas in Highlands, Piedmont and Coastal Plain provinces of Raritan Basin	C: R: Project partnership	C: R: NJDEP	L	C: R: WS Bond Act	Combining high losses with manageable project scope and data availability	Selection criteria Selection	
4. Establish parameters by which impacts and improvements are best measured through the pilot projects	C: R: Project partnership	C: R: NJDEP	L	C: R: WS Bond Act	Parameters used must be measurable or estimable at an adequate level of accuracy	Peer-reviewed parameters	
5. Establish methods to evaluate current levels and impacts of recharge losses, and future changes due to management efforts and additional land use changes	C: R: Project partnership	C: R: NJDEP	L	C: R: WS Bond Act	NJDEP method GSR-32 assesses impacts of impervious cover at site scale, based on management practices used. New methods will improve upon this method	Method that addresses both small scale and subwatershed scale	
6. Conduct a feasibility study to evaluate current and projected recharge losses, causation, evaluative metrics, alternatives for mitigation, costs, benefits, institutional and financial issues, incentives for implementation, etc.	C: R: Project partnership	C: R: NJDEP	M	C: R: WS Bond Act	Study should probably include a physically-based ground water model to understand effects of changes in flow patterns and ground water levels on streams, etc. Requires	Complete and acceptable feasibility study	

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					detailed water budget ¹		
7. Implement pilot projects based on feasibility study results	C: R: Project partnership	C: R: NJDEP	H-VH	C: R: WS Bond Act, CBT and 319 funds for stormwater mgt practices affecting stream flows and TMDLs, water supply utility funds for yield improvements	Will require cooperation at several levels of government, use of private property and cooperators, multiple sources of funding, etc. – complex project, but potentially with broad application to other watersheds	Projects complete as a percent of total target recharge restoration	
8. Monitor and evaluate pilot project results	C: R: Project partnership	C: R: NJDEP	M	C: R: WS Bond Act	Continuity of project	Environmental response relative to projected response	

¹ Includes field analysis, recharge distribution, precipitation, evapotranspiration, runoff, anthropogenic inputs and outputs of water flow, preferably for fairly small catchment areas. Long Island/Nassau County studies by USGS, CDM and others can be useful in designing a Raritan Basin study and may be applicable in Coastal Plain as a method of reducing costs.