

4.11 CULTURAL RESOURCES

Section 4.11 describes the specific direct and indirect impacts on cultural resources that could result from implementation of the proposed action or other action alternatives. Both the construction and operation elements of the proposed action have the potential to impact the cultural resources of both Tinian and Pagan.

As noted in Section 3.11, Department of Defense actions within this area are covered by two Programmatic Agreements—one for military training activities relating to the Mariana Islands Range Complex EIS/OEIS (DoD 2010a), and one for the Guam and CNMI Military Relocation EIS (DoD 2010b) to establish four ranges on Tinian. If an action alternative is selected, then a new Section 106 of the National Historic Preservation Act programmatic agreement would be signed and implemented to resolve adverse effects to historic properties. The programmatic agreement for this proposed action would reference the Mariana Islands Range Complex EIS/OEIS programmatic agreement and supersede the Tinian-specific portions of the Guam and CNMI Military Relocation EIS programmatic agreement. If the no-action alternative were selected, then Tinian-specific stipulations in the Guam and CNMI Military Relocation programmatic agreement (Department of Defense 2011) would be implemented. Section 106 consultation for the current proposed action was initiated on April 20, 2013 and will be completed prior to publication of this Final EIS/OEIS.

4.11.1 Approach to Analysis

The cultural resources impact analysis addresses potential effects to historic properties (districts, sites, buildings, structures, or objects that are listed in or considered eligible for listing in the National Register of Historic Places). The analysis also considers potential impacts to other kinds of resources that may not be eligible for the National Register of Historic Places, including cultural practices, cemeteries, memorials, sacred sites, or medicinal plants. The Tinian and Pagan RTAs and their associated support facilities/infrastructure construction footprints (described in Chapter 2, *Proposed Action and Alternatives*) were examined in relation to locations of historic properties and resources of cultural importance using Geographic Information System to identify potential impacts due to construction and operations. Training area disturbance footprints were also accounted for to ensure that the full range of potential impacts was identified. Under the proposed action, impacts may be either direct or indirect and are distinguished as follows.

Direct impacts occur at the same place and/or time as actions generated by proposed construction (e.g., ground-disturbing activities) and operations (e.g., range use). These impacts may include, but are not limited to, the following:

- Physical destruction, damage, or alteration
- Ground disturbances such as excavating, filling, grubbing (i.e., use of heavy equipment to remove vegetation), and vegetation maintenance (i.e., trimming vegetation, mowing grass, limbing trees)
- Demolition

Direct impacts from construction ground disturbance and operational vegetation clearing were assumed within all areas labeled as facility footprints in Chapter 2, *Proposed Action and Alternatives*, and as

“Vegetation Maintenance” in Appendix F, *Geology and Soils Technical Memo*. Vegetation clearance, including grubbing, would occur in areas such as along roads, Convoy Course engagement areas, Tracked Vehicle Driver’s Course, objective areas, and target areas (Range Complex A).

Indirect impacts are caused by or result from project- or operation-related activities, occur usually later in time or space, and are reasonably foreseeable. Potential causes of indirect impacts include, but are not limited to, the following:

- Reducing public access to historic properties and resources of cultural importance
- Changes in setting through visual or audible intrusions when these characteristics are important to the significance of the resource
- Potential increase in erosion and ground disturbance related to project-related activities
- Deferred monitoring or stabilization of sites, if needed, while ranges are in operation

The process for identifying and evaluating the significance of the impact is determined by the magnitude and nature of the action; the nature and extent of potential effects on historic properties and resources of cultural importance; and the likely nature and location of historic properties and resources of cultural importance within areas that may be impacted. Under the National Historic Preservation Act, adverse effects result from the direct loss of character-defining features and/or aspects of integrity of a historic property. Under NEPA, significant impacts to resources of cultural importance could occur if the characteristics that make the resource important to the culture are altered. If significant impacts were determined, then mitigation may be proposed to minimize or mitigate the adverse effects or impacts. A discussion of impacts to historic properties at the Tinian International Airport in accordance with Section 4(f) of the Department of Transportation Act of 1966 is included in Section 4.19.

4.11.2 Resource Management Measures

Resource management measures applicable to cultural resources include the following:

4.11.2.1 Avoidance and Minimization Measures

- To the degree possible, historic properties and resources of cultural importance were avoided when planning initial construction and operations areas for the proposed action. This included moving target locations, firing positions, engagement zones, and surface radar sites, as well as moving the High Hazard Impact Area boundaries to avoid the North Field National Historic Landmark. Department of Defense also minimized construction associated with the use of Amphibious Assault Vehicles to certain beaches and sited roads and construction laydown areas to avoid impacting historic properties where feasible. Construction was avoided on the historic runways in the North Field National Historic Landmark and use of tracked vehicles was avoided on historic roads associated with the landmark. Department of Defense would further avoid impacts to historic properties and resources of cultural importance during construction and operations through troop education, marking of sensitive areas, repairing roads, and policing areas at the completion of exercises.
- On Tinian and Pagan, if beach sand is compacted or displaced by landing craft so that the natural appearance of the beach has been altered, the beach topography will be restored within 3 days of the exercise using non-mechanized methods (e.g., rakes or other hand tools).

- Specific measures for avoiding and minimizing impacts to historic properties would be stipulated in a Programmatic Agreement regarding the current undertaking. These measures include implementation of the Secretary of the Interior's Standards for Rehabilitation for all maintenance and repair of runways for the North Field Historic Landmark and the evaluation of archaeological resources found during construction or operations. Department of Defense would follow standard operating procedures as outlined in the agreement document for inventorying areas or properties that have not been inventoried.

4.11.2.2 Best Management Practices and Standard Operating Procedures

Best management practices and standard operating procedures that are applicable to cultural resources are listed below and a complete listing is provided in Appendix D, *Best Management Practices*.

- Best management practices for erosion control, Spill Prevention, Control and Countermeasures Plans and Facility Response Plans, and Hazardous Materials Management Plans would be implemented to prevent indirect impacts to historic properties during construction and operations from potential contaminants and sediments. A Fire Prevention and Management plan would be implemented to minimize fire risk from training activities that could have an indirect impact to historic properties and resources of cultural importance.
- The Department of Defense would implement a Range Training Area Management Plan that would include stipulations to adhere to protection measures established in cultural resource management plans and implement a monitoring program for minimizing groundwater contamination. Through the Range Environmental Vulnerability Assessment program, the Marine Corps would identify potential release of munitions constituents and develop additional best management practices at the ranges to minimize off-site contamination.

4.11.3 Tinian

4.11.3.1 Tinian Alternative 1

4.11.3.1.1 Construction Impacts

As described in Section 2.4, *Tinian Alternatives*, Tinian Alternative 1 RTA development and construction would include construction and improvements for support facilities and infrastructure (e.g., base camp, airport, port, Munitions Storage Area, roadways, utilities) and training facilities (e.g., Range Complexes A, B, C, D, and Military Lease Area-wide training assets). These activities would result in ground disturbance (e.g., vegetation clearing, grubbing, grading, excavation, and filling), and potentially impact historic properties and resources of cultural importance.

In total, 1,902 acres (771 hectares) of ground disturbance would occur under Tinian Alternative 1 (see Table 2.4-8). Specific vegetation clearance areas within Range Complexes A, B, C, and D; the Landing Zone within Range Complex D; and the Military Lease Area-wide training assets are discussed in Section 4.2, *Geology and Soils* and Appendix F, *Geology and Soils Technical Memo*. [Table 4.11-1](#) summarizes the historic properties impacted by construction activities associated with Tinian Alternative 1. Specific impacts to historic properties and resources of cultural importance are described in more detail by RTA or construction project and in Appendix N, *Cultural Resources Technical Memo*.

Table 4.11-1. Tinian Alternative 1: Summary of Significant Direct Impacts on Historic Properties from Construction

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	20
Range Complex B	Multi-purpose Training Range, Combat Pistol Range, Anti-armor Tracking Range, Battle Site Zero Range	9
Range Complex C	Infantry Platoon Battle Course, Field Fire Range, Multi-Purpose Automated Unknown Distance Range	14
Range Complex D	Northern Battle Area Complex, Urban Assault Course	3
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	8
	Munitions Storage Area	3
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	86
	Base Camp	1
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	19
Outside Military Lease Area	Tinian International Airport	2
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	4
Total		172

Range Complex A: As described in Section 2.4.1, *Tinian Alternatives*, ground disturbance within Range Complex A would occur within the footprint of the ground ranges as well as within the target areas. Construction-related activities, such as grubbing, grading, excavation, and soil removal associated with construction of a perimeter road, an access road, and target areas, would significantly impact 20 historic properties. These 20 historic properties include 3 Pre-Contact sites (1 ceramic scatter and 2 cave sites), 7 pre-World War II Japanese Administration sites, 4 World War II-era Japanese defensive sites, and 6 World War II American military sites. Two of these sites are memorials, the Hinode American Memorial Shrine and the Nan'yo Kohatsu Kaisha Shrine. Significant direct impacts would occur to eight historic properties because of the construction of fences and roads around the perimeter of the High Hazard Impact Area. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be impacted by construction activities associated with Alternative 1.

Construction could also significantly impact 3 acres (1 hectare) of native limestone forest, which could contain resources of cultural importance, such as medicinal plants. Significant direct impacts to other cultural resources of cultural importance would include the disturbance of the two memorials described above.

Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. The roundabout, a portion of Broadway

Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex A target objectives. This closure would be temporary and the impact would be less than significant.

Range Complex B: As described in Section 2.4.1, *Tinian Alternatives*, ground ranges, objective areas, roadways, and pathways would be constructed as part of Range Complex B. Construction-related activities such as grubbing, excavation, and soil removal, as well as grubbing for vegetation clearance of interior roadways and target firing points would significantly impact 9 historic properties. These historic properties include 4 pre-World War II Japanese Administration sites, 2 World War II-era Japanese defensive sites, and 3 World War II American military sites. As stated above, indirect impacts to historic properties due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Broadway Avenue would be closed during construction of Range Complex B target objectives. This closure would be temporary and the impact would be less than significant.

No resources of cultural importance were identified within Range Complex B.

Range Complex C: As described in Section 2.4.1, *Tinian Alternatives*, ground ranges, roadways, and 20 temporary roofless structures would be constructed in Range Complex C. Construction-related activities such as grubbing, excavation, and soil removal would significantly impact 14 historic properties. These historic properties include 5 pre-World War II Japanese Administration sites, 2 World War II-era Japanese defensive sites, and 7 World War II American military sites. No impacts would occur to resources of cultural importance at Range Complex C due to construction. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Range Complex D: As described in Section 2.4.1, *Tinian Alternatives*, ground ranges would be constructed and 20 temporary roofless structures would be installed at the Urban Assault Complex in Range Complex D. A Landing Zone, an Unmanned Aircraft Systems Ground Station, and the Forward Arming and Refueling Point would be located on existing cleared runways associated with North Field and would not require vegetation clearing or ground disturbance. The Drop Zone would be cleared of vegetation. Historic assets, such as runways and remnant structures, would be avoided during construction. However, ground disturbance from grading, grubbing, and soil removal would occur in between these assets along interior roadways and at proposed target areas. These construction-related activities would have a significant direct impact to three historic properties, all World War II American military archaeological sites. One of the properties, the North Field runways and associated surrounding areas, is a contributing feature to the North Field National Historic Landmark. Although the runways themselves would be avoided, the surrounding area would be disturbed by construction and vegetation clearing. Therefore, the Landmark would be significantly impacted by ground disturbance associated with the construction of the target areas and a portion of the Convoy Course. The vegetation clearance at the existing runways, however, is considered to be a beneficial impact as it prevents deterioration of the pavement and restores the area to its historic appearance.

No resources of cultural importance were identified within Range Complex D. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access

restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes: As described in Section 2.4.1, *Tinian Alternatives*, construction associated with Tinian Alternative 1 would include support facilities (e.g., base camp, Munitions Storage Area), road improvements, utility improvements, and Military Lease Area-wide training assets (e.g., Convoy Course, Tracked Vehicle Driver's Course, Tactical Amphibious Training Areas). Construction-related activities would have a significant direct impact to the following 120 historic properties:

- Eight historic properties would be significantly impacted by grading, excavation, and soil removal associated with road construction and grubbing associated with vegetation clearance of the proposed Convoy Course Engagement Areas. These historic properties include three pre-World War II Japanese Administration sites, two World War II-era Japanese defensive sites, and three World War II American military sites.
- Three historic properties would be significantly impacted by grading, excavation and soil removal within the proposed Munitions Storage Area. These historic properties are pre-World War II Japanese Administration sites.
- Eighty-six historic properties would be significantly impacted by grading, excavation, and soil removal through widening of roads, trenching for utility lines, erection of fences, and improvements for the Tracked Vehicle Driver's Course. These historic properties include 4 Pre-Contact *latte* sites, 5 Pre-Contact ceramic scatters, 2 Pre-Contact cave sites, 29 pre-World War II Japanese Administration sites, 17 World War II-era Japanese defensive sites, and 29 World War II American military sites.
- One historic property, West Field, would be significantly impacted by grading, excavation, and soil removal within the proposed base camp.
- Three historic properties at the tactical amphibious training areas would be significantly impacted by grading, excavation, and soil removal associated with road construction and heavy machinery use during construction activities, including the World War II landing beach at Unai Chulu, a traditional cultural property, and a *latte* site.
- Nineteen historic properties would be significantly impacted by grading, excavation, and soil removal associated with construction at artillery firing points, surface radar locations, and Observation Posts, and grubbing and clearing at the landing zones. These historic properties would include 1 Pre-Contact *latte* site, 8 pre-World War II Japanese Administration sites, 4 World War II-era Japanese defensive sites, and 6 World War II American military sites.

Most of the significant impacts associated with these properties occur because of the construction of fences and roads or the grubbing associated with the clearance of landing areas and Observation Posts. As these are large, dispersed sites occurring throughout the Military Lease Area, complete avoidance is not possible. However, in most cases, only a portion of the site would be impacted by the proposed action. Existing roads surrounding the North Field National Historic Landmark, which are recommended as contributing features to the cultural landscape, would be improved for public access and for use by the Convoy Course and the Tracked Vehicle Driver's Course. Improvement of poorly maintained roads would be a beneficial impact to the Landmark; however, grubbing and clearing associated with the construction of the roads would have a significant direct impact to other historic properties.

Additionally, as described in Section 2.4.1, *Tinian Alternatives*, under Tinian Alternative 1, an amphibious landing area would be constructed at Unai Chulu. Construction would occur at the access roads leading to the beach and on an area off shore, where an amphibious landing ramp would be constructed to assist in Amphibious Assault Vehicle training operations. Heavy machinery would be used on the beach and a construction laydown area would be placed behind the beach in an area of low archaeological sensitivity as defined through archaeological testing (Athens 2009). Ground disturbance associated with the use of heavy machinery on the beach and on the existing access roads would have a significant direct impact on three historic properties. Unai Chulu, in addition to being a contributing feature of the North Field National Historic Landmark, also includes a Pre-Contact *latte* site and is considered a potential traditional cultural property. A permanent change in the setting of the beach would be a significant impact to these historic properties. An additional staging area would be located at North Field on an existing cleared runway, which would not impact the runways or the Landmark since it would be temporary and not involve ground disturbance.

An underwater study (Burns 2010) identified a series of magnetic anomalies that potentially represent a submerged cultural resource (e.g., an Amphibious Assault Vehicle, portions of a shipwreck, or historic debris) within the area of proposed dredging around the ramp at Unai Chulu. Marine biological surveys in the area have identified anchors and remnants of World War II-era amphibious assault vehicles. Depending upon the type of submerged cultural resource, it could be managed under the Sunken Military Craft Act, as well as the National Historic Preservation Act.

The purpose of the Sunken Military Craft Act is to protect sunken military vessels and aircraft and the remains of their crews from unauthorized disturbance. This statute confirms that these vessels are sovereign property and provides for archaeological research permits and civil enforcement measures, including substantial penalties, to prevent unauthorized disturbance. Under the Sunken Military Craft Act, a permit is required before any disturbance or investigations can occur to a sunken military craft. Wreck sites that are not entire aircraft or ships, but are parts strewn in a debris field are considered archaeological sites and are managed in accordance with the National Historic Preservation Act. Further investigation would be required to identify the nature of the anomalies. To the degree possible, these anomalies would be avoided during construction. If they cannot be avoided, identification efforts would be conducted to determine whether the anomalies represent a historic property. Therefore, construction of an amphibious landing ramp may impact submerged historic properties.

No resources of cultural importance were identified within the construction areas for these training assets. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Construction of the amphibious landing ramp would likely cause a change in the local fish populations; some populations could decrease, while others may increase (see *Marine Biology*, Section 4.10.3.1). As this change would be temporary during the construction process, the impact would be less than significant.

Outside the Military Lease Area: As described in Section 2.4.1, *Tinian Alternatives*, construction-related activities outside of the Military Lease Area would occur in an area immediately north of the Tinian International Airport runways and at the Port of Tinian, as well as along roads modified to accommodate Tracked Vehicle Transit Lanes and a Supply Route. All of the areas proposed for development at the Port

of Tinian and along the Tracked Vehicle Transit Lanes and Supply Route have been surveyed. Construction-related activities such as clearing, excavation, and soil removal as well as grubbing and vegetation clearance of roadways and port and aircraft support structures would have a significant direct impact to 6 historic properties, which include 2 Pre-Contact sites (ceramic/artifact scatters), 3 pre-World War II Japanese Administration sites, and 1 World War II American military site.

No resources of cultural importance were identified within the proposed construction areas for these training assets. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Significant direct impacts to historic properties and resources of cultural importance would result from construction associated with Tinian Alternative 1. This alternative would have a significant direct impact to 172 historic properties in the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. Historic properties include the North Field National Historic Landmark; Pre-Contact *latte* sites, pottery scatters, and rock shelters; pre-World War II Japanese farms (primarily concrete foundations, cisterns) and shrines; and World War II-era Japanese and American military sites. However, as RTA design is finalized, the Department of Defense will seek to further avoid or minimize impacts on historic properties and resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.3.1.2 Operation Impacts

As described in Section 2.4.1, *Tinian Alternatives*, under Tinian Alternative 1, training facility operations and maintenance would occur within the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. Live-fire and aviation training would occur at Range Complex A; vehicle-mounted and dismounted (i.e., foot) training involving firing at stationary and moving targets by rifles, machine guns and rocket launchers would occur at Range Complex B; platoon level training involving firing at targets with rifles and inert grenades, rockets, and mortars at Range Complex C; and aviation training and ground training would occur at Range Complex D. The ground training at Range Complex D would involve mostly foot traffic and use of rifles and inert ammunition for grenade launchers, mortars, and rockets.

Other operations within the Military Lease Area would include use of firing points into the High Hazard Impact Area, Convoy Course engagement areas, landing zones, Observation Posts and radar sites, and foot and vehicle traffic on roads and the Tracked Vehicle Driver's Course. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and impacts to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in the ranges under construction impacts, impacts to historic properties from training operations at the Range Complexes B, C, and D will focus on training maneuvers. Training maneuvers concern vehicle and foot traffic within areas; no digging would occur within maneuver areas. However, potential ground disturbance to historic

properties in Range Complex A is larger than the footprint for construction and could occur throughout the High Hazard Impact Area.

[Table 4.11-2](#) summarizes the historic properties impacted by operations for Tinian Alternative 1; impacts associated with construction are summarized in [Table 4.11-1](#). In Range Complex A, 12 sites, also impacted by construction activities under Tinian Alternative 1, would be significantly impacted by operations.

During training events, foot and vehicle maneuvering would occur within range complexes, Tracked Vehicle Driver's Course, Convoy Course, maneuver areas, and roads. Vehicle traffic would be confined to established roads and trails that are designed to avoid historic properties and, therefore, would not impact historic properties. Use of historic roads associated with the North Field National Historic Landmark by convoys and other vehicles would be in keeping with existing use and would not impact this historic property. Tracked vehicles would use newly constructed gravel roads adjacent to the historic roads to prevent damage. Impacts to historic properties from foot traffic would be minimal, as it would occur primarily on roads and designated pathways or sporadically throughout the maneuver areas.

Table 4.11-2. Tinian Alternative 1 Summary of Significant Direct Impacts on Historic Properties from Operations

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	12*
Range Complex B	Multi-purpose Training Range, Combat Pistol Range, Anti-armor Tracking Range, Battle Site Zero Range	0
Range Complex C	Infantry Platoon Battle Course, Field Fire Range, Multi-purpose Automated Unknown Distance Range	0
Range Complex D	Northern Battle Area Complex, Urban Assault Course	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	0
	Munitions Storage Area	0
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	0
	Base Camp	0
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	0
Outside Military Lease Area	Tinian International Airport	0
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	0
Total		15

Note: *All of these sites are also impacted under construction, but are located outside of the area of proposed ground disturbance for construction. Sites solely in the construction area are not included in this total.

Various types of tactical amphibious training would occur at four beaches—Unai Chulu, Unai Babui, Unai Masalok, and Unai Lam Lam. Training at Unai Chulu would involve Amphibious Assault Vehicles, Landing Craft Air Cushion vessels, inflatable boats, and combat swimmers. Training at Unai Babui and Unai Masalok would involve the use of Landing Craft Air Cushion vessels, combat swimmers, and inflatable boats. Amphibious training at Unai Lam Lam would involve inflatable boats and combat swimmers. No impacts would occur to historic properties associated with these beaches due to training operations. Training and range management activities associated with Tinian Alternative 1 would have a significant direct impact to three historic properties, the landing beach at Unai Chulu, which is part of the North Field National Historic Landmark, a traditional cultural property, and a *latte* site due to ground disturbance caused by Amphibious Assault Vehicle traffic. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 4.11.2, Resource Management Measures](#)). As much as possible impacts to the *latte* site would be avoided by using existing and newly constructed roads.

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the large size of the surface danger zones and dispersal of historic properties.

Resources of cultural importance, such as cemeteries, memorials, or potential areas with medicinal plants, would not be directly impacted at these training assets by training operations.

In general, public access would be allowed to all locations except for the High Hazard Impact Area, the Munitions Storage Area, the base camp, and the Observation Posts and Surface Radar sites, when training is not occurring. It is envisioned that public access to some or all areas of the RTA, with the exceptions mentioned above, would occur during a couple of daylight hours on a nearly daily basis during the 20 weeks of live-fire training. A range control facility and dedicated range scheduler would be in place to assess public access in real-time and to provide advance notice of public access dates, time frames, and areas. Range control and the scheduler would coordinate public access directly with the Tinian Mayor's Office and other interested parties, such as ranchers and entities within the tourism industry. Access procedures would be implemented to ensure safety and provide guidance and direction. Therefore, intermittent and temporary loss of public access is not considered a significant indirect impact to cultural resources. Historic properties within the High Hazard Impact Area, base camp, Munitions Storage Area, and the Observation Posts and Surface Radar sites would already have been significantly impacted by construction activities and loss of access to these areas would be a less than significant impact.

The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed permanently by the use of the High Hazard Impact Area of Range Complex A. This closure would be permanent and would be a significant indirect impact to the Landmark.

The permanent presence of Observation Posts and surface radar sites would not be visible to most historic properties. However, towers associated with Surface Radar sites would be constructed at Unai Babui and near Unai Dankulo. As discussed in Section 4.12.3.1, *Visual Resources*, a Surface Radar site would be constructed adjacent and south of Unai Dankulo and would be visible from the beach, which is a traditional cultural property. Another Surface Radar Site would be constructed within a *latte* site at Unai Babui. The permanent location of these towers would have a significant indirect impact to these historic properties.

Construction of the amphibious landing ramp would likely cause a change in the local fish populations through a permanent loss in coral reef habitat. Some populations could decrease, while others may increase (see, Section 4.10.3.1, *Marine Biology*). As this shoreline is part of a traditional cultural property associated with fishing, this change would be a significant indirect impact to the historic property.

Significant direct impacts would result from operational activities under Tinian Alternative 1. Twelve historic properties, also impacted by construction, would be significantly impacted by operations in Range Complex A. Three historic properties at Unai Chulu may be significantly impacted by training operations. However, as RTA design is finalized, the Department of Defense would seek to further avoid or minimize impacts to historic properties and other resources of cultural importance.

Significant indirect impacts to historic properties would occur to the North Field National Historic Landmark due to closure of the roundabout on Broadway Avenue, to historic properties at Unai Babui and Unai Dankulo due to the permanent presence of surface radar towers, and to the traditional cultural property at Unai Chulu from changes in the fish populations from the landing ramp construction for amphibious training.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.3.2 Tinian Alternative 2

4.11.3.2.1 Construction Impacts

As described in Section 2.4.3, Tinian Alternative 2 construction activities would occur within the Military Lease Area, immediately north of Tinian International Airport runways, and at the Port of Tinian. Tinian Alternative 2 construction activities would occur within the same areas as Tinian Alternative 1, but would accommodate an additional Battle Area Complex (Range Complex C) and five additional Convoy Course Engagement Areas. This development and construction would result in 2,025 acres (820 hectares) (see Table 2.4-8) of ground disturbance (e.g., vegetation clearing, grubbing, grading, excavation, and filling), and impact historic properties and resources of cultural importance. [Table 4.11-3](#) summarizes the 182 historic properties that would be impacted by construction-related activities for Tinian Alternative 2, which is slightly more than the 172 impacted under Tinian Alternative 1. Specific impacts to historic properties and resources of cultural importance are described in more detail by RTA or construction project below and in Appendix N, *Cultural Resources Technical Memo*.

Table 4.11-3. Tinian Alternative 2 Summary of Significant Direct Impacts on Historic Properties from Construction

Complex	Range	Number of Historic Properties
Range Complex A	High Hazard Impact Area	20
Range Complex B	Multi-purpose Training Range, Combat Pistol Range, Anti-armor Tracking Range, Battle Site Zero Range	9
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multi-purpose Automated Unknown Distance Range, Urban Assault Course	25
Range Complex D	Northern Battle Area Complex, Urban Assault Course	3
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	7
	Munitions Storage Area	3
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	86
	Base Camp	1
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	19
Outside Military Lease Area	Tinian International Airport	2
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	4
Total		182

Range Complex A: Construction-related activities such as grubbing, grading, excavation, and soil removal at Range Complex A under Tinian Alternative 2 would be the same as under Tinian Alternative 1 and would have a significant direct impact to the same 20 historic properties and the same resources of cultural importance (native limestone forest and two memorials) discussed in [Section 4.11.3.1, Tinian Alternative 1](#). Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. The roundabout, a portion of Broadway Avenue, which is an entrance way to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex A target objectives. This closure would be temporary and the impact would be less than significant.

Range Complex B: Construction-related activities at Range Complex B under Tinian Alternative 2 would be the same as under Tinian Alternative 1 and would have a significant direct impact to the same 9 historic properties as described in [Section 4.11.3.1, Tinian Alternative 1](#). No resources of cultural importance were identified within Range Complex B.

Range Complex C: Construction-related activities at Range Complex C under Tinian Alternative 2 would be similar to those described under Tinian Alternative 1 except for the addition of a southern area Battle Complex and the associated Urban Assault Course. As described in Section 2.4.1, *Tinian Alternatives*, ground ranges, roadways, and 20 temporary roofless structures would be constructed in Range Complex C. Construction-related activities such as vegetation clearing, excavation, and soil removal would have a significant direct impact to 25 historic properties, compared to the 14 impacted under Tinian Alternative

1. These historic properties would include 1 Pre-Contact site, 14 pre-World War II Japanese Administration sites, 1 World War II-era Japanese defensive site, and 9 World War II American military sites. Most of these significant impacts occur because of the construction of roads to the target areas. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be impacted by the proposed action. No resources of cultural importance were identified within Range Complex C. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Range Complex D: Construction-related activities under Tinian Alternative 2 would be the same as under Tinian Alternative 1 and would have a significant direct impact to three historic properties, all World War II American military archaeological sites. One of the properties, the North Field runways and associated surrounding areas, is a contributing feature to the North Field National Historic Landmark. Although the runways themselves would be avoided, the surrounding area would be disturbed by construction and vegetation clearing. Therefore, the Landmark would be significantly impacted by ground disturbance associated with the construction of the target areas and a portion of the Convoy Course. Vegetation clearance at the existing runways within the proposed Drop Zone, however, is considered to be a beneficial impact as it prevents deterioration of the pavement and restores the area to its historic appearance.

No resources of cultural importance were identified within Range Complex D. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increases during construction would be less than significant as they would be intermittent and temporary.

Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes: Construction associated with Military Lease Area-wide assets under Tinian Alternative 2 would be similar to Tinian Alternative 1 ([Section 4.11.3.1](#)), but would also include five additional Convoy Engagement Areas. It would have a significant direct impact to 119 historic properties, one less than under Tinian Alternative 1. The historic properties would include 13 Pre-Contact sites (6 latte sites, 5 ceramic scatters, and 2 rock overhangs/caves), 43 pre-World War II Japanese Administration sites, 23 World War II-era Japanese defensive sites, 39 World War II American military sites, and 1 traditional cultural property. Most of these significant impacts occur because of the construction of roads. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be impacted by the proposed action. Existing roads surrounding the North Field National Historic Landmark, which are recommended as contributing features to the cultural landscape, would be improved for public access and for use by the Convoy Course and the Tracked Vehicle Driver's Course. Improvement of poorly maintained roads would be a beneficial impact to the Landmark; however, grubbing and clearing associated with the construction of the roads would have a significant direct impact to other historic properties.

Additionally under Tinian Alternative 2, construction activities at the amphibious landing beach at Unai Chulu, would be the same as under Tinian Alternative 1 ([Section 4.11.3.1](#)) and would have a significant direct impact to the same three historic properties (the landing beach, which is part of the North Field National Historic Landmark and would constitute a significant impact to the Landmark, a potential

traditional cultural property, and a *latte* site) as described in [Section 4.11.3.1, Tinian Alternative 1](#). A permanent change in the setting of the beach would be a significant impact to the potential traditional cultural property. An additional staging area would be located at North Field on an existing cleared runway, which would not impact the runways or the Landmark since it would be temporary and not involve ground disturbance. Construction of an amphibious landing ramp may impact submerged historic properties.

No resources of cultural importance were identified within these training asset areas. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Construction of the amphibious landing ramp would likely cause a change in the local fish populations; some populations could decrease, while others may increase (see Section 4.10.3.1, *Marine Biology*). As this change would be temporary during the construction process, the impact would be less than significant.

Outside the Military Lease Area: Construction-related activities outside of the Military Lease Area would occur in an area immediately north of the Tinian International Airport runways and at the Port of Tinian, as well as along roads modified to accommodate the Tracked Vehicle Transit Lanes and a Supply Route. These activities would be the same as under Tinian Alternative 1. Construction-related activities such as clearing, excavation, and soil removal as well as vegetation clearance of roadways and port and aircraft support structures would significantly impact the same six historic properties as described in [Section 4.11.3.1, Tinian Alternative 1](#).

No resources of cultural importance were identified within these training asset areas. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Tinian Alternative 2 construction activities would result in significant direct impacts to historic properties and resources of cultural importance. Construction would significantly impact 182 historic properties in the Military Lease Area, immediately north of the Tinian International Airport runways, and the Port of Tinian. Historic properties include the North Field National Historic Landmark; Pre-Contact *latte* sites, pottery scatters, and rock shelters; pre-World War II Japanese farms and shrines; and World War II-era Japanese and American military sites. However, as RTA design is finalized, the Department of Defense will seek to further avoid or minimize impacts to historic properties and resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.3.2.2 Operation Impacts

As described in Section 2.4.3, Tinian Alternative 2 operations and maintenance would occur within the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of

Tinian. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and impacts to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in the ranges under construction impacts, impacts to historic properties from training operations at the Range Complexes B, C, and D will focus on training maneuvers. Training maneuvers concern vehicle and foot traffic within areas; no digging would occur within maneuver areas. However, potential ground disturbance to historic properties in Range Complex A is larger than the footprint for construction and could occur throughout the High Hazard Impact Area. [Table 4.11-4](#) summarizes the historic properties impacted by operations for Tinian Alternative 1; impacts associated with construction are summarized in [Table 4.11-3](#). In Range Complex A, 12 sites, also impacted by construction, would be significantly impacted by operations.

Use of historic roads associated with the North Field National Historic Landmark by convoys and other vehicles would be in keeping with existing use and would not impact this historic property. Tracked vehicles would use newly constructed gravel roads adjacent to the historic roads to prevent damage. Impacts to historic properties from foot traffic would be minimal, as it would occur primarily on roads and designated pathways or sporadically throughout the maneuver areas.

Table 4.11-4. Tinian Alternative 2 Summary of Significant Direct Impacts on Historic Properties from Operations

Complex	Range	Number of Historic Properties
Range Complex A	High Hazard Impact Area	12*
Range Complex B	Multi-purpose Training Range, Combat Pistol Range, Anti-armor Tracking Range, Battle Site Zero Range	0
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multi-purpose Automated Unknown Distance Range, Urban Assault Course	0
Range Complex D	Northern Battle Area Complex, Urban Assault Course	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	0
	Munitions Storage Area	0
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	0
	Base Camp	0
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	0
Outside Military Lease Area	Tinian International Airport	0
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	0
Total		15

Note: *All of these sites are also impacted under construction, but are located outside of the area of proposed ground disturbance for construction. Sites solely in the construction area are not included in this total.

Training and range management activities associated with Tinian Alternative 2 would have a significant direct impact to three historic properties, the landing beach at Unai Chulu, which is part of the North Field National Historic Landmark a traditional cultural property, and a *latte* site due to ground

disturbance caused by Amphibious Assault Vehicle traffic. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 4.11.2, Resource Management Measures](#)). As much as possible impacts to the *latte* site would be avoided by using existing and newly constructed roads.

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

In general, public access would be allowed to all locations except for the High Hazard Impact Area, the Munitions Storage Area, the base camp, and the Observation Posts and Surface Radar sites, when training is not occurring. It is envisioned that public access to some or all areas of the RTA, with the exceptions mentioned above, would occur during a couple of daylight hours on a nearly daily basis during the 20 weeks of live-fire training. A range control facility and dedicated range scheduler would be in place to assess public access in real-time and to provide advance notice of public access dates, time frames, and areas. Range control and the scheduler would coordinate public access directly with the Tinian Mayor's Office and other interested parties, such as ranchers and entities within the tourism industry. Access procedures would be implemented to ensure safety and provide guidance and direction. Therefore, intermittent and temporary loss of public access is not considered a significant indirect impact to cultural resources. Historic properties with the High Hazard Impact Area, base camp, Munitions Storage Area, and the Observation Posts and Surface Radar sites would already have been significantly impacted by construction activities and loss of access to these areas would be less than significant.

No resources of cultural importance were identified within these training asset areas.

The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed permanently by the use of the High Hazard Impact Area of Range Complex A. This closure would be a significant indirect impact to the Landmark.

The permanent presence of Observation Posts and Surface Radar sites would not be visible to most historic properties. However, towers associated with Surface Radar sites would be constructed at Unai Babui and near Unai Dankulo. As discussed in Section 4.12.3.1, *Visual Resources*, a Surface Radar site would be constructed adjacent and south of Unai Dankulo and would be visible from the beach, which is a traditional cultural property. Another Surface Radar site would be constructed within a *latte* site at Unai Babui. The permanent location of these towers would have a significant indirect impact to these historic properties.

Construction of the ramp at Unai Chulu would likely cause a change in the local fish populations through a permanent loss in coral reef habitat. Some populations could decrease, while others may increase (see Section 4.10, *Marine Biology*). As this shoreline is part of a potential traditional cultural property associated with fishing, this change would be a significant indirect impact to the historic property.

Significant direct impacts would result from operational activities under Tinian Alternative 2. As discussed under Tinian Alternative 1, 12 historic properties within Range Complex A and three historic properties at Unai Chulu (the landing beach associated with the North Field National Historic Landmark, a potential traditional cultural property, and a *latte* site) would be significantly impacted in the area of potential effects. Significant indirect impacts would occur to the North Field National Historic Landmark from the permanent closure of the roundabout on Broadway Avenue, to a *latte* site and a potential traditional cultural property (Unai Dankulo) from visual impacts due to Surface Radar sites, and to a potential traditional cultural property (Unai Chulu) from changes in fish populations due to ramp construction. However, as RTA design is finalized, the Department of Defense would seek to further avoid or minimize impacts to historic properties and other resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.3.3 Tinian Alternative 3

4.11.3.3.1 Construction Impacts

As described in Section 2.4.4, Tinian Alternative 3 RTA development and construction would result in 2,003 acres (811 hectares) (see Table 2.4-8) of ground disturbance (e.g., vegetation clearing, grubbing, grading, excavation, and filling), and impact historic properties and resources of cultural importance. Tinian Alternative 3 construction activities would occur within the same areas as Tinian Alternative 1, but would accommodate an additional Battle Area Complex (Range Complex C) and five additional Convoy Course Engagement Areas. Only a Drop Zone would be established in Range Complex D. [Table 4.11-5](#) summarizes the 179 historic properties that would be directly impacted by construction-related activities for Tinian Alternative 3; 7 more than under Tinian Alternative 1. Specific impacts to historic properties and resources of cultural importance are described in more detail by RTA or construction project below and in Appendix N, *Cultural Resources Technical Memo*.

Table 4.11-5. Tinian Alternative 3 Summary of Significant Direct Impacts on Historic Properties from Construction

Complex	Range	Number of Historic Properties
Range Complex A	High Hazard Impact Area	20
Range Complex B	Multi-purpose Training Range, Combat Pistol Range, Anti-armor Tracking Range, Battle Site Zero Range	9
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multi-purpose Automated Unknown Distance Range, Urban Assault Course	25
Range Complex D	Drop Zone	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	7
	Munitions Storage Area	3
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	86
	Base Camp	1
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	19
Outside Military Lease Area	Tinian International Airport	2
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	4
Total		179

Range Complex A. Construction-related activities such as grubbing, grading, excavation, and filling at Range Complex A under Tinian Alternative 3 would be the same as under Tinian Alternative 1 and would have a significant direct impact to the same 20 historic properties and the same resources of cultural importance (native limestone forest and two memorials) as described in [Section 4.11.3.1](#). Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex A target objectives. This closure would be temporary and the impact would be less than significant.

Range Complex B. Construction-related activities at Range Complex B under Tinian Alternative 3 would be the same as under Tinian Alternative 1 and would have a significant impact to the same nine historic properties as described in [Section 4.11.3.1](#). No resources of cultural importance were identified within Range Complex B.

Range Complex C. Construction-related activities under Tinian Alternative 3 would be similar to that under Tinian Alternative 1 except that there would be the construction of a southern Battle Area Complex and associated Urban Assault Course. Construction-related activities such as clearing, excavation, and soil removal would have a significant impact to 25 historic properties (see [Table 4.11-5](#)), compared to the 14 impacted under Tinian Alternative 1. Most of these impacts occur because of the construction of roads to the target areas. Since sites in this area tend to be large and dispersed,

complete avoidance is not possible. However, in most cases only a portion of the site would be impacted by the proposed action. No resources of cultural importance were identified within Range Complex C. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Range Complex D: No construction would be conducted at Range Complex D under Tinian Alternative 3, although vegetation would be cleared around the runways similar to Tinian Alternative 1. This vegetation clearance is considered to be a beneficial impact as it prevents deterioration of the historic runways, which are a contributing feature to the North Field National Historic Landmark and restores the area to its historic appearance. Therefore, no significant impacts due to construction would occur at Range Complex D.

Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes: Construction associated with Military Lease Area-wide assets under Tinian Alternative 3 would be similar to Tinian Alternative 1 ([Section 4.11.3.1](#)), but would include additional road improvements. It would significantly impact 119 historic properties; one less than under Tinian Alternative 1 (see [Table 4.11-5](#)). The historic properties would include 13 Pre-Contact sites (6 *latte* sites, 5 ceramic scatters, and 2 rock overhangs/caves), 43 pre-World War II Japanese Administration sites, 23 World War II-era Japanese defensive sites, 39 World War II American military sites, and 1 potential traditional cultural property. Most of these significant impacts occur because of the construction of roads. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be impacted by the proposed action. Existing roads surrounding the North Field National Historic Landmark, which are recommended as contributing features to the cultural landscape, would be improved for public access and for use by the Convoy Course and the Tracked Vehicle Driver's Course. Improvement of poorly maintained roads would be a beneficial impact to the Landmark; however, grubbing and clearing associated with the construction of the roads would have a significant direct impact to other historic properties.

Under Tinian Alternative 3, construction activities at the amphibious training area at Unai Chulu would be the same as under Tinian Alternative 1 and would have a significant direct impact to the same three historic properties (the landing beach, which is part of the North Field National Historic Landmark and would constitute a significant impact to the Landmark, a traditional cultural property, and a *latte* site) as described in [Section 4.11.3.1](#). An additional staging area would be located at North Field on an existing cleared runway, which would not impact the runways or the Landmark since it would be temporary and not involve ground disturbance. Construction of an amphibious landing ramp may impact submerged historic properties.

No resources of cultural importance were identified within these training asset areas. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Construction of the amphibious landing ramp would likely cause a change in the local fish populations; some populations could decrease, while others may increase (see Section 4.10, *Marine Biology*). As this change would be temporary during the construction process, the impact would be less than significant.

Outside the Military Lease Area: Construction-related activities outside of the Military Lease Area would occur in an area immediately north of the Tinian International Airport runways and at the Port of Tinian, as well as along roads modified to accommodate the Tracked Vehicle Transit Lanes and a Supply Route. These activities would be the same as under Tinian Alternative 1. Construction-related activities such as clearing, excavation, and soil removal as well as vegetation clearance of roadways and port and aircraft support structures would significantly impact the same six historic properties as described in [Section 4.11.3.1, Tinian Alternative 1.](#)

No resources of cultural importance were identified within these training assets. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Significant direct impacts from construction would occur under Tinian Alternative 3 to historic properties and resources of cultural importance. Tinian Alternative 3 would significantly impact 179 historic properties in the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. Historic properties include the North Field National Historic Landmark; Pre-Contact *latte* sites, pottery scatters, and rock shelters; pre-World War II Japanese farms and shrines; and World War II-era Japanese and American military sites. However, as RTA design is finalized, the Department of Defense will seek to further avoid or minimize impacts to historic properties and resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.3.3.2 Operation Impacts

As described in Section 2.4.4, Tinian Alternative 3 operations and maintenance would occur within the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and impacts to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in the ranges under construction impacts, impacts to historic properties from training operations at the Range Complexes B, C, and D will focus on training maneuvers. Training maneuvers concern vehicle and foot traffic within areas; no digging would occur within maneuver areas. However, potential ground disturbance to historic properties in Range Complex A is larger than the footprint for construction and could occur throughout the High Hazard Impact Area. [Table 4.11-6](#) summarizes the historic properties impacted by operations for Tinian Alternative 3; impacts associated with construction are summarized in [Table 4.11-5](#). In Range Complex A, 12 sites, also impacted by construction, would be significantly impacted by operations.

Use of historic roads associated with the North Field National Historic Landmark by convoys and other vehicles would be in keeping with existing use and would not impact this historic property. Tracked

vehicles would use newly constructed gravel roads adjacent to the historic roads to prevent damage. Impacts to historic properties from foot traffic would be minimal, as it would occur primarily on roads and designated pathways or sporadically throughout the maneuver areas.

Table 4.11-6. Tinian Alternative 3 Summary of Significant Direct Impacts on Historic Properties from Operations

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	12*
Range Complex B	Multi-purpose Training Range, Combat Pistol Range, Anti-armor Tracking Range, Battle Site Zero Range	0
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multi-purpose Automated Unknown Distance Range, Urban Assault Course	0
Range Complex D	Drop Zone	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	0
	Munitions Storage Area	0
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	0
	Base Camp	0
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	0
Outside Military Lease Area	Tinian International Airport	0
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	0
Total		15

Note: *All of these sites are also impacted under construction, but are also located outside of the area of proposed ground disturbance for construction. Sites solely in the construction area are not included in this total.

Training and range management activities associated with Tinian Alternative 3 would have a significant direct impact to three historic properties, the landing beach at Unai Chulu, which is part of the North Field National Historic Landmark and a traditional cultural property, and a *latte* site due to ground disturbance caused by Amphibious Assault Vehicle traffic. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 4.11.2, Resource Management Measures](#)). As much as possible impacts to the *latte* site would be avoided by using existing and newly constructed roads.

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

In general, public access would be allowed to all locations except for the High Hazard Impact Area, the Munitions Storage Area, the base camp, and the Observation Posts and Surface Radar sites, when training is not occurring. It is envisioned that public access to some or all areas of the RTA, with the exceptions mentioned above, would occur during a couple of daylight hours on a nearly daily basis during the 20 weeks of live-fire training. A range control facility and dedicated range scheduler would be in place to assess public access in real-time and to provide advance notice of public access dates, time frames, and areas. Range control and the scheduler would coordinate public access directly with the Tinian Mayor's Office and other interested parties, such as ranchers and entities within the tourism industry. Access procedures would be implemented to ensure safety and provide guidance and direction. Therefore, intermittent and temporary loss of public access is not considered a significant indirect impact to cultural resources. Historic properties with the High Hazard Impact Area, base camp, Munitions Storage Area, and the Observation Posts and Surface Radar sites would already have been significantly impacted by construction activities and loss of access to these areas would be less than significant.

No resources of cultural importance were identified within these training asset areas.

The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed permanently by the use of the High Hazard Impact Area of Range Complex A. This closure would be a significant indirect impact to the Landmark.

The permanent presence of Observation Posts and Surface Radar sites would not be visible to most historic properties. However, towers associated with Surface Radar sites would be constructed at Unai Babui and near Unai Dankulo. As discussed in *Visual Resources*, Section 4.12.3.1, a Surface Radar Site would be constructed adjacent and south of Unai Dankulo and would be visible from the beach, which is a traditional cultural property. Another Surface Radar Site would be constructed within a *latte* site at Unai Babui. The permanent location of these towers would have a significant indirect impact to these historic properties.

Construction of the amphibious landing ramp at Unai Chulu would likely cause a change in the local fish populations through a permanent loss in coral reef habitat. Some populations could decrease, while others may increase (see *Marine Biology*, Section 4.10.3.1). As this shoreline is part of a potential traditional cultural property associated with fishing, this change would be a significant indirect impact to the property.

Significant direct impacts would result from operational activities under Tinian Alternative 3. As discussed under Tinian Alternative 1, 12 historic properties within Range Complex A and 3 historic properties at Unai Chulu would be significantly impacted in the area of potential effects. Significant indirect impacts would occur to the North Field National Historic Landmark from the permanent closure of the roundabout on Broadway Avenue, to a *latte* site, and a potential traditional cultural property (Unai Dankulo) from visual impacts due to Surface Radar sites, and to a potential traditional cultural property (Unai Chulu) from changes in fish populations due to ramp construction. However, as RTA design is finalized, the Department of Defense would seek to further avoid or minimized impacts to historic properties and other resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.3.4 Tinian No-Action Alternative

Activities during the periodic military non-live-fire training exercises on Tinian in the Military Lease Area would not impact historic properties and resources of cultural importance as these have been designed to avoid impacts by restricting ground disturbance and to improve historic runways and structures within the North Field National Historic Landmark. Establishing the four ranges on Tinian would result in significant impacts to cultural resources. These impacts were analyzed in the Guam and CNMI Military Relocation EIS and resolved through a Programmatic Agreement (Department of Defense 2011) that identified measures to mitigate significant impacts. Significant impacts to historic properties from the Mariana Islands Range Complex training were analyzed in the Mariana Islands Range Complex EIS and resolved through a Programmatic Agreement (Department of Defense 2009). Through the measures prescribed in these Programmatic Agreements, significant impacts to cultural resources would be resolved.

4.11.3.5 Summary of Impacts for Tinian Alternatives

[Table 4.11-7](#) provides a comparison of the potential impacts to cultural resources for the three Tinian alternatives and the no-action alternative.

Table 4.11-7. Summary of Impacts for Tinian Alternatives

Resource Area	Tinian (Alternative 1)		Tinian (Alternative 2)		Tinian (Alternative 3)		No-Action Alternative	
Cultural Resources	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Range Complex A	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	Not applicable	Not applicable
Range Complex B	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	Not applicable	Not applicable
Range Complex C	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	Not applicable	Not applicable
Range Complex D	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	NI	LSI	Not applicable	Not applicable
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	SI mitigated to LSI	Not applicable	Not applicable
Tinian International Airport	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	Not applicable	Not applicable
Outside Military Lease Area	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	SI mitigated to LSI	LSI	Not applicable	Not applicable
Military Lease Area	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	SI mitigated to LSI	SI mitigated to LSI

Legend: LSI = less than significant impact; NI = no impact; SI = significant impact. Shading is used to highlight the significant impacts.

4.11.3.6 Summary of Potential Mitigation Measures for Tinian Alternatives

[Table 4.11-8](#) provides a summary of the potential mitigation measures for cultural resources for the three Tinian alternatives.

Table 4.11-8. Summary of Potential Mitigation Measures for Tinian Alternatives

<i>Impacts</i>	<i>Category</i>	<i>Potential Mitigation Measures</i>	<i>Tinian Phase</i>	
			<i>Construction</i>	<i>Operation</i>
CULTURAL RESOURCES				
All Tinian alternatives would have a significant direct impact on historic properties in the Military Lease Area, immediately north of Tinian International Airport runways, and at the Port of Tinian. <ul style="list-style-type: none"> Tinian Alternative 1 would have a significant direct impact to 172 historic properties from construction and to 15 historic properties from operations, as well as significant indirect impacts to 4 historic properties. These historic properties include the North Field National Historic Landmark; Pre-Contact <i>latte</i> sites, pottery scatters, and rock shelters; pre-World War II Japanese farms and shrines; World War II-era Japanese and American military sites; and potential traditional cultural properties. Tinian Alternative 2 would have a significant direct impact to 182 historic properties from construction and to 15 historic properties from operations, as well as significant indirect impacts to 4 historic properties. These historic properties include. North Field National Historic Landmark; Pre-Contact <i>latte</i> sites, pottery scatters, and rock shelters; pre-World War II Japanese farms and shrines; World War II-era Japanese and American military sites; and potential traditional cultural properties. 	<i>SI mitigated to LSI</i>	Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.	X	X

Table 4.11-8. Summary of Potential Mitigation Measures for Tinian Alternatives

<i>Impacts</i>	<i>Category</i>	<i>Potential Mitigation Measures</i>	<i>Tinian Phase</i>	
			<i>Construction</i>	<i>Operation</i>
<ul style="list-style-type: none"> • Tinian Alternative 3 would have a significant direct impact to 179 historic properties from construction and to 15 historic properties from operation, as well as significant indirect impacts to 4 historic properties. These historic properties include the North Field National Historic Landmark; Pre-Contact <i>latte</i> sites, pottery scatters, and rock shelters; pre-World War II Japanese farms and shrines; World War II-era Japanese and American military sites; and potential traditional cultural properties. 				

Legend: *LSI* = less than significant impact; *SI* = significant impact. Shading is used to highlight the significant impacts.

4.11.4 Pagan

4.11.4.1 Pagan Alternative 1

4.11.4.1.1 Construction Impacts

As described in Section 2.5, *Pagan Alternatives*, two High Hazard Impact Areas would be established in the North Range Complex under Pagan Alternative 1. The expeditionary airfield, munitions storage area, and base camp would be developed north of the isthmus. This development and construction would result in 764 acres (310 hectares) (see Table 2.5-6) of ground disturbance (primarily due to vegetation clearance), and potentially impact historic properties and resources of cultural importance. [Table 4.11-9](#) summarizes the historic properties impacted by construction-related activities for Pagan Alternative 1. Specific impacts to historic properties and resources of cultural importance are described in more detail below and in Appendix N, *Cultural Resources Technical Memo*.

Table 4.11-9. Pagan Alternative 1 Summary of Significant Direct Impacts on Historic Properties from Construction

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
North Range Complex	North High Hazard Impact Area	2
	Landing Zones	2
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	4
	Amphibious Training Areas	0
	Live-Fire Maneuver Area	0
	Isthmus High Hazard Impact Area	2*
	Military Training Trails	7
	Airfield/Base Camp/Bivouac Area/Munitions Storage Area	10
South Range Complex	Non-Live-Fire Maneuver Area	0
Total		27

Note: *Although this area has not been surveyed, former residents indicate that two potential historic properties are located in the area of potential effects.

North Range Complex: As described in Section 2.5.2, *Pagan Alternative 1*, construction associated with the High Hazard Impact Area in the north would be minimal; however, 600 acres (243 hectares) would need to be cleared through grubbing for target placement, landing zones, and firing positions. Of this total, about 7 acres (3 hectares) is composed of native forest that would be removed (see Section 4.9, *Terrestrial Biology*). A firebreak would be established along the perimeter of the northern High Hazard Impact Area and eight targets put within the impact area. Although most of this area has not been surveyed, in general, the area is covered by lava to depths of over 30 feet (9.1 meters) from recent volcanic eruptions. Historic properties would not be found on the surface in this area. Outside of the lava area, historic properties tend to be found nearer to the coastal areas. Most of the area of potential effects for the firebreak has been surveyed. Construction-related activities associated with the firebreak under Pagan Alternative 1 would have a significant direct impact to two historic properties including one Pre-Contact artifact scatter and one World War II-era Japanese defensive site. Construction would also impact 7 acres (3 hectares) of native forest which could contain resources of cultural importance, such

as medicinal plants. No other resources of cultural importance, such as cemeteries or memorials, would be directly impacted by construction in this area.

Construction associated with High Hazard Impact Area located on the isthmus would likewise be minimal; however, 167 acres (68 hectares) would need to be cleared for target placement. Of this total, about 7 acres (3 hectares) is composed of native forest that would be removed (see Section 4.9, *Terrestrial Biology*). A firebreak would be established along the perimeter and one target would be cleared during construction within the isthmus High Hazard Impact Area. Because of thick vegetation and steep topography, the isthmus area has not been surveyed for archaeological resources, but it does contain two areas identified by former residents as the location of Kannathomhum, a *latte* village located close to the coast, and one unnamed location, which probably contained World War II-era Japanese military features. Other archaeological sites in the area are unlikely based on the steep topography and lack of accessibility to coastal resources. Construction of a firebreak would not significantly impact these resources, but grubbing during vegetation clearance associated with a target would have a significant direct impact to these resources. Construction would also significantly impact 7 acres (3 hectares) of native forest which could contain resources of cultural importance. A resource of cultural importance, a potential area for collecting betel nuts, also could be impacted by construction.

No construction would occur at the amphibious landing beaches or within the Live-Fire Maneuver Area. Eleven landing zones, 1 Field Artillery Direct Firing Range Position, 10 Field Artillery Indirect Firing Positions (8 co-occur with landing zones), and 6 firing points associated with the Mortar Range would be constructed throughout the northern portion of the island. Most of the landing zones and artillery firing points have either been surveyed or are located on lava. Of the 2 unsurveyed landing zones and the 2 unsurveyed firing points associated with the Mortar Range, 3 are located in steep interior areas surrounding Mount Pagan, and 1 is located in the High Hazard Impact Area on the isthmus in an area surrounded by steep topography. Both of these areas have a low potential for containing historic properties. Construction-related activities associated with the clearing and grubbing of landing zones and firing points under Pagan Alternative 1 would have a significant direct impact to six historic properties including one Pre-Contact *latte* site, one pre-World War II Japanese Administration site, and four World War II-era Japanese defensive sites.

A military training trail network would be constructed around the perimeter of the northern portion of Pagan to provide access to the base camp/bivouac area, Landing Zones, and the northern High Hazard Impact Area. A portion of the access road construction would involve the improvement of existing trails, while new trails would be constructed as well. A total of 39 acres (16 hectares) would be cleared and graded in the construction of these trails. Construction-related activities under Pagan Alternative 1 would have a significant direct impact to 7 historic properties including 2 Pre-Contact sites (*latte* sites), 2 pre-World War II Japanese Administration sites, and 3 World War II-era Japanese defensive sites. Given the steep topography of the area which restrict locations of trails (both existing and proposed), it is difficult to avoid known historic properties. Construction would also significantly impact 5 acres (2 hectares) of native forest which could contain resources of cultural importance. No other resources of cultural importance have been identified in this area.

The area adjacent to an existing airfield would contain the expeditionary base camp/bivouac area, interior roads, temporary munitions storage area, and airfield improvements. A grass airfield would be improved, and a temporary munitions storage area would be constructed. These areas would be cleared

of vegetation. Construction-related activities such as grading, grubbing, and soil removal would have a significant direct impact to 10 historic properties including 1 Pre-Contact site (*latte* site), 4 pre-World War II Japanese Administration sites, and 5 World War II-era Japanese defensive sites. Resources of cultural importance would not be impacted by construction.

Although public access would not be allowed in the construction area, the public may be allowed in nearby areas depending upon the type of construction. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in the noise and visual setting would be intermittent and temporary and result in a less than significant impact.

South Range Complex: The South Range Complex would be used as a non-live-fire maneuver area. There would be no construction-related ground clearance undertaken; therefore, there would be no direct or indirect impacts to historic properties or resources of cultural importance from construction activities associated with the establishment of the South Range Complex.

Although public access would not be allowed to the construction area, the public may be allowed in nearby areas in south Pagan when construction is ongoing. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and result in a less than significant impact.

Pagan Alternative 1 would result in significant direct impacts to historic properties and resources of cultural importance from construction activities. It would significantly impact up to 27 historic properties in the range complexes and expeditionary area. Historic properties include Pre-Contact *latte* complexes, pre-World War II Japanese Administration sites, and World War II-era Japanese defensive sites. However, as range design is finalized, the Department of Defense will seek to further avoid or minimize impacts on historic properties and resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.4.1.2 Operation Impacts

As described in Section 2.5, *Pagan Alternatives*, under Pagan Alternative 1, operations and maintenance would occur within the North and South Range Complexes.

Target areas in the High Hazard Impact Areas would be used for live-fire and inert munitions training. In general, the footprint for operations is very similar to the construction footprints and most ground disturbance, and impacts to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in most areas under construction impacts, impacts to historic properties from training operations will focus on training maneuvers. Training maneuvers consist of vehicle and foot traffic within maneuver areas; no digging would occur within the maneuver areas. However, potential ground disturbance to historic

properties in the High Hazard Impact Areas is larger than the footprint for construction and target placement and could occur throughout either of the High Hazard Impact Areas.

[Table 4.11-10](#) summarizes the historic properties impacted by operations for Pagan Alternative 1; impacts associated with construction are summarized in [Table 4.11-9](#). In the High Hazard Impact Areas, five historic properties, also impacted by construction, would be significantly impacted by operations. Although not all of the northern High Hazard Impact Area has been surveyed; it is primarily covered in lava. Should sites be preserved under the lava, impacts are unlikely since the depth of the ground disturbance associated with munitions would be less than the depth of the lava. Other archaeological sites within the isthmus High Hazard Impact Area are unlikely based on the steep topography and lack of accessibility to coastal resources.

Table 4.11-10. Pagan Alternative 1 Summary of Significant Direct Impacts on Historic Properties from Operations

Complex	Range	Number of Historic Properties
North Range Complex	North High Hazard Impact Area	5*
	Landing Zones	0
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	0
	Amphibious Training Areas	1
	Live-Fire Maneuver Area	46
	Isthmus High Hazard Impact Area	2*
	Military Training Trails	0
	Airfield/Base Camp/Bivouac Area/Munitions Storage Area	0
South Range Complex	Non-Live-Fire Maneuver Area	NA
Total		54

Notes: *All of these sites are impacted by vegetation clearing in target areas, but are located outside of the area of proposed clearing. Sites solely in the construction/cleared area are not included in this total.

Legend: NA = not applicable.

Training in the northern maneuver areas includes patrolling, establishing defensive positions, and firing live-fire weapons into and/or around the High Hazard Impact Area and integrating supporting arms (including aviation, artillery, and naval gunfire assets). Where possible, mounted wheeled and tracked vehicle maneuvering would be accomplished in the northern maneuver area as well. Vehicles would move along military training trails as well as other terrain that they could safely navigate. Ground disturbance associated with wheeled and tracked vehicles off of roadways and trails would have a significant direct impact to up to 46 historic properties, including 5 Pre-Contact *latte* sites, 1 Pre-Contact midden site, and 40 Japanese Administration sites. Off-road vehicle use could also impact resources of cultural importance such as medicinal plants and plant gathering areas near the shoreline, but would not impact such resources located along clifflines or on steep slopes. However, training units would be required to identify engagement area locations, direction of attack, targets/threats to be engaged, and types of weapon and ammunition to be used during an engagement. Developed scenarios would be submitted to range control for approval prior to implementation. This process would allow implementation of measures to avoid and protect historic properties and resources of cultural importance.

Foot maneuvers would occur in the South Range Complex. A limited amount of survey has been conducted in the South Range Complex due to steep topography. Information from surveys conducted in the south and interviews with former residents indicate that there are probably at least eight *latte* villages located primarily along coastal areas. However, impacts to historic properties from foot traffic would be minimal, as it would occur primarily on designated pathways or sporadically throughout the maneuver area.

Amphibious training, consisting of swimmer and inflatable boat landings, would occur at six beaches—Red, Green, Blue, South, North, and Gold. Amphibious Assault Vehicles and Landing Craft Air Cushion vessels would be used at Red, Green, and Blue beaches. Landing Craft Air Cushion vessels would be used at Red, Green, Blue, and South beaches. Use by swimmers and inflatable boats would have a minimal impact to any historic properties, including traditional cultural properties, and resources of cultural importance. Use of Amphibious Assault Vehicles and Landing Craft Air Cushion vessels could cause ground disturbance on the beach. Landing Craft Air Cushion vessels would have a significant direct impact to one historic property, a World War II-era Japanese airfield. All beaches have been surveyed and no other resources are recorded within the vicinity of the training areas. The beach areas associated with two potential traditional cultural properties, Red Beach (Shomshon) and South Beach (Regusa), would be disturbed by amphibious landing operations. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 4.11.2, Resource Management Measures](#)). The resulting impact to these potential traditional cultural properties would be less than significant.

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

In general, public access would be allowed to all locations except for the High Hazard Impact Areas, which would be permanently restricted due to the presence of unexploded ordnance, when training is not occurring. It is envisioned that public access would be allowed at times when such training events are not taking place and may be available during other times depending upon the type of training taking place. This may include public access to areas of southern Pagan while training is occurring elsewhere. Therefore, intermittent and temporary loss of public access is not considered a significant indirect impact to cultural resources. Historic properties within the High Hazard Impact Area would already have been significantly impacted by construction activities and loss of access to these areas would be a less than significant impact.

Indirect impacts to historic properties and resources of cultural importance due to visual intrusions and noise-level increase from training would be less than significant. An increase in noise and changes in visual setting may occur during operations in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and result in a less than significant impact. Indirect impacts to resources of cultural importance such as Laguna Sanhalom due to contamination by munitions in the

northern High Hazard Impact Area would be less than significant due to the implementation of best management practices associated with a Range Training Area Management Plan (see [Section 4.11.2, Resource Management Measures](#)).

Significant direct impacts would result from Pagan Alternative 1 operational activities. Up to 54 historic properties and resources of cultural importance would be significantly impacted by off-road wheeled and tracked vehicle use in the maneuver areas, munitions training in the High Hazard Impact Areas, and amphibious training. However, as RTA design is finalized, the Department of Defense would seek to further avoid or minimize impacts to historic properties and other resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.4.2 Pagan Alternative 2

4.11.4.2.1 Construction Impacts

Under Pagan Alternative 2, only one, smaller northern High Hazard Impact Area would be established in North Range Complex. This would potentially impact historic properties and resources of cultural importance. Ground disturbance primarily associated with vegetation removal would total 696 acres (283 hectares), or 38 fewer acres (28 hectares) when compared to Pagan Alternative 1 (see Table 2.5-6). [Table 4.11-11](#) summarizes the historic properties impacted by construction-related activities for Pagan Alternative 2. Specific significant impacts to historic properties and resources of cultural importance would be the same as found under Pagan Alternative 1, with the exception being that the isthmus High Hazard Impact Area would not be established. A more detailed description of potential impacts follows the table and is included in Appendix N, *Cultural Resources Technical Memo*.

Table 4.11-11. Pagan Alternative 2: Summary of Significant Direct Impacts on Historic Properties from Construction

Complex	Range	Number of Historic Properties
North Range Complex	North High Hazard Impact Area	2
	Landing Zones	2
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	4
	Amphibious Training Areas	0
	Live-Fire Maneuver Area	0
	Military Training Trails	7
	Airfield/ Base Camp/Bivouac Area/Munitions Storage Area	10
South Range Complex	Non-Live-Fire Maneuver Area	NA
Total		25

Legend: NA = not applicable.

North Range Complex: Construction associated with the High Hazard Impact Area in the north differs from construction under Pagan Alternative 1 as there would be no High Hazard Impact Area on the isthmus. Although the size of the High Hazard Impact Area would be smaller than the northern High Hazard Impact Area under Pagan Alternative 1, the target clearance would be the same. Although most of this area has not been surveyed, in general, the area is covered by lava to depths of over 30 feet (9.1 meters) from recent volcanic eruptions. Historic properties would not be found on the surface in this area. Outside of the lava area, historic properties tend to be found nearer to the coastal areas. Most of the area of potential effects for the firebreak has been surveyed. Construction-related activities associated with the firebreak under Pagan Alternative 2 would have a significant direct impact to the same two historic properties (one Pre-Contact artifact scatter and one World War II-era Japanese defensive site) as under Pagan Alternative 1. Construction would also impact 7 acres (3 hectares) of native forest which could contain resources of cultural importance, such as medicinal plants. No other resources of cultural importance, such as cemeteries or memorials, would be directly impacted by construction in this area.

Like under Pagan Alternative 1, no construction would occur at the amphibious training beaches or within the Live-Fire Maneuver Area. Thirteen Landing Zones would be cleared, which is two more than under Pagan Alternative 1 and five firing points would be cleared for the Mortar Range. Most of the landing zones and artillery firing points have been surveyed or are located on lava. Of the four unsurveyed landing zones and the one unsurveyed firing point associated with the Mortar Range, all are located in steep interior areas surrounding Mount Pagan and have a low potential for containing historic properties. As under Pagan Alternative 1, construction-related activities associated with clearing landing zones and firing points under Pagan Alternative 2 would have a significant direct impact to six historic properties, including one Pre-Contact *latte* site, one pre-World War II Japanese Administration site, and four World War II-era Japanese defensive sites. Significant direct impacts to historic properties from construction of a military trail network would impact the same seven historic properties as under Pagan Alternative 1 ([Section 4.11.4.1](#)).

Under Pagan Alternative 2, construction-related impacts associated with the base camp/bivouac area would be the same as found under Pagan Alternative 1 and directly impact the same 10 historic properties as under Pagan Alternative 1 ([Section 4.11.4.1](#)). Like under Pagan Alternative 1, although public access would not be allowed in the construction area, the public may be allowed in nearby areas depending upon the type of construction. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and result in a less than significant impact.

South Range Complex: Under Pagan Alternative 2, the same non-live-fire maneuver area would be established. There would be no construction-related ground clearance undertaken; therefore, there would be no direct impacts to historic properties or resources of cultural importance from construction. Although public access would not be allowed in the construction area, the public may be allowed in nearby areas in south Pagan when construction is ongoing. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in the noise and visual setting would be intermittent and temporary and result in a less than significant impact.

Pagan Alternative 2 would result in significant direct impacts to historic properties and resources of cultural importance from construction activities. It would have a significant direct impact to 25 historic properties in the range complexes and expeditionary area. Historic properties include Pre-Contact *latte* complexes, pre-World War II Japanese Administration sites, and World War II-era Japanese defensive sites. However, as range design is finalized, the Department of Defense will seek to avoid historic properties and resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.4.2.2 Operation Impacts

As described in Section 2.5.3, *Pagan Alternative 2*, operations and maintenance under Pagan Alternative 2 would be similar to Pagan Alternative 1. The primary difference would be that there would only be one, smaller High Hazard Impact Area established in the North Range Complex. In addition, 13 landing zones would be maintained and used; two more than under Pagan Alternative 1. As a result of the smaller High Hazard Impact area in the north and elimination of the High Hazard Impact Area on the isthmus, four fewer historic properties would be impacted by operations. Significant direct impacts would result from Pagan Alternative 2 operational activities to 50 historic properties. [Table 4.11-12](#) summarizes the historic properties impacted by operations for Pagan Alternative 2; impacts associated with construction are summarized in [Table 4.11-11](#). In the High Hazard Impact Area, three historic properties, also impacted by construction, would be significantly impacted by operations. Although not all of the High Hazard Impact Area has been surveyed; it is primarily covered in lava. Should sites be preserved under the lava, impacts are unlikely since the depth of the ground disturbance associated with munitions would be less than the depth of the lava.

Table 4.11-12. Pagan Alternative 2: Summary of Significant Direct Impacts on Historic Properties from Operations

Complex	Range	Number of Historic Properties
North Range Complex	North High Hazard Impact Area	3*
	Landing Zones	0
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	0
	Amphibious Training Areas	1
	Live-Fire Maneuver Area	46
	Military Training Trails	0
	Airfield/ Base Camp/Bivouac Area/Munitions Storage Area	0
South Range Complex	Non-Live-Fire Maneuver Area	NA
	Total	50

Note: *All of these sites are impacted by vegetation clearing in target areas, but are located outside of the area of proposed clearing. Sites solely in the construction/cleared area are not included in this total.

Legend: NA = not applicable.

Training in the northern maneuver area would be the same as under Pagan Alternative 1 and would directly impact the same 46 historic properties from tracked and wheeled vehicle use. Foot maneuvers would occur in the South Range Complex, but impacts to historic properties would be minimal, as it would occur primarily on designated pathways or sporadically throughout the maneuver area.

Amphibious training, consisting of swimmer and inflatable boat landings, would occur at six beaches—Red, Green, Blue, South, North, and Gold. Amphibious Assault Vehicles and Landing Craft Air Cushion vessels would be used at Red, Green, and Blue beaches. Landing Craft Air Cushion vessels would be used at Red, Green, Blue, and South beaches. Use by swimmers and inflatable boats would have a minimal impact to any historic properties, including traditional cultural properties, and resources of cultural importance. Use of Amphibious Assault Vehicles and Landing Craft Air Cushion vessels could cause ground disturbance on the beach. Landing Craft Air Cushion vessels could have a significant direct impact to one historic property, a World War II-era Japanese airfield. All beaches have been surveyed and no other resources are recorded within the vicinity of the training areas. The beach areas associated with two potential traditional cultural properties, Red Beach (Shomshon) and South Beach (Regusa), would be disturbed by amphibious landing operations. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 4.11.2, Resource Management Measures](#)). The resulting impact to these potential traditional cultural properties would be less than significant. The potential for direct impacts to historic properties and resources of cultural importance from stray rounds in surface danger zones is considered to be extremely low.

As with Pagan Alternative 1, indirect impacts due to restrictions in public access to historic properties and resources of cultural importance is less than significant since loss of access to all areas except for the High Hazard Impact Area would be intermittent and temporary. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions and noise-level increase from training would be less than significant. Public access would be allowed in certain areas while operations are ongoing depending upon the type of training. An increase in noise and changes in visual setting may occur during operations in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and result in a less than significant impact. Indirect impacts to resources of cultural importance such as Laguna Sanhalom due to contamination by munitions in the northern High Hazard Impact Area would be less than significant due to the implementation of best management practices associated with a Range Training Area Management Plan (see [Section 4.11.2, Resource Management Measures](#)).

Significant direct impacts would result from Pagan Alternative 2 operational activities. Up to 50 historic properties and resources of cultural importance would be significantly impacted by off-road wheeled and tracked vehicle use in the maneuver areas, munitions training in the High Hazard Impact Area, and amphibious training. However, as RTA design is finalized, the Department of Defense would seek to further avoid or minimize impacts to historic properties and other resources of cultural importance.

Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.

4.11.4.3 Pagan No-Action Alternative

Under the Pagan no-action alternative, no military construction or live-fire military training operations associated with the proposed action would occur on Pagan. Limited activities would occur including periodic visits for eco-tourism, scientific surveys, and military training for search and rescue. These activities represent minor disruptions to existing conditions. Therefore, the no-action alternative would have less than significant impacts on cultural resources on Pagan.

4.11.4.4 Summary of Impacts for Pagan Alternatives

[Table 4.11-13](#) provides a comparison of the potential impacts to cultural resources for the two Pagan alternatives and the no-action alternative.

Table 4.11-13. Summary of Impacts for Pagan Alternatives

Resource Area	Pagan (Alternative 1)		Pagan (Alternative 2)		No-Action Alternative	
	Construction	Operation	Construction	Operation	Construction	Operation
Cultural Resources						
North Range Complex	<i>SI mitigated to LSI</i>	<i>SI mitigated to LSI</i>	<i>SI mitigated to LSI</i>	<i>SI mitigated to LSI</i>	<i>LSI</i>	<i>LSI</i>
South Range Complex	<i>LSI</i>	<i>LSI</i>	<i>LSI</i>	<i>LSI</i>	<i>LSI</i>	<i>LSI</i>

Legend: *LSI* = less than significant impact; *SI* = significant impact. Shading is used to highlight the significant impacts.

4.11.4.5 Summary of Potential Mitigation Measures for Pagan Alternatives

[Table 4.11-14](#) provides a summary of the potential mitigation measures for cultural resources for the two Pagan alternatives.

Table 4.11-14. Summary of Potential Mitigation Measures for Pagan Alternatives

<i>Impacts</i>	<i>Category</i>	<i>Potential Mitigation Measures</i>	<i>Pagan Phase</i>	
			<i>Construction</i>	<i>Operation</i>
CULTURAL RESOURCES				
All Pagan alternatives would have a significant direct impact to historic properties. <ul style="list-style-type: none"> Pagan Alternative 1 would have a significant direct impact to 27 historic properties and resources of cultural importance in the range complexes and expeditionary area due to vegetation clearance, as well as 54 historic properties due to operations. These historic properties include Pre-Contact <i>latte</i> complexes, pre-World War II Japanese Administration sites, and World War II-era Japanese defensive sites. Pagan Alternative 2 would have a significant direct impact to 25 historic properties and resources of cultural importance in the range complexes and expeditionary area due to construction, as well as 50 historic properties due to operations. These historic properties include Pre-Contact <i>latte</i> complexes, pre-World War II Japanese Administration sites, and World War II-era Japanese defensive sites. 	<i>SI mitigated to LSI</i>	Measures to mitigate significant impacts to historic properties will be identified through consultation with the CNMI Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service, and other interested parties representing the interests of the local government and the public. These measures, which may include data recovery excavations, archaeological monitoring, documentation, public education, and/or other appropriate measures, will be formalized in an agreement document.	X	X

Legend: *LSI* = less than significant impact; *SI* = significant impact. Shading is used to highlight the significant impacts.