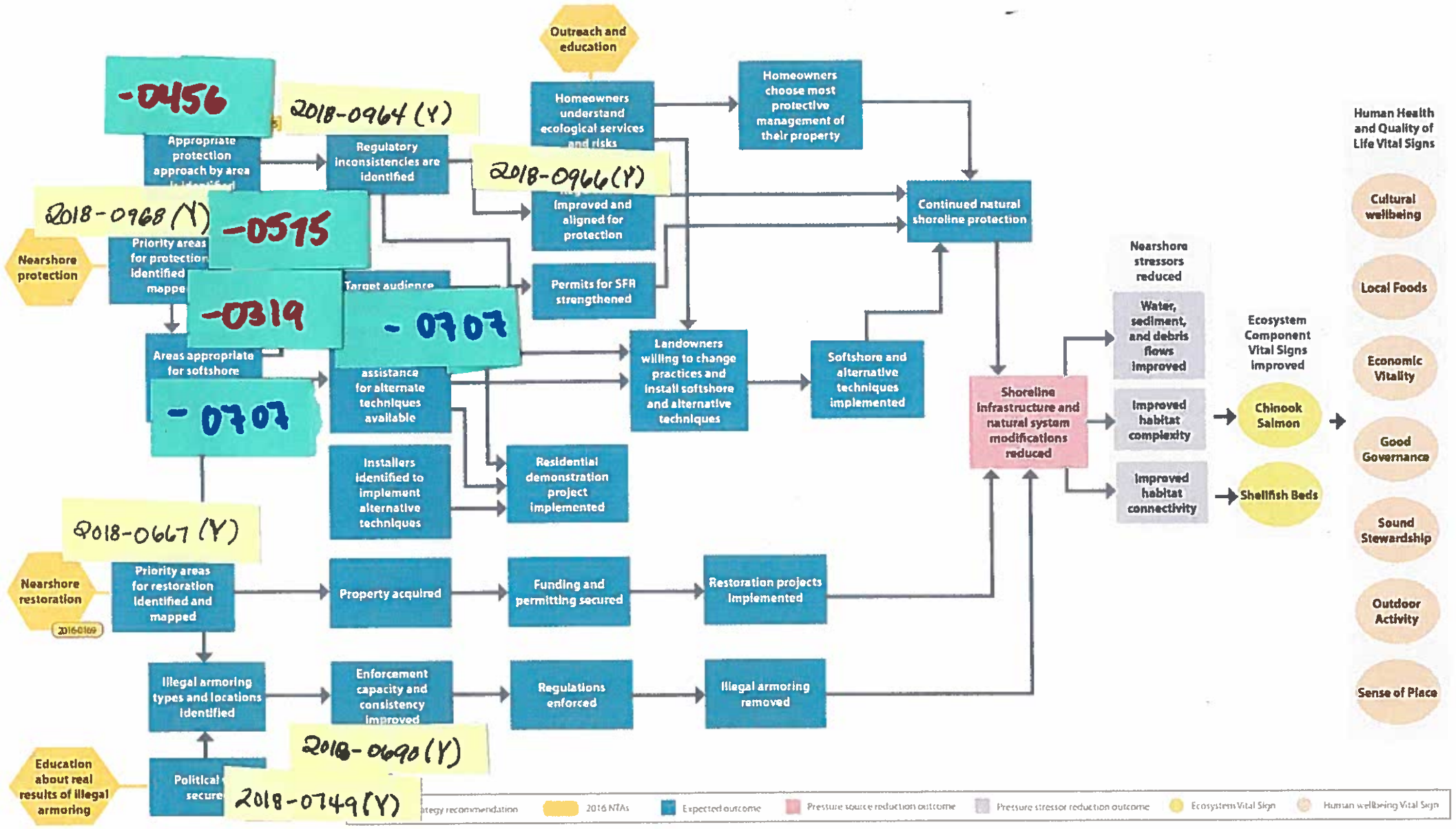
Strategies 01.1 and 01.2: Nearshore Protection and Restoration

The goal of these two strategies is to reduce shoreline armoring and increase use of softshore protection techniques in the nearshore. Numerous suggestions in this strategy are already in progress, and there are also 2016 NTAs shown on the results chain. Initially, a GIS analysis would be used to identify and map areas that currently have intact function. This information, cross-referenced with existing permits, should reveal paths for protection and restoration.

For protection paths, outreach and education can increase the number of property owners who understand the value of protecting natural functions on their property and make decisions that support these natural functions. In some cases, that protection may be secured through regulations by strengthening and enforcing permitting requirements for shoreline development activities. In other cases, protection may be secured through softshore armoring. Under this scenario, a target audience would need to be identified, qualified installers secured, and incentives and technical assistance made available. A demonstration project may also help encourage landowners to choose and implement softshore approaches over either new (or replacement) traditional bulkheads.

The restoration path involves addressing illegal armoring through improved enforcement capacity and consistency. The second restoration path focuses on successfully implementing restoration projects in already-identified priority restoration areas.



NTA ID	NTA Owner/Title	NTA Short Description
2016-0403	Snohomish County: Shoreline Inventory	Supplement the inventory and analysis of shoreline conditions in Snohomish County.
2016-0171	Snohomish County MRC: Marine Resources Committee, Port Susan	Reduce and prevent new construction of shoreline armoring in the Port Susan Marine Stewardship Area. Target communication with landowners of priority sites for armor removal, protection, and restoration.
2016-0315	WSU Extension: Model Volunteer Program for Oil Spill Response/Assessment	Create and implement a community-based oil spill assessment and response effort that will serve as a model for other regions. Expand nearshore benthic/intertidal citizen science data collection and quality.
2016-0133	Sound Salmon Solutions: Watershed Education for Decision Makers, Stillaguamish Basin	Increase the awareness and involvement of local decision-makers in local environmental issues, especially related to water quality, stormwater, shellfish protection, and salmon recovery. *Note this NTA is also shown on Strategies 08.1: Implementation of GMA Recognizing Puget Sound Recovery Goals and 10.1 and 10.2: Freshwater Protection and Restoration*
2016-0169	Snohomish County MRC: Marine Resources Committee, Snohomish Estuary Cleanup	Restore estuarine and nearshore habitats. Remove derelict vessels and creosote to improve habitat in the Snohomish Estuary for a number of species, including Chinook salmon.
2016-0268	Expand Conservation District Shoreline Technical	Establish a network of conservation district programs to collaborate with shoreline landowners and promote naturally functioning marine

Strategy 02.1: Integrated Planning

The goal of this strategy is to develop reach-scale integrated planning across land uses (agriculture, flood risk, and habitat) to incorporate future projections (e.g., climate change and growth) and resiliency planning. This effort will need to be linked to the ongoing processes that support land use planning, because regulatory updates are currently separate from ecosystem recovery efforts. This strategy will confirm that productive agriculture will be protected and communities will be safe from floods.

In the integrated planning strategy, parties must first be willing to come to the table, benefits and challenges must be identified and communicated, and data for various land uses must be made available. These enabling conditions will allow development of strategic approaches for meeting community needs and goals. For agriculture, this may include land base needs, drainage and flood protection assurances, and an ongoing voice in planning processes. For developed areas, strategic plans could include better growth planning and flood protections for homes, businesses, and critical infrastructure. Finally, the ecosystem recovery community and tribes will likely look to existing salmon recovery plans that identify the most critical areas to restore through levee setback and riparian zone planting for fish.

Once each community's needs are transparent and better understood, local communities can work to define an integrated approach. With these agreements, projects will be implemented in lands that are identified as being the most appropriate and yield the biggest gains for the investment. Finally, monitoring, feedback, and conversations with each land use community will inform changes in iterative plans to ensure that all parties continue to meet their goals. The result of integrated planning will be a decreased impact from development and agriculture through the reduction of shoreline armoring and levees, resulting in an improvement in floodplains, estuaries, land cover, salmon, summer stream flows, and freshwater quality.

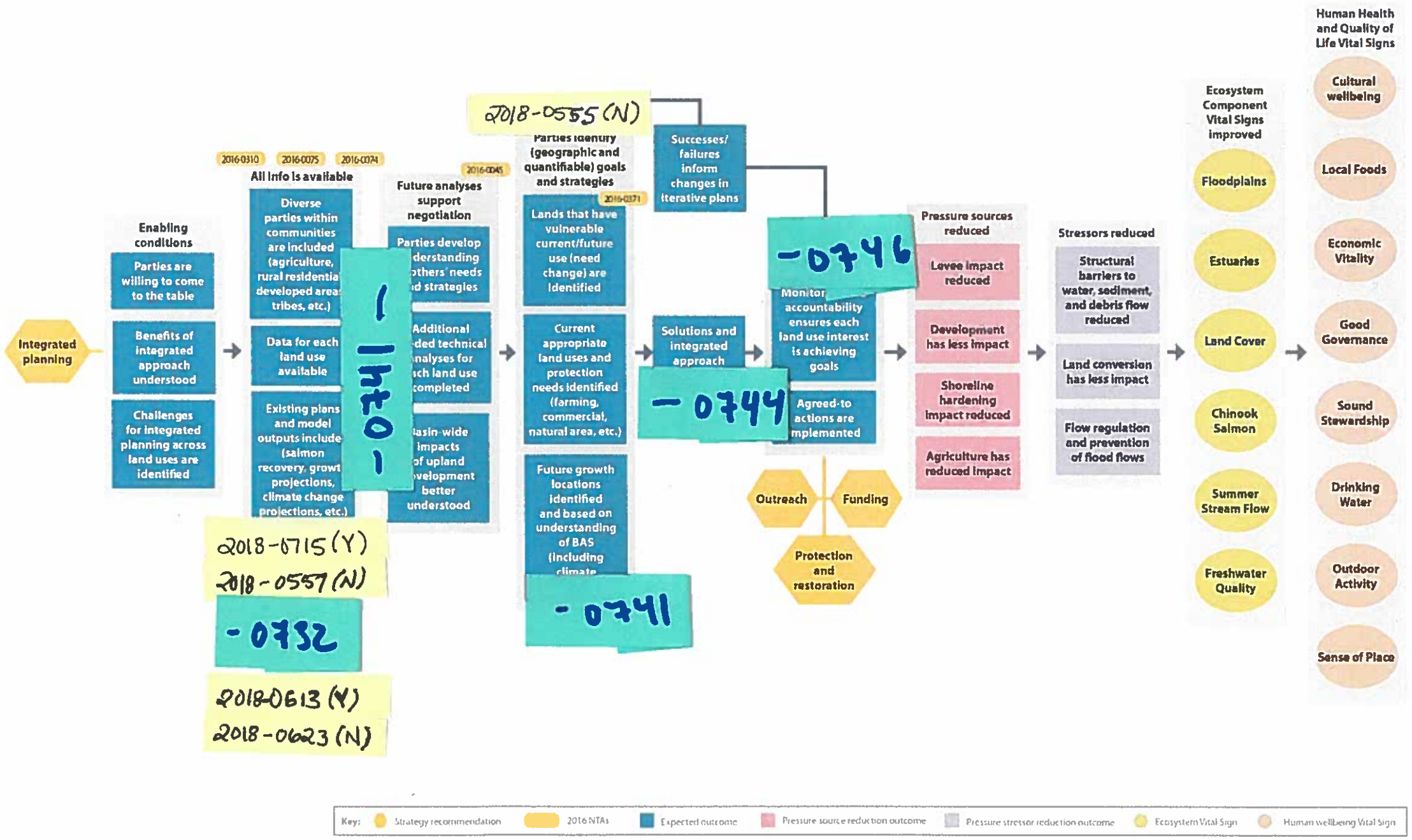


FIGURE 10. INTEGRATED PLANNING STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0310	Snohomish County: Integrated Floodplain Management	Facilitate the implementation of multiple-benefit floodplain restoration and protection projects in the Snohomish and Stillaguamish basins by increasing cooperation and coordination among fish, farm, and flood control stakeholders.
2016-0075	Snohomish CD: Snohomish County Climate Resilient Agriculture Strategy	Develop an agriculture strategy for Snohomish County that incorporates climate change projections into a plan for a resilient, economically viable, and community-sustaining agricultural industry into the future.
2016-0074	Snohomish CD: Climate Resiliency in Snohomish River Floodplain	Develop climate-resilient approaches to achieving net benefits to agriculture and salmon habitat in the Snohomish River floodplain.
2016-0045	King County: Balancing Fish, Farms, and Floods in King County's Snoqualmie Watershed	Implement a buffer task force initiative to provide a riparian buffer strategy that balances salmon recovery with agricultural viability, and develop a long-term strategy for agricultural land management in the Snoqualmie Agricultural Production District.
2016-0371	Retention of Agricultural Lands at Risk of Conversion in Puget Sound	Identify the projected risk of agricultural land conversion to nonagricultural uses using the Washington State Parcel Database developed by the University of Washington School of Environmental and Forest Sciences.

Strategy 03.1: Improve Funding for Restoration

The primary goal of this strategy is to develop an integrated approach to funding for large capital levee setback or removal projects. No 2016 NTAs were relevant to this strategy, but it is included in this Plan because the Sno-Stilly LIO evaluated the strategy as lower for local feasibility but higher for potential impact. The strategy's inclusion in this Plan is intended to highlight where regional assistance may be necessary in addition to the LIO's expected contributions to ecosystem recovery.

In a successful funding strategy for Sno-Stilly LIO restoration projects and other efforts related to ecosystem recovery, the first set of outcomes that would need to be attained are controlled at the regional level. These include more consistently available funding with minimum of 5-year funding windows. Additionally, regional policies around funding would need to change, resulting in funding, administration, and regulatory coordination; allowances for projects that demonstrate multi-benefits; and improved nimbleness of funding. The ongoing investments made by LIO stakeholders should be also better presented to justify increased state and federal funding.

If regional funding mechanisms were improved, then the LIO could expect that regional sources would be identified for each local project and local sources could be more effectively understood and used. If these two results were in place, the LIO might next see members having an easier time accessing funding and that funding would be easily justifiable because strategic plan priorities are clear. That would result in funding being secured and projects implemented.

Monitoring of projects will allow for adaptive management of the strategic plan, thereby improving implementation over time.

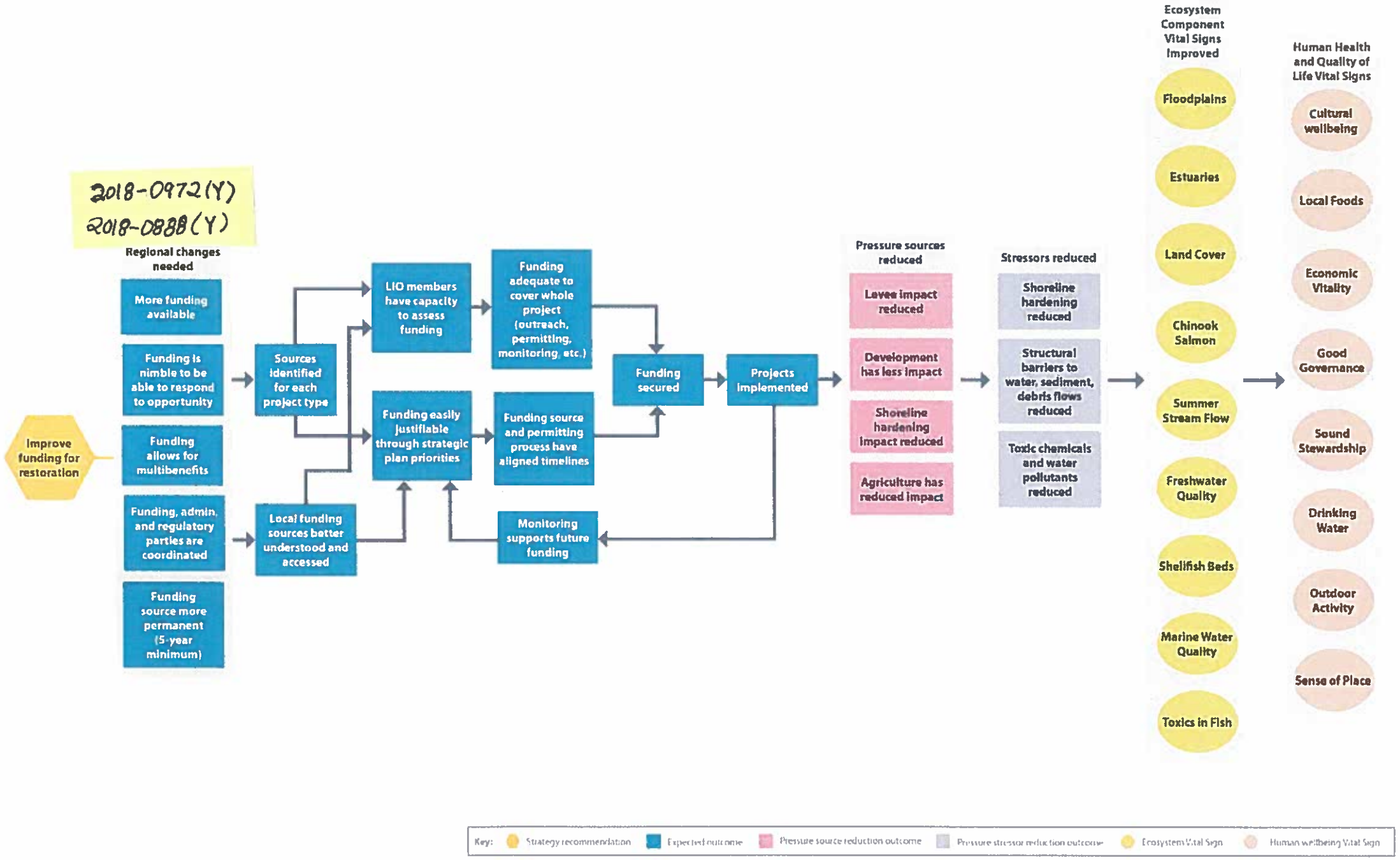


FIGURE 11. IMPROVE FUNDING FOR RESTORATION STRATEGY RESULTS CHAIN

Strategy 04.1: Outreach for Stormwater Stewardship

The goal of this strategy is to change behaviors to improve stormwater management practices and reduce non-point source pollution. Note that although these behaviors are specific to stormwater, the strategy logic could apply to other types of outreach for behavior change, as well.

Public support and behavior changes will be critical for achieving stormwater stewardship. This strategy would implement an outreach campaign—building on existing outreach efforts—to change behaviors of residential and commercial/industrial property owners related to the products they use, the manner in which they dispose of them, and improved stormwater management practices to reduce non-point source pollution. Before beginning a campaign, preliminary work would need to include securing the assistance of outreach specialists, coordinating between multiple stakeholders, and generating/locating quality data to support prioritization.

With that groundwork in place, the outreach campaign would begin by identifying priority areas and targeting specific behaviors for change, along with securing funding. To develop an appropriate message and delivery mechanism, the target audience and their needs and values would need to be understood. This should include an examination of needs and constraints across both privileged and disadvantaged communities, with considerations for social justice. Additional enabling conditions would include crafting appropriate messaging and ensuring no technical or financial barriers are in place.

The message for the target audience would include appropriate technical background information and support for their desired behavior change. When the message is received, we anticipate that a subset of the audience may change their behavior to align with the new information. Monitoring will be in place to determine whether both behavior and environmental conditions are changing as expected. The result of the outreach will be implementation of green stormwater infrastructure projects and best management practices (BMPs), and a reduction in

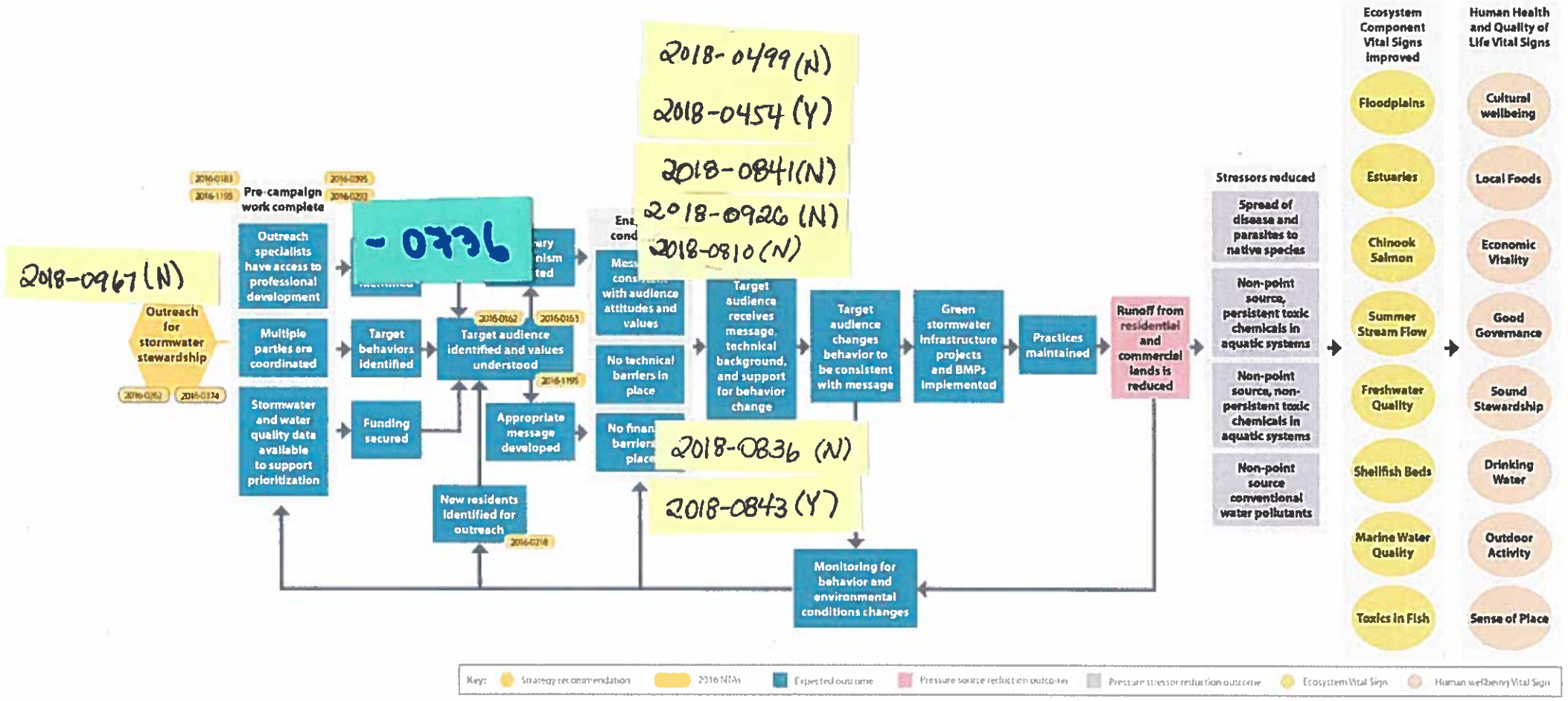


FIGURE 12. OUTREACH FOR STORMWATER STEWARDSHIP STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0262	Snohomish County: Natural Yard Care Behavior Change Campaign	Implement a Natural Yard Care Behavior Change campaign to decrease toxic loading in Snohomish County in alignment with King County. *Note this NTA is also shown on Strategy 05.1: NPS Assessment and Product Stewardship*
2016-0374	Snohomish CD: Urban Climate Resiliency in the Snohomish Basin	Develop social marketing strategies and two demonstration projects for urban climate resilience in new and planned developments in the Snohomish Basin.
2016-0183	WSU Extension: Stormwater Outreach and Education Collaboration and Best Management Practices Prioritization	Collaborate with organizations from the Stillaguamish/Snohomish watersheds to prioritize local stormwater best management practices that can be addressed through outreach and education. Coordinate and prioritize actions to improve on-the-ground success.
2016-0395	Snohomish County: Lower Stillaguamish Pollution Identification and Correction Program	Continue working with partner agencies to identify and remove sources of fecal coliform and nutrient pollution in the Lower Stillaguamish River basin, primarily from on-site sewage systems, livestock manure, and household pet waste. *Note this NTA is also shown on Strategies 07.1: On-site Sewage System Management and 05.1: Non-point Source Assessment and Product Stewardship*
2016-0162	WSU Extension: Latino Stormwater and Low-Impact Development Outreach Project in Southwest Snohomish County	Improve water quality conditions in selected southwest Snohomish County streams and lakes by increasing engagement with underserved local Latinos in stormwater pollution efforts.
2016-0163	WSU Extension: Pet Waste Reduction through Veterinary Clinic Outreach	Change dog owner behavior to encourage scooping, bagging, and trashing pet waste by initiating more than 16,000 conversations between vet clinic staff and clients, potentially removing more than 136,000 pounds of fecal matter in 1 year.
2016-1195	WSU Extension: Snohomish County Local Implementation of Puget Sound Starts Here	Collaborate with ECO Net partners to launch a local-scale Puget Sound Starts Here campaign in Snohomish County that is hands-on, face-to-face, and results in increased awareness and adoption of water quality behavioral changes.
2016-0218	Snohomish CD: Puget Sound Starts... at My School!	Involve students, staff, and families in the design, installation, and maintenance of four low-impact development projects on school campuses in Everett and Mill Creek.
2016-0246	Better Ground	Increase impact at the local level by providing urban and rural residents with website and outreach tools to implement best management practices on private property.
2016-0292	Puget Sound Conservation District Stormwater Action Team	Raise the capacity of stormwater services in conservation districts and their partners across Puget Sound through the replication of rain garden, sound education, de-pave, and monitoring programs.

Strategy 05.1: Non-point Source Assessment and Product Stewardship

The goal of this strategy is to determine the sources and characteristics of emerging and persistent conventional contaminants of concern, and develop programs to reduce them.

First, as new contaminants emerge as non-point source pollution problems in stormwater, this strategy would establish an ongoing investigation of the contaminants and their sources, provide corrective measures where possible, and implement product stewardship management strategies (e.g., pharmaceuticals, flame retardants, and fertilizers).

Once the investigation provides better understanding of the contaminant sources, loading, and effects, technical solutions would be explored, in coordination with product manufacturing and retail. Locally led Pollution Identification and Correction programs could also be used to identify bacterial contaminant sources, which would then allow for landowner education—paired with technical or cost-sharing resources where needed—and regulatory backstopping to ensure compliance. Meanwhile, another aspect of the investigation would be focused on the feasibility and impact of new technologies. Once those are understood, tested, and approved, they could be incorporated into the solutions.

This strategy includes product stewardship actions and coordination with manufacturing and retail that were ranked by the Sno-Stilly LIO as lower for feasibility but higher for impact, to highlight needed regional assistance.

Product stewardship and BMPs could then be implemented and water quality regulations could be updated at the state and federal level. Better management of stormwater would result, with lower pollution loading, and better safeguards for fish, wildlife, habitats, and human health and quality of life.

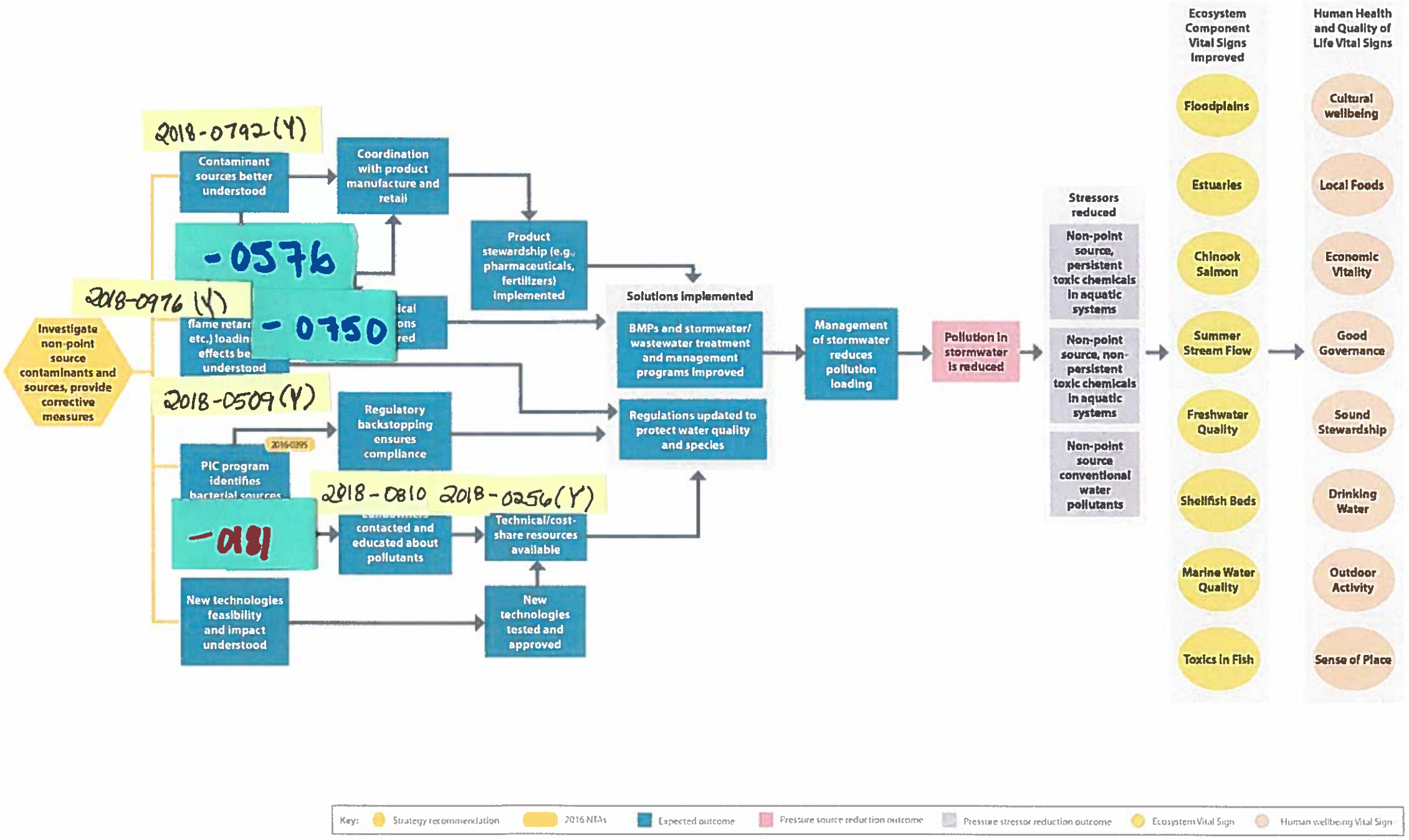


FIGURE 13. NON-POINT SOURCE ASSESSMENT AND PRODUCT STEWARDSHIP STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0262	Snohomish County: Natural Yard Care Behavior Change Campaign	Implement a Natural Yard Care Behavior Change campaign to decrease toxic loading in Snohomish County in alignment with King County. *Note this NTA is also shown on Strategy 04.1: Stormwater Outreach*
2016-0395	Snohomish County: Lower Stillaguamish Pollution Identification and Correction Program	Continue working with partner agencies to identify and remove sources of fecal coliform and nutrient pollution in the Lower Stillaguamish River basin, primarily from on-site sewage systems, livestock manure, and household pet waste. *Note this NTA is also shown on Strategies 04.1: Stormwater Outreach and 07.1: On-site Sewage System Management*
2016-0370	Puget Sound Clean Waters Livestock Stewardship Program	Provide enhanced educational opportunities, technical assistance, conservation planning tools, project designs, and financial assistance to livestock owners to prevent fecal coliform pollution.

Strategy o6.1: Stormwater Retrofit and LID

The goal of this strategy is to provide better treatment and infiltration of stormwater through retrofitting legacy public stormwater systems. It is intended to work in combination with other strategies directed at changing stormwater practices of private property owners and additional investigation and corrective measures directed at non-point source pollution. The strategy is expected to support both local and regional approaches.

Once public properties with stormwater problems are identified, jurisdictions could choose appropriate approaches, either retrofitting legacy systems, or promoting low-impact development and other green infrastructure approaches. For the first approach, legacy systems on public property that are retrofitted would be maintained to continue to provide improved treatment and increased infiltration. For the second approach, new development and redevelopment would be targeted for low-impact development (LID) techniques to meet stormwater regulations. In both approaches, implementation and effectiveness monitoring would be provided to ensure ongoing management is effective at increasing infiltration and treatment. To aid in the monitoring program, public green infrastructure mapping would be produced.

Not only would the quantity of stormwater runoff be reduced from present conditions, new development would have less impact, chemical loading would be reduced, and flow regulation would be improved.

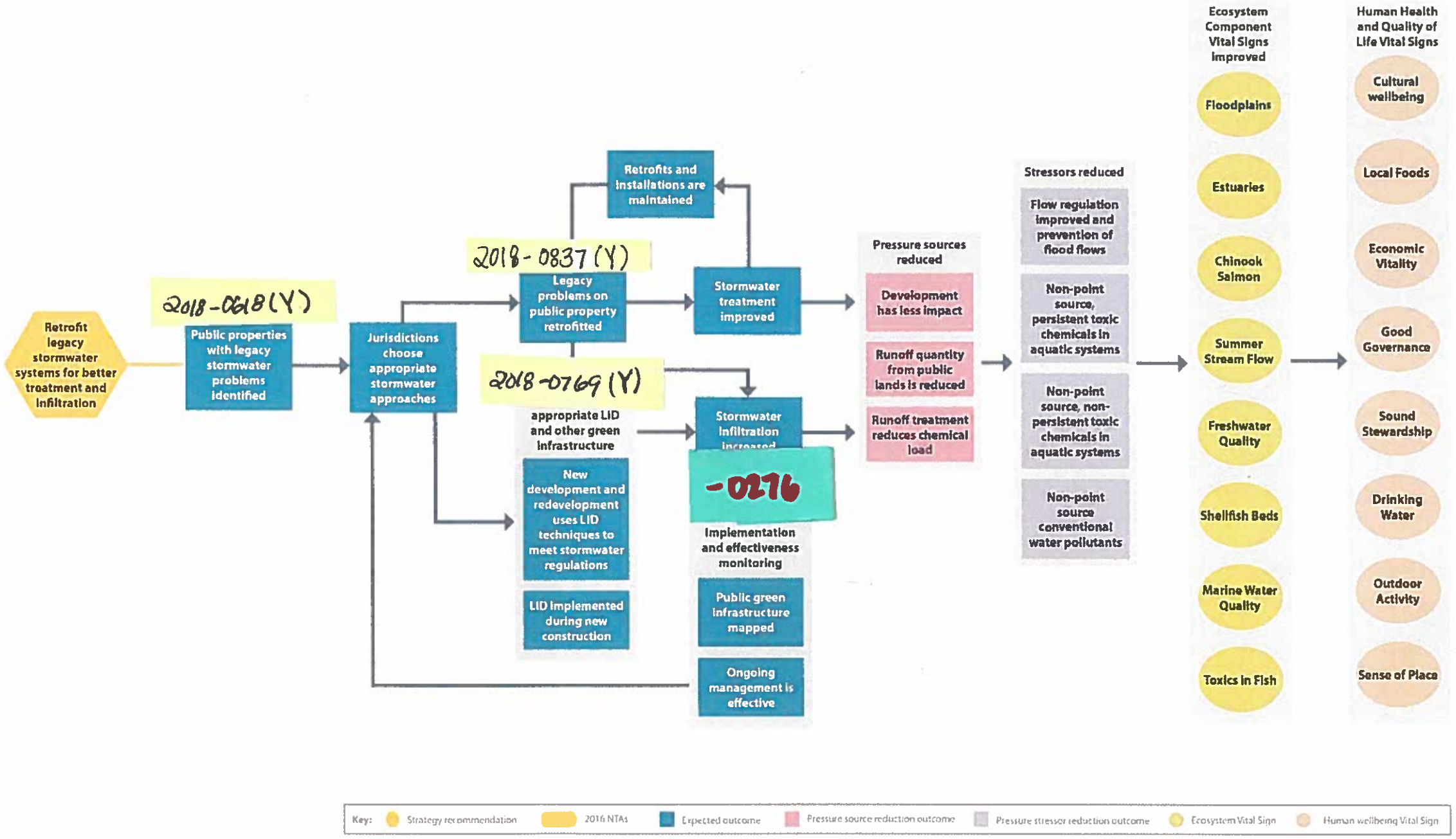


FIGURE 14. STORMWATER RETROFIT AND LID STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0083	City of Arlington: Arlington Stormwater Treatment and Emerging Contaminant Reduction	Complete design and install infrastructure needed to release reclaimed water to Old-town stormwater wetland to provide dry-season hydrological support and treatment of endocrine disruptors.
2016-0311	City of Everett/Port of Everett: Fisherman's Harbor Stormwater Quality Improvement Project	Provide treatment to the primary significant sources of untreated stormwater being discharged to the Port's Fisherman's Harbor development area including three Port of Everett and two City of Everett stormwater outfalls.

Strategy 07.1: On-site Sewage System Management

The goal of this strategy is to improve on-site septic system management to reduce the spread of non-point source pollutants and human pathogens. On-site sewage systems require careful siting, maintenance, and inspections to prevent impacts to groundwater and surface waterbodies. Many on-site sewage system problems are difficult for individuals, especially in low-income populations, to fix without financial assistance. This strategy seeks to provide the necessary outreach, technical assistance, incentives, and enforcement to allow for improved on-site septic system management.

With involvement of the local health jurisdiction, local Pollution Identification and Correction programs, or their equivalents, and sanitary surveys can be used to provide proactive assessment and identification of problems with failing septic systems. Where appropriate, such as in beach communities with erosion problems, the systems could be converted to sewer or small on-site community systems. In other areas, owners would be notified of the need to correct their failing systems and cost share incentives and/or loan programs would be made available. Regulatory backstopping would ensure compliance, and the failing systems are expected to be fixed.

These local programs should be assessed—and improved when necessary—to ensure they continue to use the most current BMPs and technologies and to increase their effectiveness on an ongoing basis. With good siting and design of new on-site sewage systems, continual improvements to management programs, remediation of problem systems, and owner education, on-site sewage systems should be more appropriately operated and managed and impacts are expected to be reduced.

This strategy will also need to rely on technical assistance, outreach, and funding, which are not shown on this results chain but can be cross-referenced to the related stormwater strategies.

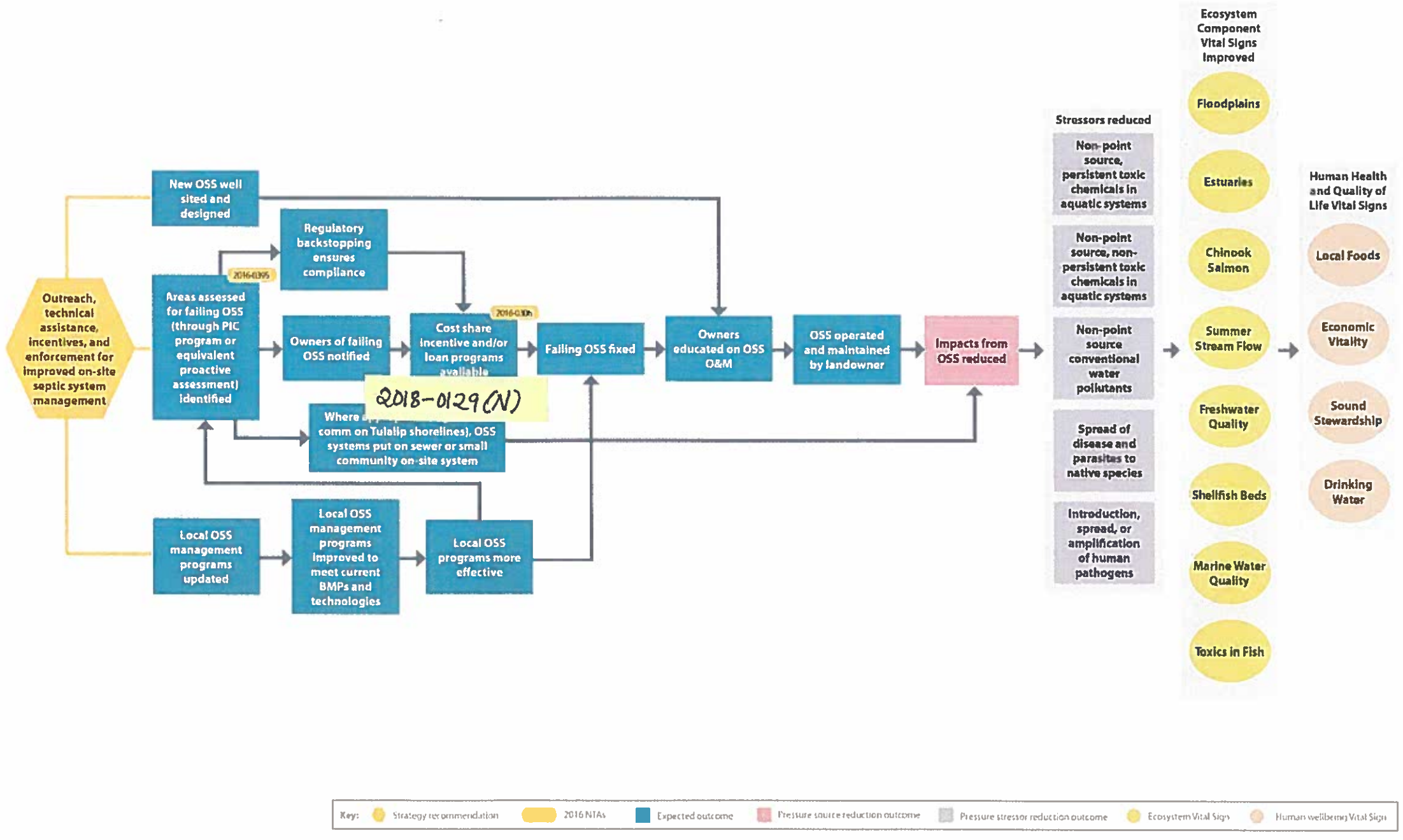


FIGURE 15. ON-SITE SEWAGE SYSTEM MANAGEMENT STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0395	Snohomish County: Lower Stillaguamish Pollution Identification and Correction Program	Continue working with partner agencies to identify and remove sources of fecal coliform and nutrient pollution in the Lower Stillaguamish River basin, primarily from on-site sewage systems, livestock manure, and household pet waste. *Note this NTA is also shown on Strategies 04.1: Stormwater Outreach and 05.1: Non-point Source Assessment and Product Stewardship*
2016-0306	Snohomish County: Financing Options for Healthy Onsite Sewage Systems	Provide affordable financing options and education to help residents in the Snohomish-Stillaguamish watersheds maintain healthy on-site sewage systems through grants, rebates, and workshops.

Strategy 08.1: Implementation of GMA Recognizing Puget Sound Recovery Goals

The goal of this strategy is to link Puget Sound recovery goals to implementation of the GMA by incorporating recovery goals into Comprehensive Plan goals, objectives, and policies, and initiating a culture shift so all decisions are made through a Puget Sound recovery lens. In combination with limiting growth outside the UGA, the strategy would address barriers to increasing density, including reducing costs and timelines. If this were achieved in tandem with increasing demand for dense communities—resulting in an improved market for density—then more growth would happen in UGAs. More growth in UGAs, along with reducing opportunities for conversion outside of UGAs, would result in an overall reduction of the development impact.

The Sno-Stilly LIO is emphasizing the importance of maintaining a regionally consistent high standard for local interpretation and implementation of the GMA. The first result that would need to be in place at the regional level is improved funding associated with monitoring and adaptive management, alignment, and clarity of regulations. This would allow for continual improvement of the GMA. Improved consistency in implementing the GMA, along with conversion protection and improved mapping to direct growth and UGA boundary adjustments, would result in Comprehensive Plans and associated zoning and regulations that recognize Puget Sound recovery goals.

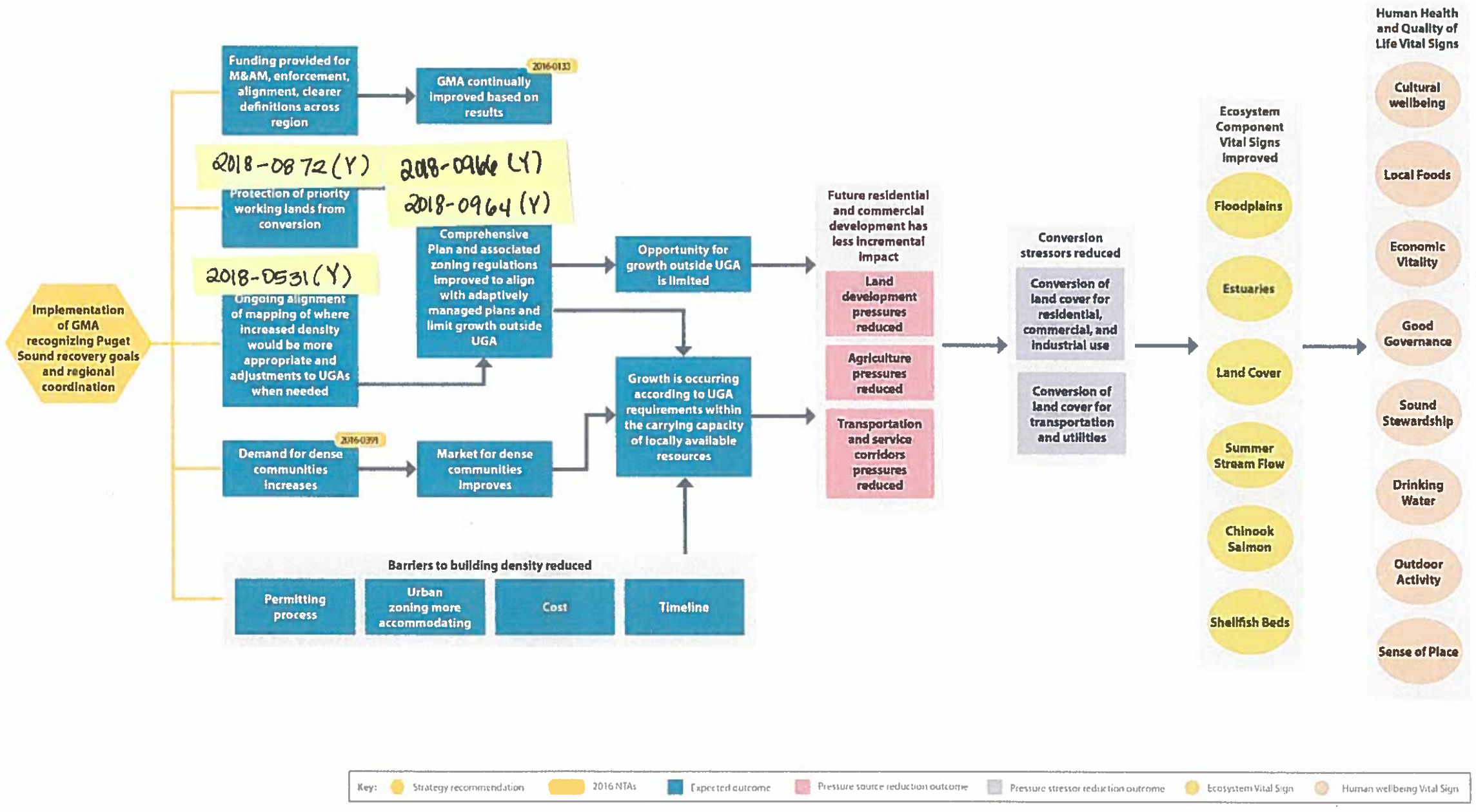


FIGURE 16. IMPLEMENTATION OF GMA RECOGNIZING PUGET SOUND RECOVERY GOALS STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0391	Snohomish County: Initiatives to Support Infill in Urban Growth Areas in Snohomish County	Support opportunities and incentives to increase capacity and accommodate growth in urban areas with three independent initiatives.
2016-0133	Sound Salmon Solutions: Watershed Education for Decision Makers, Stillaguamish Basin	Increase the awareness and involvement of local decision-makers in local environmental issues, especially related to water quality, stormwater, shellfish protection, and salmon recovery. *Note this NTA is also shown on Strategies 01.1 and 01.2: Nearshore Protection and Restoration, and 10.1 and 10.2: Freshwater Protection and Restoration*

Strategy 09.1: Stream Flow Protection

The goal of this strategy is to provide protection to improve low flows. This strategy also relates to the recent detailed planning work in the *Snohomish Basin Protection Plan* (Snohomish County Surface Water Management et al. 2015).

Currently, in many areas of the Sno-Stilly LIO, there is concern about stream flows—both low summer flows and high flashy flows. The stream flow protection strategy is intended to first secure data to help managers better understand the relationship between land use, withdrawals, and seasonal flows within an already naturally variable flow regime.

Once the relationships are better understood, specific geographies and hydrologic features that are critical to maintaining flows can be prioritized. Special attention will be paid to climate impacts. The prioritization will allow for identification of the proper tools to improve protection or avoidance of further degradation either by jurisdiction, land use type, or specific landscape feature. Prioritizing specific reaches will also allow for implementers to engage specific water management partners.

Finally, the result of better protection will be improved functioning for natural features, specific built solutions, and new withdrawal agreements that reduce the impact on flows.

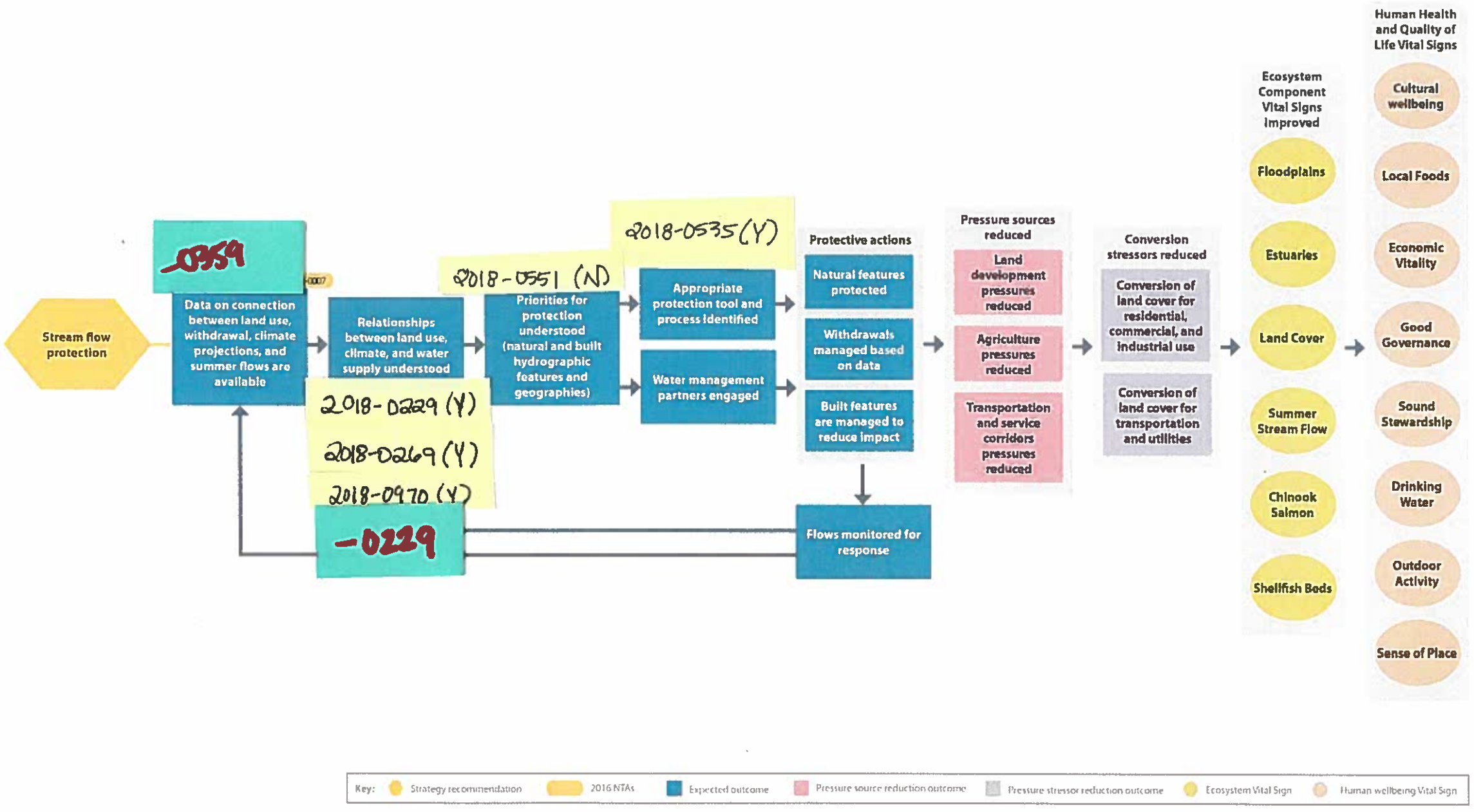


FIGURE 17. STREAM FLOW PROTECTION STRATEGY RESULTS CHAIN

NTA ID	NTA Owner/Title	NTA Short Description
2016-0007	Snoqualmie Tribe: Snoqualmie Hydrology	Investigate low-flow hydrology in the lower mainstem Snoqualmie River (below Snoqualmie Falls) and identify opportunities for habitat enhancement and protection.

Strategies 10.1 and 10.2: Freshwater and Estuarine Protection and Restoration

The goal of these two strategies is to reduce armoring and increase use of natural shoreline protection techniques. Numerous suggestions in this strategy are already in progress, and there are also many 2016 NTAs shown on the results chain. The Sno-Stilly LIO specified that integrated planning (Strategy 02.1) should precede freshwater protection and restoration. Integrated planning results would allow LIO members to agree on areas that would be targeted for projects and protection, thus limiting conflict between land uses and reducing delays in implementation.

First, monitoring data would be used to improve understanding of baseline conditions. For protection, better baseline data would allow for priority areas to be identified and mappe… turn, would allow managers to align appr… protection tools with each area. Once appropriate tools were identified, there would be a variety of results based on the tool that was applied. First, outreach and education may result in property owners understanding the value of protecting the functions on their property and next choosing the most protective property management. If incentives were made available where appropriate, property managers could manage their property to keep ecological functions intact.

If the most appropriate protection tool suggested a regulatory approach, then it would be expected that regulatory inconsistencies would be identified and salmon recovery priorities would be considered in regulations. This would result in regulations being improved and aligned for better freshwater protection.

For restoration, baseline condition understanding would also be needed in order to prioritize and map areas for projects. The next necessary outcomes would be to complete restoration design and acquire property (if necessary). Funding and permitting would need to be secured to allow for project implementation.

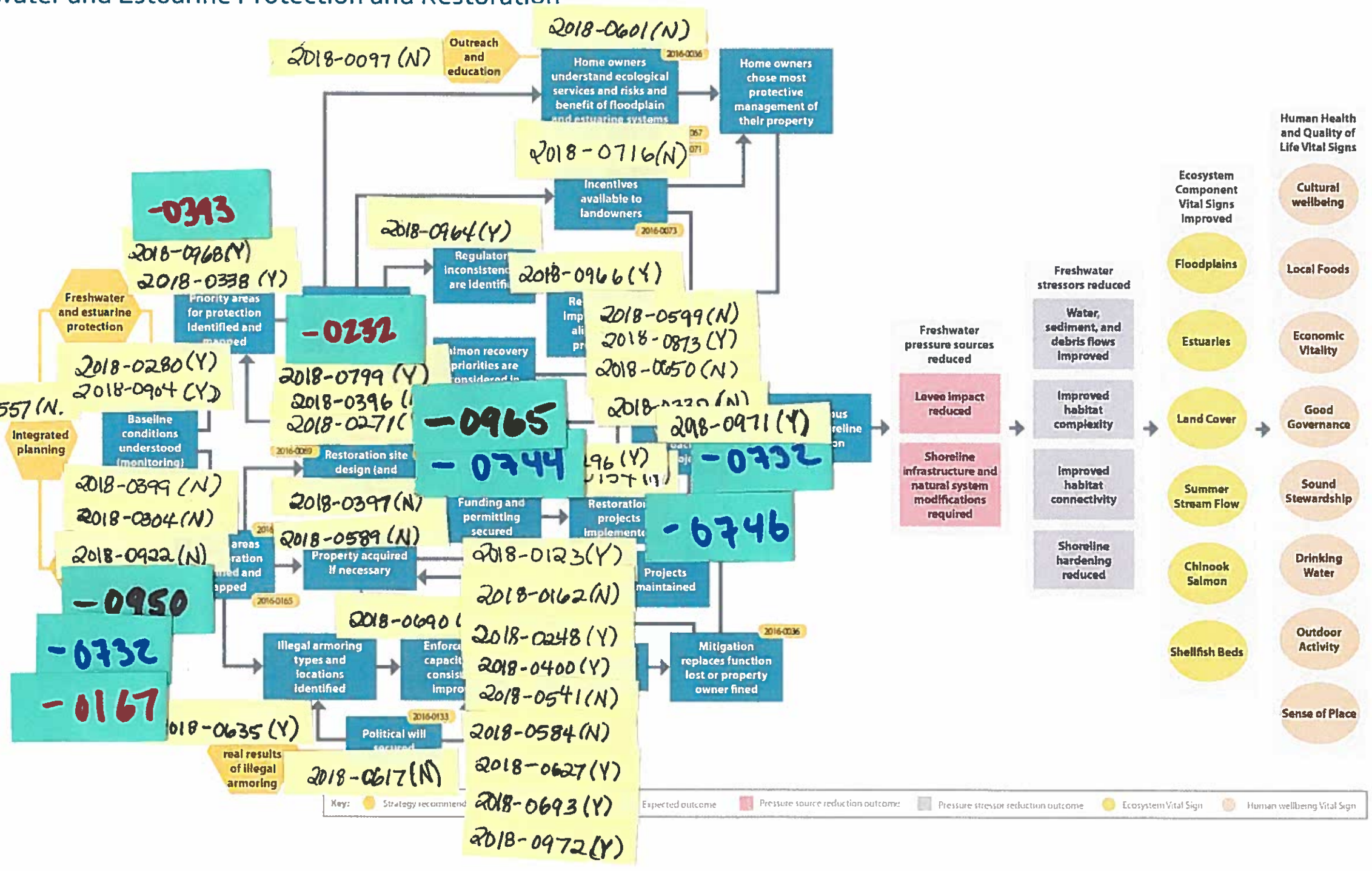


FIGURE 18. FRESHWATER AND ESTUARINE PROTECTION AND RESTORATION STRATEGIES RESULTS CHAIN