

Intermediate Force Capabilities Countering Adversaries across the Competition Continuum

Peter Dobias, PhD; and Kyle Christensen

Abstract: This article outlines the relevance of intermediate force capabilities as a key enabler for North Atlantic Treaty Organization (NATO) operations in the gray zone.¹ NATO adversaries, well aware of the NATO thresholds for employment of lethal force, intentionally operate in a way that limits the alliance's options in crisis and conflict situations. At present, these options are often restricted to two extremes of mere presence or the use of lethal force. Summarizing almost two decades of NATO research into nonlethal/intermediate force capabilities, the article examines the applicability of these capabilities across the competition continuum. Finally, the article makes two key observations. First, it identifies future modeling and simulation requirements to represent employment of intermediate force capabilities, and second, it identifies possible promising research and development of subdomains in directed energy nonlethal weapons.

Keywords: hybrid warfare, gray zone, intermediate force capabilities

Introduction

The North Atlantic Treaty Organization's (NATO) 2030 Initiative and Strategic Concept commit the alliance to "prevent crises, manage conflicts and stabilize post-conflict situations" and "ensure that NATO has

Dr. Peter Dobias is the head of Land and Operational Commands Operational Research at Defence Research and Development Canada (DRDC). His earlier roles at DRDC included lead of the Maritime Forces Pacific Operational Research, lead of Metrics Team at Afghanistan-Pakistan Center of U.S. Central Command, and lead of Land Wargaming Group. Kyle D. Christensen is a strategic analyst at the Centre for Operational Research and Analysis, DRDC, Ottawa, Canada. He is currently science advisor at Canadian Joint Operations Command, where he provides strategic analysis advice to the senior leadership. His previous research postings include NATO's Joint Analysis and Lessons Learned Centre, Lisbon, Portugal; the Canadian Joint Warfare Centre, Ottawa; and the Directorate of Maritime Strategy, Ottawa.

Journal of Advanced Military Studies vol. 14, no. 1

Spring 2023

www.usmcu.edu/mcupress

<https://doi.org/10.21140/mcu.j.20231401010>

the full range of capabilities necessary to deter and defend against any threat to the safety and security of our populations.”² One of the challenges of the current security environment, where our adversaries, well aware of NATO thresholds for employment of lethal force, operate with impunity below the level of armed conflict:

Adversaries are undertaking acts of aggression that deliberately stay below the lethal force threshold or that ensure a lethal response from NATO would incur costs—undesired escalation, risks of collateral damage including civilian casualties, negative narratives, and other adverse strategic or political outcomes—to the Alliance.³

Examples of these activities range from dangerous aerial and maritime approaches, fomenting unrest in third countries, to sponsoring insurgencies and terrorist attacks. In short, NATO’s adversaries are undertaking acts of aggression that either deliberately stay below the level of armed conflict threshold or that ensure that any lethal response from NATO would incur costs such as undesired escalation or civilian casualties, all resulting in negative narratives and other adverse strategic outcomes.⁴

Currently, the NATO responses are often limited to two extremes of mere presence or applying lethal force, thus ceding the initiative to the adversaries. As will be discussed in this article, intermediate force capabilities help solve this military problem across the competition continuum, with concept experimentation (wargaming) results highlighting contributions that build through the stages of the *Framework for Future Alliance Operations*.⁵ These active means, such as directed energy nonlethal weapons (NLW), cyber, electromagnetic warfare, and information operations help to deliver effects beyond presence but below the threshold of using lethal force.⁶

This article, in summarizing the last 20 years of NATO research in NLW (and more recently intermediate force capabilities), shows how these capabilities could provide NATO with the ability to deter or counter adversaries’ activity in the gray zone and facilitate use of lethal force when the latter is justified. The next section discusses the current and future security and operational environment, considering the full spectrum from competition, through to confrontation, to an open conflict. It is then followed by the definition of intermediate force (IF) and intermediate force capabilities as proposed by a recently completed study under NATO Systems Analysis and Studies (SAS) designated SAS-151.⁷ After that, the recently developed NATO intermediate force capabilities concept and the associated wargaming campaign are described in greater detail. Finally, it is followed by a discussion of current capability deficiencies and future research and development opportunities as identified by the NATO SAS-151 wargaming campaign.

Security Environment: From Competition to Conflict

Analyses of the international security environment have increasingly drawn at-

tion to what is becoming understood as the “competition continuum,” often referred to as the gray zone.⁸ Military operations in the space between peace and war where states are currently involved in competition with each other presents unique challenges for military planners. A Rand study exploring these challenges defined the competition continuum (i.e., gray zone) as “an operational space between peace and war, involving coercive actions to change the status quo below a threshold that, in most cases, would prompt a conventional military response, often by blurring the line between military and non-military actions and the attribution for events.”⁹ *Competition Continuum*, Joint Doctrine Note (JDN) 1-19, defines the competition continuum as “a world of enduring competition conducted through a mixture of cooperation, competition below armed conflict, and armed conflict.”¹⁰ These definitions highlight several key aspects/characteristics of the competition continuum as a unique and challenging environment.

First, the competition continuum is truly a continuum and not several distinct zones, points, or steps along an escalation ladder. For instance, academic literature will often break the continuum down for illustrative purposes, such as into cooperation, collaboration, competition, confrontation/conflict, and/or clash/armed warfare.¹¹ This often gives the false impression that one transitions from one distinct zone to another. However, as noted in *Competition Continuum*, “The competition continuum is not a three-part [or four- or five-part] model substitute for the two-part peace/war model . . . [as] cooperation, competition below armed conflict, and armed conflict can occur simultaneously.”¹² As such, one can be involved in simultaneous interactions with the same strategic actor at different points along the competition continuum. Actors can also move up and down the continuum depending on the status of their relationship with another actor and even skip steps along the continuum. Thus, operationalizing activities in the competition continuum involves using all elements of state power (as will be described below) and controlling escalation/deescalation both vertically and horizontally.¹³

Second, adversaries will purposefully and actively try to blur the line(s) between zones in the competition continuum rather than reinforce their differences. One way this is most effective is when an adversary plays on the ambiguity of legal, political, and/or scientific aspects of attribution. This occurs most typically in the cyber domain and has caused challenges for NATO regarding whether a particular malicious act could trigger Article V.¹⁴ In this case, a state knows it has been attacked, but it is not 100 percent sure who is responsible for the attack.¹⁵ The most important of these lines, however, is to blur the line between outright war and the area of competition below armed conflict/open hostilities. This involves generating a situation where it is unclear whether a state of war exists, and if it does, who is a belligerent and who is not.¹⁶ An adversary who can confuse and obfuscate the fact that one is even being attacked holds a distinct strategic advantage in an engagement.

Third, conducting, exploiting, and taking advantage of activities below the

threshold of armed conflict has generally been perceived as a course of action pursued by weaker states against stronger states. Remaining below the threshold of armed conflict enables weaker states to pursue interests in opposition to stronger states and challenge stronger states because they no longer have to engage superior adversaries in head-to-head confrontations.¹⁷ However, exploiting the competition continuum below armed conflict is in fact being used in peer-to-peer or near-peer relationships, and even in situations where stronger states engage in and pursue interests and activities against weaker states.

Consequently, states are actively seeking ways and means to exploit seams and gaps in each other's defense capabilities and security architecture in the current strategic environment. Frank G. Hoffman notes that these activities encompass a "full range of different modes of warfare including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder. . . . [It] can be conducted by both states and a variety of non-state actors."¹⁸ Thus, activities in the competition continuum involve all elements of state power, actions aimed deliberately below the level of state-on-state use of force, and are typically synchronized and coordinated toward objectives in an organized manner to achieve synergistic effects.¹⁹ This is important because of the immediate relevance of these potential effects on security relationships and agreements. Actions below the level of overt conflict threaten a state's security interests by appearing to call into question its ability to defend its interests.²⁰

Finally, activities in the competition continuum are about seizing and maintaining the initiative, causing decision-making challenges, and creating strategic dilemmas for one's adversary. To use a well-known military decision-making framework, it is not about getting inside the observe–orient–decide–act (OODA) loop of an adversary, or about performing the OODA loop faster than an adversary, but about paralyzing and/or breaking the adversary's OODA loop. Ultimately, judicious and controlled application of gray zone tactics, techniques, and capabilities is to create strategic, operational, and/or tactical dilemmas for an opponent. As noted, the aim is to not so much challenge an opponent in a head-to-head confrontation, but rather to constrain the options available to them, thereby maximizing one's operational freedom of movement in the area between peace and war.²¹ Because these activities take place below the threshold of armed conflict, they paint opponents into a corner—constraining a state's military, diplomatic, economic, and political decision space by forcing them to either accept the emerging status quo or use force to resolve the dilemma.

Intermediate Force Capabilities and NATO

During the last two decades, NATO pursued a series of nonlethal weapons (NLW) studies. Of these, SAS-078 (NLW Capability-Based Analysis) resulted in the list of NATO NLW requirements approved by NATO Allied Command Operations and Supreme Allied Command Transformation and a list of iden-

tified NATO capability gaps.²² The study was based on a set of 37 security vignettes that were assessed during two seminar wargames sponsored by the Allied Command Transformation. While reflecting on the realities of the conflicts in Afghanistan and Iraq, the vignette set went beyond counterinsurgency and identified the requirements much more broadly. The identified vignettes encompassed land, maritime, and air operations and included port protection, boarding operations, counterterrorism in maritime and land domain, search and rescue, noncombatant evacuation, convoy operations, megacity failure, and a variety of counterinsurgency vignettes. There were 34 identified counter-personnel and countermateriel requirements across these 37 vignettes.²³ These included the requirement to warn, tag, stop, move, deny access, suppress, degrade, and disable personnel both individually and in groups in a variety of environments. Similarly, it included requirements to stop, move, degrade, and disable a variety of vessels and vehicles or disable sensor and weapon systems.

Between 2014 and 2017, SAS-094 studied and validated the NLW contribution to mission success.²⁴ This study reviewed lessons learned from Afghanistan and Iraq and executed a series of wargames and, in conjunction with NATO Defence Against Terrorism Programme of Work, two live NATO Non-Lethal Technology Experiments (NNTEX). The study demonstrated that in many scenarios (checkpoint and access control, patrol, maritime vessel boarding, search and seizure), NLWs enhanced time and space for decision making, improved mission success, and decreased both collateral damage and risk to allied troops.²⁵ For example, the final report from the maritime experiment observed: “Integrating non-lethal capabilities into the VBSS teams’ mission improved their operational effectiveness to warn, move, deny access, suppress individuals, and decrease civilian casualties,” and in the conclusions it states, “integrating non-lethal capabilities into VBSS missions demonstrated military utility during NNTEX-15M. The non-lethal systems of the Enhanced CAPSET provided the VBSS teams with additional, and more effective, escalation of force options while conducting their missions.”²⁶ Similarly, the NNTEX-15L concluded that “the non-lethal capabilities improved mission effectiveness, provided additional means of warning and communication, and significantly reduced likelihood of collateral damage.”²⁷

In 2018, the NATO SAS-133 study introduced the term *intermediate force capabilities* to replace the term nonlethal weapons. The latter term became somewhat controversial and insufficient to describe a wide range of capabilities to deliver often reversible effects that attempt to minimize undesirable casualties or material damage. Furthermore, the definition of nonlethal can be rather controversial, especially when including counter-materiel capabilities.²⁸

Finally, in 2019, the NATO SAS-151 study designed and implemented two wargames demonstrating the value of intermediate force capabilities in the maritime domain across tactical, operational, and strategic levels.²⁹ To enable this cross-level assessment, a novel approach to wargaming was developed.³⁰ This approach combined several distinct tabletop wargame approaches into

one. For the initial two games this approach consisted of a free kriegspiel (for the tactical/operational levels) and a matrix game (for the strategic level). However, this approach was later improved by adding additional structure to the kriegspiel and modifying the matrix game to include the use of a diplomatic-information-military-economic framework.³¹ The impact of intermediate force capabilities and the wargaming approach utilized for the SAS-151 wargame series were demonstrated at the 2020 NATO Concept Development and Experimentation Conference. Later, the NATO Military Committee tasked the Allied Command Transformation to develop an intermediate force capabilities concept, and SAS-151 was asked to support the effort.³²

In response to the tasking, SAS-151 and the Allied Command Transformation subsequently jointly proposed defining intermediate force as “force below lethal intent to temporarily impair, disrupt, delay, or neutralise targets across all domains” and intermediate force capabilities as “active means below lethal intent that temporarily impair, disrupt, delay, or neutralise targets across all domains and all phases of competition and conflict.”³³ Using this definition, intermediate force capabilities became a unifying term encompassing not only NLW (including variety of directed energy capabilities), but also electromagnetic warfare, cyber, influence/information operations, and even stability policing and use of special operations forces. Rand has conducted an independent study that leveraged a custom-built logic model, which was then applied to past operational vignettes.³⁴ The study addressed the questions of how NLWs contributed to the operation, which NLWs were most applicable in certain contexts, and the effects on adversary actions and tactical risk, among other insights.³⁵ The results of the study were twofold. One, the model showed that when related to the desired operational outcomes, these capabilities have commonalities that broadly address the hybrid warfare/gray zone requirements. And second, the application to past operational vignettes led to conclusions that the “key outcomes include improved gray-zone capabilities, the ability to operate in environments that would otherwise have been too risky, and enhanced perceptions of U.S. forces.”³⁶

Intermediate Force Capability Concept Development

The NATO intermediate force capabilities concept was developed and validated by SAS-151 through a series of wargames with the strategic environment progressing from competition to conflict. The first game focused on force protection tasks. These included access point control, handling noncompliant crowds, and dealing with small unmanned aerial systems used to harass or attack protected targets. The considered intermediate force capabilities were largely represented by directed energy nonlethal weapons. The wargame demonstrated the value of directed energy nonlethal weapons, but it also brought up the need to conduct a preemptive information operations campaign to stress the non-lethality/no permanent damage of these systems.³⁷

The second wargame focused on the use of intermediate force capabilities in

escalation management at the operational level, again in the maritime domain. While the focus remained on the directed energy nonlethal weapons, there was also an increased role for an information operations campaign. In this case, managing escalation at the tactical level (e.g., managing the threat of the use of force by the adversary's paramilitary units without resorting to lethal force) and extended decision-making space proved invaluable for strategic escalation management (i.e., prevention of a large-scale conflict). The intermediate force capabilities were critical in enabling friendly forces to execute the naval task group's air operations while the adversary simultaneously used small unmanned aerial systems to try to block these operations. The tactical use of intermediate force capabilities enabled the friendly forces to retain task group cohesion and consequently operational and strategic initiative and enabled them to manage escalation. However, the maritime domain wargame reinforced the need for preemptive information operations campaign focused on the safety of directed energy nonlethal weapons. The wargame also brought to attention the need for additional capabilities (electromagnetic warfare and cyber).³⁸

The third game shifted to the land domain (capacity building scenario) and began at a higher level on the strategic escalation ladder.³⁹ The scenario for the wargame involved hostile forces using lethal force against host nation and NATO forces. There was also a threat of an imminent escalation (invasion) of the host nation if NATO forces gave any justification to the opposing forces. The scenario contained the added complexity of hostile forces using civilians as human shields and increasing countermobility challenges for NATO forces. The hostile forces intentionally organized crowds to block NATO quick reaction forces, who were deployed to assist friendly forces under attack. From the friendly force perspective, the possibility of using intermediate force capabilities to facilitate lethal engagement was explored. The intermediate force capabilities enabled more targeted use of lethal force when required, while significantly reducing collateral damage (e.g., intermediate force capabilities stopping hostile vehicles or suppressing the adversary's targeting, to enable the more effective use of lethal force at the place and time of the friendly force's choosing). The wargame also showed that intermediate force capabilities could be effectively used to counter the use of civilians as a countermobility tool. The scenario suggested that the mobility of intermediate force capabilities may be more important than their range/power.⁴⁰

A series of two wargames focusing on the operational use of information operations was then conducted. These two games, apart from introducing a novel approach to wargaming information operations by creating an audience that, while removed from the information operations teams, still participated in information exchange and creation. The game assessed the effectiveness of various information operations capabilities and approaches in forming a strategic situation. One of the key observations was that it would be beneficial (and might be a strategic necessity) for NATO countries to provide intermediate force capabilities to partner/host nations in order to manage domestic esca-

tion, particularly when competing international actors are involved (e.g., another country leveraging its ethnic minorities as a destabilizing factor in another country).⁴¹

The final game involved joint operations (a contested noncombatant evacuation from a port at the beginning of interstate hostilities). The game tested the previously identified ends, means, and ways of intermediate force capabilities. For example, it considered intermediate force capabilities roles such as countermobility and countering an adversary's use of civilians in a countermobility role, crowd management, stopping/slowing vehicles and vessels, and countering small unmanned aerial systems. It validated the advantages of mobility versus range and power, and it also considered hostile intermediate force capabilities employment against NATO forces. One of the key observations from this particular wargame was the cost of inaction. Without intermediate force capabilities, the NATO forces had only two options: doing nothing or resorting to lethal force. From the strategic perspective both options were costly. NATO forces chose inaction, which led to severe strategic consequences and forced NATO countries to submit to the adversary's conditions. The outcomes of the game informed the final Allied Command Transformation intermediate force capabilities concept workshop and led to the final intermediate force capabilities draft submitted to the Allied Command Transformation.⁴²

Apart from informing concept development, the wargaming series led to a recommendation to further develop wargaming and modeling and simulation capabilities to enable better (and higher fidelity) representation of the intermediate force capabilities employment to support doctrine development and options analysis for intermediate force capabilities acquisition. An initial proof of concept was executed in August 2022 under the NATO SAS-MSG-ET-EZ study. The event involved integration of the Command Professional Edition™ (Command PE™) constructive simulation application with a strategic wargame scenario. It led to a series of recommendations that were incorporated in a proposal for a NATO SAS-MSG-180 study that has commenced this year. The study will have two objectives: 1) development of a federated intermediate force capabilities representation in constructive simulations, and 2) integration of modeling and simulation and wargaming to enable high-fidelity validation of tactical capabilities across all levels of warfare.⁴³

Capability Deficiencies and Research and Development Opportunities

Apart from leading to the development of the intermediate force capabilities concept, the wargame series provided some insights relevant for future research and development, particularly in the domain of directed energy nonlethal weapons. One system that stood out was the Active Denial System (mm wave).⁴⁴ This finding was consistent with the concurrent Rand study.⁴⁵ The games suggested that the mobility of the system was often more important than range. This was true about other systems such as the radio-frequency vehicle stopping

device as well. Game three and four also showed quite conclusively that the ability to mount these capabilities on armored vehicles and aircraft, particularly helicopters, would be a game changer.⁴⁶ Another capability gap, if addressed, that would provide a significant advantage, is a vehicle-/vessel-stopping device. Ideally, stopping devices should be controllable remotely and should be able to stop large systems, including armored vehicles.⁴⁷

However, the games also conclusively demonstrated that legacy less-lethal and NLW systems (e.g., batons, pepper spray/tear gas, rubber bullets/bean-bag rounds, electro-muscular incapacitation devices [e.g., the Taser™], etc.) can be counterproductive as they can create the impression of the use of excessive force. During the wargame, their employment led to unintended escalation and helped fuel the adversary's narrative that NATO was participating in the oppression of ethnic minorities. In contrast, the directed energy nonlethal weapons were effective at minimizing negative effects. Nevertheless, even long-range directed energy systems were effectively countered by staying out of range of the system. Thus, the notional mobile systems performed much better and had greater operational effect.⁴⁸

Conclusions and Recommendations

NATO adversaries are undertaking acts of aggression that deliberately stay below the lethal force threshold or that ensure a lethal response from NATO would incur undesirable cost to the alliance.⁴⁹ NATO capabilities to counter gray-zone actions are limited, particularly at the tactical level, and consequently NATO forces could plausibly find themselves in a situation where the only two options are doing nothing or using lethal force. Both of these reactions might have very negative operational or strategic consequences through emboldening adversaries (former) or unwanted escalation and miscalculation (latter). Intermediate force capabilities provide NATO and its members with a range of options between these two extremes and consequently would enable them to:

- Better manage escalation below the threshold of an armed conflict;
- Better manage escalation in the context of irregular warfare;
- Manage situations where an adversary uses civilians as a weapon (e.g., in countercountermobility scenarios);
- Maintain force protection options in situations where the use of lethal force may be undesirable or problematic from a collateral damage perspective (e.g., in the vicinity of critical infrastructure); and
- When appropriate, facilitate the more effective use of lethal force while reducing undesirable effects.

However, the past research also revealed limitations of the use of tabletop wargames for options comparison between specific intermediate force capabilities.⁵⁰ Furthermore, tabletop wargames in general have limited ability to model small unit/platform-level performance. Since further research work is required into doctrine and techniques, tactics, and procedures of intermediate force ca-

pabilities employment, it will be necessary to develop improved fidelity of intermediate force capabilities representation through computer-assisted wargames. At the same time, it is necessary to maintain the ability to assess operational and strategic implications of the intermediate force capabilities employment.⁵¹ At present, there is limited representation of intermediate force capabilities in existing computer wargames; adding capabilities that rely on cognitive responses may be nontrivial.⁵² To address these challenges, NATO Science and Technology Board approved a bipanel study designated SAS-MSG-180 that will work on: a) development of better representation of intermediate force capabilities in constructive simulations and b) working on modeling and simulation wargaming integration to improve the ability to assess operational and strategic benefits of intermediate force capabilities (and by extension any cross-domain/cross-level capabilities). The expectation is that this study will result in the intermediate force capabilities representation in existing computer-assisted wargames, while preserving the ability to assess the impact of intermediate force capabilities employment at the operational and strategic level developed by SAS-151.

The second observation, consistent between SAS-151 and the Rand logic model, is that not all intermediate force capabilities have equal tactical and operational benefits. Consistently during wargames, legacy NLW systems (batons, CS gas, rubber bullets, etc.) were the least effective, while the directed energy nonlethal weapons showed the most promise.⁵³ Of particular benefits in the games were the active denial system (to ensure allied forces' mobility in the presence of civilians), high-power microwave counterunmanned aerial systems, and radio frequency vehicle stopping devices (including the ability to slow or stop heavy vehicles up to and including tanks). One of the observations consistent across all the games was that the range of these systems was secondary to mobility. That means that the capability requirements should prioritize the size, shape, and power requirements over the range. SAS-151 study concluded that small and light enough directed energy nonlethal weapons capabilities to be suitable for airborne and small armored vehicle applications would be more beneficial than having long-range systems.⁵⁴

In summary, more than 20 years of NATO intermediate force capabilities/NLW research showed potential tactical and operational benefits of these capabilities in deterring and countering hostile activities in the gray zone. Future research needs to explore intermediate force capabilities representation in computer-assisted wargames and simulations to enable high-fidelity options comparison for acquisition and doctrine development at individual/platform level.

Endnotes

1. When the authors cite NATO documents, they may reference sources that are not currently publicly available and are part of the authors' personal document collections.
2. *NATO 2030: Making a Strong Alliance Even Stronger* (Brussels, Belgium: NATO, 2021); "Brussels Summit Communique," press release, 14 June 2021; and "Active En-

- agement, Modern Defence: Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization,” NATO, November 2010.
3. NATO Intermediate Force Capability Concept, Fourth Draft, Submitted to NATO Supreme Allied Command Transformation in December 2021.
 4. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, NATO STO TR-SAS-151, December 2022.
 5. *Framework for Future Alliance Operations* (Rome, Italy: NATO Defence College, 2018).
 6. NATO SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex E: Draft intermediate force capabilities Concept, NATO STO TR-SAS-151, December 2022.
 7. Systems Analysis and Studies is a research panel under NATO Science and Technology Organization. The studies executed by this panel bear designation SAS-XYZ, where XYZ is the number assigned to the study.
 8. A review of available literature reveals terms such as irregular, asymmetrical, unconventional, unrestricted, nonlinear, nontraditional, new generation, next generation, full spectrum, political warfare, lawfare, multinodal, multivariant, and pan-domain. Frank G. Hoffman, “Examining Complex Forms of Conflict: Gray Zone and Hybrid Challenges,” *PRISM* 7, no. 4 (2018): 30–47.
 9. Lyle J. Morris et al., *Gaining Competitive Advantage in the Gray Zone: Response Operations for Coercive Aggression Below the Threshold of Major War* (Santa Monica, CA: Rand, 2019), 8, <https://doi.org/10.7249/RR2942>.
 10. *Competition Continuum*, Joint Doctrine Note 1-19 (Washington, DC: Joint Chiefs of Staff, 2019), 2.
 11. Susan LeVine, “Beyond Bean Bags and Rubber Bullets: Intermediate Force Capabilities Across the Competition Continuum,” *Joint Force Quarterly*, no. 100 (2021): 19–24; and Mikael Weissmann, “Hybrid Warfare and Hybrid Threats Today and Tomorrow: Towards an Analytical Framework,” *Journal on Baltic Security* 5, no. 1 (2019): 17–26, <https://doi.org/10.2478/jobs-2019-0002>.
 12. *Competition Continuum*.
 13. Erik Reichborn-Kjennerud and Patrick Cullen, “What Is Hybrid Warfare?,” policy brief, Norwegian Institute for International Affairs, January 2016.
 14. Christopher Porter and Klara Jordan, “Don’t Let Cyber Attribution Debates Tear Apart the NATO Alliance,” *Lawfare* (blog), 14 February 2019.
 15. A corollary to this situation is when a state is sure who undertook the attack but does not have sufficient evidence. Rory Cormac and Richard J. Aldrich, “Grey Is the New Black: Covert Action and Implausible Deniability,” *International Affairs* 94, no. 3 (2018): 477–94, <https://doi.org/10.1093/ia/iyy067>.
 16. Cormac and Aldrich, “Grey Is the New Black.”
 17. *Countering Anti-Access/Area Denial Challenges: Strategies and Capabilities* (Singapore: S. Rajaratnam School of International Studies and Institute of Defence and Strategic Studies, 2017).
 18. Frank G. Hoffman, *Conflict in the 21st Century: The Rise of Hybrid Wars* (Arlington, VA: Potomac Institute for Policy Studies, 2007), 8.
 19. Frank G. Hoffman, “The Contemporary Spectrum of Conflict: Protracted, Gray Zone, Ambiguous, and Hybrid Modes of War,” in *2016 Index of U.S. Military Strength* (Washington, DC: Heritage Foundation, 2016); and Hal Brands, “Paradoxes of the Gray Zone,” Foreign Policy Research Institute, 5 February 2016.
 20. Bastian Giegerich, “Hybrid Warfare and the Changing Character of Conflict,” *Connections* 15, no. 2 (Spring 2016): 65–72.
 21. Andrew F. Krepinevich, Barry Watts, and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003).
 22. NATO SAS-078 Research Task Group, *NATO Non-Lethal Weapons Capabilities-Based Assessment*, NATO RTO-TR-SAS-078, December 2012; and NATO SAS-078 Re-

- search Task Group, *NATO Non-Lethal Weapons Capabilities-Based Assessment*, Annex C: SAS-078 NLW Requirement Descriptions, NATO RTO-TR-SAS-078, December 2012.
23. NATO SAS-078 Research Task Group, *NATO Non-Lethal Weapons Capabilities-Based Assessment*, chap. 2, NATO RTO-TR-SAS-078, December 2012.
 24. NATO SAS-094 Research Task Group, *Analytical Support to the Development and Experimentation of NLW Concepts of Operation and Employment*, NATO STO-TR-SAS-094, April 2017.
 25. NATO SAS-094 Research Task Group, “Analytical Support to the Development and Experimentation of NLW Concepts of Operation and Employment.”
 26. K. Sheehy, *NATO Non-Lethal Technology Exercise 2015 Maritime (NNTEX-15M) Military Utility Assessment*, Defence Against Terrorism Programme of Work, October 2015.
 27. P. Dobias and C. Eisler, *NATO Non-Lethal Technology Exercise (NNTEX) 16-Land: First Look*, NATO Science and Technology Organization, October 2016.
 28. NATO SAS-133 Research Task Group, *Addressing Obstacles to the Acquisition, Deployment, and Employment of Non-Lethal Weapons—Using Intermediate Force to Bridge the Gap between Presence and Lethal Force*, NATO STO-TR-SAS-133, March 2020.
 29. Kyle Christensen et al., *Use of Intermediate Force Capability Game Series: Game 1—NATO Naval Task Group in Port*, Scientific Letter, DRDC-RDDC-2020-L180, Ottawa: Defence R&D—CORA, October 2020; and NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex F: Use of Intermediate Force Capability Game Series: Game 2—NATO Naval Task Group in Confined Waterway, NATO STO TR-SAS-151, December 2022.
 30. Kyle Christensen and Peter Dobias, “Wargaming the Use of Intermediate Force Capabilities in the Gray Zone,” *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* (2021): <https://doi.org/10.1177/15485129211010227>
 31. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex I: Use of Intermediate Force Capability Game Series: Game 4—Contested Non-Combatant Evacuation Operation Scenario, NATO STO TR-SAS-151, December 2022.
 32. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex A, NATO STO TR-SAS-151, December 2022.
 33. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*.
 34. Krista Romita Grocholski et al., *How to Effectively Assess the Impact of Non-Lethal Weapons as Intermediate Force Capabilities* (Santa Monica, CA: Rand, 2022), <https://doi.org/10.7249/RR654-1>.
 35. Grocholski et al., *How to Effectively Assess the Impact of Non-Lethal Weapons as Intermediate Force Capabilities*.
 36. Grocholski et al., *How to Effectively Assess the Impact of Non-Lethal Weapons as Intermediate Force Capabilities*.
 37. Christensen et al., *Use of Intermediate Force Capability Game Series*.
 38. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*.
 39. By “higher level on the strategic escalation ladder,” the authors mean the third game started closer to the open conflict—below the armed conflict line than the previous games.
 40. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex G: Use of Intermediate Force Capability Game Series: Game 3—Land Operations, NATO STO TR-SAS-151, December 2022.

41. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex H: Use of Intermediate Force Capability Game Series: Information Operations and Information Warfare, NATO STO TR-SAS-151, December 2022.
42. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex I: Use of Intermediate Force Capability Game Series: Game 4—Contested Non-Combatant Evacuation Operation Scenario.
43. NATO Exploratory Team SAS-MSG-ET-EZ, *Proof-of-Concept for Integrated Simulation and Wargaming Approach to Representing Intermediate Force Capabilities*, NATO STO-TM-SAS-MSG-ET-EZ, December 2022.
44. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*.
45. Grocholski et al., *How to Effectively Assess the Impact of Non-Lethal Weapons as Intermediate Force Capabilities*.
46. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex G and Annex I, NATO STO TR-SAS-151, December 2022.
47. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex G and Annex I.
48. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex G and Annex I.
49. NATO Intermediate Force Capability Concept, Fourth Draft, Submitted to NATO Supreme Allied Command Transformation in December 2021.
50. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*.
51. Christensen and Dobias, “Wargaming the Use of Intermediate Force Capabilities in the Gray Zone.”
52. NATO Exploratory Team SAS-MSG-ET-EZ, *Proof-of-Concept for Integrated Simulation and Wargaming Approach to Representing Intermediate Force Capabilities*, NATO STO-TM-SAS-MSG-ET-EZ, December 2022.
53. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*; Grocholski et al., *How to Effectively Assess the Impact of Non-Lethal Weapons as Intermediate Force Capabilities*; and NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*.
54. NATO Research Task Group SAS-151, *Intermediate Force Capabilities (intermediate force capabilities) Concept Development and Experimentation to Counter Adversary Aggression*, Annex I: Use of Intermediate Force Capability Game Series: Game 4—Contested Non-Combatant Evacuation Operation Scenario.