
5.0 Cumulative Impacts

5.0 CUMULATIVE IMPACTS

5.1 APPROACH

The approach taken in the analysis of cumulative effects follows the objectives of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations and CEQ guidance. CEQ regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508) provide the implementing procedures for NEPA. The regulations define cumulative effects as:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7).

CEQ guidance appears in the handbook, *Considering Cumulative Effects* (Council on Environmental Quality, 1997). The contribution of a Proposed Action to the overall impacts in a region of influence is of particular concern. While a single project may have individually minor impacts, when it is considered together with other projects on a regional scale, the effect may be collectively significant. A cumulative impact is the additive effect of all projects in the geographic area.

In general, the effects of a particular action or group of actions must meet all of the following criteria to be considered cumulative impacts:

- The effects of several actions occur in a common locale or region of influence
- The effects on a particular resource are similar in nature
- The effects are long-term since short-term impacts dissipate and cease to contribute to cumulative impacts

5.2 PROJECTS ANALYZED FOR CUMULATIVE IMPACTS

Past, present, and reasonably foreseeable actions in the cumulative effects region or region of influence are summarized in Table 5.2-1. The following represents a list of past, present, and planned projects with the potential to interact with each of the project alternatives but are neither dependent on nor part of the Proposed Action.

Table 5.2-1. Cumulative Projects List

Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
U.S. Fish and Wildlife Service (USFWS) Plant Critical Habitat	Oahu	USFWS	Protection of habitat for federally designated threatened and endangered plants.	Ongoing	Beneficial
Prescribed Burns at Makua Military Reservation (MMR)	MMR	U.S. Army	Prescribed burns conducted to reduce fuel load at MMR and to facilitate unexploded ordnance (UXO) clearance and surveys for cultural resources.	2002, 2003, and ongoing	Additive
Stryker Brigade Combat Team Transformation	Oahu and Hawaii	U.S. Army	Multiple construction projects and land acquisitions for converting the 2nd Brigade of the 25th ID(L) into a Stryker Brigade Combat Team.	Unknown; all construction to commence by 2008	Additive
Prescribed Burns at Army Installations on Oahu (other than MMR)	Oahu	U.S. Army	Prescribed burn to reduce fuel load at ranges. This also facilitates UXO clearance and surveys for cultural resources.	2003 and ongoing	Additive
Kahuku Windmill and Hook Parcels Land Acquisition	Kahuku Training Area (KTA)	U.S. Army	Purchase adjacent lands for Current Forces training.	2003	Neutral
Turtle Bay Resort Improvements	KTA	Turtle Bay Resort	Hotel expansion and renovations.	2004	Neutral
Residential Communities Initiative	Army Bases on Oahu	U.S. Army	The Army plans to turn over approximately 8,300 units of housing on Oahu to a private developer for redevelopment and operation for 50 years.	2004-2054	Neutral
Farrington Highway Improvements	Mākaha (near MMR)	State of Hawaii	Construct safety and operation improvements for Farrington Highway, including sidewalks, signalized pedestrian crosswalk or bridges, and continuous left turn fences.	Funded through 2004	Additive
Farrington Highway, Replacement of Mākaha Bridges 3 and 3A	Mākaha (near MMR)	State of Hawaii	Replace two timber bridges in the vicinity of Mākaha Beach Park.	Funded through 2004	Neutral
Integrated Training Area Management (ITAM)	All Oahu ranges	U.S. Army	The intent of the ITAM program is to systematically provide uniform training land management capability across U.S. Army, Hawaii (USARHAW) and to ensure that the carrying capacity of the training lands is maintained over time.	Ongoing	Beneficial

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Table 5.2-1. Cumulative Projects List (Continued)

Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Implementation of the Integrated Natural Resources Management Plan (INRMP)	Oahu	U.S. Army	The INRMP “preserves, protects and enhances natural and cultural resources and complies with all applicable laws and regulations, while improving the Army’s capability to conduct training and maintain military readiness.”	Not all projects funded. Plan covers 2002-2006	Beneficial
Implementation of the Integrated Cultural Resource Management Plan (ICRMP)	Oahu	U.S. Army	The intent of the ICRMP is to preserve, protect, and enhance cultural resources; it complies with all applicable laws and regulations, while improving the Army’s capability to conduct training and maintain military readiness.	Ongoing	Beneficial
Implementation of Proposed Range and Training Land Program Development Plan Actions	Oahu	U.S. Army	A planning document for managing range facilities and training areas based on Army training doctrine and resource guidance.	Ongoing	Beneficial
Installation Information Infrastructure Architecture (I3A)	Schofield Barracks Military Reservation (SBMR) - Main Post; Wheeler Army Airfield (WAAF)	U.S. Army	Install fiber optics cables from the cantonment area to the ranges, motor pool, and other facilities within the installation.	2004	Additive
Drum Road Upgrade	Helemano Military Reservation (HMR) to KTA	U.S. Army	Align, widen, and harden approximately 23 miles (37 kilometers) of the dirt and gravel road that runs from the end of the paved road at HMR to the end of the paved road at KTA. Road upgrade done to accommodate Current Forces training.	2005/2006	Additive
Residential Development	Wai`anae	Not available (N/A)	Constructed 7 housing units.	2001/2002	Additive
Residential Development	Wai`anae	N/A	Construct 1,504 housing units.	2002 and beyond	Additive
Residential Development	Ewa	N/A	Constructed 636 housing units.	2000/2001	Additive
Residential Development	Ewa	N/A	Constructed 900 housing units.	2001/2002	Additive
Residential Development	Ewa	N/A	Construct 22,049 housing units.	Unknown	Additive
Kapolei Parkway	Ewa	Dept. of Transportation Services (DTS)	Construct a new four-lane (six lanes, if needed) boulevard across much of the Ewa plain, from Ko Olina to Ocean Pointe.	Unknown	Additive

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Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
North-South Road	Ewa	State Dept. of Transportation (DOT)	Construct a new four-lane boulevard makai from a future H-1 interchange to near Ewa Villages.	Underway	Additive
Land Transfer – Dillingham Military Reservation (DMR)	DMR	U.S. Army	Return of the portion of the beach land in front of DMR to the state	Unknown	Neutral
Advanced Wastewater Treatment Upgrade	SBMR	U.S. Army	Upgrade current sewage treatment to an advanced treatment and effluent system.	2005	Neutral
Army Facility Strategy Program	SBMR/WAAF	U.S. Army	Projects include an aviation motor pool complex at WAAF, two physical fitness centers (SBMR, WAAF), a general instruction building, and upgrades to the range at SBMR.	Unknown	Additive
Hot Cargo Pad	Hickam Air Force Base (HAFB)	U.S. Air Force	Construct facilities to simultaneously load three C-5/ C-17 aircraft.	Unknown	Additive
Lā`ie Wastewater Collection System Expansion Phase II – Lā`ie	Lā`ie (adjacent to KTA)	Town of Lā`ie	Upgrade the sewage collection system in Lā`ie.	2004	Neutral
Drydock 2 Waterfront Support Facility	Pearl Harbor (near HAFB)	U.S. Navy	Construct two story metal buildings, renovate latrine, and demolish several buildings.	2003	Neutral
Kamehameha Highway Bridge Replacements	Kawela Camp Road, Kaula Road (near SBMR)	State of Hawaii	Replace Kawela Stream bridge and Upper Poamoho Stream Bridge	Funded through 2004	Neutral
Kamehameha Highway Traffic Improvements	Kahalu`u to Waimea Bay (near KTA)	State of Hawaii	Construct passing lanes and turning lanes at intersections, modify traffic signals, and install signs, flashers, and other warning devices.	Funded through 2004	Beneficial
Wai`anae Sustainable Communities Plan	Waianae	Honolulu Dept. of Planning and Permitting	A 20-year land use plan for the Wai`anae planning area.	Ongoing	Neutral
Central Oahu Sustainable Communities Plan	Central Oahu	Honolulu Dept. of Planning and Permitting	A 25-year plan guiding land use planning for central Oahu.	Ongoing	Neutral
25th ID(L) & USARHAW Revitalization Program	Oahu	U.S. Army	Construct and renovate water tanks and central ID Lab.	2006-2008	Additive
Proposal to base eight C-17 aircraft at HAFB and the departure of four C-130 aircraft from HAFB.	HAFB	U.S. Air Force	Basing of eight C-17 aircraft at HAFB; four C-130 aircraft would depart from HAFB.	Unknown	Additive

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Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Department of Hawaiian Homelands Residential and Agricultural Development	Nānākuli-Wai`anae	Department of Hawaiian Homelands	Development of 16 parcels to provide up to 3,684 single family homes and farm lots.		Additive
Maluohai Phase III	Kapolei	Unknown	Construct 45 homes.	August 2004	Additive
Golf Course Development	Ewa, Central Oahu, and Wai`anae	N/A	Develop 171 golf holes on 1,798 acres at nine golf courses.	2002 and beyond	Additive
Makaha 242-foot Reservoir No. 2	Wai`anae	Board of Water Supply (BWS)	Construct a new water reservoir in Makaha Valley, adjacent to the first reservoir.	Completed	Additive
Nānākuli 242-foot Reservoir	Wai`anae	BWS	Construct a new reservoir on Puu Haleakala in Nānākuli.	Unknown	Additive
Wai`anae Regional Park	Wai`anae	Dept. of Design and Construction (DDC)	Expand the existing regional park and add other improvements, such as an ocean recreation center and additional fields.	Underway	Additive
Wai`anae Wastewater Treatment Plant Modification	Wai`anae	DDC	Wastewater improvements to the existing treatment plant.	Completed	Neutral
Wai`anae Coast Emergency Alternate Route	Wai`anae	DTS	Develop a second through-road (for emergencies only) Mauka of Farrington Highway from Makaha to Nānākuli, by constructing new road links between existing sections of public or private road.	Unknown	Additive
Honouliuli Waste Water Treatment Plant (WWTP) Effluent Reuse	Ewa	DDC	Modify transmission system to distribute 13 million gallons per day (MGD) of reclaimed wastewater, as required by consent decree.	Completed	Neutral
Honouliuli WWTP Handling Upgrades	Ewa	DDC	Modify solids handling facilities and odor control to improve operations within current 38 MGD capacity.	Underway	Neutral
Honouliuli WWTP Expansion	Ewa	DDC	Increase the primary liquid treatment capacity (an increase of 13 MGD).	Unknown	Neutral
Kamokila (Honokai Hale) Community Park	Ewa	DDC	Acquire the land under an existing city park, including land needed for access.	Underway	Neutral
Ewa Mahiko District Park	Ewa	DDC	Develop a new park at the old mill site in Ewa Villages.	Underway	Neutral
Honouliuli WWTP site Expansion (Mauka)	Ewa	DDC	Add 27 acres to the existing WWTP site so that ultimate capacity can be raised above 51 MGD.	Underway	Neutral

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Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Asing Community Park	Ewa	DDC	Develop a new 24-acre park to serve West Loch Estates and Fairways.	Underway	Additive
Farrington Highway Improvement	Ewa	DDC	Increase the right-of-way and widen highway from two lanes to six lanes along 12 miles from Fort Weaver Road to the proposed North-South Road.	Unknown	Additive
Oneula Beach Park Expansion	Ewa	DDC	Add six acres in conjunction with the development of the Ocean Pointe community.	Underway	Neutral
Kalaeloa Regional Park	Ewa	DDC	Develop a new regional park on approximately 456 acres of the former Barbers Point Naval Air Station.	Underway	Neutral
Makakilo Neighborhood Park	Ewa	DDC	Develop a new neighborhood park in the Makakilo area of the water park.	Underway	Neutral
Renton Road Improvements (Ewa Town)	Ewa	DTS	Widening the road from two to four lanes within Ewa Villages.	Underway	Additive
Kaloi Gulch Channel	Ewa	N/A	Drainage improvements in the Varona Village area of Ewa Villages.	Underway	Neutral
Kalaeloa Desalination Plant	Ewa	BWS	Construct a new, high-technology 15 MGD water production facility in Campbell Industrial Park.	Underway	Neutral
Ewa Shaft Renovation	Ewa	BWS	Convert an existing private irrigation source into a municipal water production facility.	Underway	Neutral
Park Row Road	Ewa	DTS	Construct a short extension of Park Row Road makai from Renton Road to the future Kapolei Parkway.	Underway	Neutral
Residential Development	Central Oahu	N/A	Constructed 644 housing units.	2000/2001	Additive
Residential Development	Central Oahu	N/A	Constructed 811 housing units.	2001/2002	Additive
Residential Development	Central Oahu	N/A	Construct 8,710 housing units.	2002 and beyond	Additive
Pearl Harbor Historic Trail (Middle Loch Park)	Central Oahu	DDC	Aiea and Pearl City communities interested in enhancing a walking trail from Ewa to Ko Olina Resort along old OR&L railroad corridor. Trail is intended to preserve land and open space and offer views of Pearl Harbor and nearby wetlands.	2001 and beyond	Neutral
Waipahu Wells III	Central Oahu	BWS	Potable well installation along with 5 pumps to produce 2-3 MGD for the surrounding area.	Underway	Neutral

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Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Waipio Peninsula Recreation Complex	Central Oahu	DDC	Public soccer complex and park includes soccer fields, stadium, parking lot, and park.	Completed	Neutral
Central Oahu Regional Park (Waiola Sports Complex)	Central Oahu	DDC	Public sports complex includes a park, baseball fields, and tennis courts.	Underway	Neutral
Waipahu Wells II Addition (two projects)	Central Oahu	BWS	Construction of pump and reservoir improvements including a 1.5 MGD well.	Underway	Neutral
Waipahu Wells IV	Central Oahu	BWS	Installation of four 1.5 MGD wells, and GAC treatment facility.	Underway	Neutral
Haleiwa Drainage Improvements	North Shore	DDC	Upgrades to the existing drainage ditch along Haleiwa Road (mauka side).	Underway	Neutral
Banzai Rock Beach Support Park	North Shore	DDC	Develop a new parking area (and possibly bath house) mauka of Kamehameha Highway.	Underway	Neutral
Kaunala Beach Park	North Shore	DDC	Create a new beach park at the Velzyland surf site, including a comfort station and a pavilion.	Underway	Neutral
Kahawai Beach Support Park (including Sunset Beach Recreation Center)	North Shore	DDC	Create a new 2.6-acre park mauka of Kamehameha Highway near Pupukea Beach Park, to include a recreation center, comfort station, additional parking, and an area for an open market.	Underway	Neutral
Waimea Valley Park	North Shore	DDC	Purchase the Waimea Falls Park, a private recreational area and botanical garden, in order to preserve the scenic valley and the botanical collection and keep the tourist attraction running.	Land acquisition underway	Beneficial
Residential Development	Primary Urban Center	N/A	Constructed 74 housing units.	2000/2001	Additive
Residential Development	Primary Urban Center	N/A	Constructed 91 housing units.	2001/2002	Additive
Residential Development	Primary Urban Center	N/A	Construct 1,667 housing units.	2002 and beyond	Additive
Nimitz Highway Reconstructed Sewer (Fort Street Mall to Alakea Street)	Primary Urban Center	N/A	Install 30-inch-diameter, 800-foot long subsurface water line between Fort Street Mall and Alakea Street.	2000/2001	Additive

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Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Moanalua Road Widening	Primary Urban Center	DDC	Widening one lane of a 1,000-foot-long corridor.	2001 and beyond (no design to date; funding pending)	Additive
Pele Street Mini-Park	Primary Urban Center	DDC	Small community park	2004	Neutral
Residential Development	East Honolulu	N/A	Constructed 204 housing units.	2000/2001	Additive
Residential Development	East Honolulu	N/A	Constructed 165 housing units.	2001/2002	Additive
Residential Development	East Honolulu	N/A	Construct 1,177 housing units.	2002 and beyond	Additive
Waiialae Nui Well	East Honolulu	BWS	Construct a new potable well near the Waiialae Nui residential subdivision.	Completed	Neutral
Kalama Valley Community Park	East Honolulu	DDC	Construct new recreation building and related site improvements.	Underway	Additive
Koko Crater Botanical Garden	East Honolulu	DDC	Construct a new visitor center and related site improvements.	Underway	Additive
Koko Head Regional Park and Nature Preserve	East Honolulu	DDC	Modifications include education and visitor centers, parking, roadways, comfort stations, an enhanced trail system, and a people mover system.	Underway	Additive
Aina Haina Nature Preserve	East Honolulu	DDC	Develop a new nature park, complete with a trail system, parking, and related improvements.	Unknown	Additive
Queen's Beach Park (Wawamalu)	East Honolulu	DDC	Construct a new beach park in the Queen's Beach area, east of the Hawaii Kai Golf Course.	Completed	Neutral
Hanauma Bay Modification	East Honolulu	DDC	Modifications included parking, food concessions, and information/education centers.	Completed	Neutral
Kamilo Iki Community Park Modifications	East Honolulu	DDC	Develop new athletic fields and courts at an existing park.	Underway	Neutral
Ka Iwi Shoreline Park	East Honolulu	DDC	Construct limited park improvements along Ka Iwi Coast, in conjunction with the state.	Land acquisition completed	Neutral
Wailupe Stream Flood Control	East Honolulu	DDC	Plan to channelize Wailupe Stream in Aina Haina and expand the existing upland drainage basin.	Underway	Additive
Aina Haina Slide Remediation, Zone B	East Honolulu	DDC	Plan to create a passive park by compacting, regrading, and landscaping to stabilize a slide area.	Underway	Neutral

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Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Koko Crater Access Road	East Honolulu	DDC	Construct a boulevard to replace and relocate the existing private road into Koko Crater.	Underway	Additive
Koko Crater Entrance Park	East Honolulu	DDC	Construct a new passive park between Queens Gate and the proposed Koko Villas subdivision.	Underway	Neutral
Residential Development	Koolaupoko	N/A	Constructed 75 housing units.	2000/2001	Additive
Residential Development	Koolaupoko	N/A	Constructed 86 housing units.	2001/2002	Additive
Residential Development	Koolaupoko	N/A	Construct 1,381 housing units.	2002 and beyond	Additive
Kamehameha Highway Scenic Enhancement	Koolaupoko	DDC	Acquiring and preserving the Waihee Marsh along the shoreline in the Kahaluu area.	Unknown	Beneficial
Haiku Valley Nature Preserve	Koolaupoko	DDC	Plans to purchase and improve the former US Coast Guard Omega Station and the Haiku Stairs as a park and nature preserve.	Underway	Beneficial
Waiahole Beach Park	Koolaupoko	DDC	Plans to expand and improve the existing Waiahole Beach Park.	Underway	Neutral
Waimanalo Well II	Koolaupoko	BWS	Construct a new potable water well mauka of the former Meadow Gold Dairies pasture land.	Unknown	Neutral
Kahaluu Regional Park	Koolaupoko	DDC	Plans to expand the existing regional park mauka toward the Kahaluu Elementary School and adjacent park.	Underway	Neutral
Kailua 272 Reservoir	Koolaupoko	BWS	Construct a new reservoir at Kalae O Kaiwa Ridge in Kailua.	Underway	Additive
Kaneohe Stream Green Belt Park	Koolaupoko	DDC	Plans to establish a greenbelt park along the lower reaches of Kaneohe Stream.	Underway	Neutral
Kawa Stream Improvements	Koolaupoko	DDC	Channelize Kawa Stream within the Piloiloa Subdivision behind Castle High School in Kaneohe.	Underway	Additive
Kailua Beach Park Improvements	Koolaupoko	DDC	Construct a new pavilion, canoe halau, relocated comfort station, and various grounds improvements.	Unknown	Neutral
Waimanalo Treatment and Disposal System	Koolaupoko	DDC	Expand the existing Waimanalo Wastewater Treatment Plant to accommodate increasing demand and to provide service to areas currently using cesspools.	Underway	Neutral

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Kawai Nui Gateway Park	Koolaupoko	DDC	Plans to create a nature walk, dog park, and additional landscaping at various places along the northern and eastern borders of Kawai Nui Marsh.	Underway	Neutral
Kawai Nui Community Park	Koolaupoko	DDC	Improve an existing park by adding a recreation building, comfort station, and play courts.	Completed	Neutral
Kailua Park	Koolaupoko	DDC	Develop a new nature park in Maunawili Valley, surrounding and including the existing Luana Hills Golf Course.	Land acquisition underway	Neutral
Pali Golf Course Improvements	Koolaupoko	DDC	Modifications include replacing the clubhouse and improving all areas of the golf course.	Underway	Neutral
Kaneohe Bayside Park (Kahua O Waikalua Neighborhood Park)	Koolaupoko	DDC	Create a new park on the site of the soon-to-be-phased-out Kaneohe Sewage Treatment Plant, to include ball fields and open spaces.	Underway	Neutral
Waikane Nature Preserve	Koolaupoko	DDC	Establish a nature preserve in Waikane Valley, with improvements limited to walking trails.	Underway	Neutral
Kuou Well III	Koolaupoko	DDC	Construct a new potable water well next to Ho'omaluhia Botanical Garden in Kaneohe.	Completed	Neutral
Kualoa Regional Park	Koolaupoko	DDC	Upgrade an existing park by constructing a sewage system and improving buildings and roads.	Underway	Neutral
Kailua Sewage Treatment Plant Modification	Koolaupoko	DDC	Upgrade the existing plant to increase storage capacity and improve odor control.	Underway	Neutral
Kaneohe Sewage Treatment Plant Modification	Koolaupoko	DDC	Convert the existing treatment plant to a pretreatment facility that has additional capacity to handle wet-weather flows, and demolish the existing structures and tanks so that the land can be used as a park.	Completed	Neutral
Heeia Kea Park	Koolaupoko	DDC	Create a nature park and passive recreational area within Heeia Kea Valley.	Underway	Neutral
Kalaeloa Artificial Reef	Ewa	State of Hawaii	Establish an artificial reef site on the seafloor offshore from the Ewa District of the Island of Oahu	Unknown	Beneficial
Kaluanui Well Addition	Koolauloa	BWS	Construct a new potable water well within Heeia Kea Valley.	Underway	Beneficial

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Hauula Community Park Building Expansion	Koolauloa	DDC	Expand the existing multi-purpose building and construct related improvements.	Underway	Neutral
Opana Wells	Koolauloa	BWS	Construct a new potable water well in the Kawela area mauka of the proposed Kuilima Resort.	Completed	Neutral
Kahuku District Park Improvements	Koolauloa	DDC	Construct a new multi-purpose building, play courts, and related improvements.	Underway	Neutral
Laie Beach Park (Bluff)	Koolauloa	DDC	Expand the existing beach park and construct related park improvements.	Underway	Neutral
Hauula Fire Station Relocation	Koolauloa	DDC	Construct a new fire station (possibly including an ambulance facility) outside of the flood plain area.	Underway	Neutral
Hawaii Superferry		DOT, Harbors Division	Operation of a high-speed ferry between the islands of Oahu, Maui, and Kauai, running in designated close-to-shore water lanes.	2007	Additive
ATG Trainer Facility		U.S. Navy	Warehouse structure to house Anti-terrorism Force Protection trainers/simulators.	To Be Determined	Neutral
Waterfront Upgrade		U.S. Navy	Wharf and supporting facilities to berth Pearl Harbor home ported submarines.	To Be Determined	Additive
Consolidated fire station	Naval Station area	U.S. Navy	Consolidation of three fire stations into one new station.	To Be Determined	Neutral
Fire station	West Loch	U.S. Navy	Replacement of existing fire station.	To Be Determined	Neutral
Compressed air plant	Pearl Harbor Naval Shipyard dry docks, Yankee and Sierra piers	U.S. Navy	Compressed air plant to support submarine overhauls and repairs.	To Be Determined	Additive
Magazine driveway paving	Driveways to Naval Magazine (NAVMAG) ammunition magazines	U.S. Navy	Pavement of unpaved driveways.	To Be Determined	Additive
Renovate Facilities for Naval Undersea Warfare Center Detachment Hawaii	Ford Island	U.S. Navy	Renovate five buildings and construct underwater test facility.	Unknown	Additive
Ship Maintenance Waterfront Facility		U.S. Navy	Building renovations.	To Be Determined	Additive

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P-587 Pacific Fleet Submarine Drive-In	Beckoning Point, Pearl Harbor, HI	Naval Station Pearl Harbor	Construction of a concrete slip to support a drive-in Magnetic Silencing Facility.	FY08 program year	Additive
P-202 Joint Forces Deployment Staging Area	NS Pearl Harbor, HI	Commander, Navy Region Hawaii; Commander, Navy Installations Command	Creation of a deployment staging area to support deployment of Joint Forces.	FY09 program year	Additive
P-173 Construct Communication Center, Naval Computer and Telecommunications Area Master Station	Wahiawa	U.S. Navy	Construction of a communication center.	FY08 program year	Neutral
P-004 Construct Conference and Technology Learning Center	Ft. DeRussy	U.S. Navy	Construction of a learning center.	To Be Determined	Neutral
P-005 Joint Prisoner of War/Missing in Action (POW/MIA) Accounting Command	Hickam AFB	U.S. Navy	Construction of a facility to accommodate the Joint POW/MIA Accounting Command.	To Be Determined	Neutral
P-578 Construct Fitness Center	NAVSTA Main Base	U.S. Navy	Construction of a fitness center.	To Be Determined	Neutral
P-182 Construct Missile Magazines, NAVMAG WL	NAVMAG PH, West Loch	U.S. Navy	Construction of five earth-covered box magazines.	To Be Determined	Additive
P-013 Consolidate Command Support Functions	NCTAMS PAC, Wahiawa	U.S. Navy	Renovation and demolition of buildings in support of consolidation of support functions.	2010	Additive
P-634 Waterfront Upgrades Bravo 21	Bravo docks 20 and 21	U.S. Navy	Construction of new concrete wharves.	2010	Additive
P-302 Dry Dock Ship Support Services	Dry docks 1 and 2, Bravo piers 1 and 2	U.S. Navy	Modifications of docks and piers to provide ship support services.	2012	Additive
P-639 Construct Advanced SEAL Delivery System/SEAL Delivery Vehicle (ASDS/SDV) Operations Wharf	Wharf Victor 2	U.S. Navy	Construction of a new wharf structure.	2013	Additive
FY09 MCON P-422 Advanced Radar Detection Laboratory (ARDEL)	PMRF	U.S. Navy	Construction of Advanced Radar Facility	2009 and beyond	Additive

Note:

Neutral: The project listed would not contribute substantially to cumulative effects on resources impacted by the Proposed Action.**Additive:** The project listed would, or is likely to contribute substantially to cumulative effects on resources impacted by the Proposed Action.**Beneficial:** The project listed would, or is likely to reduce or offset cumulative effects on resources impacted by the Proposed Action.2
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Table 5.2-1. Cumulative Projects List (Continued)

Project	Related Project Location	Project Sponsor	Project Description	Projected Completion Date	Relevance to HRC EIS
Rim of the Pacific (RIMPAC) Exercise	HRC	U.S. Navy	RIMPAC is a biennial, sea controlled projection fleet exercise that has been conducted since 1968.	2006	Additive
Undersea Warfare Exercise (USWEX)	HRC	U.S. Navy	USWEX is an advanced Anti-Submarine Warfare Exercise proposed to be conducted by the U.S. Navy's Carrier Strike Groups and Expeditionary Strike Groups while in transit from the west coast of the United States to the western Pacific Ocean.	2007	Additive
P-8A Multi-Mission Maritime Aircraft	Hickam AFB	U.S. Navy	Introduction of P-8A Multi-Mission Maritime Aircraft to the Navy Fleet. Proposed action includes transition from existing P-3C aircraft to P-8A Multi-Mission Maritime Aircraft. Hickam AFB has been identified as one of several potential receiving sites. A Notice of Intent to prepare an EIS was published in the <i>Federal Register</i> in December 2006.	2011-2019	Additive
Replacement of F-15 Aircraft with F-22A Aircraft	Hickam AFB	Air Force and Air National Guard	The Air Force and Air National Guard proposes to replace the Hawaii Air National Guard F-15 aircraft with F-22A aircraft at Hickam AFB.	2011	Additive

Source: U.S. Army, 2005

Note:

Neutral: The project listed would not contribute substantially to cumulative effects on resources impacted by the Proposed Action.

Additive: The project listed would, or is likely to contribute substantially to cumulative effects on resources impacted by the Proposed Action.

Beneficial: The project listed would, or is likely to reduce or offset cumulative effects on resources impacted by the Proposed Action.

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11 5.2.1 OTHER ACTIVITIES

12 5.2.1.1 COMMERCIAL FISHING

13 To date, there have only been three observed interactions with Endangered Species Act (ESA)
14 listed whale species and the Hawaii-based longline fisheries. Two of the incidents involved
15 humpback whales, and one involved a sperm whale. Recent Biological Opinions have
16 concluded that the region's pelagic fisheries are not likely to have an adverse effect on the
17 populations of the seven ESA listed whale species in the region. Previous interactions with
18 Hawaiian monk seals in the early 1990s, while not directly observed, were evidenced by
19 wounds and gear entanglements of seals seen at French Frigate Shoals. Establishment of a
20 50-nautical-mile protection zone around the Northwestern Hawaiian Islands appears to have
21 resolved interactions between the longline fishery and monk seals. In pelagic fisheries
22 managed under a Fisheries Management Plan in the Hawaii region, there are documented
23 interactions with several non-ESA listed marine mammals. Observer data from the Hawaii-
24 based longline fishery show that interactions with non-ESA listed marine mammals are not

1 infrequent. At present, the Hawaii-based pelagic longline fisheries are classified as a Category I
2 fishery under Section 118 of the Marine Mammal Protection Act which has frequent serious
3 injuries and mortalities of marine mammals incidental to commercial fishing (National Oceanic
4 Atmospheric Administration Fisheries, 2007). Therefore, the potential for cumulative impacts on
5 marine mammals from commercial fishing could be significant.

6 Observer data from the Hawaii-based longline fishery also show that sea turtles found within the
7 Hawaii Range Complex (HRC) are incidentally taken in this fishery which may be a significant
8 source of mortality for three of these species—leatherback, loggerhead, and olive ridley turtles.

9 **5.2.1.2 COMMERCIAL AND RECREATIONAL VESSEL TRAFFIC**

10 Ship strikes, or ship collisions with whales, are a recognized source of whale mortality
11 worldwide. Of the 11 species known to be hit by ships, the most frequently reported is the fin
12 whale. In the Hawaiian Islands, ship strikes of the humpback whale are of particular concern.
13 Ship strikes remain a significant threat to some whale populations. In North Atlantic right
14 whales, for example, ship strikes are believed to be a significant factor limiting the recovery of
15 this species (Knowlton and Kraus, 2001).

16 Whale-watching tours are becoming increasingly popular, and ship strikes have risen in recent
17 years. In 2006, nine vessel collisions related to whale watching activities were reported to the
18 National Oceanic and Atmospheric Administration (NOAA) (National Oceanic and Atmospheric
19 Administration, 2007). Whale watching could also have an effect on whales by distracting them,
20 displacing them from rich food patches, or by dispersing food patches with wake or propeller
21 wash (Katona and Kraus, 1999).

22 A review of recent reports on ship strikes provides some insight regarding the types of whales,
23 locations, and vessels involved, but also reveal significant gaps in the data. The Large Whale
24 Ship Strike Database provides a summary of the 292 worldwide confirmed or possible
25 whale/ship collisions from 1975 through 2002 (Jensen and Silber, 2003). The report notes that
26 the database represents a minimum number of collisions, because the vast majority probably go
27 undetected or unreported.

28 All types of ships can hit whales, and much of the time the marine mammal is either seen too
29 late, not observed until the collision occurs, or not detected. The ability of a ship to avoid a
30 collision and to detect a collision depends on a variety of factors, including environmental
31 conditions, ship design, size, and manning.

32 Naval ships, particularly the smaller ships such as Navy frigates and destroyers and Coast
33 Guard cutters, have a number of advantages for avoiding ship strikes as compared to most
34 merchant vessels.

- 35 • Navy and Coast Guard ships have their bridges positioned forward, offering good
36 visibility ahead of the bow.
- 37 • Crew size is much larger than merchant ships, and there are dedicated lookouts
38 posted during each watch.

- 1 • Naval vessels are generally twin screw and much more maneuverable than single
- 2 screw commercial craft.
- 3 • Due to smaller ship size and higher deck manning, some Navy and Coast Guard
- 4 vessels are likely to detect any strike that does occur, and these agencies' standard
- 5 operating procedures include reporting of ship strikes.
- 6 • Overall, the percentages of Navy traffic relative to overall large shipping traffic are
- 7 very small (on the order of 2 percent).
- 8

9 NOAA continues to review all shipping activities and their relationship to cumulative effects, in
 10 particular on large whale species. According to the NOAA report, the factors that contribute to
 11 ship strikes of whales are not clear, nor is it understood why some species appear more
 12 vulnerable than others. Nonetheless, the number of known ship strikes indicates that deaths
 13 and injuries from ships and shipping activities remain a threat to endangered large whale
 14 species, North Atlantic right whales in particular.

15 **5.2.1.3 COASTAL DEVELOPMENT ACTIVITIES**

16 Habitat loss and degradation is now acknowledged to be a significant threat to cetacean
 17 populations (Kemp, 1996). The impact of coastal development on whales has not been
 18 thoroughly investigated. Habitat alteration has the potential to disrupt the social behavior, food
 19 supply, and health of whales. Such activities may stress the animals and cause them to avoid
 20 traditional feeding and breeding areas, or migratory routes. The most serious threat to cetacean
 21 populations from habitat destruction may ultimately prove to be its impact on the lower trophic
 22 levels in their food chains (Kemp, 1996).

23 Likewise, habitat loss and degradation for listed sea turtles (e.g. green and hawksbill turtles)
 24 that rest and forage in the nearshore and nest on selected beaches in the Hawaiian Archipelago
 25 pose a serious potential threat to their recovery as noted in their Recovery Plans.

26 **5.2.1.4 ENVIRONMENTAL CONTAMINATION AND BIOTOXINS**

27 Insufficient information is available to determine how, or at what levels and in what
 28 combinations, environmental contaminants may affect cetaceans (Marine Mammal Commission,
 29 2003). There is growing evidence that high contaminant burdens are associated with several
 30 physiological abnormalities, including skeletal deformations, developmental effects, reproductive
 31 and immunological disorders, and hormonal alterations (Reijnders and Aguilar, 2002). It is
 32 possible that anthropogenic chemical contaminants initially cause immunosuppression,
 33 rendering whales susceptible to opportunistic bacterial, viral, and parasitic infection (De Swart et
 34 al., 1995). Specific information regarding the potential effects of environmental contamination
 35 on marine mammals in the Hawaiian Islands is not available, and therefore cumulative effects
 36 can not be adequately assessed.

37 **5.2.1.5 SCIENTIFIC RESEARCH PERMITS**

38 There are currently 30 scientific research permits and General Authorizations for research
 39 issued by the National Marine Fisheries Service (NMFS) for cetacean work in the wild in the
 40 North Pacific. Of these, 14 specify Hawaiian waters either as one location or the primary
 41 location for research. The most invasive research involves tagging or biopsy while the

1 remainder focus on vessel and aerial surveys and close approach for photo-identification.
2 Species covered by these permits and authorizations include small odontocetes, sperm whales
3 and large mysticetes. One permit issued to the Office of Protected Resources, NMFS allows for
4 responses to strandings and entanglements of listed marine mammals. NMFS has also issued
5 General Authorizations for commercial photography of non-listed marine mammals, provided
6 that the activity does not rise to Level A Harassment of the animals. These authorizations are
7 usually issued for no more than 1 or 2 years, depending on the project.

8 The impact of this type of research is largely unmeasured. However, given the analysis and
9 scrutiny given to permit applications, it is assumed that any adverse effects are largely transitory
10 (e.g., inadvertent harassment, biopsy effects, etc.). Further, where monitoring of individuals
11 subjected to this level of impact is possible, reports generally indicate either no significant
12 behavioral changes or short-term changes with relatively quick return to normal behavior. Data
13 to assess population level effects from research are not currently available, and even if data
14 were available it is uncertain that research effects could be separately identified from other
15 adverse effects to cetacean populations in Hawaiian waters.

16 Military readiness activities within the HRC are not expected to add significantly to the
17 cumulative effects of permitted cetacean research in Hawaiian waters with the implementation
18 of mitigation measures identified in Chapter 6.0.

19 It should be noted that there are a number of endangered marine mammal species found within
20 the HRC with inexact population estimates such as fin whales, sei whales, and sperm whales.
21 However, the winter breeding aggregation of humpback whales utilizing the waters of the main
22 Hawaiian islands appears to have increased significantly over the past three decades, despite
23 increases in vessel activity (including whale watching, large cruise ships and cargo/container
24 ships) and marine construction. Aerial surveys and photo-identification/re-sighting data have
25 documented this increase. There may be contributions from other breeding aggregations in the
26 North Pacific Basin such as Japan and Mexico but their significance has not yet been
27 determined.

28 **5.3 CUMULATIVE IMPACT ANALYSIS**

29 This section addresses the additive effects of the No-action Alternative, Alternative 1, or
30 Alternative 2 in combination with the projects identified in Section 5.2. Since environmental
31 analyses for some of the projects listed are not complete or do not include quantitative data,
32 cumulative impacts are addressed qualitatively and are described below.

33

5.3.1 AIR QUALITY

Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 5.2-1 would result in increases in air emissions within the region of influence. However, the State of Hawaii is generally in compliance with the Federal National Ambient Air Quality Standards and the State Ambient Air Quality Standards. Air pollution levels in Hawaii are generally low due to the small size and isolation of the state. Historic air quality monitoring data do not show any recent upward or downward trends in average air quality conditions in Oahu or Hawaii (U.S. Army, 2005). Federal ozone standards have not been exceeded in Hawaii during the past decade, despite the cumulative emissions from highway traffic, commercial and military aircraft operations, commercial and industrial facility operations, agriculture operations, and construction projects in both urban and rural areas. Training operations that occur in the open ocean have limited effect on air quality due to their distance offshore and meteorological conditions. For operations occurring at Pacific Missile Range Facility (PMRF), a Title V Covered Source Permit has been issued and was renewed in 2003 to cover all significant stationary emissions sources on PMRF. Aircraft and missile exhaust emissions are considered mobile sources and are thus exempt from permitting requirements. Minor increases in air emissions may occur as a result of implementation of Alternatives 1 and 2; however, these increases would not violate the Federal or State ambient air quality standards or any other Federal or State air standards, rules, or regulations.

5.3.2 AIRSPACE

The development of military lands prior to and after World War II had the biggest impact on airspace in the Hawaiian Islands. The expansion of military airfields continued as larger and more military aircraft were stationed in Hawaii. Following World War II, the increase in tourism resulted in an expansion of civilian airfields and airports. As with the military, the civilian aircraft increased in numbers and size requiring expansion of the existing airports. This historic development resulted in close monitoring of airspace as the land area is small in Hawaii with limited airspace (U.S. Army, 2004).

Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 5.2-1 would not incrementally affect airspace within the region of influence because no airspace impacts were identified in the analysis presented in Chapter 4.0. No other projects in the region of influence have been identified that would have the potential for incremental additive cumulative impacts on controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airports/airfields, or air traffic control. Consultation with the Federal Aviation Administration on all matters affecting airspace would eliminate the possibility of indirect adverse impacts and associated cumulative impacts on airspace use in the Hawaiian Islands.

5.3.3 BIOLOGICAL RESOURCES

5.3.3.1 ONSHORE BIOLOGICAL RESOURCES

Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with the cumulative actions listed in Table 5.2-1 could affect terrestrial biological resources within the region of influence. Several operations contribute cumulatively to habitat degradation, including disturbance to soils and vegetation, spread of invasive non-native species, erosion and sedimentation, and impacts on native plant species. Although individual impacts may be less

1 than significant, collectively they have the potential to be significant over time and space. Some
 2 potential effects of invasive species are difficult to foresee (such as leading to a change in fire
 3 frequency or intensity); however, it is clear that the potential for damage associated with
 4 introduction or spread of invasive plant species is high and increases over time with repeated
 5 training missions, especially exercises that cover a very large area, because of the difficulty in
 6 effectively monitoring for invasive establishment and achieving timely control. The Navy is
 7 addressing these effects with several strategies including (1) implementation of Integrated
 8 Natural Resources Management Plans (INRMPs), (2) continued development and
 9 implementation of measures to prevent the establishment of invasive plant species by
 10 minimizing the potential for introductions of seed or other plant parts (propagules) of exotic
 11 species, and (3) finding and eliminating incipient populations before they are able to spread.
 12 Key measures include:

- 13 • Minimizing the amount of seed or propagules of non-native plant species introduced
 14 to the islands through continued efforts to remove seed and soil from all vehicles
 15 (including contractor vehicles) coming to the island by pressure washing at the ports
 16 of debarcation, and stepped up efforts to ensure that imported construction materials
 17 such as sand, gravel, aggregate, or road base material are weed free.
- 18 • Regular monitoring and treatment to detect and eliminate establishing exotic species,
 19 focusing on areas where equipment and construction materials come ashore and
 20 areas within which there is movement of equipment and personnel and soil
 21 disturbance which favor the spread and establishment of invasive species (e.g.,
 22 along roadsides, and disturbed areas).
- 23 • Effective measures to foster the reestablishment of native vegetation in areas where
 24 non-native vegetation is present.
- 25 • Prohibiting living plant materials to be brought to the islands from the mainland (in
 26 order to avoid introduction of inappropriate genetic strains of native plants or exotic
 27 species, including weeds, insects and invertebrates).
 28

29 Although there are impacts associated with the implementation of the No-action Alternative,
 30 Alternative 1, and Alternative 2 on terrestrial biology within the HRC; these impacts would be
 31 mitigated to less than significant level. Any construction project or training operation would be
 32 required to be in compliance with the established INRMP and U.S. Fish and Wildlife Service
 33 Biological Opinions. In addition, any project proposed within the HRC affecting threatened or
 34 endangered species would have included ESA Section 7 consultation addressing direct,
 35 indirect, and cumulative impacts.

36 **5.3.3.2 OPEN OCEAN AND OFFSHORE BIOLOGICAL RESOURCES**

37 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
 38 the cumulative actions listed in Table 5.2-1 could affect marine biological resources within the
 39 region of influence; however, no significant impacts in the overall health and viability of
 40 commercial, recreational, and other fish stocks would occur. HRC training activities occur within
 41 a 235,000-nm² area of ocean. Although underwater detonations could have an effect on
 42 individual fish, these activities would occur infrequently. Therefore, the incremental impacts
 43 would be localized and temporary and would not represent a significant contribution to the
 44 cumulative effects on marine fish or their habitat, including corals and coral reefs. Mitigation
 45 measures for green turtles, Hawaiian monk seals, and cetaceans are expected to mitigate any

1 adverse effects to individuals that may be found in those areas where underwater detonations
2 occur, and thus any contribution to cumulative impacts would be minimal.

3 Actions and activities identified in Section 5.2.1 contribute in some fashion to cumulative effects
4 on listed sea turtles and marine mammals found within the HRC. The Hawaii-based longline
5 fishery affects some species of cetaceans and sea turtles in the Central North Pacific and will
6 likely have greater impacts than any of the military readiness activities presented in this
7 Environmental Impact Statement (EIS) / Overseas EIS (OEIS).

8 Many of the migratory species of large whales examined in this EIS/OEIS could be at risk to
9 ship strike from all sources during their migrations within the HRC as well as their destinations
10 outside of the HRC operating area. These species include humpback whales, fin whales, sperm
11 whales, sei whales, Bryde's whales, and minke whales. Commercial shipping and commercial
12 fishing could contribute to ship strike as part of cumulative effects. As noted in Jensen and
13 Silber (2003), certain classes of vessels are likely over-represented in the data, in particular
14 Federal vessels including Navy and Coast Guard ships. Factors that contribute to this include
15 non-reporting by commercial vessels, failure to recognize ship-strikes by larger ships (e.g.,
16 $\geq 40,000$ tons), smaller Navy and Coast Guard ships, and greater numbers of dedicated
17 observers/watch standers aboard Navy and Coast Guard ships which result in more and better
18 reporting. Over the past decade Jensen and Silber (2003) noted seven ship strikes in Hawaiian
19 waters. Of these, one was a Navy ship entering the channel at Pearl Harbor, one was a charter
20 fishing boat, one was a high speed water taxi, and the remainder were commercial whale watch
21 vessels. The contribution to cumulative effects by military readiness activities within the HRC
22 with respect to ship strike are expected to be minimal given the mitigation measures identified in
23 Chapter 6.0.

24 Where state, county, and private coastal development may likely affect green and hawksbill
25 turtle foraging and resting habitat, particularly in the Main Hawaiian Islands, both NEPA and
26 ESA analysis will likely be conducted to evaluate impacts to these species. Based on the
27 mitigation measures presented in Chapter 6.0, military readiness activities within the HRC are
28 not expected to contribute to cumulative effects to sea turtle habitat.

29 The effects of scientific research on cetaceans within the HRC is not expected to be significant
30 and the contribution to cumulative effects of military readiness activities within the HRC with
31 respect to scientific research are expected to be minimal due to implementation of the mitigation
32 measures presented in Chapter 6.0.

33 Cumulative effects from chronic or continuous anthropogenic sound can affect marine mammals
34 by masking important natural sounds, cause physiological effects and stress, habituation, and
35 sensitization (review by Richardson et al., 1995). During training exercises, mid-frequency
36 sonar will add to regional sound levels, but the cumulative effects of potential short-term and
37 intermittent acoustic exposure to marine mammals are not known. The analysis of potential
38 effects of mid-frequency active sonar from training operations determined there is a potential for
39 harassment of marine mammals. It is possible that harassment in any form may cause a stress
40 response (Fair and Becker, 2000). Cetaceans can exhibit some of the same stress symptoms
41 as found in terrestrial mammals (Curry, 1999). Disturbance from ship traffic, noise from ships,
42 aircraft, and/or exposure to biotoxins and anthropogenic contaminants may stress animals,
43 weakening their immune systems, making them more vulnerable to parasites and diseases that
44 normally would not be fatal. It is possible that the temporary harassment incidents associated

1 with military readiness training within the HRC would result in a minimal incremental contribution
2 to cumulative impacts on marine mammals. The mitigation measures identified in Chapter 6.0
3 would be implemented to minimize any potential adverse effects to marine mammals.

4 Impacts from military readiness activities associated with the HRC, including the use of mid-
5 frequency active sonar, are not likely to affect the identified species or stock of sea turtles or
6 marine mammals through effects on annual rates of recruitment or survival. Therefore, the
7 incremental impacts from these activities would not represent a significant contribution to the
8 cumulative effects on marine mammals or sea turtles when added to other past, present, and
9 reasonably foreseeable future actions.

10 **5.3.4 CULTURAL RESOURCES**

11 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
12 the cumulative actions listed in Table 5.2-1 would not result in significant cumulative impacts to
13 cultural resources. The types of impacts typically associated with the alternatives include
14 disturbance of archaeological or Native Hawaiian sites during ground disturbance (construction
15 or troop/equipment movement) or the unanticipated discovery of archaeological materials. In
16 accordance with Section 106 of the National Historic Preservation Act (36 CFR 800), cultural
17 resources mitigation measures as described in the various sections of Chapter 4.0 would be
18 implemented, including avoidance of resources (the preferred mitigation) and/or implementation
19 of specific requirements already outlined in agency planning documents for the affected area
20 (e.g., Integrated Cultural Resource Management Plans, Programmatic Agreements,
21 Memorandums of Agreement). Some actions may also require the development of additional
22 mitigation measures through consultation with the Hawaii State Historic Preservation Office,
23 Council (as appropriate), and local Native Hawaiian organizations. Given the rigorous review
24 process required under Section 106 prior to activities taking place, the measures already in
25 place within agency planning documents to mitigate potential effects, and the diverse range of
26 locations where activities would occur (representing different cultural contexts and site types),
27 the implementation of alternatives presented in this EIS, either individually or as a whole, would
28 not result in significant cumulative impacts.

29 **5.3.5 GEOLOGY AND SOILS**

30 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
31 the cumulative actions listed in Table 5.2-1 would not result in significant impacts to geology and
32 soils within the region of influence. The impacts on geology are very minor and mostly consist
33 of limited temporal and spatial disturbances to underwater sediments or localized soil
34 disturbance in previously disturbed areas on the islands. Erosion is a naturally recurring issue,
35 but it is not heavily exacerbated by military operations. While construction type projects in the
36 region may have localized erosion, overall cumulative effects would be negligible since Best
37 Management Practices for soil disturbing activities are typically implemented during any
38 construction activity.

39 **5.3.6 HAZARDOUS MATERIALS AND WASTE**

40 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
41 the cumulative actions listed in Table 5.2-1 would not result in cumulative impacts associated
42 with the use of hazardous materials within the region of influence. There are a large number of

1 hazardous materials inherent in the training and testing operations within the HRC. For
2 ordnance items that are used in the water, the vast majority are recovered (torpedoes), while
3 non-ordnance items like sonobuoys are discarded. The primary concern with sonobuoys is the
4 metal in the batteries, but studies have shown that with the three types of batteries in use, there
5 is no substantial degradation of marine water quality. There are no hazardous waste disposal
6 sites located on any of the Hawaiian Islands. Hazardous waste is barged to the mainland or
7 other counties for disposal. There are no capacity issues in regards to hazardous waste
8 because it is only sent to a facility that will accept the waste.

9 The majority of the materials in artillery shells, naval gunfire shells, and cannon shells are
10 converted into gaseous products. Hazardous materials and waste not converted to gaseous
11 products are contained within designated impact areas. Overall, constituents of concern have
12 little effect or result in only short-term impacts on water quality and soils. There is no long-term
13 degradation of marine or surface water quality and less than significant impacts overall.

14 Cumulatively, hazardous materials and waste, when added to those of the other projects
15 examined, would not result in significant impacts for the region. The factors that influence this
16 analysis are: (1) many of the training ordnance items are retrieved from the water and recycled
17 for later use; (2) items that cannot be retrieved are dispersed over a wide area, separated by
18 long distances, and do not aggregate (thus, there is little likelihood that the constituents of
19 concern would be additive); (3) the concentrations in the water from constituents of concern are
20 small; (4) constituents disperse rapidly into a large volume of ocean water, further diluting their
21 effects; (5) hazardous constituents on land are primarily confined to designated, active "ranges"
22 that are set aside, managed, and used to conduct research, development, testing, and
23 evaluation and training with munitions; and (6) the hazardous constituents are further clustered
24 into specific impact areas, inside the ranges, that are designed to capture and contain the
25 explosives and resulting debris.

26 **5.3.7 HEALTH AND SAFETY**

27 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
28 the cumulative actions listed in Table 5.2-1 would not affect public health and safety within the
29 region of influence. The major factors influencing this analysis are: (1) the distance of
30 hazardous operations from the islands; (2) the dispersed context of the operations, such that the
31 intensity of the effects are not additive; (3) the lack of synergistic effects; (4) comprehensive
32 Navy safety procedures in place to ensure that members of the general public are not placed in
33 physical jeopardy due to testing and training operations at sea; and (5) specific range clearance
34 procedures and practices implemented daily prior to commencement of hazardous operations.
35 Based on these factors, no significant cumulative impacts would occur relative to public health
36 and safety.

37 **5.3.8 LAND USE**

38 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
39 the identified cumulative actions listed in Table 5.2-1 would not affect land use within the region
40 of influence because no adverse land use impacts were identified in Chapter 4.0, and most
41 training activities would occur on existing military installations and ranges with no change in use
42 or land use designation. No land uses are proposed which would be incompatible with State of
43 Hawaii planning efforts. PMRF would continue to maintain a strip of coastline for public

1 recreational purposes (except when closed for hazardous operations). Overall, recreational
2 resources would continue to be protected and shoreline access would continue to be
3 unimpeded.

4 **5.3.9 NOISE**

5 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
6 the cumulative actions listed in Table 5.2-1 would not incrementally affect noise within the
7 region of influence. Noise levels are inherently localized because sound levels decrease
8 relatively quickly with increasing distance from the source. Cumulative impacts would occur
9 when multiple projects affect the same geographic areas simultaneously or when sequential
10 projects extend the duration of noise impacts on a given area over a longer period of time. The
11 noise environment in the Hawaiian Islands has changed over the years with the increase in
12 human activity. The increased level of training operations proposed under Alternatives 1 and 2
13 would increase noise levels; however, noise levels from training operations would be
14 intermittent and similar to other noise levels already experienced in the region of influence. In
15 addition, spatial separation among the cumulative projects listed in Table 5.2-1 would minimize
16 or preclude cumulative noise impacts within the region of influence.

17 For the open ocean, the cumulative impact of these projects in a regional context does not
18 reach a level of significance because of the intermittent nature of the noise events and the lack
19 of sensitive receptors over the large ocean areas involved. Potential cumulative impacts
20 associated with underwater noise and impacts to marine mammals are addressed in Section
21 5.3.3.2.

22 On Oahu, the Honolulu International Airport is a major commercial hub for air traffic throughout
23 the Pacific. Introduction of additional military aircraft (P-8A MMA and F-22) noted in Table 5.2-1
24 would not be expected to have a substantial effect on noise contours, which are dominated by
25 commercial traffic.

26 **5.3.10 SOCIOECONOMICS**

27 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
28 the cumulative actions listed in Table 5.2-1 would not result in significant socioeconomic
29 impacts within the region of influence. Implementation of the No-action Alternative, Alternative
30 1, or Alternative 2 would not produce any significant regional employment, income, housing, or
31 infrastructure impacts. Effects on commercial and recreational fishermen, commercial tour
32 boats, divers, and boaters would be short term in nature and produce some temporary access
33 limitations. Some offshore operations, especially if coincident with peak fishing locations and
34 periods or whale migration periods, could cause temporary displacement and potential
35 economic loss to individual fishermen and commercial tour boat operators. However, most
36 offshore operations are of short duration and have a small operational footprint. Effects on
37 fishermen and commercial tour boat operators are mitigated by public notification of scheduled
38 activities. In selected instances where safety requires exclusive use of a specific area,
39 commercial fishing vessels, commercial vessels, or private vessels may be asked to relocate to
40 a safer nearby area for the duration of the exercise. These measures should not significantly
41 impact any individual fisherman, overall commercial revenue, or public recreational opportunity
42 in the open ocean area. Implementation of the No-action Alternative, Alternative 1, or
43 Alternative 2 would not affect minority or low-income populations disproportionately, nor would

1 children be exposed to increased noise levels or safety risks because operations mainly occur
2 in marine waters where no populations of children exist.

3 **5.3.11 TRANSPORTATION**

4 Implementation of the No-action Alternative, Alternative 1, or Alternative 2 in conjunction with
5 the cumulative actions listed in Table 5.2-1 would not represent a significant increase in average
6 daily traffic on island roadways or vessel traffic in the open ocean. Within the regional context
7 of the Hawaiian Islands, there are large numbers of ship and boat movements. Ship traffic is, to
8 a degree, additive, and the trends are upward. However, the civilian traffic of commercial
9 shipping and military training by Navy ships generally tend to steam to and remain in range
10 areas for training and testing operations. Navy training operations do not have a significant
11 impact on other vessel traffic in the Hawaiian waters. In regards to the Hawaii Superferry, given
12 the location of the ferry water lanes, it is not anticipated that the increased vessel traffic from
13 this commuting vessel would contribute to the cumulative effects when assessed in combination
14 with the actions proposed in this EIS/OEIS.

15 **5.3.12 UTILITIES**

16 Implementation of the No-action, Alternative 1, or Alternative 2 in conjunction with the identified
17 cumulative actions listed in Table 5.2-1 would not affect utility services within the region of
18 influence because no adverse impacts were identified in Chapter 4.0, and there are no major
19 proposed increases or changes in utility service demand. In addition, implementation of the No-
20 action Alternative, Alternative 1, and Alternative 2 would not result in an increase in personnel
21 that would increase utility demand.

22 **5.3.13 WATER RESOURCES**

23 Implementation of the No-action Alternative, Alternative 1 or Alternative 2 in conjunction with the
24 identified cumulative actions listed in Table 5.2-1 would not result in significant impacts to water
25 quality within the region of influence. For offshore training operations, the Navy would comply
26 with the *Oil and Hazardous Substance Release and Contingency Plan* (40 CFR 300) developed
27 for Navy activities within the HRC. When evaluated individually or cumulatively, these projects
28 have either no impact or only short-term impacts on water quality. Water quality impacts
29 associated with implementation of the No-action Alternative, Alternative 1, or Alternative 2 are
30 transitory in nature and would not reach a level of significance even in conjunction with the
31 impacts of the other actions considered in a regional context (see Section 5.3.6).

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