



Prepared for:

National Oceanic and Atmospheric Administration  
National Marine Fisheries Service

## Programmatic Environmental Impact Statement

### Appendix H: Hawaiian Monk Seal Research and Enhancement Proposed Levels of Take for PEIS Alternatives 1, 3 and 4

#### Final PEIS for Hawaiian Monk Seal Recovery Actions

March 2014



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**Appendix H, Table 1: Activities Proposed under the Alternative 1, Status Quo.**

**Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Niihau Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
1. Monitoring	Any	Both	150	3	Disturbance from visual observation and photo-identification during ground monitoring and vessel and aerial surveys (including unmanned aerial and amphibious vehicles); and from installation and repair of remote video cameras	MHI	Annually at any time of year.
			50	1		Niihau Is.	
			50	1		Necker Is.	
			250	5		French Frigate Shoals	
			10	1		Gardner Pinnacles	
			250	3		Laysan Is.	
			225	3		Lisianski Is.	
			200	3		Pearl and Hermes Reef	
			100	2		Midway Atoll	
			150	2		Kure Atoll	
5	1	Johnston Atoll					
2a. Tagging	Any except nursing pups, lactating or obviously pregnant females.	Both	30	3	Restraint, tagging (flipper and PIT), collect flipper plugs, morphometrics (length and girth), whisker sampling (cut)	MHI	Annually at any time of year (predominantly during summer field camps). All of the animals may also be taken by Tasks 1 and 3. Weaned pups in the MHI may also have ultrasound performed concurrent with flipper tagging. At French Frigate Shoals, 35 weaned pups of either sex may have a sonic tag deployed on a third flipper tag (annually over three years).
			25	1		Niihau Is.	
			15	1		Necker Is.	
			150	3		French Frigate Shoals	
			75	3		Laysan Is.	
			50	3		Lisianski Is.	
			50	3		Pearl and Hermes Reef	
			25	2		Midway Atoll	
			35	2		Kure Atoll	
1	1	Johnston Atoll					
2b. Retagging	Any except nursing pups, lactating or obviously pregnant females.	Both	100	1	Restraint, retagging (flipper), flipper plugs, morphometrics, whisker sampling (cut)	Hawaiian Archipelago	Annually at any time of year. Seals may have been taken by monitoring (Task 1) and may have been tagged in previous years.

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Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
3. Marking	Any	Both	75	2	Temporary bleach marking	MHI	Annually at any time of year. All of the animals may also be taken by monitoring (Task 1) and tagging (Task 2).
			30	2		Nihoa Is.	
			30	2		Necker Is.	
			250	2		French Frigate Shoals	
			250	2		Laysan Is.	
			225	2		Lisianski Is.	
			200	2		Pearl and Hermes Reef	
			100	2		Midway Atoll	
			150	2		Kure Atoll	
			5	1		Johnston Atoll	
4. Health Screening and Foraging Studies	Any healthy seal excluding lactating females with pups and nursing pups	Both	70	2	Restraint, sedation, tagging, blood sampling, swabs, blubber biopsy, whisker sampling (cut without sedation or pull with sedation), weight, morphometrics, ultrasound, instrumentation	Hawaiian Archipelago	Annually any time of year. Sixty (60) healthy seals may be instrumented. Recaptures for instrument removal and sampling. All animals may have been taken by Tasks 1-3.
	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	30	2	Restraint, sedation, tagging, blood sampling, swabs, blubber biopsy, whisker sampling (cut or pull), morphometrics, ultrasound, treatment (lance and cleanse abscesses), humane euthanasia or incidental mortality of 10 moribund animals	Hawaiian Archipelago	Annually at any time of year. Includes humane euthanasia of up to 10 moribund or severely injured seals at discretion of veterinarian authorized over a five-year period. All animals may have been taken by Tasks 1-3.

**Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
5. Intestinal Parasite Treatment	Pups $\geq$ 120 days post-weaning and juveniles up to age 3	Both	200	4	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces, fecal loop, or digital extraction), whisker sampling (cut), anti-helmintic treatment	Hawaiian Archipelago	Annually, year-round; may be combined with other capture activities.  Medical treatments authorized at discretion of consulting/attending veterinarian.
				8	Additional anti-helmintic treatments via topical application without capture and restraint		
6. Translocation	Nursing pup	Both	20	6	Capture, restraint, and relocation by hand to natural mother or prospective foster mother, whisker sampling (cut)	Hawaiian Archipelago, Johnston Atoll	Establishing/re-establishing maternal association. Annually at any time of year but predominantly during summer field camps. Most takes will occur in the NWHI (intra-island/atoll).
	Weaned Pup	Both	35	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, fecal, whisker sampling - cut or pull), and relocation from high risk areas via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Risk alleviation. Annually at any time of year. Most takes occur at French Frigate Shoals (intra-atoll) or within the Main Hawaiian Islands.

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Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
	Weaned Pup	Both	6	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, fecal, whisker sampling - cut or pull), instrumentation, temporary holding, translocation from areas of low survival via boat and ship	NWHI	Seals may be translocated within the NWHI.
7. Adult Male Removal	Adult	Male	10	2	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, fecal, whisker sampling - cut or pull), instrumentation/translocation, permanent captivity, or euthanasia	Hawaiian Archipelago; Johnston Atoll	Up to 10 males may be removed over a five year period. Euthanasia via IV sodium pentobarbital, captive penetrating bolt, or gunshot.
8. Disentangle	Any	Both	As warranted (likely not to exceed 25/year)	>1	Disentanglement and dehooking (with or without capture, sedation, and release); whisker sampling (cut or pull)	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3.
9. Conduct Necropsies	Any	Both	As warranted	1	Necropsy any seal found dead, that died during restraint, or that was euthanized. After necropsy, use seal tissue as bait for permitted shark removals to enhance seal survival.	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year.
10. Opportunistic Retrieval of samples	Any	Both	Unlimited samples	Unlimited samples	Collect parts (placenta, scats, spews, and molted fur/skin) from haul out areas	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year but predominantly during summer field camps.

**Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
11. Import and Export Parts	Any	Both	Unlimited import/export	Unlimited samples	Export (and re-import) Hawaiian monk seal samples. Import (and re-export) Mediterranean monk seal specimens for research related to monk seal conservation	World-wide (including but not limited to Canada, the Netherlands, Scotland, Greece, Australia)	Annually at any time of year.
12. Incidental harassment of monk seals	Any	Both	200	2	Incidental harassment during any research and enhancement activity	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. Total incidental harassment over all activities.
13. Unintentional Mortality	Any	Both	2	1	During any research or enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed 2 deaths in any one year.

**Appendix H, Table 2: Activities Proposed under Alternative 3 – Limited Translocation (Preferred Alternative).**

<b>Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative).</b> Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Niihau Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.							
Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
1. Monitoring (Research)	Any	Both	250	5	Disturbance from visual observation and photo-identification during ground monitoring (including terrestrial/amphibious unmanned vehicles), vessel and aerial surveys (including unmanned aerial vehicles); and from installation and repair of remote video cameras	MHI	Annually at any time of year.
			100	3		Niihau Is.	
			75	3		Necker Is.	
			250	5		French Frigate Shoals	
			10	1		Gardner Pinnacles	
			400	5		Laysan Is.	
			275	5		Lisianski Is.	
			400	5		Pearl and Hermes Reef	
			150	5		Midway Atoll	
			200	5		Kure Atoll	
			5	3		Johnston Atoll	
2.a Tagging (Research)	Any except most nursing pups, lactating or	Both	60	3	Restraint, tagging (flipper and PIT), collect flipper plugs, vibrissae, morphometrics (length and girth), ultrasound	MHI	Annually at any time of year (predominantly during summer field camps).
			25	3		Niihau Is.	

**Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 - Limited Translocation (Preferred Alternative).** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
	obviously pregnant females.		15	3		Necker Is.	Seals may also be taken by Tasks 1 and 3.  Seals may also have ultrasound performed concurrent with flipper tagging  At French Frigate Shoals, 35 weaned pups of either sex may have a sonic tag deployed on a third flipper tag.  Any remaining nursing pups at end of field season may be tagged.
			100	3		French Frigate Shoals	
			75	3		Laysan Is.	
			70	3		Lisianski Is.	
			70	3		Pearl and Hermes Reef	
			50	3		Midway Atoll	
			50	3		Kure Atoll	
			5	3		Johnston Atoll	
2.b Retagging (Research)	Any except most nursing pups, lactating or obviously pregnant females	Both	100	1	Restraint, retagging (flipper), flipper plugs, vibrissae, morphometrics	Hawaiian Archipelago	Annually at any time of year. Seals may have been taken by disturbance (Task 1) and may have been tagged in previous years.
3. Marking (Research)	Any	Both	150	3	Temporary bleach marking	MHI	Annually at any time of year. All of the animals may also be taken by disturbance (Task 1) and tagging (Task 2).
			60	3		Nihoa Is.	
			30	3		Necker Is.	
			250	3		French Frigate Shoals	
			250	3		Laysan Is.	

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
			250	3		Lisianski Is.	
			250	3		Pearl and Hermes Reef	
			100	3		Midway Atoll	
			150	3		Kure Atoll	
			5	3		Johnston Atoll	
4.a Health Screening and Instrumentation (Research)	Any healthy seal excluding lactating females with pups and nursing pups	Both	100	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), weight, morphometrics, ultrasound, instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually any time of year. Sixty (60) healthy seals may be instrumented. Recaptures for instrument removal and sampling. All animals may have been taken by Tasks 1-3.
4.b Health Screening, Treatment, and Instrumentation (Research and Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	30	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), bleach marking, treatment if needed (lance abscesses, administer long-acting antibiotic), weight, morphometrics, ultrasound, instrumentation, humane euthanasia or incidental mortality of 10 moribund animals	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year. Includes humane euthanasia of up to 10 moribund or severely injured seals at discretion of veterinarian over a five-year period. All animals may have been taken by Tasks 1-3.

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
4.c Health Screening, Treatment, and Instrumentation (Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	As warranted (est. < 30)	As directed by vet	Restraint, treatment (lance abscesses, administer long-acting antibiotic), sedation, vibrissae, bleach marking, and instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year.  All animals may have been taken by Tasks 1-3. May also occur during health screening of unhealthy seals.
5.a Intestinal Parasite Treatment (Deworming Research and Enhancement)	Pups ≥ 120 days post-weaning and juveniles up to age 3	Both	300	8	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces or fecal sample collected via fecal loop or digital extraction); up to 4 deworming treatments using oral or injectable drugs; up to 4 post-treatment monitoring takes at regular intervals (visual assessments and recapture for weight, morphometrics, and fecal sampling)	Hawaiian Archipelago and Johnston Atoll	Annually, year-round. Treatments may be combined with other activities requiring restraint and sedation  Medical treatments authorized at discretion of consulting/attending veterinarian.  If monthly treatment determined effective during research phase, capture/restraint for follow up sampling and morphometrics would be discontinued and only topical treatment would be administered.
				4	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces, fecal loop, or digital extraction), and topical anti-helmintic treatment		
				8	Additional topical anti-helmintic treatments via topical application without capture and restraint (up to 12 monthly treatments annually via topical anti-helmintic);		

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
6.a Translocation to Save Abandoned Pups (Enhancement)	Nursing pup	Both	As warranted (est. < 20)	6	Capture, restraint, and relocation by hand to natural mother or prospective foster mother	Hawaiian Archipelago, Johnston Atoll	Establishing/re-establishing maternal association. Annually at any time of year but predominantly during summer field camps. Most takes will occur in the NWHI (intra-island/atoll).
6.b Translocation to Alleviate Risks (Enhancement)	All	Both	As warranted (est. < 60)	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, and relocation from high risk areas via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Risk alleviation. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Pups near weaning (e.g., within a few days of the mother leaving) and that are at high risk of mortality may be translocated. Seals may also be hazed away from dangerous locations.
6.c Two-Stage Translocation (Enhancement)	Weaned Pup	Both	20	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation from areas of low survival via boat, ship, vehicle, or aircraft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 1 <sup>st</sup> stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted. <b>Translocations within the NWHI or from the MHI to the NWHI, are allowed, but not from the NWHI to MHI.</b> Details to be determined through application of decision framework in Appendix A.
	Juvenile and Sub-adult	Both	30	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 2 <sup>nd</sup> stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted.

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
					Surviving juveniles that had been translocated as weaned pups returned to their natal or other suitable site (includes seals from 1 <sup>st</sup> stage of translocation that remained at recipient site until at least age 2 yr).		Translocations within or between any subpopulations in the species range allowed. <i>Note that seals originally born in the MHI and previously taken to the NWHI may be returned to the MHI.</i>  Details to be determined through application of decision framework in Appendix A.
6.d Translocation for Research	Juvenile, sub-adult and adult	Both	6	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocate between subpopulations	Hawaiian Archipelago, Johnston Atoll	Research to determine survival of translocated juveniles to inform two-stage translocation enhancement. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Seals with unmanageable behavior in the MHI may be translocated to the NWHI as part of this study.
7.a Adult Male Removal (Enhancement)	Adult	Male	20	2	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation/translocation, permanent captivity, or euthanasia	Hawaiian Archipelago; Johnston Atoll	Up to 20 males may be removed annually, but only 10 lethal removals over a five-year period. Taste aversion testing may occur on adult male seals brought into captivity.
7.b Adult Male Hazing (Enhancement)	Adult	Male	As warranted (est. <10)	As warranted (est. <10)	Haze	Hawaiian Archipelago; Johnston Atoll	Aggressive males may be hazed away from conspecific victims in cases of immediate risk of injury or death or when specific males repeatedly attack conspecifics.

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
8. Disentangle and Dehook (Enhancement)	Any	Both	As warranted (est. < 75)	As warranted	Disentanglement and dehooking (with or without capture, sedation, and release); collect vibrissae	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3.
9. Conduct Necropsies (Research)	Any	Both	As warranted	1	Necropsy any seal found dead, that died during restraint, or that was euthanized. After, use seal tissue as bait for permitted shark removals	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year.
10. Opportunistic Retrieval of Samples (Research)	Any	Both	1,100	Unlimited samples	Collect parts (placentae, scats, spews, and molted fur/skin) from haul out areas	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year but predominantly during summer field camps.
11. Import and Export Parts (Research)	Any	Both	Unlimited import/export	Unlimited samples	Import/export/receive	World-wide (including but not limited to Canada, the Netherlands, Scotland, Greece, Australia)	Annually at any time of year. Export (and re-import) Hawaiian monk seal samples collected under the authority of this permit. Import (and re-export) Mediterranean monk seal specimens for research related to monk seal conservation.
12. Supplemental Feeding	Pup or Juvenile	Both	12	Unlimited	Supplemental feeding of post-rehabilitated seals	NWHI	Annually at any time of year seals may be fed at daily or longer intervals for up to one year.

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
(Enhancement)							
13. Behavioral Modification (Research and Enhancement)	Any	Both	20	As warranted (est. <20)	Intentional harassment for behavior modification. Aversive conditioning and other methods including but not limited to: Capture restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, translocation, temporary holding; hazing using visual, audible and tactile means; impeding movement with barriers, etc. Chemical taste aversion with lithium chloride in captivity only.	MHI	Annually at any time of year. Prevent seals from socializing with humans; alter behavior of seals socialized to humans or behaving in a manner dangerous to the seal or public safety. Seals may be brought into temporary captivity for taste aversion research. Experimental protocols to determine optimal methods.
14. Vaccinations (Research and Enhancement)	Any	Both	1,100	4	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), and administration of vaccine	Hawaiian Archipelago	Annually at any time of year.

**Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 - Limited Translocation (Preferred Alternative).** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
15. Incidental harassment of monk seals (Research and	Any	Both	400	3	Incidental harassment during any research and enhancement activity including opportunistic sample collection	Hawaiian Archipelago; Johnston Atoll	Total incidental harassment over all activities.
16.a Unintentional Mortality (Research)	Any	Both	2	1	During any research activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
16.b Unintentional Mortality (Enhancement)	Weaned pup	Both	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
	Juvenile/subadult	Both	4	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Eight unintentional mortalities over a five-year period not to exceed four deaths in any one year.
	Adult	Male	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.

Appendix H, Table 3: Activities Proposed under Alternative 4 – Enhanced Implementation.

<b>Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation.</b> Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Niihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.							
Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
1. Monitoring (Research)	Any	Both	250	5	Disturbance from visual observation and photo-identification during ground monitoring (including terrestrial/amphibious unmanned vehicles), vessel and aerial surveys (including unmanned aerial vehicles); and from installation and repair of remote video cameras	MHI	Annually at any time of year.
			100	3		Niihoa Is.	
			75	3		Necker Is.	
			250	5		French Frigate Shoals	
			10	1		Gardner Pinnacles	
			400	5		Laysan Is.	
			275	5		Lisianski Is.	
			400	5		Pearl and Hermes Reef	
			150	5		Midway Atoll	
			200	5		Kure Atoll	
			5	3		Johnston Atoll	
2.a Tagging (Research)	Any except most nursing pups,	Both	60	3	Restraint, tagging (flipper and PIT), collect flipper plugs, vibrissae, morphometrics (length and girth), ultrasound	MHI	Annually at any time of year (predominantly during summer field camps).
			25	3		Niihoa Is.	

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 - Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
	lactating or obviously pregnant females.		15	3		Necker Is.	Seals may also be taken by Tasks 1 and 3.  Seals may also have ultrasound performed concurrent with flipper tagging  At French Frigate Shoals, 35 weaned pups of either sex may have a sonic tag deployed on a third flipper tag.  Any remaining nursing pups at end of field season may be tagged.
			100	3		French Frigate Shoals	
			75	3		Laysan Is.	
			70	3		Lisianski Is.	
			70	3		Pearl and Hermes Reef	
			50	3		Midway Atoll	
			50	3		Kure Atoll	
			5	3		Johnston Atoll	
2.b Retagging (Research)			Any except most nursing pups, lactating or obviously pregnant females	Both		100	
3. Marking (Research)	Any	Both	150	3	Temporary bleach marking	MHI	Annually at any time of year. All of the animals may also be taken by disturbance (Task 1) and tagging (Task 2).
			60	3		Nihoa Is.	
			30	3		Necker Is.	
			250	3		French Frigate Shoals	

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
			250	3		Laysan Is.	
			250	3		Lisianski Is.	
			250	3		Pearl and Hermes Reef	
			100	3		Midway Atoll	
			150	3		Kure Atoll	
			5	3		Johnston Atoll	
4.a Health Screening and Instrumentation (Research)	Any healthy seal excluding lactating females with pups and nursing pups	Both	100	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), weight, morphometrics, ultrasound, instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually any time of year. Sixty (60) healthy seals may be instrumented. Recaptures for instrument removal and sampling. All animals may have been taken by Tasks 1-3.
4.b Health Screening, Treatment, and Instrumentation (Research and Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	30	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), bleach marking, treatment if needed (lance abscesses, administer long-acting antibiotic), weight, morphometrics, ultrasound, instrumentation, humane euthanasia or incidental mortality of 10 moribund animals	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year. Includes humane euthanasia of up to 10 moribund or severely injured seals at discretion of veterinarian over a five-year period. All animals may have been taken by Tasks 1-3.

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 - Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
4.c Health Screening, Treatment, and Instrumentation (Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	As warranted (est. < 30)	As directed by vet	Restraint, treatment (lance abscesses, administer long-acting antibiotic), sedation, vibrissae, bleach marking, and instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year.  All animals may have been taken by Tasks 1-3. May also occur during health screening of unhealthy seals.
5.a Intestinal Parasite Treatment (Deworming Research and Enhancement)	Pups ≥ 120 days post-weaning and juveniles up to age 3	Both	300	8	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces or fecal sample collected via fecal loop or digital extraction); up to 4 deworming treatments using oral or injectable drugs; up to 4 post-treatment monitoring takes at regular intervals (visual assessments and recapture for weight, morphometrics, and fecal sampling)	Hawaiian Archipelago and Johnston Atoll	Annually, year-round. Treatments may be combined with other activities requiring restraint and sedation  Medical treatments authorized at discretion of consulting/attending veterinarian.  If monthly treatment determined effective during research phase, capture/restraint for follow up sampling and morphometrics would be discontinued and only topical treatment would be administered.
				4	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces, fecal loop, or digital extraction), and topical anti-helmintic treatment		
				8	Additional topical anti-helmintic treatments via topical application without capture and restraint (up to 12 monthly treatments annually via topical anti-helmintic);		

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
6.a Translocation to Save Abandoned Pups (Enhancement)	Nursing pup	Both	As warranted (est. < 20)	6	Capture, restraint, and relocation by hand to natural mother or prospective foster mother	Hawaiian Archipelago, Johnston Atoll	Establishing/re-establishing maternal association. Annually at any time of year but predominantly during summer field camps. Most takes will occur in the NWHI (intra-island/atoll).
6.b Translocation to Alleviate Risks (Enhancement)	All	Both	As warranted (est. < 60)	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, and relocation from high risk areas via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Risk alleviation. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Pups near weaning (e.g., within a few days of the mother leaving) and that are at high risk of mortality may be translocated. Seals may also be hazed away from dangerous locations.
6.c Two-Stage Translocation (Enhancement)	Weaned Pup	Both	20	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation from areas of low survival via boat, ship, vehicle, or aircraft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 1 <sup>st</sup> stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted. <b>Translocations within the NWHI, from the MHI to the NWHI, or from the NWHI to the MHI are allowed.</b> Details to be determined through application of decision framework in Appendix F.
	Juvenile and Sub-adult	Both	30	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 2 <sup>nd</sup> stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted.

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
					Surviving juveniles that had been translocated as weaned pups returned to their natal or other suitable site (includes seals from 1 <sup>st</sup> stage of translocation that remained at recipient site until at least age 2 yr).		Translocations within or between any subpopulations in the species range allowed. <i>Note that seals originally born in the MHI and previously taken to the NWHI may be returned to the MHI.</i>  Details to be determined through application of decision framework in Appendix F.
6.d Translocation for Research	Juvenile, sub-adult and adult	Both	6	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocate between subpopulations	Hawaiian Archipelago, Johnston Atoll	Research to determine survival of translocated juveniles to inform two-stage translocation enhancement. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Seals with unmanageable behavior in the MHI may be translocated to the NWHI as part of this study.
7.a Adult Male Removal (Enhancement)	Adult	Male	20	2	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation/translocation, permanent captivity, or euthanasia	Hawaiian Archipelago; Johnston Atoll	Up to 20 males may be removed annually, but only 10 lethal removals over a five-year period. Taste aversion testing may occur on adult male seals brought into captivity.
7.b Adult Male Hazing (Enhancement)	Adult	Male	As warranted (est. <10)	As warranted (est. <10)	Haze	Hawaiian Archipelago; Johnston Atoll	Aggressive males may be hazed away from conspecific victims in cases of immediate risk of injury or death or when specific males repeatedly attack conspecifics.

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Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
8. Disentangle and Dehook (Enhancement)	Any	Both	As warranted (est. < 75)	As warranted	Disentanglement and dehooking (with or without capture, sedation, and release); collect vibrissae	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3.
9. Conduct Necropsies (Research)	Any	Both	As warranted	1	Necropsy any seal found dead, that died during restraint, or that was euthanized. After, use seal tissue as bait for permitted shark removals	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year.
10. Opportunistic Retrieval of Samples (Research)	Any	Both	1,100	Unlimited samples	Collect parts (placentae, scats, spews, and molted fur/skin) from haul out areas	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year but predominantly during summer field camps.
11. Import and Export Parts (Research)	Any	Both	Unlimited import/export	Unlimited samples	Import/export/receive	World-wide (including but not limited to Canada, the Netherlands, Scotland, Greece, Australia)	Annually at any time of year. Export (and re-import) Hawaiian monk seal samples collected under the authority of this permit. Import (and re-export) Mediterranean monk seal specimens for research related to monk seal conservation.
12. Supplemental Feeding	Pup or Juvenile	Both	12	Unlimited	Supplemental feeding of post-rehabilitated seals	NWHI	Annually at any time of year seals may be fed at daily or longer intervals for up to one year.

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
(Enhancement)							
13. Behavioral Modification (Research and Enhancement)	Any	Both	20	As warranted (est. <20)	Intentional harassment for behavior modification. Aversive conditioning and other methods including but not limited to: Capture restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, translocation, temporary holding; hazing using visual, audible and tactile means; impeding movement with barriers, etc. Chemical taste aversion with lithium chloride in captivity only.	MHI	Annually at any time of year. Prevent seals from socializing with humans; alter behavior of seals socialized to humans or behaving in a manner dangerous to the seal or public safety. Seals may be brought into temporary captivity for taste aversion research. Experimental protocols to determine optimal methods.
14. Vaccination (Research and Enhancement)	Any	Both	1,100	4	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), and administration of vaccine	Hawaiian Archipelago	Annually at any time of year.

**Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation.** Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
15. Incidental harassment (Research and Enhancement)	Any	Both	400	3	Incidental harassment during any research and enhancement activity including opportunistic sample collection	Hawaiian Archipelago; Johnston Atoll	Total incidental harassment over all activities.
16.a Unintentional Mortality (Research)	Any	Both	2	1	During any research activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
16.b Unintentional Mortality (Enhancement)	Weaned pup	Both	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
	Juvenile/subadult	Both	4	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Eight unintentional mortalities over a five-year period not to exceed four deaths in any one year.
	Adult	Male	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.

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