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*Form Approved*  
OMB No. 0704-0188

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<b>1. REPORT DATE (DD-MM-YYYY)</b> 13 February 2006	<b>2. REPORT TYPE</b> FINAL	<b>3. DATES COVERED (From - To)</b>
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<b>4. TITLE AND SUBTITLE</b> The Submarine and Operational Art: The Need for Joint ASW	<b>5a. CONTRACT NUMBER</b>
	<b>5b. GRANT NUMBER</b>
	<b>5c. PROGRAM ELEMENT NUMBER</b>

<b>6. AUTHOR(S)</b>  LCDR Brian Elkowitz  Paper Advisor (if Any): N/A	<b>5d. PROJECT NUMBER</b>
	<b>5e. TASK NUMBER</b>
	<b>5f. WORK UNIT NUMBER</b>

<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b>  Joint Military Operations Department Naval War College 686 Cushing Road Newport, RI 02841-1207	<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>
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<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>	<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>
	<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>

**12. DISTRIBUTION / AVAILABILITY STATEMENT**  
Distribution Statement A: Approved for public release; Distribution is unlimited.

**13. SUPPLEMENTARY NOTES** A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.

**14. ABSTRACT**

The United States military relies heavily upon sealift to conduct operations on foreign lands. The threat of an enemy submarine in an area of operations will have a significant impact on the U.S. ability to conduct operations in the littoral or on land. Antisubmarine warfare should no longer be conducted by just the navy - the threat posed by potential adversary's submarines is too great and too challenging to be conducted by the navy alone. Continuing with the recent efforts of Fleet ASW Command, the Navy must find a single voice to discuss ASW, its training, practices and doctrine throughout the joint force.

**15. SUBJECT TERMS**  
Antisubmarine warfare (ASW); submarine; littoral; Fleet ASW Command; intelligence, surveillance, and reconnaissance (ISR); logistics; operational functions

<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>  14	<b>19a. NAME OF RESPONSIBLE PERSON</b> Chairman, JMO Dept
<b>a. REPORT</b> UNCLASSIFIED	<b>b. ABSTRACT</b> UNCLASSIFIED	<b>c. THIS PAGE</b> UNCLASSIFIED			<b>19b. TELEPHONE NUMBER (include area code)</b> 401-841-3556

**NAVAL WAR COLLEGE  
Newport, R.I.**

**The Submarine and Operational Art: The Need for Joint ASW**

by

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LCDR, USN**

**A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.**

**Signature: \_\_\_\_\_**

**13 February, 2006**

## INTRODUCTION

**“ASW is both an art and a science. It has to do with investments in technology and it has to do with the art part, operational art.”**

**Admiral Walt Doran, COMPACFLT<sup>1</sup>**

Future operations and battles will require the United States to achieve battlespace dominance, particularly on the sea. Due to the United States’ reliance on sealift to supply its forces in combat away from home, the littoral regions are key to U.S. joint doctrine. A full 95% of all material required for American forces is sent by sea.<sup>2</sup>

The modern submarine is very capable and as a single tactical platform has the ability to shape the operational battlespace through near-mastery of many operational functions: fires, intelligence, movement and maneuver, and protection. As a tactical platform, the submarine affects more than the tactical arena – it can have operational and strategic effects as well.

The United States’ antisubmarine warfare (ASW) capability has recently been a focus of many top Navy leaders because for too many years it was thought to be unnecessary after the fall of the Soviet Union. After many years of interaction with Soviet submarines during the Cold War, the U.S. had nearly undisputed dominance in open-ocean ASW. Throughout the 1990’s the U.S. Navy, and in particular the submarine force, looked for new missions in order to remain relevant in the post-Cold War world.<sup>3</sup> The focus of operations for the U.S. Navy then shifted from the open-ocean battle with the Soviets or Russians to littoral operations near shore and in shallow water. U.S. joint forces are heavily dependent on access through the littoral regions of the world where most nations operate their submarines, to

conduct both sea and land operations, thus emphasizing the need for a robust ASW capability.

The U.S. Navy still contends that it can control the undersea battlespace, albeit with a Cold War era view of ASW. No longer are naval leaders concerned with the next big open ocean battle; instead they are concerned with protecting their fleet and friendly shipping in the congested, noisy and sometimes submarine-infested littoral waters of the world. Because of limited resources and shortened timelines for most future operations that the U.S. military is likely to undertake, the Navy doesn't have the luxury of performing the patient, "awfully slow warfare"<sup>4</sup> that was conducted during the Cold War.

As potential adversaries acquire and build modern submarines, both diesel- and nuclear-powered, the U.S. must consider what operational and strategic effects these tactical platforms will have on the actions of a joint force commander during future conflicts. As a result of the submarine's impact, the U.S. must revamp its ASW practices and doctrine to move beyond the Cold War model and into a truly joint era of ASW doctrine, training and practices.

### **ASW: A Quick History**

**"Just as the Navy is the enabling force for the other services, ASW is the enabling mission for the Navy."<sup>5</sup>**

Throughout the Cold War, submarines played a key role against the Soviet Union. The U.S. utilized fast attack submarines to keep track of Soviet ballistic missile submarines, always ready to sink them with a torpedo attack. Until the 1980's, the U.S. submarine force enjoyed a large acoustic advantage over its noisy Soviet counterpart. This afforded military

commanders a certain confidence about U.S. ASW capabilities, a confidence that still exists today but is slightly unfounded.<sup>6</sup>

With the introduction of the Soviet Akula class attack submarine in the mid 1980's, the U.S.'s acoustic advantage was nearly erased as the Soviets greatly expanded their acoustic quieting technologies<sup>7</sup>. This technology was transferred to Soviet ballistic missile submarines as well, significantly changing the ASW problem by making it more difficult to track the Soviet submarines. After the sudden collapse of the Soviet Union, the Russians still deployed a few of their submarines but eventually they were no longer seen as the menacing threat they once were.

Throughout the 1990's the U.S. Navy's ASW capability waned as other missions and roles were assigned to the various ASW platforms. Submarines were used in many other roles, with the greatest emphasis being placed on strike warfare and persistent intelligence, surveillance and reconnaissance (ISR) in numerous littoral regions of interest. Anti-submarine warfare aircraft were either re-tasked (as the P-3 was with overland missions) or were simply retired (as was the S-3 Viking). The ASW helicopter community previously had divided its capability into passive and active platforms, but has now combined all the capability into one platform, the MH-60R. Unfortunately, this is also the platform of choice to protect surface ships from swarming small boat attacks, as well as providing other services to the carrier strike group like mail and cargo transfer, radar surveillance and personnel transfer. The end result of the ASW holiday was a force that had much fewer platforms and limited proficiency in conducting ASW.

Not until 2003 did ASW return to the forefront as a major warfare area. It was then that Chief of Naval Operations Vern Clark established Task Force ASW which was directed

to review and study options available for revamping the Navy's ASW mission and pushing technology that can assist the fleet with ASW.<sup>8</sup> In April 2004, Fleet ASW Command was established to integrate ASW training and operations.<sup>9</sup> Fleet ASW Command has also written the Global ASW CONOPS, which is intended to provide uniform guidance when performing ASW, regardless of which theater the operation takes place.<sup>10</sup>

### **Current ASW Practices**

Modern submarines, especially diesel submarines operating submerged on battery power, are extremely quiet and thus difficult to detect. "With a competent crew and the kind of advanced weapons that are now widely available.... a modern non-nuclear submarine deployed in its own backyard might become a poor man's Akula,"<sup>11</sup> thus changing the perceived acoustic advantage that many in today's Navy believe the U.S. still enjoys. As occurred in the 1980's with the introduction of the extremely quiet Akula, the modern diesel submarine presents a huge challenge for today's joint force maritime component commander (JFMCC). He must be able to find, track, and if necessary neutralize enemy submarines in order to gain access to the littoral and allow the flow of forces and material required to conduct land operations.

Current thought in much of the Navy is that before a carrier strike group and the subsequent logistics ships are sent to an area of possible enemy submarine activity, the JFMCC will simply send one or two fast attack submarines to track and sink the enemy submarine.<sup>12</sup> The reality is far different. Antisubmarine warfare is a platform intensive operation that requires much more than one or two fast attack submarines. The submarine is still the best ASW platform, but it can no longer do it alone. Take, for example, the 2004 incident where a Chinese Han nuclear submarine was detected in Japanese territorial waters.

The tracking effort required a combined American and Japanese effort that consisted of multiple P-3 patrol planes, several ASW-capable destroyers, numerous ASW helicopters, a T-AGOS surveillance ship and multiple submarines.<sup>13</sup> The operation lasted for about one day and required a small fleet of ships, submarines and aircraft to track an old, noisy Chinese nuclear submarine.

In another example of a submarine tracking operation<sup>14</sup> it took four submarines, numerous P-3 aircraft, four destroyers and one ship with low frequency active sonar to track a quiet nuclear submarine. The operation lasted several days and was the focus for the entire theater of operations, including changes to the track plan of a carrier strike group – just because of one submarine.

Because of past successes in closely monitoring Soviet, then Russian, submarine activity, military commanders have come to expect that the U.S. Navy will be able to easily determine the precise location and activity of enemy submarines in any given environment. This too is far from the reality because of the extremely high noise level in the littoral areas where hundreds of vessels (fishing, merchant, military) operate in the vicinity of submarines that are very quiet and tremendously capable.

### **Submarines and the Operational Functions**

**“Nothing so traumatizes U.S. surface naval commanders as having even a few submarines out of home port and unlocated. In this sense, enemy submarines play a significant role just by remaining undetected.”<sup>15</sup>**

The submarine is first and foremost a tactical platform. But because of its versatility, it can have an enormous impact on the operational battlespace since it has the ability to conduct so many of the operational functions, particularly fires, intelligence, protection and command and control.

Operational fires and the submarine go hand in hand. A submarine can obviously conduct ship attacks, but can also perform land attack missions. Each type of fire has the ability to decisively shape the battlespace. Take, for example, a Chinese SONG diesel submarine launching land attack cruise missiles at the island of Guam, targeting the air force or naval base there. The same submarine could also conduct torpedo attacks against maritime prepositioning ships located at either Guam or Saipan. Either of these attacks would have a disastrous impact on the U.S. military's ability to perform large scale operations in the Pacific theater. Another example is an Iranian KILO diesel submarine operating in the Strait of Hormuz that sinks a U.S. warship or even a large supertanker as it enters or exits the Persian Gulf. Should that occur, the U.S. fleet commander would likely stop the flow of U.S. ships into or out of the Persian Gulf until the KILO was located and probably sank. Each example would have a profound strategic and operational impact on U.S. operations.

The submarine can also perform indirect fires through the clandestine insertion of special operations forces at a port berthing U.S. ships. Those forces could then perform sabotage or other attacks against U.S. forces in the port. Additionally, the mere threat of an enemy submarine's presence in an operating area affects how the U.S. forces will operate. In most cases, the high value units (aircraft carriers and logistics ships) along with most other shipping will be steered clear of the area until the area has been "sanitized" or the submarine has been located away from U.S. ships. By forcing the U.S. forces to change areas of operations or to delay operations in a specific area, the enemy submarine has effectively performed a sea denial mission.

The submarine is capable of collecting operational intelligence that most other platforms cannot accomplish since the submarine's stealth and potential for remaining undetected allow it to loiter in close proximity to its target. Whether it is a nuclear submarine operating near a U.S. port or a diesel submarine loitering near a choke point reporting on U.S. force movements, the use of a covert platform can provide extremely valuable intelligence while the target is unaware of the collection.

The same platform collecting intelligence near a choke point is capable of simultaneously providing operational protection by attacking U.S. forces entering the area. Remember the example of a U.S. warship being sunk by an Iranian Kilo – this could be considered protection of Iran by preventing U.S. access to waters near Iran. The submarine can also provide escort duty for surface ships, depending on the speed of advance required, by moving ahead of the fleet, checking for enemy ships and then either reporting their location or conducting attacks.

A submarine has the ability to impact command and control of forces by providing timely and actionable intelligence to higher authority. Most submarines, American included, do not have the communications capability to actually command and control forces, but the information provided by a submarine can allow more timely and better positioning of their nation's forces.

The remaining two operational functions are more concerned with what impact an adversary's submarine can have on U.S. logistics and movement and maneuver, rather than their own country's. As previously discussed, a submarine is able to conduct operational fires against U.S. ships. If those fires are directed at U.S. supply ships such as maritime prepositioning ships at anchor in Guam or Saipan, it would have a disastrous impact on U.S.

logistics for any operation in the Pacific theater. The loss of just one Large, Medium-speed, Roll-on/Roll-off (LMSR) ship carrying prepositioned equipment would drastically change the logistics train for U.S. forces: one LMSR is the equivalent of 300 C-17 Globemaster III or 220 C-5A Galaxy sorties.<sup>16</sup> The loss of the ship would not only greatly increase the timeline to supply the troops, but make it difficult for the military to find replacement equipment.

The exploits of American submarines in the Pacific theater of World War II provide a compelling example of how a submarine force can nearly cripple an enemy's seaborne logistic train. The U.S. submarine fleet comprised only two percent of the American Navy, yet it accounted for 55 percent of all Japanese ships sunk,<sup>17</sup> many of which were logistics ships. The Japanese lack of fuel for their ships and aircraft greatly hampered their efforts in the latter parts of the war.

Additionally, the presence, or mere threat, of an enemy submarine will change U.S. fleet movement and maneuver because of the hazard posed by that single submarine. Thus, the proper placement of an enemy submarine can drastically alter U.S. plans by denying access to coastal areas, by preventing movement of logistics ships into a port or by denying use of a specific area of the ocean.

Since any submarine can easily encompass so many of the operational functions and have such a profound impact on not only the maritime area of operations, but also on the land forces through attacks on logistics, it is imperative that the U.S. maintain ASW superiority over any potential adversary.

### **Then, Now and into the Future**

**“The threat of submarines can be solved only if the operational commanders seize control of this challenge and use all services and platforms.”<sup>18</sup>**

During the Cold War, ASW was a force on force event, usually one submarine tracking another. There was some cueing from other platforms or sensors, but it was primarily a sub-on-sub event. The U.S. had an abundant force structure that allowed accomplishment of this type of ASW. While there were high risks involved in this game of submarine cat and mouse, the U.S. felt its very survival was threatened by the Soviets and was thus willing to accept those risks.

In the post Cold War world the U.S. has fewer submarines and ships and is now facing more capable adversaries. Most conflicts are or will be distant from the United States and are seen as being fought for less than vital interests so there is less risk and sacrifice allowed.<sup>19</sup> Also, the U.S. does not have the force structure, nor does it enjoy the acoustic advantage over modern submarines that it had over Soviet submarines to do one on one submarine tracking. The U.S. Navy and the American population is very casualty averse. So, if faced with the possibility or the actual losses of ships at sea, “we will stop and eliminate that threat before proceeding, and.... its elimination will not be immediate and may take weeks.”<sup>20</sup>

In the foreseeable future, ASW must not be seen as just a Navy problem. While it is true that the Navy is the ASW expert, there are others that should have a keen interest in the ASW fight. The Army relies heavily on sea based prepositioning forces and a surge sealift fleet. The Marines get to the fight almost exclusively by ships. The Air Force would be required to meet the logistics demand by air if sealift is no longer a viable option (recall the number of air sorties to equal one LMSR ship). And the global economy is deeply reliant on merchant shipping – any disruption in the flow of oil supertankers from the Persian Gulf or

merchant ships through the Strait of Malacca would have devastating impacts on the world economy. Antisubmarine warfare is an essential warfare area that can prevent adverse actions against not only U.S. and friendly forces, but harmful attacks on the world's economy.

ASW should be performed by the rest of the American armed forces as well. The Air Force has a doctrine document, Countersea Operations, which discusses the use of Air Force aircraft in ASW, surface sea surveillance and antisurface ship warfare roles. With minimal training, Air Force pilots can be provided the necessary tools to accomplish ASW searches while enroute to other, more traditional Air Force missions. The same can be said for Navy and Marine Corps pilots that are not traditionally ASW-trained. "The first major hurdle to achieving joint ASW efforts is to train non-ASW crews on what to look for and how to pass the location of the submarine to the ASW commanders."<sup>21</sup> Only after the combatant commanders place the same emphasis on ASW as they do on strike warfare, will it truly reach the realm of joint warfare.

### **The Way Ahead**

**"ASW has become such an important warfare skill....that the United States no longer has the luxury of using solely naval forces."<sup>22</sup>**

First and foremost, it is necessary for American military leaders to move beyond the Cold War mentality that believes the U.S. will know the exact location and activity of all enemy submarines. This belief is unrealistic and requires too many assets to even attempt that level of fidelity. The joint force commander needs to consider the submarine threat during operational planning and realize it may take much longer to localize, let alone sink, a submarine than he desires. With that realization the joint force can produce realistic logistics

plans that account for added transit times or different sea ports of debarkation forced by the threat of an enemy submarine. The joint force commander, his staff, and especially the maritime component commander, should not be focused only on destroying enemy submarines, but ensuring they are unable to interfere with the desired U.S. courses of action. All too often the desire for kinetic action against an adversary prevents other options from being considered.

Second, the U.S. Navy must continue the recent trend of increasing focus on ASW proficiency, by concentrating on not only the tactics, but also the platforms. The Fleet ASW Command has reenergized the ASW community, but the assets required to conduct ASW have been tapped for too many other missions. With more missions there “is increased competition for space, training time and money”<sup>23</sup> – and the ASW mission has historically lost that competition to other missions.

Today’s carrier and expeditionary strike groups have very little organic ASW capability. The S-3 Viking has been retired<sup>24</sup> leaving the only organic airborne ASW asset as the H-60 variants which have a more limited range and capability than the S-3 did. The P-3 Orion is still a very capable ASW aircraft, but many other missions have pulled the P-3 away from ASW practice and proficiency. The success of overland ISR flights and even bombing in Afghanistan has led many leaders to call for greater use of the P-3 in such roles, all at the expense of ASW - its original mission.

The fast attack submarine fleet must not be reduced from its current size because it remains the best ASW platform in the U.S. arsenal. The 2001 Quadrennial Defense Review “specified a minimum force level of 55 SSNs (attack submarines) necessary to fulfill combatant commanders’ high priority needs.”<sup>25</sup> And with today’s attack submarine force of

54, the Combatant Commanders “currently want 150% times (sic) the ‘critical’ mission days that we (submarine force) can provide.”<sup>26</sup> With a build rate of one Virginia class SSN per year, by 2025, the U.S. submarine fleet would number less than 30.<sup>27</sup> Without a sizeable fast attack fleet, naval commanders will have very little ability to do long-dwell, extensive ASW operations prior to a fleet’s arrival in an area of operations.

Third, the U.S. Navy must resist the temptation to find a panacea for ASW through technology. An insight into this mindset was given by then-CNO, Admiral Vern Clark, who stated in 2004 that his goal was “to ‘fundamentally change’ ASW operations away from individual platforms – ship, submarine or aircraft – to a system with the attributes of ‘pervasive awareness, persistence and speed, all enabled by technological agility.’”<sup>28</sup>

Many other technologies have been promised to allow the Navy to “go off-board our platforms, using unmanned aerial, surface and underwater vehicles, and a network of distributed sensors to provide the identification and localization that would allow quick transition to the attack.”<sup>29</sup> As mentioned before, this focuses on kinetic action: the attack. While this may be the only option if an enemy submarine is operating in a littoral region that the U.S. must access, if a submarine is operating in a less confined area many other options should be considered. One option would be to utilize the future unmanned underwater vehicles to provide decoy services, providing the sound signature of the high value unit that could lure an enemy submarine in one direction while the real vessels transit in another direction. Another option is something that may not be a strictly military operation: information operations and diplomacy. Similar to Operation Noble Anvil in Kosovo, the U.S. could inform an adversary that if their submarine(s) are noted getting underway they will be sunk immediately. In this sense enemy submarines could essentially be defeated

while they are still in port. The bottom line is that the United States needs to seek out any and all means by which the military can prevent submarines from interfering with its desired courses of action.

Finally, the U.S. Navy should increase the level of attention on ASW in the joint world. This will require a concerted effort on the part of the Navy, and will only happen when the combatant commanders force their staffs to plan exercises that train a joint force to conduct ASW. These exercises must be conducted against realistic targets rather than U.S. nuclear submarines pretending to be a quiet diesel submarine. Initiatives such as the leasing of the Swedish submarine Gotland, which participated in numerous ASW exercises off the U.S. west coast in 2005-2006<sup>30</sup>, should be continued and expanded. In the PACOM theater, more extensive exercises that utilize more than a few U.S. ships and submarines, should be implemented with countries like Japan, Australia, India and Korea, although there are many more candidates. In the other theaters around the world, opportunities abound and the combatant commander is the force that can make them happen.

## **Conclusion**

**“The United States may dominate the surface and even the air, but until it can dominate the undersea space at and en route to operating areas, movements of forces may be in jeopardy.”<sup>31</sup>**

The U.S. Navy remains the premiere navy of the world – that is unquestioned. What the Navy must realize is while it is the best in the world, it will not be able to maintain that status without developing a more robust joint ASW doctrine. Technology will be a key enabler, but cannot be seen as the silver-bullet that will solve all the challenges of ASW. The Navy, and in particular the submarine force, should embark on an educational campaign to inform the military and civilian leaders in the Department of Defense of the threat

submarines pose not only to ships and submarines, but also to the services' logistics that are part of "highly coordinated timelines for major regional conflicts."<sup>32</sup>

The United States cannot afford to have another ASW holiday as happened in the 1990's. The efforts of Task Force ASW and Fleet ASW Command have made a difference since their inception in 2003 and 2004, but they must continue to press the Navy for money, time and assets to train the ASW forces. These commands must ensure they unify the efforts of the Navy towards ASW and not let each section of the Navy (air, surface, submarine) try to solve the ASW problem alone. Once the Navy is able to speak with one ASW voice, which must happen quickly, it will be able to make a case to the rest of the military for the importance of ASW.

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### Endnotes

<sup>1</sup> Admiral Walt Doran quoted in Nick Jonson, "U.S. Navy must invest in technology, training for ASW, Doran Says," Aerospace Daily, OCT 2003.

<sup>2</sup> "Command Brief," Military Sealift Command.

<sup>3</sup> Author's observation as a member of the submarine force.

<sup>4</sup> Admiral John Nathman, VCNO, quoted in Richard Burgess, "Awfully Slow Warfare," Sea Power. January 2005.

<sup>5</sup> Owen Cote & Harvey Sapolsky, Antisubmarine Warfare after the Cold War (Cambridge: MIT Security Studies Program), 3.

<sup>6</sup> Assessment based upon author's experience against numerous diesel and nuclear submarines.

<sup>7</sup> Cote & Sapolsky, p 10.

<sup>8</sup> Otto Kreisher, "As Underwater Threat Re-emerges, Navy Renews Emphasis on ASW," Sea Power, Oct 2004.

<sup>9</sup> Ibid.

<sup>10</sup> Due to the classification of the Global ASW CONOPS, it was not utilized as a source for this paper.

<sup>11</sup> Cote and Sapolsky, p 7

<sup>12</sup> Based on author's participation in numerous fleet and battle group exercises.

<sup>13</sup> Peter Dutton, "International Law and the Strategic Implications of the November 2004 'HAN Incident,'" (Unpublished Research Paper, Naval War College, Newport, RI: 2005), 2.

<sup>14</sup> Due to classification issues, the details have been omitted. The author has first hand knowledge of the operation.

<sup>15</sup> James H. Patton, "ASW is Back." US Naval Institute Proceedings, (February 2004).

<sup>16</sup> MSC Command Brief

<sup>17</sup> Naval Submarine League, United States Submarines, (Annandale: Barnes and Noble 2002), 134.

<sup>18</sup> Richard Farrell, "Revitalize ASW," US Naval Institute Proceedings, (December 2003).

<sup>19</sup> Cote and Sapolsky, p 15.

<sup>20</sup> Ibid, p 13.

<sup>21</sup> Farrell.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

<sup>24</sup> Norman Polmar, "Airborne ASW: A Critical Issue," US Naval Institute Proceedings, (April and May 2004).

<sup>25</sup> VADM Charles Munns, “Oral Statement,” U.S. Congress, House, Armed Services Committee, Subcommittee on Projection of Forces on the Nuclear Submarine Force – Past, Present, and Future. 15 June 2005, 6.

<sup>26</sup> Ibid.

<sup>27</sup> Norman Polmar, “Submarines under attack,” US Naval Institute Proceedings, (June 2005).

<sup>28</sup> Admiral Vern Clark quoted in Kreisher.

<sup>29</sup> Admiral Mark Kenney quoted in Kreisher.

<sup>30</sup> Audrey McAvoy, “USS Ronald Reagan Trains To Find Silent Threat,” Honolulu Star Bulletin, 22 January 2006.

<sup>31</sup> William J. Holland, “The Navy is more than hauling marines,” US Naval Institute Proceedings, (May 2004).

<sup>32</sup> Farrell.

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