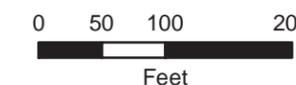
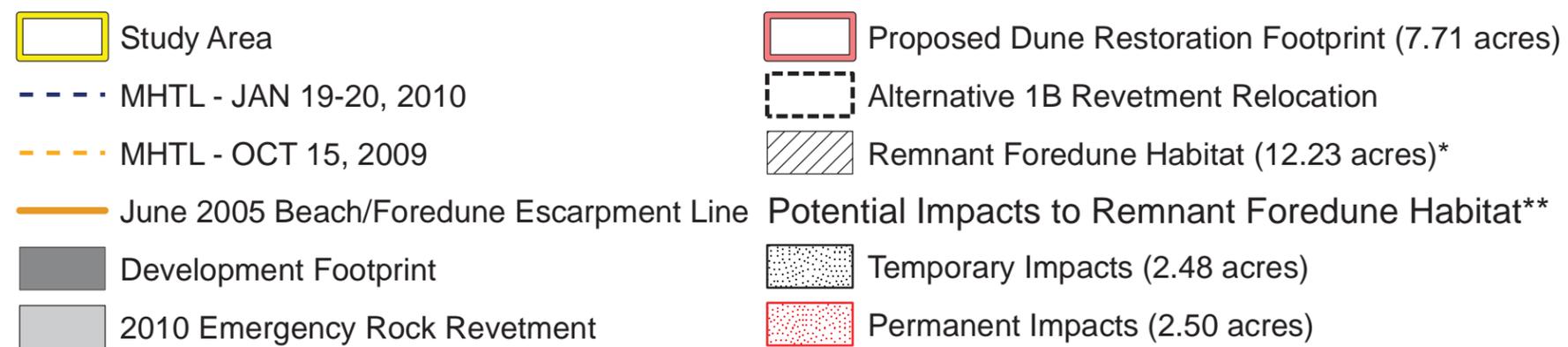


Broad Beach  
Restoration Project

Malibu,  
California

Figure 10-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 1B  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

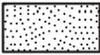
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

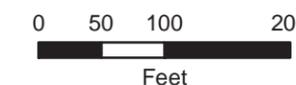
Broad Beach  
Restoration Project

Malibu,  
California

Figure 10-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 1B  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 1B Revetment Relocation             |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.48 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (2.50 acres)                  |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

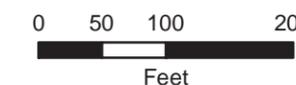
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 2 Revetment Relocation
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (1.86 acres)
- Permanent Impacts (1.31 acres)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

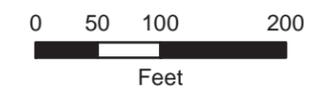
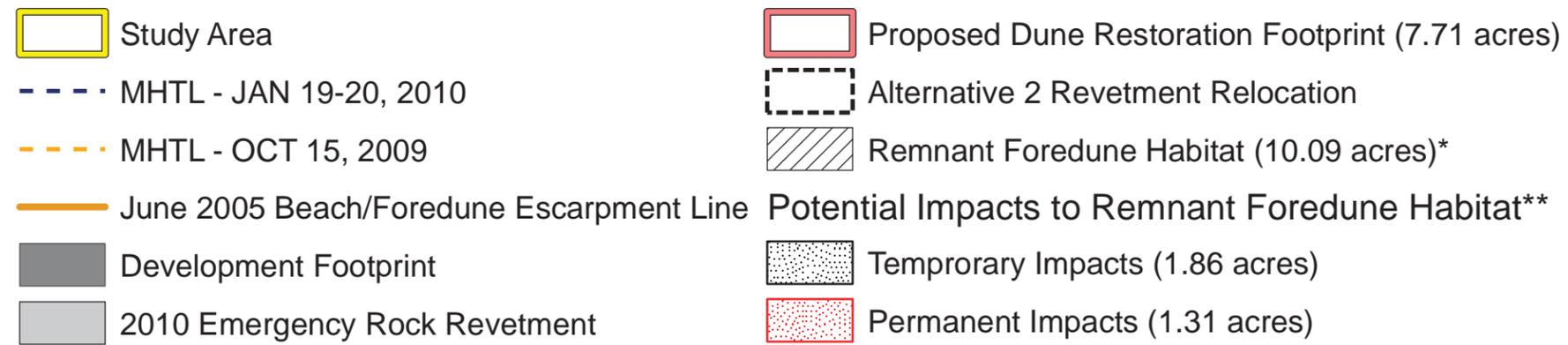
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2013  
Existing Conditions



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

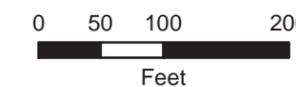
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2013  
Existing Conditions

- |  |  |
|--|--|
| Study Area                               | Proposed Dune Restoration Footprint (7.71 acres)       |
| MHTL - JAN 19-20, 2010                   | Alternative 2 Revetment Relocation                     |
| MHTL - OCT 15, 2009                      | Remnant Foredune Habitat (10.09 acres)*                |
| June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b> |
| Development Footprint                    | Temporary Impacts (1.86 acres)                         |
| 2010 Emergency Rock Revetment            | Permanent Impacts (1.31 acres)                         |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

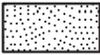
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

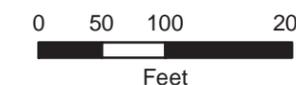
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2013  
Existing Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 2 Revetment Relocation              |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (10.09 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (1.86 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (1.31 acres)                  |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

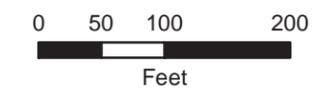
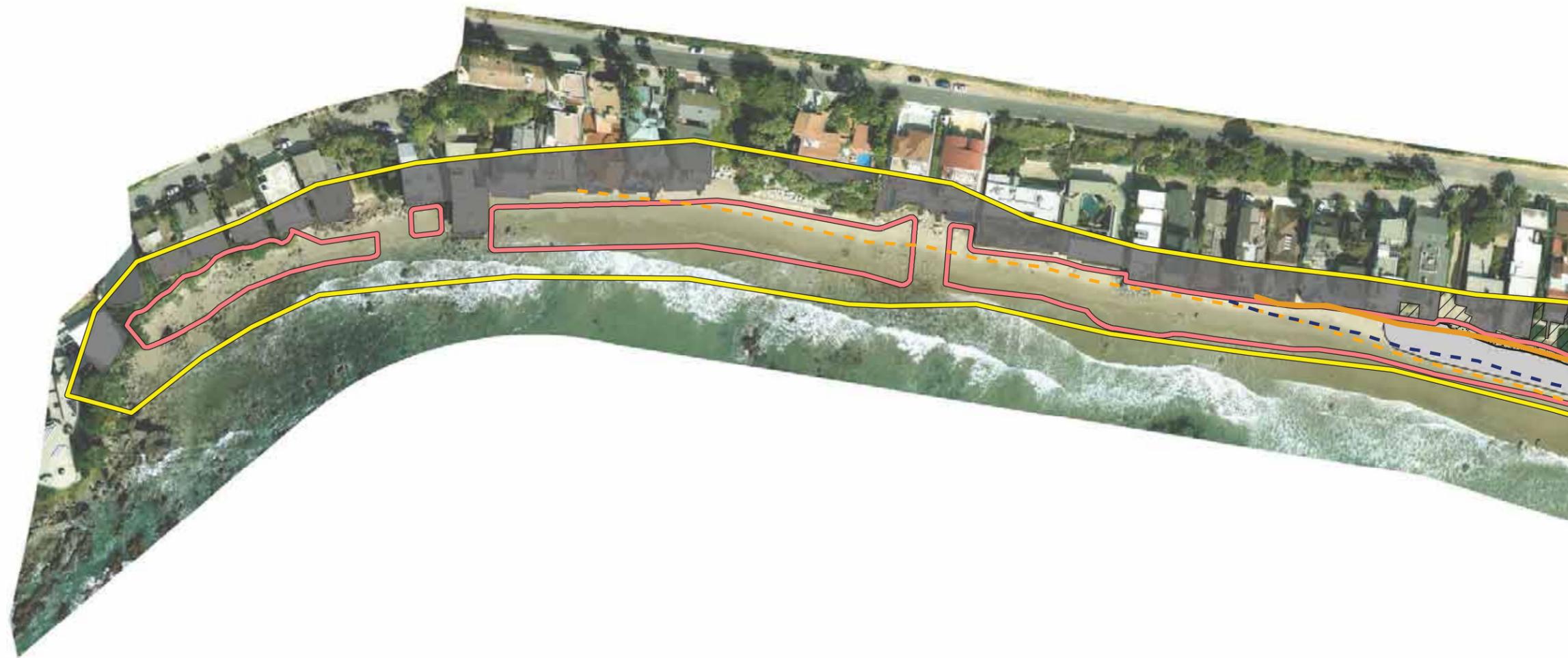
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2013  
Existing Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 2 Revetment Relocation              |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (10.09 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (1.86 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (1.31 acres)                  |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

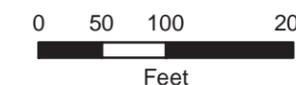
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2005  
Baseline Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 2 Revetment Relocation
- Remnant Foredune Habitat (12.23 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.48 acres)
- Permanent Impacts (2.54 acres)



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

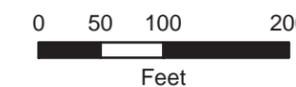
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2005  
Baseline Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 2 Revetment Relocation
- Remnant Foredune Habitat (12.23 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.48 acres)
- Permanent Impacts (2.54 acres)



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

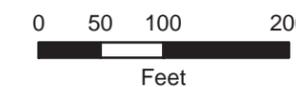
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 2 Revetment Relocation              |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.48 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (2.54 acres)                  |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

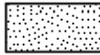
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

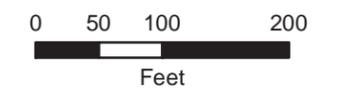
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 2 Revetment Relocation              |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.48 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (2.54 acres)                  |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

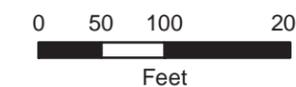
Broad Beach  
Restoration Project

Malibu,  
California

Figure 11-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 2  
Relative to 2005  
Baseline Conditions

- |  |  |
|--|--|
| Study Area                               | Proposed Dune Restoration Footprint (7.71 acres)       |
| MHTL - JAN 19-20, 2010                   | Alternative 2 Revetment Relocation                     |
| MHTL - OCT 15, 2009                      | Remnant Foredune Habitat (12.23 acres)*                |
| June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b> |
| Development Footprint                    | Temporary Impacts (2.48 acres)                         |
| 2010 Emergency Rock Revetment            | Permanent Impacts (2.54 acres)                         |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

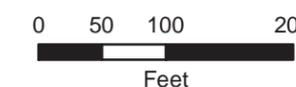
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3A Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.58 acres)
- Permanent Impacts (0.90 acre)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\*Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

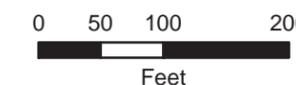
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3A Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.58 acres)
- Permanent Impacts (0.90 acre)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\*Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

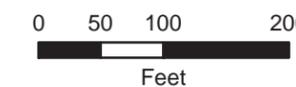
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3A Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.58 acres)
- Permanent Impacts (0.90 acre)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\*Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

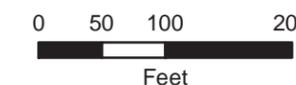
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2013  
Existing Conditions

- |  |  |
|--|--|
| Study Area                               | Proposed Dune Restoration Footprint (7.71 acres)       |
| MHTL - JAN 19-20, 2010                   | Alternative 3A Seawall Pull-back Location              |
| MHTL - OCT 15, 2009                      | Remnant Foredune Habitat (10.09 acres)*                |
| June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b> |
| Development Footprint                    | Temporary Impacts (2.58 acres)                         |
| 2010 Emergency Rock Revetment            | Permanent Impacts (0.90 acre)                          |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\*Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

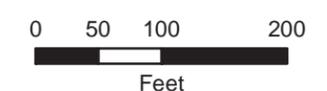
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3A Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.58 acres)
- Permanent Impacts (0.90 acre)



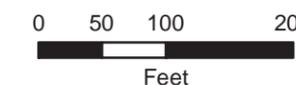
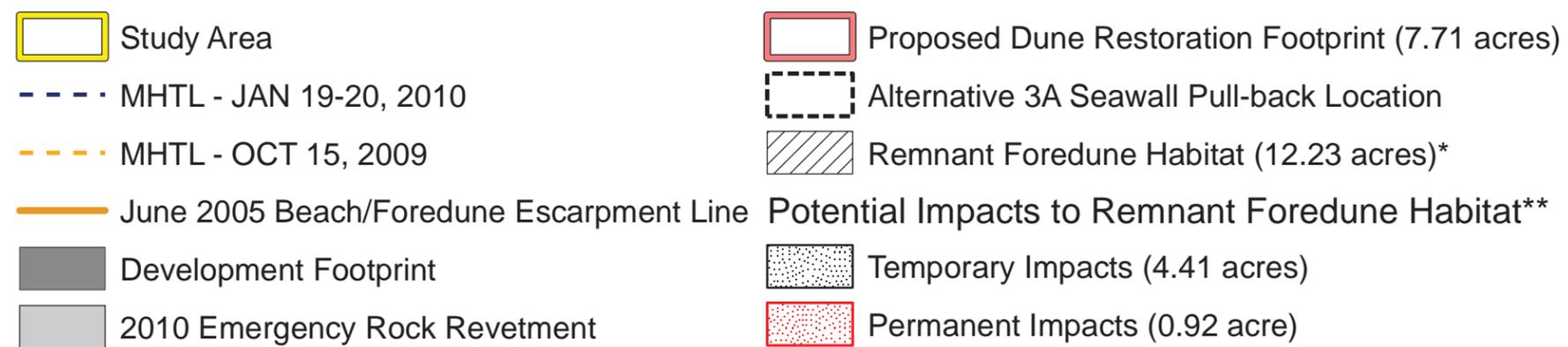
\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\*Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

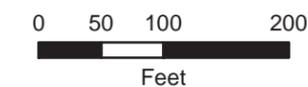
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2005  
Baseline Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3A Seawall Pull-back Location
- Remnant Foredune Habitat (12.23 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (4.41 acres)
- Permanent Impacts (0.92 acre)



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

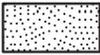
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

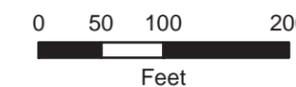
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 3A Seawall Pull-back Location       |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (4.41 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.92 acre)                   |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

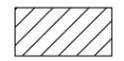
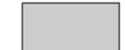
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

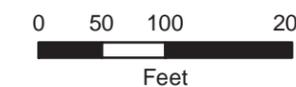
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 3A Seawall Pull-back Location       |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (4.41 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.92 acre)                   |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

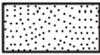
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

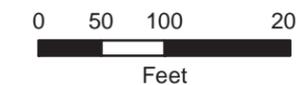
Broad Beach  
Restoration Project

Malibu,  
California

Figure 12-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3A  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 3A Seawall Pull-back Location       |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (4.41 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.92 acre)                   |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

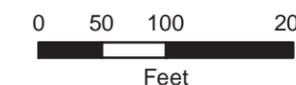
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3B Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.73 acres)
- Permanent Impacts (0.41 acre)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

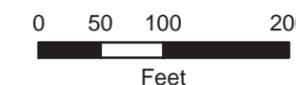
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3B Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.73 acres)
- Permanent Impacts (0.41 acre)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

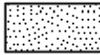
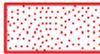
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

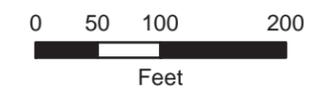
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2013  
Existing Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 3B Seawall Pull-back Location       |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (10.09 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.73 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.41 acre)                   |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

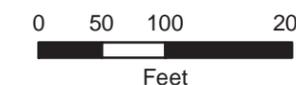
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3B Seawall Pull-back Location
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.73 acres)
- Permanent Impacts (0.41 acre)



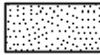
\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

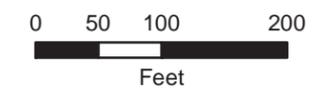
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2013  
Existing Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 3B Seawall Pull-back Location       |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (10.09 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.73 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.41 acre)                   |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2010 extent).

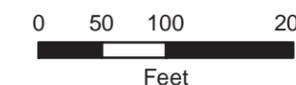
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2005  
Baseline Conditions

- |  |  |
|--|--|
| Study Area                               | Proposed Dune Restoration Footprint (7.71 acres)       |
| MHTL - JAN 19-20, 2010                   | Alternative 3B Seawall Pull-back Location              |
| MHTL - OCT 15, 2009                      | Remnant Foredune Habitat (12.23 acres)*                |
| June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b> |
| Development Footprint                    | Temporary Impacts (4.29 acres)                         |
| 2010 Emergency Rock Revetment            | Permanent Impacts (0.70 acre)                          |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

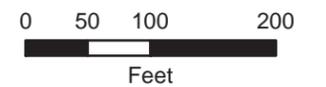
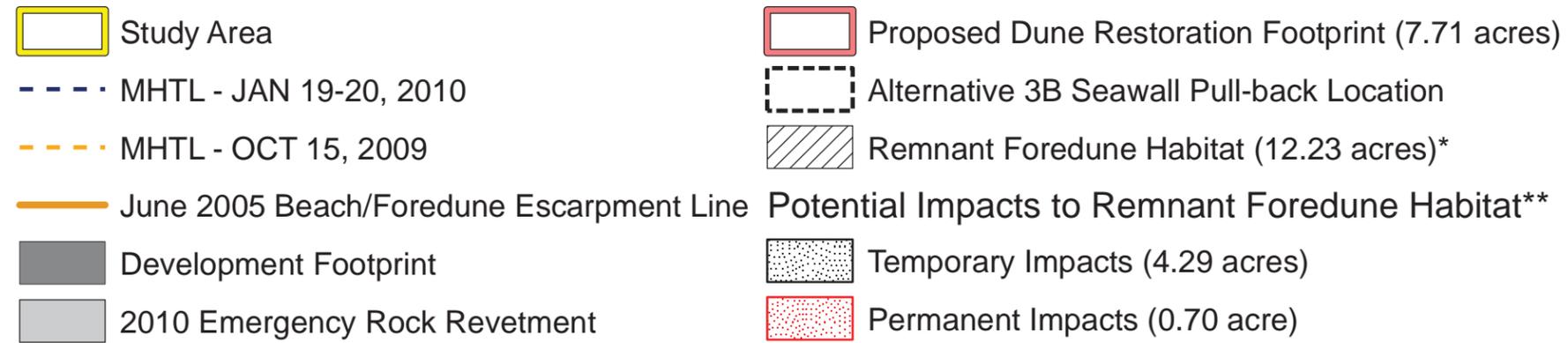
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

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Restoration Project

Malibu,  
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Figure 13-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

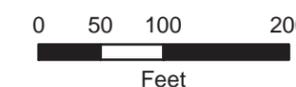
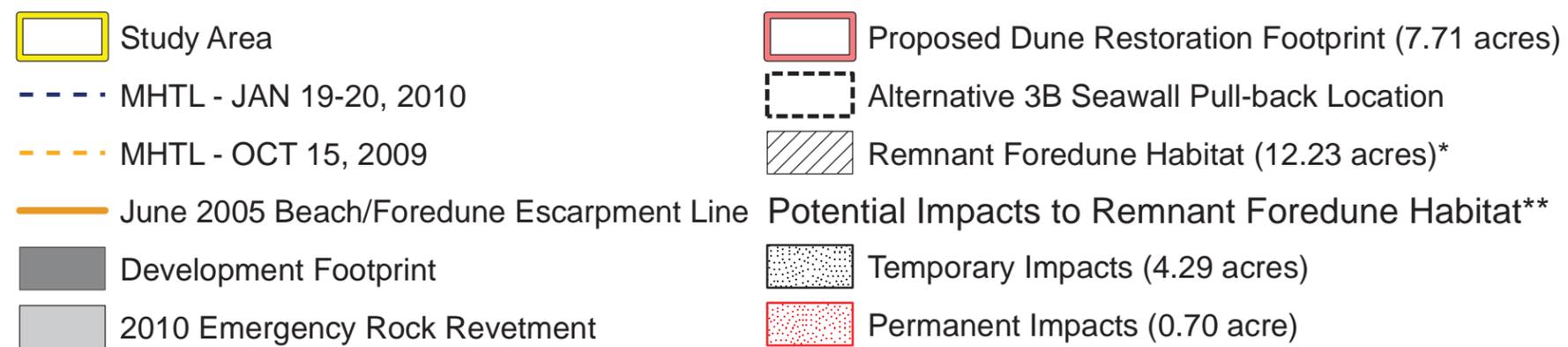
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

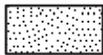
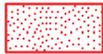
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

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Restoration Project

Malibu,  
California

Figure 13-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 3B Seawall Pull-back Location       |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (4.29 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.70 acre)                   |



0 50 100 200  
Feet

\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

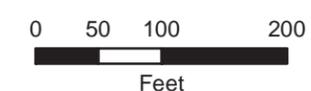
Broad Beach  
Restoration Project

Malibu,  
California

Figure 13-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 3B  
Relative to 2005  
Baseline Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 3B Seawall Pull-back Location
- Remnant Foredune Habitat (12.23 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (4.29 acres)
- Permanent Impacts (0.70 acre)



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

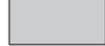
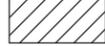
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to installation of seawall and associated rock apron in existing degraded foredune habitat (2005 extent).

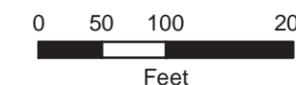
Broad Beach  
Restoration Project

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California

Figure 14-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.09 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

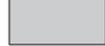
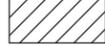
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

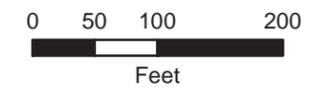
Broad Beach  
Restoration Project

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California

Figure 14-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.09 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

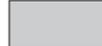
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

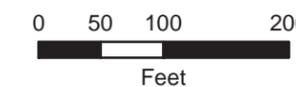
Broad Beach  
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California

Figure 14-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.09 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

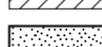
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

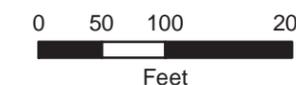
Broad Beach  
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California

Figure 14-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.09 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

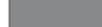
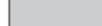
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

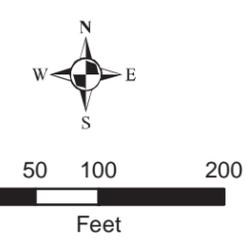
Broad Beach  
Restoration Project

Malibu,  
California

Figure 14-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.09 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

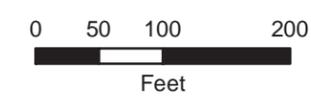
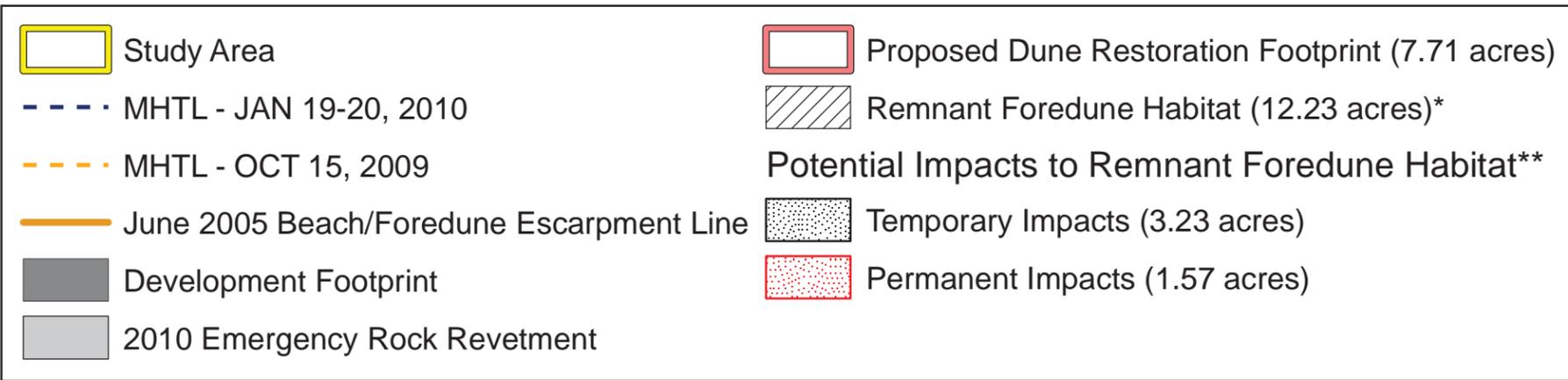
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

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Restoration Project

Malibu,  
California

Figure 14-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

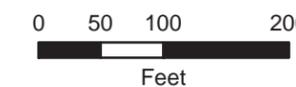
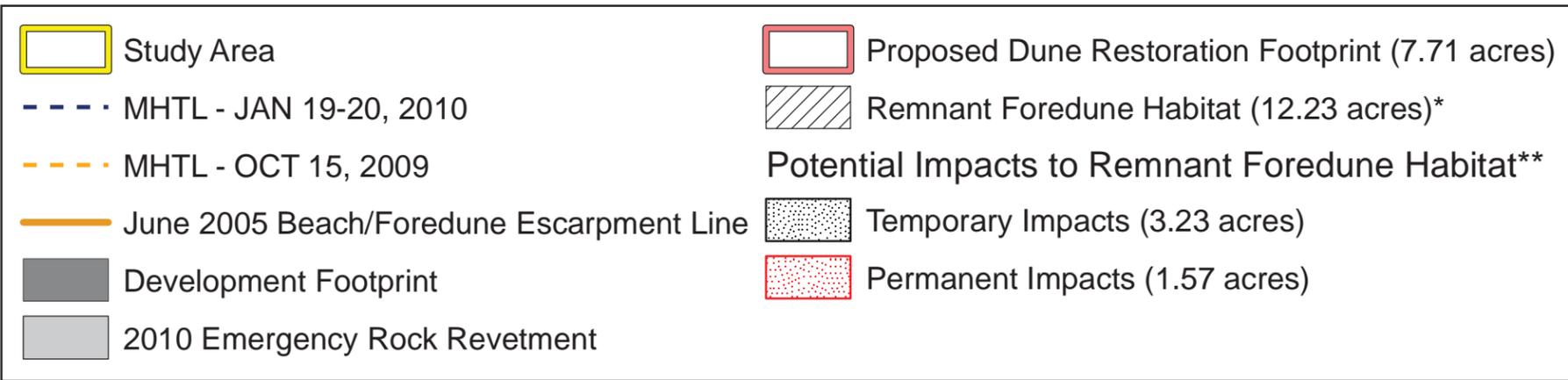
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to retention of the rock revetment in the project design.

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Malibu,  
California

Figure 14-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

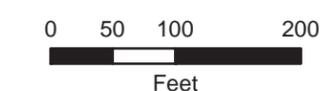
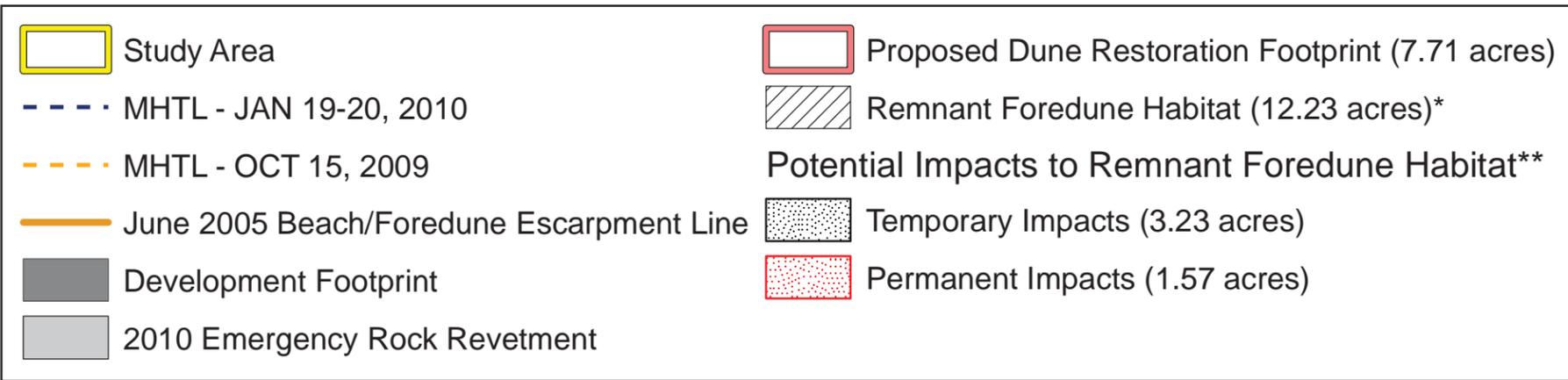
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to retention of the rock revetment in the project design.

Broad Beach  
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Malibu,  
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Figure 14-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

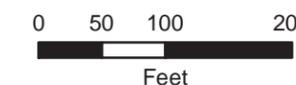
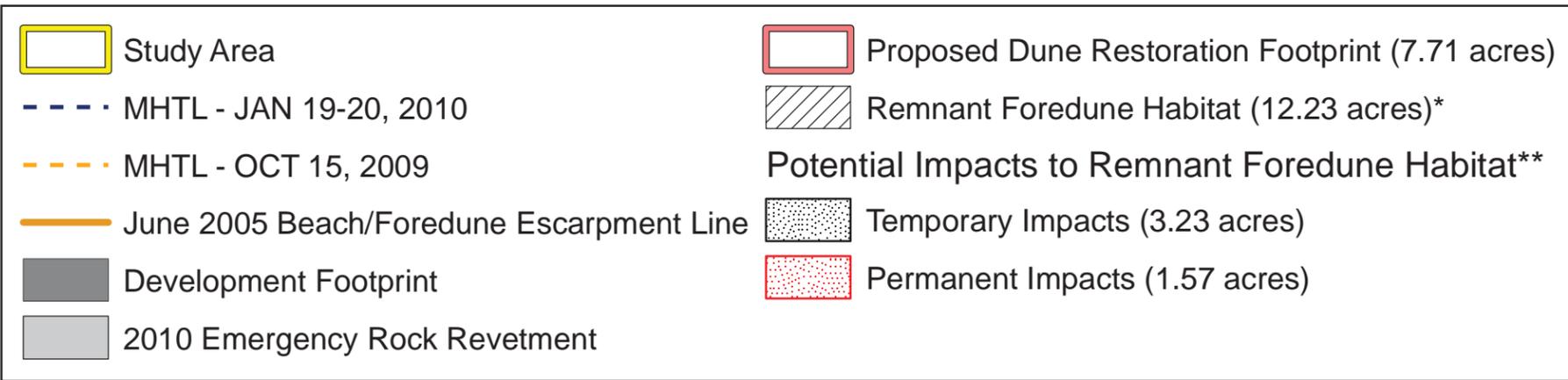
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to retention of the rock revetment in the project design.

Broad Beach  
Restoration Project

Malibu,  
California

Figure 14-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

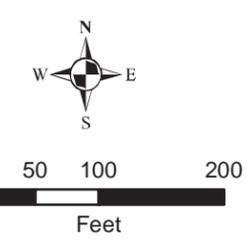
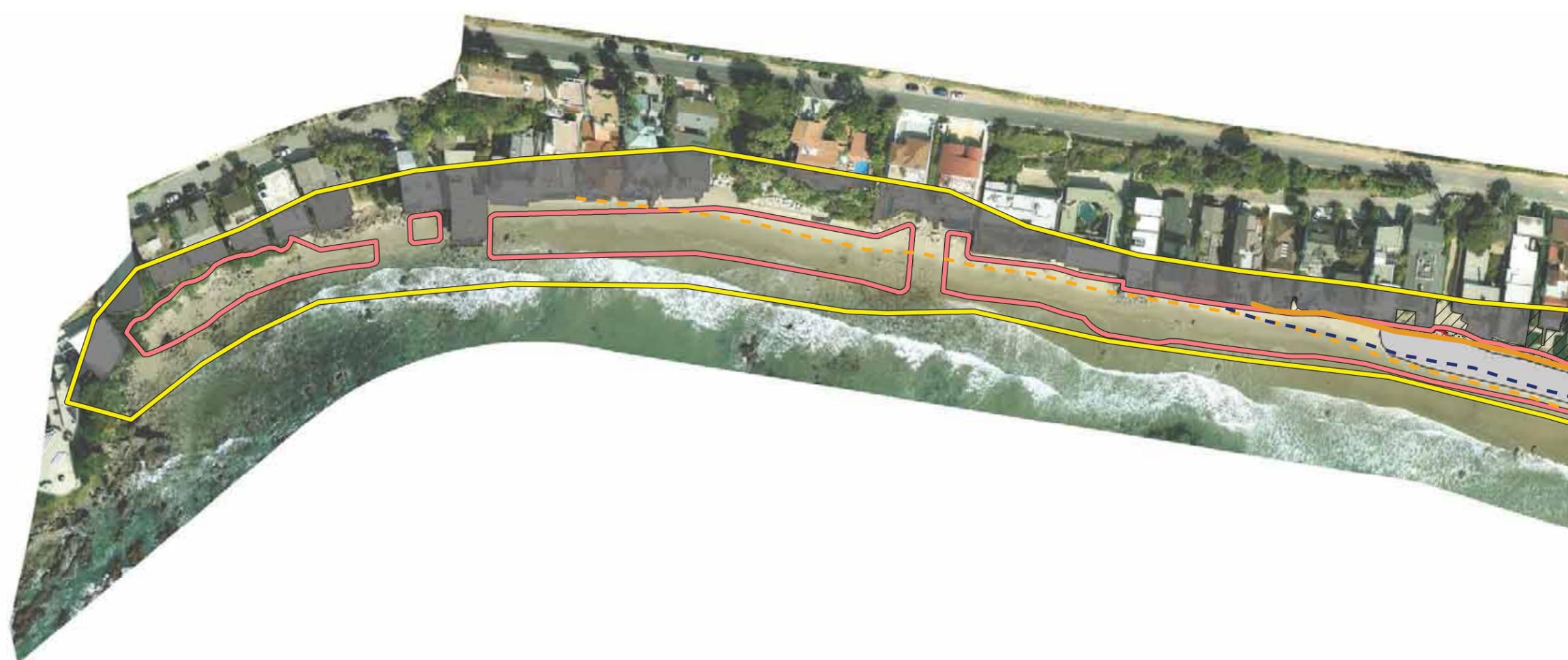
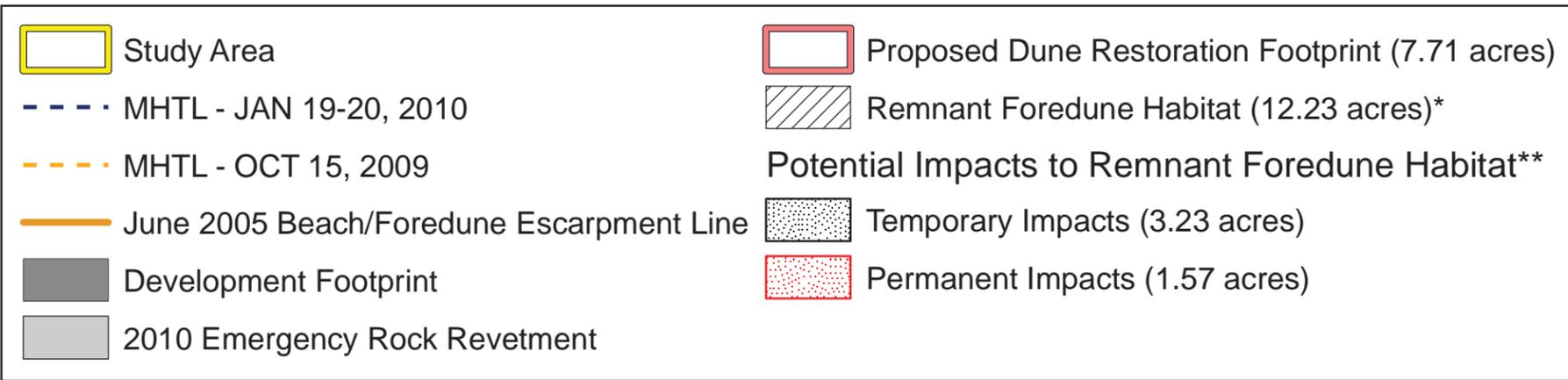
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to retention of the rock revetment in the project design.

Broad Beach  
Restoration Project

Malibu,  
California

Figure 14-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 4  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

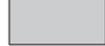
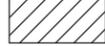
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to retention of the rock revetment in the project design.

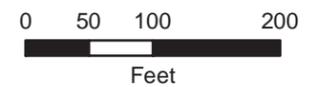
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.07 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

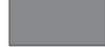
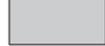
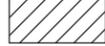
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

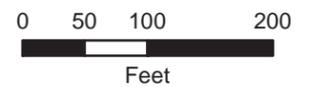
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.07 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

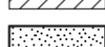
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

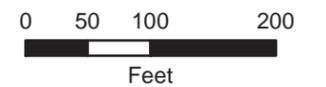
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.07 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

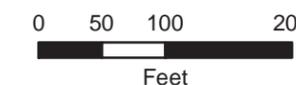
Broad Beach  
Restoration Project

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California

Figure 15-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Remnant Foredune Habitat (10.07 acres)\*
- Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

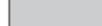
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

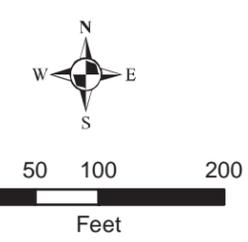
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2013  
Existing Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (10.07 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (2.95 acres)\*\*



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

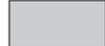
\*\* Potential impacts are due to enhancement of existing degraded foredune habitat and are temporary in nature.

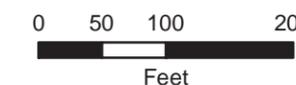
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2005  
Baseline Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (12.23 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (4.80 acres)\*\*



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

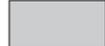
\*\* Potential impacts are due to revetment removal or enhancement of existing degraded foredune habitat and are temporary in nature.

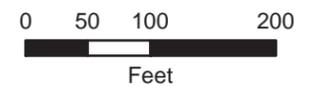
Broad Beach  
Restoration Project

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California

Figure 15-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2005  
Baseline Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (12.23 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (4.80 acres)\*\*



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

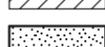
\*\* Potential impacts are due to revetment removal or enhancement of existing degraded foredune habitat and are temporary in nature.

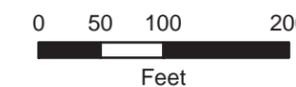
Broad Beach  
Restoration Project

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California

Figure 15-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2005  
Baseline Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (12.23 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (4.80 acres)\*\*



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

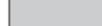
\*\* Potential impacts are due to revetment removal or enhancement of existing degraded foredune habitat and are temporary in nature.

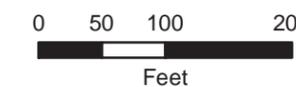
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2005  
Baseline Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (12.23 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (4.80 acres)\*\*



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

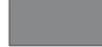
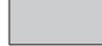
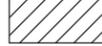
\*\* Potential impacts are due to revetment removal or enhancement of existing degraded foredune habitat and are temporary in nature.

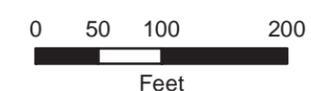
Broad Beach  
Restoration Project

Malibu,  
California

Figure 15-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 5  
Relative to 2005  
Baseline Conditions

-  Study Area
-  MHTL - JAN 19-20, 2010
-  MHTL - OCT 15, 2009
-  June 2005 Beach/Foredune Escarpment Line
-  Development Footprint
-  2010 Emergency Rock Revetment
-  Proposed Dune Restoration Footprint (7.71 acres)
-  Remnant Foredune Habitat (12.23 acres)\*
-  Potential Impacts to Remnant Foredune Habitat (4.80 acres)\*\*



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Potential impacts are due to revetment removal or enhancement of existing degraded foredune habitat and are temporary in nature.

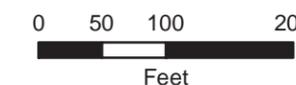
Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2013  
Existing Conditions

- |  |  |
|--|--|
| Study Area                               | Proposed Dune Restoration Footprint (7.71 acres)       |
| MHTL - JAN 19-20, 2010                   | Alternative 6A Revetment Relocation                    |
| MHTL - OCT 15, 2009                      | Remnant Foredune Habitat (10.09 acres)*                |
| June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b> |
| Development Footprint                    | Temporary Impacts (2.00 acres)                         |
| 2010 Emergency Rock Revetment            | Permanent Impacts (1.59 acres)                         |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

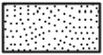
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

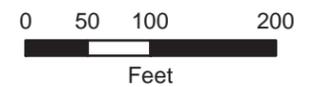
Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2013  
Existing Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 6A Revetment Relocation             |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (10.09 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.00 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (1.59 acres)                  |



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

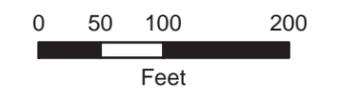
Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2013  
Existing Conditions

- Study Area
  - MHTL - JAN 19-20, 2010
  - MHTL - OCT 15, 2009
  - June 2005 Beach/Foredune Escarpment Line
  - Development Footprint
  - 2010 Emergency Rock Revetment
  - Proposed Dune Restoration Footprint (7.71 acres)
  - Alternative 6A Revetment Relocation
  - Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.00 acres)
  - Permanent Impacts (1.59 acres)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

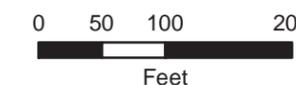
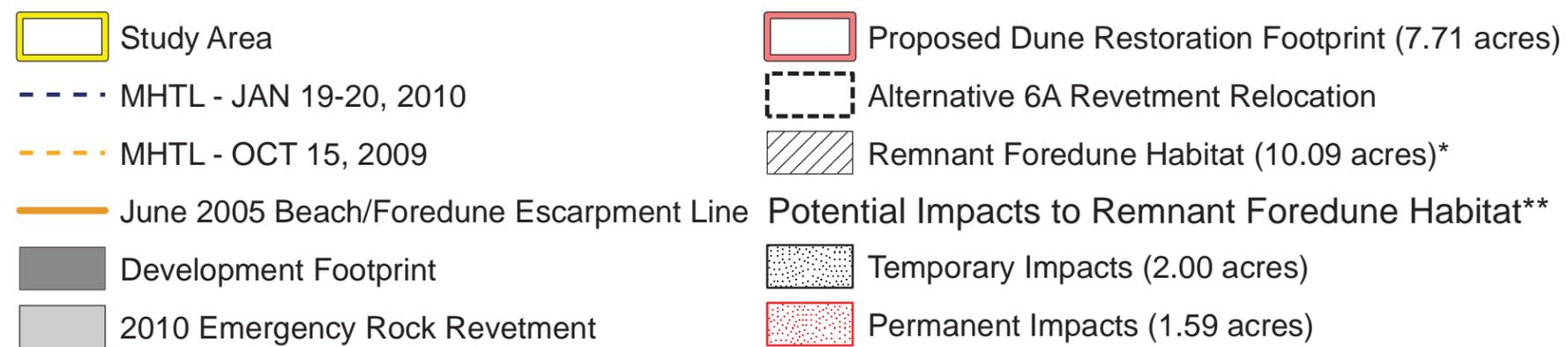
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

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Figure 16-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2013  
Existing Conditions



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

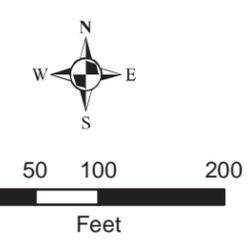
Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 6A Revetment Relocation
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.00 acres)
- Permanent Impacts (1.59 acres)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

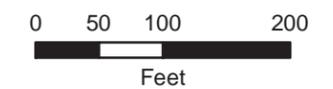
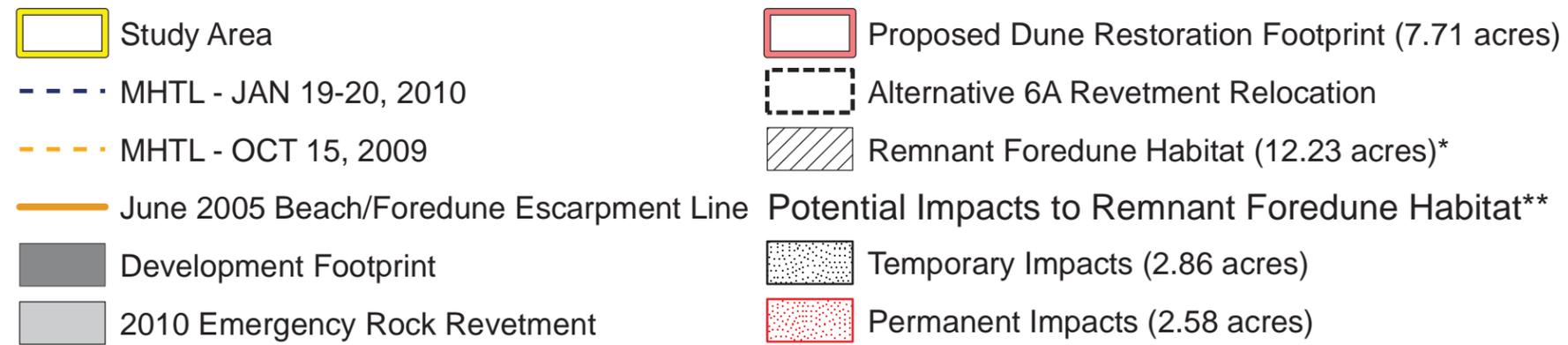
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

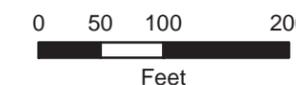
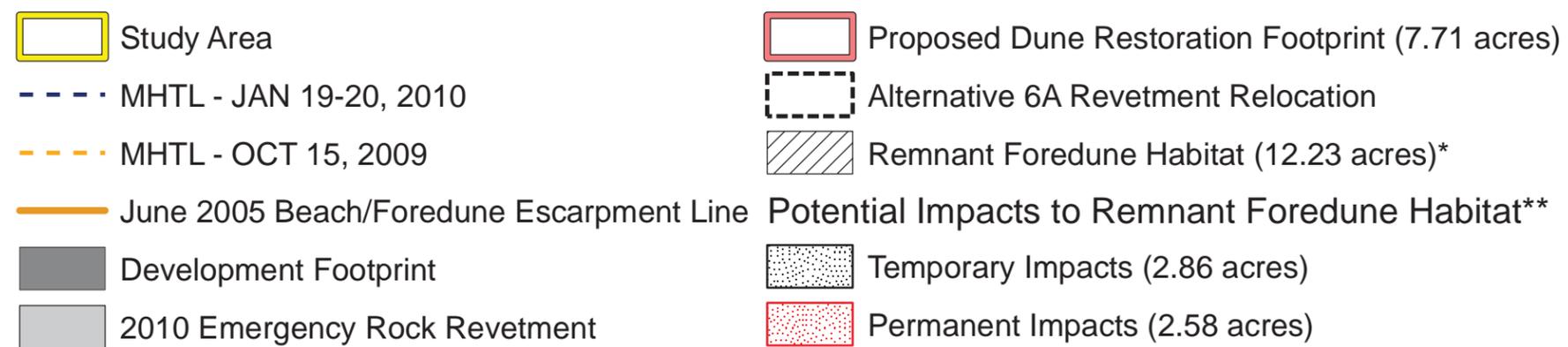
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

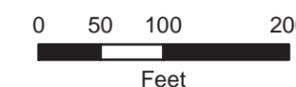
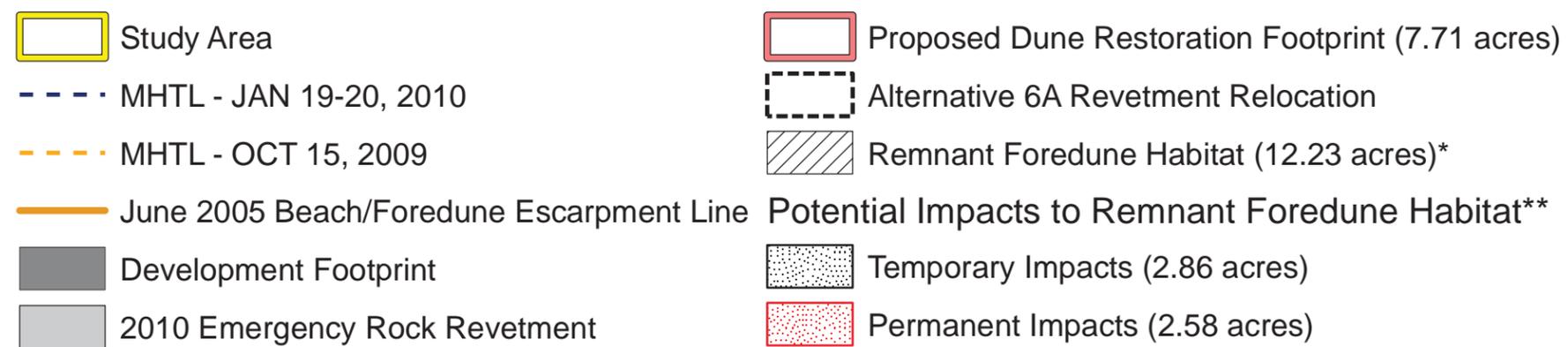
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

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Restoration Project

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Figure 16-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

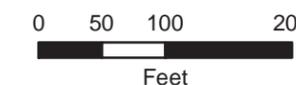
Broad Beach  
Restoration Project

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California

Figure 16-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2005  
Baseline Conditions

- |  |  |
|--|--|
| Study Area                               | Proposed Dune Restoration Footprint (7.71 acres)       |
| MHTL - JAN 19-20, 2010                   | Alternative 6A Revetment Relocation                    |
| MHTL - OCT 15, 2009                      | Remnant Foredune Habitat (12.23 acres)*                |
| June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b> |
| Development Footprint                    | Temporary Impacts (2.86 acres)                         |
| 2010 Emergency Rock Revetment            | Permanent Impacts (2.58 acres)                         |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

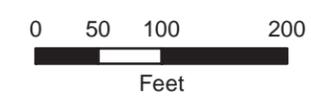
Broad Beach  
Restoration Project

Malibu,  
California

Figure 16-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6A  
Relative to 2005  
Baseline Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 6A Revetment Relocation
- Remnant Foredune Habitat (12.23 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.86 acres)
- Permanent Impacts (2.58 acres)



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

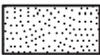
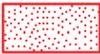
\*\* Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

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California

Figure 17-1a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2013  
Existing Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 6B Revetment Relocation             |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (10.09 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.48 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (0.91 acre)                   |



0 50 100 200  
Feet

\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

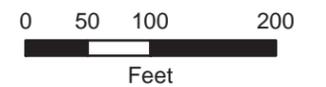
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California

Figure 17-1b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 6B Revetment Relocation
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.48 acres)
- Permanent Impacts (0.91 acre)



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

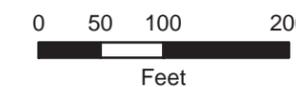
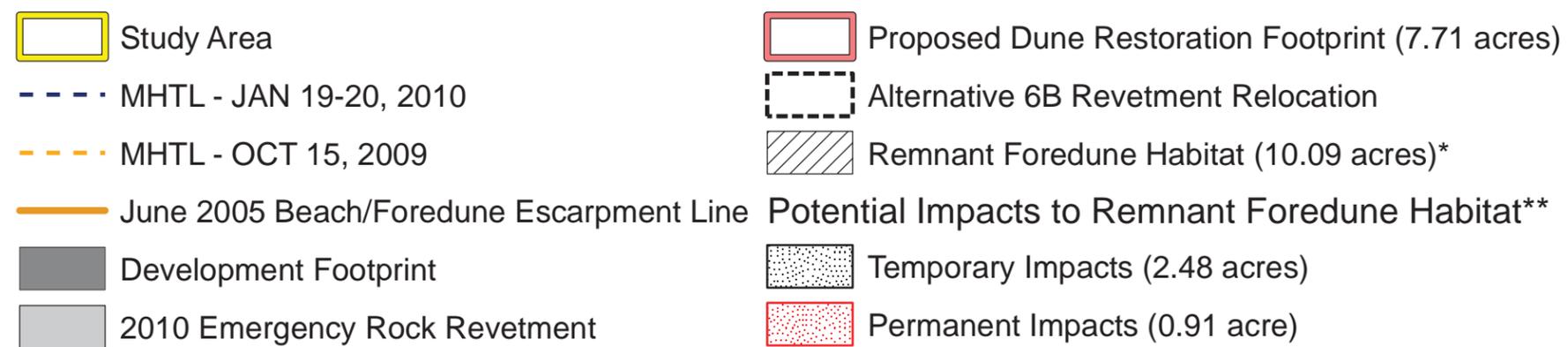
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

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Figure 17-1c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2013  
Existing Conditions



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

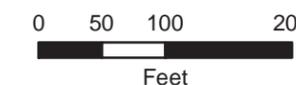
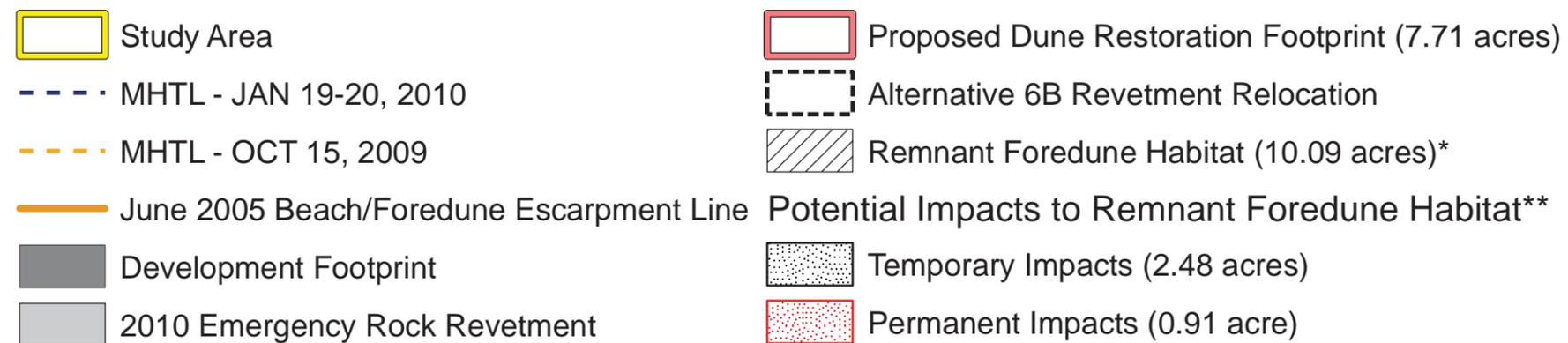
\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

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Malibu,  
California

Figure 17-1d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2013  
Existing Conditions



\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.

\*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

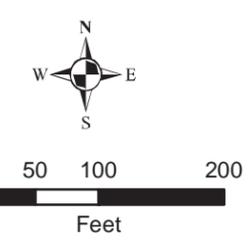
Broad Beach  
Restoration Project

Malibu,  
California

Figure 17-1e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2013  
Existing Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 6B Revetment Relocation
- Remnant Foredune Habitat (10.09 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.48 acres)
- Permanent Impacts (0.91 acre)



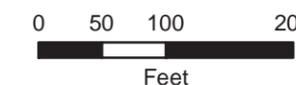
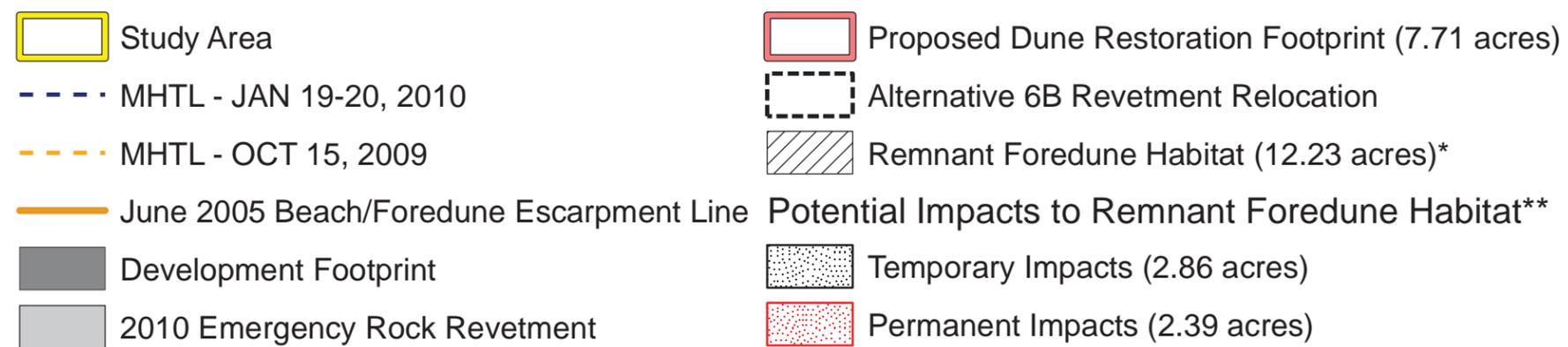
\* Remnant foredune habitat remaining after installation of Pre-2010 Shoreline Protection Structures and 2010 Emergency Rock Revetment, including areas of pocket cove formation where revetment materials were not installed or were installed but failed.  
 \*\* Temporary impacts are due to enhancement of existing degraded foredune habitat. Permanent impacts are due to relocation of revetment.

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Malibu,  
California

Figure 17-2a.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

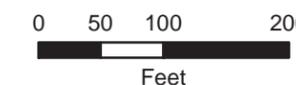
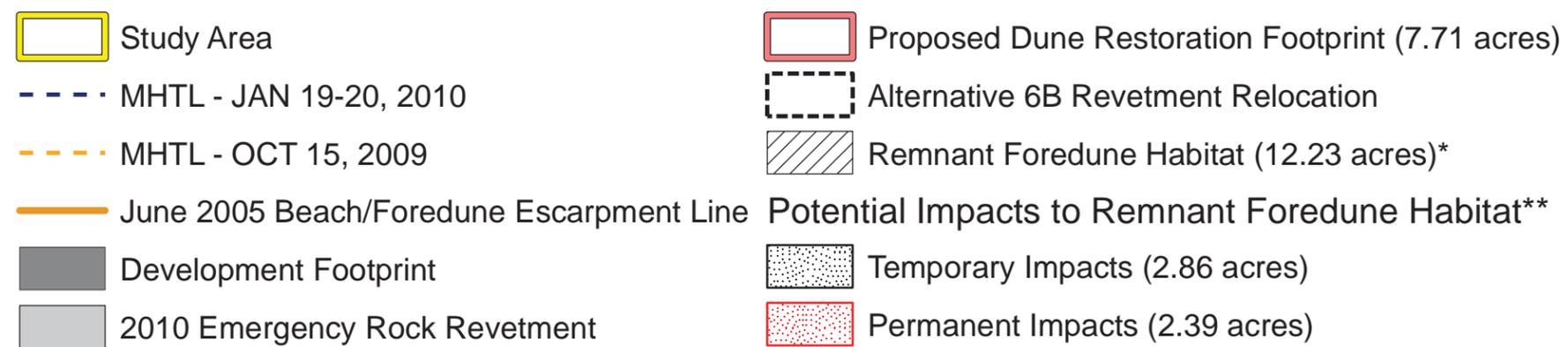
\*\*Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

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Restoration Project

Malibu,  
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Figure 17-2b.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2005  
Baseline Conditions



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

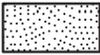
\*\*Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

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Figure 17-2c.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 6B Revetment Relocation             |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.86 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (2.39 acres)                  |



0 50 100 200  
Feet

\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

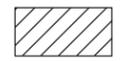
\*\*Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

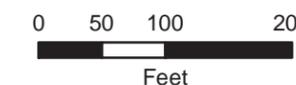
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Figure 17-2d.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2005  
Baseline Conditions

- |   |  |
|---|--|
|  Study Area                                |  Proposed Dune Restoration Footprint (7.71 acres) |
|  MHTL - JAN 19-20, 2010                   |  Alternative 6B Revetment Relocation             |
|  MHTL - OCT 15, 2009                      |  Remnant Foredune Habitat (12.23 acres)*         |
|  June 2005 Beach/Foredune Escarpment Line | <b>Potential Impacts to Remnant Foredune Habitat**</b>   |
|  Development Footprint                    |  Temporary Impacts (2.86 acres)                  |
|  2010 Emergency Rock Revetment            |  Permanent Impacts (2.39 acres)                  |



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.

\*\*Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.

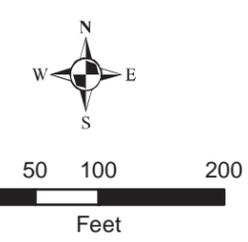
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Figure 17-2e.

Potential Impacts to  
Foredune Habitat  
Under Alternative 6B  
Relative to 2005  
Baseline Conditions

- Study Area
- MHTL - JAN 19-20, 2010
- MHTL - OCT 15, 2009
- June 2005 Beach/Foredune Escarpment Line
- Development Footprint
- 2010 Emergency Rock Revetment
- Proposed Dune Restoration Footprint (7.71 acres)
- Alternative 6B Revetment Relocation
- Remnant Foredune Habitat (12.23 acres)\*
- Potential Impacts to Remnant Foredune Habitat\*\***
- Temporary Impacts (2.86 acres)
- Permanent Impacts (2.39 acres)



\* Remnant foredune habitat based on 2005 foredune extent shown in Figure 2.  
 \*\*Temporary impacts are due to revetment removal or enhancement of existing degraded foredune habitat. Permanent impacts are due to retained and relocated sections of revetment.