Midpeninsula Regional
Open Space District

PLANNING AND NATURAL RESOURCES COMMITTEE

R-19-149
November 19, 2019

AGENDA ITEM 2

AGENDA ITEM

Science Advisory Panel Topics

GENERAL MANAGER'S RECOMMENDATION

Forward to the full Board of Directors the following two topics, unless amended by the Planning and Natural Resources Committee:

- How can the District effectively monitor changes in plant and animal populations at the landscape scale?
- What are the benefits (biodiversity, ecosystem services, survival rate, mitigation effectiveness, etc.) and costs of restoration planting compared to seeding or other revegetation options? How does this vary by species?

If desired, select one additional topic from the list in the report to establish the first year of scientific review work for the Science Advisory Panel.

SUMMARY

The Planning and Natural Resources (PNR) Committee will review thirteen potential topics for the Science Advisory Panel (Panel). The PNR Committee will recommend approximately three topics to the full Board of Directors (Board) for final Panel topic selection.

BACKGROUND

The Panel will provide an independent, science-based review of the Midpeninsula Regional Open Space District's (District) open space management practices and decisions and serve as an important resource to inform regional management topics. The Board awarded a $100,000 contract to San Francisco Estuary Institute on August 28, 2019 (R-19-120) for Panel formation and first round of scientific review. The Board received two previous Panel presentations on December 6, 2018 (R-18-148) and March 27, 2019 (R-19-32).

DISCUSSION

The PNR Committee will review thirteen potential topics for the Panel. The PNR Committee will recommend approximately three topics to the full Board for final Panel topic selection.

Panel consultant San Francisco Estuary Institute and sub-consultant Point Blue Conservation Science held a staff workshop to brainstorm and prioritize potential topics for the Panel on October 9, 2019. The following topics emerged as the top options. Staff also solicited additional topics from Board Members. The General Manager's two recommended topics are listed below

followed by topics proposed by individual Board members and additional topics generated by staff. Topics were generated and prioritized using the following criteria:

- Topic is relevant for land management and District mission
- Topic is answerable and would generate actionable information
- Topic is urgent/time-sensitive
- Topic would benefit our partners and contribute to regional information needs
- Topic would yield a good return on investment (low costs and high benefits)
- Topic would be perceived well by the public
- Topic is broadly applicable to multiple preserves or issues
- Panel is best means available to the District to address topic

In addition to the two recommended topics below, the PNR Committee is asked to select one additional topic from the topic list, if desired, resulting in a total of three topics to recommend to the full Board for final Panel topic selection.

General Manager's Recommended Topics

1. **How can the District effectively monitor changes in plant and animal populations at the landscape scale?**

Description: Research into this question will produce a plan for how to build a standardized, scientifically robust, and cost-effective monitoring approach that samples widely from both wildlife and plants, providing key information to inform District land management. Research will consider an array of monitoring methods (with the associated costs, strengths, and risks of each) and include a set of quantifiable goals for the various ecosystems and plant and wildlife populations represented within District boundaries. This will provide continual information for holistic, adaptive land management. This research would consider integrating innovative approaches not currently used by the District, potentially including passive monitoring and environmental DNA to monitor a broader array of wildlife more cost-effectively.

Value to District: By implementing a more robust yet cost-effective monitoring program, the District will contribute ecology information to the region, be better equipped to detect changes over time, and have regular data updates that will support management decisions.

2. **What are the benefits (biodiversity, ecosystem services, survival rate, mitigation effectiveness, etc.) and costs of restoration planting compared to seeding or other revegetation options? How does this vary by species?**

Description: This question will review existing revegetation methods (including planting, seeding, and others) to provide information on short- and long- term costs and benefits as well as guidance on metrics that would determine a successful restoration program based on case studies. This information may lead to suggestions of which revegetation method is preferable for a given location, ecosystem, and target plant species.

Value to District: With this information, staff would be positioned to select the mitigation technique specific to the site and plant community that would be most successful and cost-effective. The literature review would also help negotiate alternative mitigation plans with regulatory agencies. The District currently spends significant funds on restoration planting, so

this information could lead to cost savings if more cost-effective methods are identified while also increasing ecosystem resiliency.

Board Member Suggested Topics

3. **How should the District and partners decide on the most cost-effective strategy for invasive species management across District and private properties?**

Description: Research into this topic would yield a report of the costs and benefits of different invasive species management approaches. Using examples such as Slender False Brome and Sudden Oak Death, this research would examine whether approaches like up-front early detection and rapid response treatment or ongoing adaptive management are more cost-effective strategies to eradicate or manage invasive species or invasive ecosystems (sets of species) that may cross preserve boundaries.

Value to District: The District expends significant resources on invasive species management. This topic could save the District staff time and dollars by developing tools to either deal with an invasive species across multiple properties or within one property or preserve.

4. **What is the status of ecosystem cycles for the Midpeninsula area, or perhaps for the nine-county Bay Area? What are the most important and low hanging steps we could take to improve them?**

Description: The three main cycles of an ecosystem are the water cycle, the carbon cycle and the nitrogen cycle. These three cycles working in balance are responsible for carrying away waste materials and replenishing the ecosystem with the nutrients necessary to sustain life. If any of these three cycles should become unbalanced, the effects on the ecosystem can be catastrophic.

Value to District: Sustainability is a seven generation and longer commitment to continue providing in the future, what our natural environment provides us and itself today - or rather yesterday given the recent degradation. The District can help provide to local leaders and residents information on (a) how we are doing in overall sustainability from the water/carbon/nitrogen cycle point of view, (b) how the District is contributing to improving this sustainability, and (c) how the District can improve its operations.

5. **What is the status of the soils in the various ecosystems of the District (chaparral, oak woodland, redwoods, grazing, farm lands, wetlands, etc.,) and what steps can the District take to improve and/or maintain them?**

Description: Soils are the complex "foundation" for plant and all life. Soil is a mixture of mineral particles, organic materials, air, water, and living organisms. Inventory and monitoring of soils from different ecosystems will give the District a baseline in which to assess ecosystem health.

Value to District: As we understand more, the District can implement adaptive management techniques to restore and protect our lands, such as amending or altering degraded soils.

6. **What does a "sustainable" or "restorable" quarry operation and reclamation plan look like?**

Description: If we assume some amount of need for cement for the Bay Area, what are the best possible processes that will allow for minimal, but successful restoration. Are there areas where a mine location would least impact key hydrological functions and least harm the ecosystem?

Value to District: Answers to these questions may inform District negotiations with Lehigh Cement Plant and Quarry and our advocacy with Santa Clara County.

Additional Potential Topics

7. **What are the visitation and recreational use benefits and trade-offs to fulfilling District goals, including natural resource protection and ecologically-sensitive public enjoyment and education?**

Description: Research into this question will yield a comprehensive understanding of the benefits and trade-offs on the visitor use experience and surrounding ecosystem by various types and quantities of low-intensity recreation (e.g. trails, hiking, equestrian, mountain biking, dog-walking, etc.). There are many benefits associated with visiting preserves, including physical health and mental well-being. Visitor experience can be both positively and negatively affected by other people. Research into this question will aim to address the tradeoffs associated with various types and quantities of visitation and recreation, the effects on the natural environment and, the ability to further District goals regarding stewardship and public enjoyment and education. We will also investigate the effects on visitor experiences from different recreational use types and visitor densities.

Value to District: This information can be incorporated into plans for land management units, by matching the appropriate recreational use types based on District goals, ecosystem sensitivity, and the ability to provide a variety of visitor experiences. In accordance with the District's mission, this information will help management incorporate science-based findings in land management decision-making.

8. **How do fire and habitat resilience, carbon sequestration, and biodiversity develop and emerge as co-benefits from late-seral forest management?**

Description: Research into this topic would yield a report of the ecosystem services that a healthy, managed late-seral forest provides. It would include an evaluation of fire response under different fuels treatments, habitat improvements for a diverse wildlife community, and capacity to store carbon in different forest types.

Value to District: The District is currently drafting a forest management plan for La Honda, which could incorporate findings from this research on late-seral forest management. While this question would not likely provide new information for staff, a synthesis report could be useful to demonstrate the benefits of forest management to the public.

9. **How should the District select plant propagule sites, factoring in climate change, genetic integrity and diversity, disease resistance, and inbreeding/outbreeding? Should we be planting seeds from future climate analog sites rather than current analog sites? How does this selection vary by species?**

Description: A review of the latest research on climate-analog mapping and propagule sourcing (e.g. locating the source of seed for revegetation) will provide a current understanding of the potential benefits (e.g. disease resistance, climate resilience, fire resilience) and costs (e.g. loss of local genetic integrity) of importing non-local propagules during restoration plantings. Climate-analog mapping pinpoints a modern comparable environment that matches the potential future climate of a restoration site. This research will also highlight which species are most vulnerable, and therefore in need of assistance to persist further into the future.

Value to District: By implementing a new strategy for propagule selection specifically for climate resilience, the District would likely improve the odds of success of current restoration efforts to endure the change in climate. The District will be able to manage proactively rather than reactively to changes in plant and animal distributions as a result of climate change.

10. Where on the San Mateo Coast should the District focus fisheries restoration efforts in light of climate change?

Description: Research into this topic would yield a comprehensive report detailing restoration techniques beyond barrier removal, such as sediment removal, reducing streambank erosion, and streambed improvements. Fisheries restoration is a particular challenge in agricultural areas, where water is diverted from creeks for agricultural use.

Value to District: This information will help the District develop policies and prioritize projects that enhance stream restoration and management for Coho Salmon and Steelhead Trout.

11. What are land conservation and management options to enable climate change-induced species migration and minimize species loss?

Description: Research into this topic will identify species that are likely to require assisted migration and compile existing projections of species distributions under climate change. Based on the habitat requirements of a suite of focal species, the District can then design stewardship strategies that enable species movement and acquisition strategies that emphasize tracts that are a high priority for conservation.

Value to District: This information will help the District form strategies that are proactive rather than reactive to changes in plant and animal distributions as a result of climate change, and thereby be better positioned to seek grants that would fund efforts to assist species migrations (e.g. improving permeability and connectivity across the landscape). However, this question may be answered in part by the current Santa Cruz Mountains Climate Resilience Project.

12. What is the net climate impact of cattle grazing (potential increase in soil carbon minus cattle methane emissions)? What are the District's options, such as grazing regimes or dietary additives, to reduce emissions from cattle grazing?

Description: A literature review would provide scientific evidence of changes in soil carbon storage and methane emissions due to conventional and alternative practices in rangeland management, which occurs on 17 percent of the District's land. This research would also consider which rangeland management practices are appropriate for the particular sites and characteristics of the District's grazed lands.

Value to District: This topic emerged from the District's Climate Action Plan efforts to assess and reduce emissions from cattle. This information would help the District implement best practices over thousands of acres of rangeland to curb emissions of carbon dioxide and methane, greenhouse gases which contribute to global warming and climate change.

13. What is the historical ecology of beavers on the San Mateo Coast?

Description: This line of research would yield a compilation of the habitat requirements of beavers, a mapping of the historical range of beavers on the San Mateo Coast, and a description of their role as ecosystem engineers. By felling trees and building dams, beavers have a great influence on ponds, wetlands, salmon, birds, and aquifer recharge. It would also highlight examples of using beaver dam analogs in areas without beavers to alter flow and create habitat.

Value to District: This information would provide guidance for the potential reintroduction of beavers to San Mateo County as well as a framework for incorporating beaver dam analogs to assist with recovery of fish such as Coho Salmon in the absence of beavers.

FISCAL IMPACT

There are sufficient funds in the adopted Fiscal Year (FY) 2019-20 operating budget to cover the cost of Panel formation, topic selection process, and initiation of the first round of research. Additional funds will be requested as part of the FY2020-21 Budget and Action Plan process to cover the completion of the first round of research, along with an evaluation of the Panel's effectiveness and, if successful, the initiation of a second round of topic selection and research.

The Panel is not funded by Measure AA.

BOARD COMMITTEE REVIEW

This is the first Board Committee review of the Panel.

PUBLIC NOTICE

Public notice was provided as required by the Brown Act.

CEQA COMPLIANCE

This item is not a project subject to the California Environmental Quality Act.

NEXT STEPS

The full Board will consider the recommended topics from the PNR Committee and make the final Panel topic selection on January 8, 2020. Staff will negotiate the research scopes for the selected topics to ensure they fit within the adopted budget. If there is insufficient budget to proceed with all Board-selected topics, a memo will be forwarded to the Board with the top priority topics that are able to proceed within the budget constraints. Research results will be shared with the Board in fall 2020.

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