

Adaptation Roadmap

Workbook 5: Bring Together Shared Solutions

Worksheets 5A-5M

Outcomes include:
**Sets of Adaptation Strategies for Short,
Medium, and Long-Term**

Tracking Progress

Name(s):
Title/Dept./other Identifier:
Jurisdiction/Organization:
Date Worked On:
Worksheets Worked On:

Name(s):
Title/Dept./other Identifier:
Jurisdiction/Organization:
Date Worked On:
Worksheets Worked On:

Name(s):
Title/Dept./other Identifier:
Jurisdiction/Organization:
Date Worked On:
Worksheets Worked On:

Workbook 5

5.1 Explore Actions to Meet Envisioned Futures

(Worksheet 5A):

5.2 Creating Bundled Strategies That Work

Together (Worksheet 5B):

5.3 Phasing and Sequencing Strategies Over Time

(Worksheet 5C-5D):

5.4 Evaluating Tradeoffs and Making Decisions

(Worksheet 5E-5J):

ADAPTATION STRATEGIES

(Worksheets 5H-5J):

*Print Your Sets of Adaptation Strategies for the
Short, Medium, and Long-Term*

INSTRUCTIONS

Workbook 5 and Outcomes

This workbook is designed to accompany Chapter 5: Bring Together Shared Solutions to apply greater detail to the scenarios explored and advanced in Chapter 4. This chapter includes applying more technical details to the adaptation actions and strategies previously explored, and should be done with technical experts. Have on hand completed [Worksheets 4G-4N from Chapter 4](#).

This workbook differs from the other workbooks in that it recommends downloading and using the ART Adaptation Catalog Excel spreadsheet "Build Your Strategies" Tab to complete the first three sections of the workbook. The final section of **Chapter 5.4 Making Decisions on Adaptation** should be recorded in this workbook as the Excel document does not provide space for these notes.

Sets of Adaptation Strategies for Short, Medium, and Long-Term

All four sections of Chapter 5 are designed to support a final outcome of having adaptation strategies that are supported and advanced to be implemented in Chapter 6. **Section 5.1 Explore Actions to Meet Envisioned Futures** provides three subsections that give an overview of the types of adaptation actions and strategies and access to the ART Adaptation Catalog, an Excel database of adaptation actions and strategies.

- [Exploring Adaptation Actions \(Worksheets 5A\)](#)

Section 5.2 Creating Bundled Strategies That Work Together provides four subsections on how to ensure adaptation strategies include all relevant actions to be holistic.

- [Bundling Adaptation Strategies \(Worksheets 5B\)](#)

Section 5.3 Phasing and Sequences Strategies Over Time includes four subsections to add details on timing and phasing of adaptation actions to build adaptation pathways.

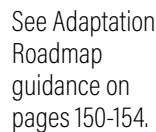
- [Phasing Strategies Over Time \(Worksheets 5C\)](#)

Section 5.4 Evaluating Tradeoffs and Making Decisions is the final section, and provides three subsections on applying evaluation criteria and additional evaluation techniques to ultimately discuss, decide, and advance robust adaptation strategies that meet the community's vision.

- [Visualizing Adaptation Pathways \(Worksheet 5D\)](#)
- [Applying Evaluation Criteria and Other Analysis \(Worksheet 5E-5F\)](#)
- [Making Decision on Adaptation \(Worksheets 5G-5J\)](#)

Supplemental Pages

The supplemental pages provide extra space to list additional notes, as needed.



Worksheet 5A:

Sets of Adaptation Strategies

Explore Actions to Meet Envisioned Futures

a) Explore adaptation actions in the ART Category tabs.

Funding and Financing

b) Use the "CREATE YOUR STRATEGIES" tab and copy and paste the **Action Category**, **Action Name**, and **Tool Type** in the spreadsheet. Consider this as a starting point that will be refined and added to as you move through sections in Chapter 5. If necessary, unhide tab D after Tool Type called Action Notes to include any comments you have as you explore actions.

Outcome: List of actions either identified from the scenarios to be advanced or actions that meet the scenarios to be advanced to continue exploring in greater detail. Note: An hypothetical example of "Create Your Strategies" is available in the ART Adaptation Catalog.

a) Explore tab categories

b) Copy and Paste
Actions into "Create
Your Strategies"
tab to track and
begin building
your adaptation
strategies

[illegible]



See Adaptation Roadmap guidance on pages 155-163.

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Worksheet 5B: Sets of Adaptation Strategies

Adding the Range of Actions Needed to Build Cohesive Strategies

a) Work through sections 5.2.1 Starting with the End in Mind, 5.2.2 Linking Plans and Programs, 5.2.3 Connecting to People, and 5.2.4 Paying for Adaptation to add additional actions together that are necessary for a robust strategy in the "CREATE YOUR ADAPTATION STRATEGIES" tab.

Draw from and build upon the initial actions selected from Worksheet 5A. This will likely include going back through the ART Adaptation Category tabs, along with other resources listed in Chapter 5. The purpose of this section is to include the suite of actions necessary (i.e. a strategy) to reach the envisioned futures from Chapter 4. This step should include actions that are feasible and represent realistic options.

b) For each action with a strategy, identify in what 3.4.4 Planning Horizon these strategies would occur in. Use the "Term" tab to list planning horizons such as near-term, mid-term, or long-term.

- Use **Worksheet 3M** and **Worksheets 4G-4N** to match actions and strategies to your planning horizons.

c) For each set of strategies, consider an overarching name to help organize related actions. For example, this could include a descriptive name such as Horizontal Levee if multiple actions are all supporting the development of that outcome. If an action is connected to various or too many other actions or not directly connected to any, you can leave this blank or create a descriptive name for these types of actions.

Outcome: List of adaptation actions that are identified as part of a related strategy (and named if appropriate), and matching of actions to planning horizons from the scenarios to advance. Note: An hypothetical example of "Create Your Strategies" is available in the ART Adaptation Catalog.

5.2

Bundled Strategies That Work Together

a) Add additional actions

b) List planning horizon term for actions and strategies

c) Name connected strategies

		3.3.4 Time Horizons		5.2 Bundling Strategies
Category*	Action Name*	Tool Type*	Term	Connected Strategies
Plans and Policies	Create/Update Local Hazard Mitigation Plan	Plans	Short Term	
Build A Project	Tidal Marsh Restoration	Green Infrastructure	Short Term	Habitat Enhancements
Plans and Policies	Update General Plan	Plans	Short Term	
Plans and Policies	Resilience Overlay Zones/Districts	Land Use Planning	Short Term	
Plans and Policies	Permitting	Permits	Short Term	
Programs and Operations	Levee Maintenance Program	Adaptive Management Program	Short Term	Horizontal Levee
Build A Project	Horizontal Levee/Ecotone Levee	Green Infrastructure	Short Term	Horizontal Levee
Capacity and Coordination	Convene Workshops	Educate	Short Term	Horizontal Levee
Plans and Policies	Horizontal Levee Study	Technical Study	Short Term	Horizontal Levee
Plans and Policies	Horizontal Levee Design	Technical Study	Short Term	Horizontal Levee
Build A Project	Beach Nourishment	Green Infrastructure	Short Term	Habitat Enhancements
Build A Project	Submerged Aquatic Vegetation (Eelgrass)	Green Infrastructure	Short Term	Habitat Enhancements
Build A Project	Contaminated Lands/Soil Monitoring Program	Adaptive Management Program	Short Term	Habitat Enhancements
Capacity and Coordination	Soil contamination management coordination	Educate	Short Term	
Build A Project	Elevate Infrastructure (railway)	Retrofit	Mid Term	
Funding and Financing	Seek grant funding	Grant	Short Term	
Funding and Financing	Annual Budget	Taxes and Fees	Short Term	
Build A Project	Contaminated site remediation	Remediation	Mid Term	
Build A Project	Add horizontal levees	Green Infrastructure	Mid Term	
Build A Project	Raise horizontal levees	Green Infrastructure	Mid Term	
Build A Project	Remove existing development	Remove	Mid Term	
Build A Project	Creek Alignment	Green Infrastructure	Mid Term	



See Adaptation
Roadmap
guidance on
pages 164-174.

Adaptation Roadmap

Worksheet 5C: Sets of Adaptation Strategies

Adding Elements of Time, Order and Points of Change

Work through sections 5.3.1 Action Lifespans and Time Horizons, 5.3.2. Sequencing and Lead Times, and 5.3.3 Applying Triggers and Decision Points to add relevant information and details to the strategies identified from Worksheet 5B in the "CREATE YOUR ADAPTATION STRATEGIES" tab. This section may require the greatest amount of technical (engineering, hydrological, advanced planning) support given the level of detail desired.

a) For each action, use the columns to consider when the actions need to be "In Place By" and the "End of Lifespan". This may include a specific time and/or Total Water Level, depending on the action. It can also be true that actions may need to be in place based on the timing of other actions. Use this section as needed to help organize Action Lifespans and Time Horizons. Unhide tab H to take notes, if needed.

b) For each action, use the columns to consider if there is a "Sequence" necessary for the actions to occur in, and expected "Lead Time" it would take in order for the action to be ready to implement. One approach for sequencing strategies may include giving sets of strategies a letter (e.g. A), and then ordering those sets by adding a number that letter (e.g. A-1, A-2, etc.). Actions occurring in tandem can have the same letter and number, while actions that require sequencing can be specifically ordered. Given the complexity of your process, it may or may not be helpful to use this sequencing approach. Adjust this worksheet and your approach as needed. Unhide tab K to take notes, if needed.

c) For each action, consider if this action has a "Trigger Needed" and/or "Decision Point," where applicable. Unhide tab N to take notes, if needed.

d) This section provides an experimental approach to developing initial adaptation pathways from the information collected in sections a-c. Apply the information collected and sort the "Sequence" column for an initial adaptation pathways visual. See the hypothetical example "Create Your Strategies" in the ART Adaptation Catalog. See 5G for additional support of developing adaptation pathways visuals.

Outcome: List of adaptation actions and strategies organized and sequenced over time.

a) Add when actions are In Place By and End of Effective Lifespan																b) Add the order or Sequence and Lead Time of actions				c) Add Triggers Needed and Decision Points, if applicable				d) Experimental approach to creating Adaptation Pathways based on information provided									
Copy from ART Catalog Tabs or Create Your Own	Review 5.3.1 Action Lifespan and Time Horizons				Review 5.3.2 Sequencing and Lead Times		Review 5.3.3 Applying Triggers and Decision Points		Immediate			Short Term (2030 - 2050)			Mid Term (2050 - 2100)																		
	In Place By	End Lifespan	Sequence	Lead Time	Trigger Needed	Decision Point	1-2 yrs	3-5 yrs	5-10 yrs	12"	24"	36"	48"	52"	66"																		
Create/Update Local Hazard Mitigation Plan	2022	2027	A	12 months	No	No		2022	2027																								
Tidal Marsh Restoration	24" TWL	Ongoing benefits	A	12-18 months	No	No																											
Update General Plan	2025	Indefinite (~20 years)	A	12 months	No	No																											
Resilience Overlay Zones/Districts Permitting	Horizontal Levee	Indefinite (~20 years)	A	3 months	No																												
Convene Workshops	Horizontal Levee		A	2 years	No																												
Horizontal Levee Study	Immediate		A1	Before levee construction	No																												
Horizontal Levee Design	Horizontal Levee		A2-	6 months	No																												
Levee Maintenance Program	Horizontal Levee	Horizontal Levee	A3-	6 months	No																												
Horizontal Levee/Ecotone Levee	Horizontal Levee	Horizontal Levee	A	1 month	Yes - Flooding or Social	Yes																											
Raise horizontal levees	36" TWL	72" TWL	A0	12-18 months to build	No																												
Beach Nourishment					Yes - Flooding or Social	Yes																											
Submerged Aquatic Vegetation (Eelgrass)	12" TWL	24" TWL	B		No	No																											
Contaminated Lands/Soil Monitoring Program	12" TWL	Ongoing benefits	B		No																												
Soil contamination management coordination	12" TWL	36" TWL	C	6 months	Yes - Flooding or Social																												
Elevate Infrastructure (railway)	12" TWL	24" TWL	C		No																												
Seek grant funding	42" TWL	84" TWL	D		Yes - Flooding or Social	Yes																											
Annual Budget	Immediate		None		Yes - Flooding or Social	Yes																											
Contaminated site remediation	Immediate		None		Yes - Flooding or Social	Yes																											
Add horizontal levees	36" TWL				Yes - Flooding or Social	Yes																											
Operations	Capacity & Coordination	Funding and Financing	CREATE YOUR STRATEGIES	Example "Create Your Strategies"																													



See Adaptation
Roadmap
guidance on
pages 164-174.

Adaptation Roadmap

Worksheet 5D: Visualizations

5.3 Visualizing Adaptation Pathways

Creating Adaptation Pathways Diagrams

Use this space to note key considerations for creating adaptation pathways diagrams. Consider this as a brainstorming space that may be refined following additional evaluation of adaptation strategies in **5.4 Tradeoffs and Decisions**, or conversations with communities and stakeholders. It may be helpful to create more than one diagram to serve different purposes.

Audience:

Audience:

Purpose of visual and scale:

Purpose of visual and scale:

Type of pathway visual (simplified, complex)

Type of pathway visual (simplified, complex)

Details to include or emphasize:

Cost estimates

Lock-ins

Dependencies

Bundling

Decision points/triggers

Other

Notes

*Link to
visuals*

Details to include or emphasize:

Cost estimates

Lock-ins

Dependencies

Bundling

Decision points/triggers

Other

Notes

*Link to
visuals*

Duplicate this PDF page to take notes on additional visualizations.



See Adaptation
Roadmap
guidance on
pages 175-181.

Adaptation Roadmap

Worksheet 5E:

Applying Evaluation Criteria - Revisit

5.4 Tradeoffs and Decision Making

Revisit Evaluation Criteria and Document Changes If Needed

Use this space to revisit and potentially update the evaluation criteria developed in **4.2.3 Evaluation Criteria**. This might occur before or after conversations with communities and changes may be suggested based on the information learned when bundling and phasing strategies in the previous sections. Review **Worksheet 4E** from **Workbook 4** and use the space below to document if any changes need to be made as well as reasons for making changes. The purpose here is to be transparent regarding if any changes are being made and *why*.

5.4.1: Final Evaluation Criteria

Notes on Changes

Feasibility

Social Benefits

Economic Benefits

*Environmental
Benefits*

Governance

Disaster/Lifecycle

*Neighboring/
Regional Impacts*



See Adaptation
Roadmap
guidance on
pages 175-181.

Adaptation Roadmap

Worksheet 5F:

Applying Evaluation Criteria - Document

5.4

Tradeoffs and Decision Making

Document Conversations While Applying Evaluation Criteria

Use this space to note how the evaluation criteria created from **4.2.3 Evaluation Criteria** and refined **5.4.1 Share Results and Apply Evaluation Criteria** is being used, and document conversations that occur during this process.

Ranking System Used

What's Being Evaluated

Assumptions for Using Criteria

Individual actions

Strategies

Other

5.4.1: Notes on Evaluation Criteria Conversation

5.4.2: Is Additional Analysis Needed? How is Feedback Being Used?

Population Impacts

Equity Analysis

Neighboring Impacts

CEQA/EIR Analysis

Other



See Adaptation
Roadmap
guidance on
pages 175-181.

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Worksheet 5G: Making Decisions on Adaptation

5.4 Tradeoffs and Decision Making

Being Transparent About Decisions

This page provides space to document *what* decisions are being made, *how*, and *why* they were selected. It also provides space to describe how adaptation actions and strategies identified meet the vision and guiding principles set by the community and stakeholders earlier in the process in **Chapter 4** and **Workbook 4** (specifically **Worksheet 4D**).

Refer back to **Chapter 2** and **Workbook 2** (and specifically **Worksheet 2G**) to describe how the decision-making process was applied to get to these final decisions for advancing adaptation.

5.4.3: Under which planning horizons are final actions/strategies and why?

Immediate

Short-term

Mid-term

Long-term

Describe evaluation criteria outcomes, any follow-up discussions or analysis, and how the team arrived at the final decision making process.

Describe the decision making process used to make final decisions



See Adaptation
Roadmap
guidance on
pages 175-181.

Adaptation Roadmap

Worksheet 5H: Sharing Adaptation Decisions

5.4 Tradeoffs and Decision Making

Describe Why Adaptation Actions and Strategies Were Chosen

Use this space to document and describe WHY individual actions and/or adaptation strategies were chosen. Document this information in a way that makes the most sense for your process. Consider how you can draw upon previous conversations and activities that occurred throughout your process. This section is the culmination of everything you've worked for, so make it clear how much this effort has been built by and for communities and stakeholders.

Planning Horizon Term:

Title or Description:

What
adaptation
actions or
strategies were
chosen?

How do they
meet the vision
and guiding
principles
from Chapter
4: Shape a
Shared Vision
of the Future?

How do they
address the
key issues
and problems
identified?

How do they
advance key
values, such
as equity, the
environment,
or economy?



See Adaptation
Roadmap
guidance on
pages 175-181.

Adaptation Roadmap

Worksheet 5I: Sharing Adaptation Decisions

5.4 Tradeoffs and Decision Making

Describe Why Adaptation Actions and Strategies Were Chosen

Use this space to document and describe WHY individual actions and/or adaptation strategies were chosen. Document this information in a way that makes the most sense for your process. Consider how you can draw upon previous conversations and activities that occurred throughout your process. This section is the culmination of everything you've worked for, so make it clear how much this effort has been built by and for communities and stakeholders.

Planning Horizon Term:

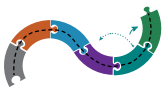
Title or Description:

What
adaptation
actions or
strategies were
chosen?

How do they
meet the vision
and guiding
principles
from Chapter
4: Shape a
Shared Vision
of the Future?

How do they
address the
key issues
and problems
identified?

How do they
advance key
values, such
as equity, the
environment,
or economy?



See Adaptation
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guidance on
pages 175-181.

Adaptation Roadmap

Worksheet 5J: Sharing Adaptation Decisions

5.4 Tradeoffs and Decision Making

Describe Why Adaptation Actions and Strategies Were Chosen

Use this space to document and describe WHY individual actions and/or adaptation strategies were chosen. Document this information in a way that makes the most sense for your process. Consider how you can draw upon previous conversations and activities that occurred throughout your process. This section is the culmination of everything you've worked for, so make it clear how much this effort has been built by and for communities and stakeholders.

Planning Horizon Term:

Title or Description:

What
adaptation
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How do they
meet the vision
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from Chapter
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Shared Vision
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SUPPLEMENTAL PAGES

Workbook 5 and Outcomes

Extra space for additional notes as needed.

Adaptation Roadmap

Supplemental Page #

Extra space for additional notes as needed.

Duplicate this PDF page to take additional supplemental notes.

Adaptation Roadmap

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Workbook 5 is a complimentary resource to the **Adaptation Roadmap: A Practitioner's Guide to Plan and Implement a Collaborative, Equitable, Integrative, and Flexible Approach to Sea Level Rise Adaptation**. These resources were created by the Adapting to Rising Tides Program at the San Francisco Bay Conservation and Development Commission. March 2022.

This workbook has been designed to meet Web Content Accessibility Guidelines (WCAG) Level AA Requirements to the extent feasible. We acknowledge parts of this document may still require additional assistance. Please contact us at BCDC at:

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